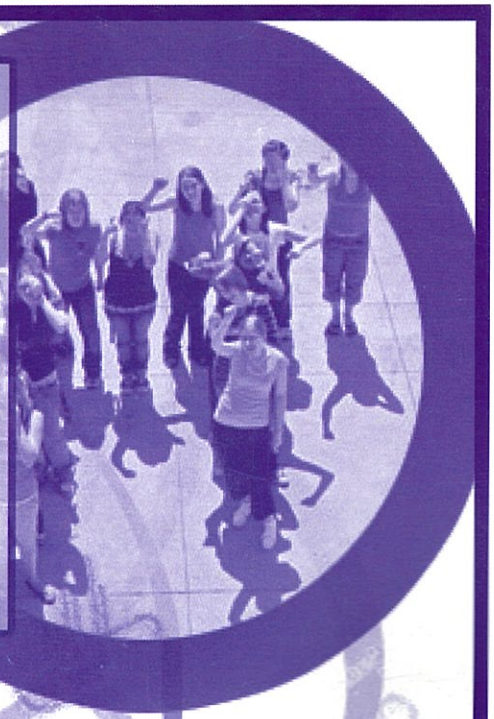
WISEST

women in scholarship, engineering, science & technology



WISEST Summer Research Program 2007

Student Reports

WISEST AT THE UNIVERSITY OF ALBERTA

Women in Scholarship, Engineering, Science and Technology

WISEST is a University of Alberta-based organization whose vision is to strengthen science by increasing gender diversity and to enhance choices in science, engineering, scholarship and technology for women of all ages. Our programs foster collaboration and communication with partners in industry, in academia and education, and in government and non-governmental organizations in the community.

WISEST was founded in 1982 with a mandate to investigate the reasons why few young women are choosing careers in the sciences and engineering, to take action to alter the situation, and to work to increase the percentage of women in decision-making roles in all fields of scholarship.

The purpose of WISEST is to initiate action to increase the representation of women in all fields of scholarship. The studies and actions of WISEST are concentrated in the under-represented decision-making fields of science, engineering and technology.

WISEST CHAIR
Dr. Lorne Babiuk,

WISEST VICE-CHAIR
Gail J. Powley, P. Eng.

WISEST COORDINATOR
Grace Ennis

WISEST STUDENT COORDINATORS
Natasha Kuzbik
Robyn Ferguson

GRAPHIC DESIGNER
Rina Chan

PHOTOGRAPHY
Weiyang Liu

RESIDENT ADVISOR
Megan Wagner

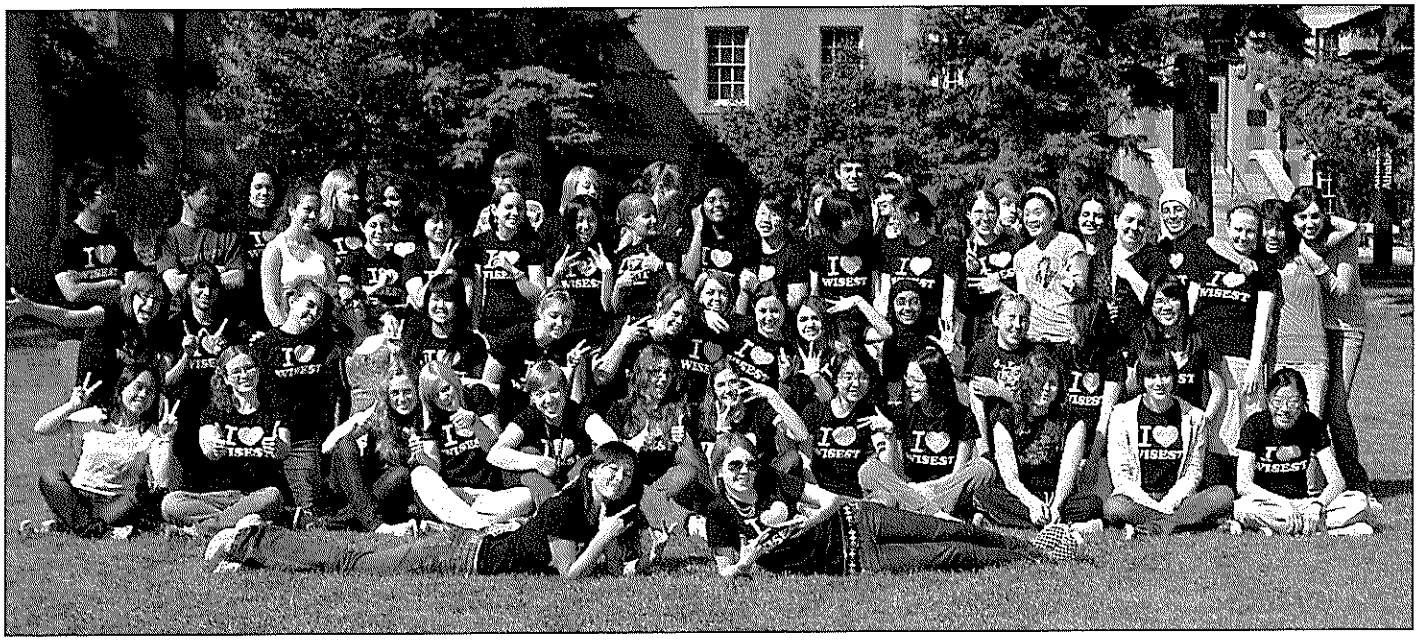
COVER DESIGN
Siwei Chen

WISEST EVENTS DESIGN
Kamalashri (Mimmy) Easwara Murthi

REPORT DIVIDER DESIGN
Shannon Huebert

CONTACT US AT:
WISEST
295 CAB
University of Alberta
Edmonton, Alberta T6G 2G1

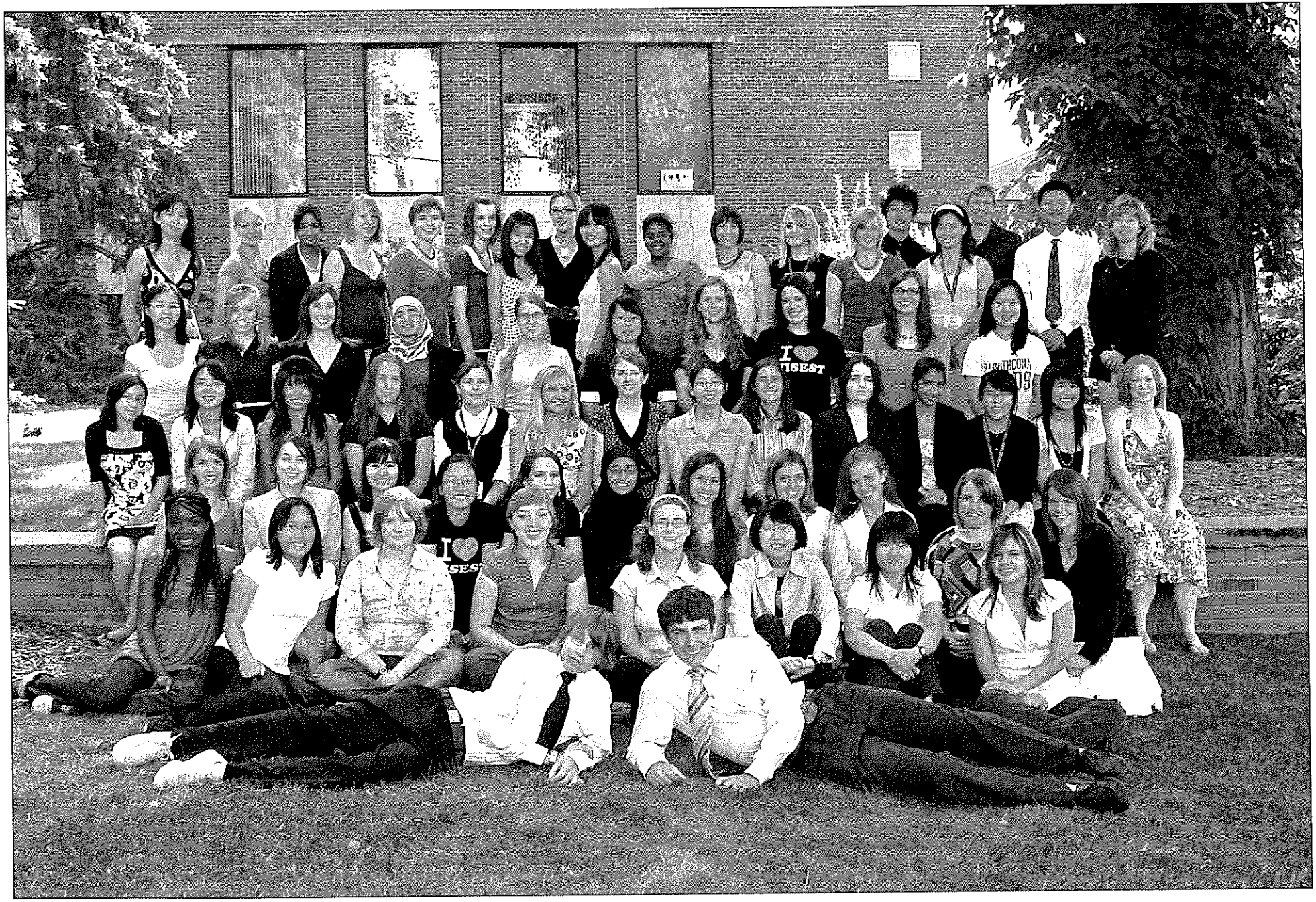
Telephone:780.492.1842
E-mail: wisest@ualberta.ca
www.wisest.ualberta.ca

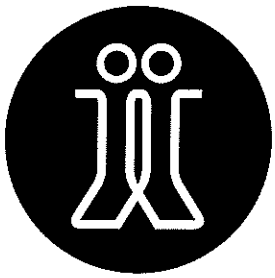


WISEST SUMMER RESEARCH PROGRAM 2007

STUDENT REPORT BOOK

2007 WISEST SUMMER RESEARCH PROGRAM STUDENTS





WISEST SUMMER RESEARCH PROGRAM 2007
STUDENT REPORT BOOK - CONTENTS

from left to right: Robyn Ferguson, Grace Ennis, Natasha Kuzbik and Gail Powley

THE ANNUAL WISEST SUMMER RESEARCH PROGRAM

By Grace Ennis [WISEST Coordinator] and Gail J. Powley, P.Eng [WISEST Vice-Chair]

IN EARLY 1982, while attending a seminar on microprocessors, Dr. Gordin Kaplan (then the University of Alberta Vice-President, Research) noted that there was only one woman among the 150 people present. This triggered the creation of a new group to promote participation of women in the non-traditional careers – Women in Scholarship, Engineering, Science and Technology (WISEST). The primary job of this group, said Dr. Kaplan, is to try to understand why women are under-represented in the hard sciences and engineering, and then do something about it. Since women are still markedly under-represented in decision-making roles in the sciences and engineering, WISEST has concentrated its efforts to date on these fields. WISEST began by investigating why relatively few young women choose and remain in careers in the sciences and engineering and then initiated several on-going programs to change the situation.

One of the first major initiatives was the WISEST Summer Research Program, a valuable six-week research experience at the University of Alberta for high school students who are making decisions about their future fields of study and career paths. Students (both young women and men) who have completed grade 11 spend six weeks working as a member of a research group within disciplines less traditional to their gender. For young women, these areas include engineering, science, and technology, and for young men, the areas of nursing, nutrition and human ecology.

The WISEST students have written personal reflections about the experiences they had in the Program and in the research laboratories under the supervision of their scientist mentors and fellow research team members. They learned first-hand about cutting-edge research, the techniques and types of research being conducted, the research career opportunities available, and they gained an introduction to academic and university life. A variety of formal weekly activities gave the students even more information about non-traditional areas of study. The student reports describe in their own words the six weeks of learning, hard work, mistakes and triumphs, and the amazing discoveries both in and outside of the lab.

The success of the WISEST Summer Research Program is due to the support of many, many people, including high school science teachers, faculty supervisors, and research team members. We offer our thanks and words of sincere appreciation to all high school teachers who sparked their students' interest in the Program, and to all university people who mentored, guided and encouraged the WISEST students to explore their interests.

WISEST would also like to acknowledge the financial support given by many local industries, philanthropic groups, the Provincial and Federal governments, and the University of Alberta. As Partners and Contributors, their sponsorship allowed WISEST to pay the students an hourly wage and give them a variety of resources and experiences. Each sponsorship allowed WISEST to recruit one more student to participate and gain valuable life experience from the Program. A detailed listing of the WISEST Partners and Contributors is included in this book and on our web page www.wisest.ualberta.ca

The WISEST students have now returned to their final year of high school to share with classmates and teachers their increased awareness of the research careers that are so vital to Alberta's future as a knowledge-based centre. We wish the WISEST students all the best in their future endeavours.

WISEST
women in scholarship, engineering, science & technology

I have no doubt that the future is bright for all of you, and that you will excel in whatever you decide to do.

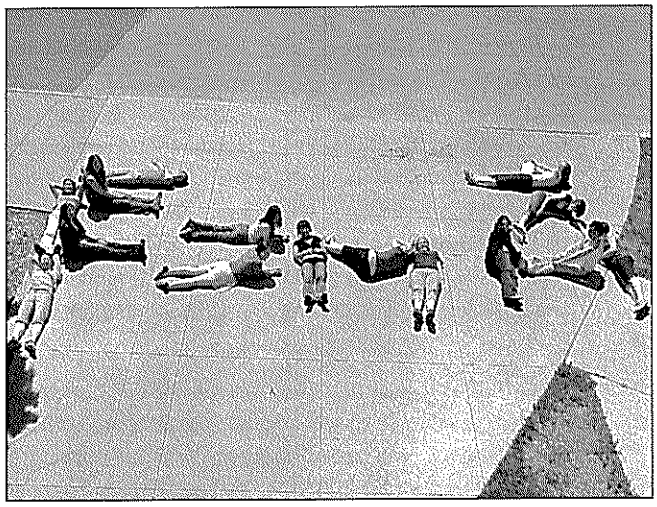
WISEST SUMMER RESEARCH PROGRAM Natasha Kuzbik [WISEST Student Coordinator]

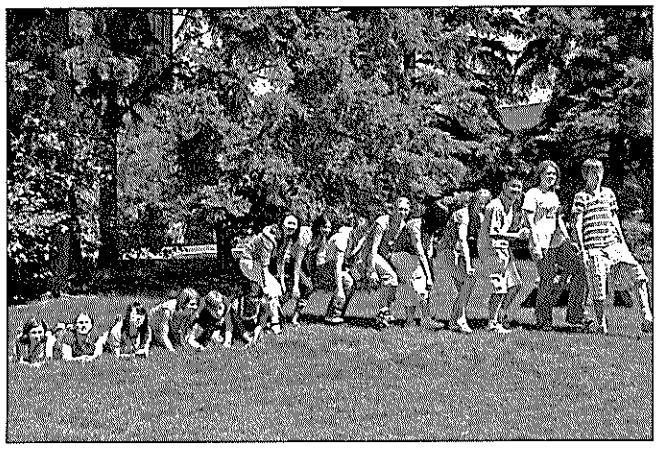
PART OF ME WISHES THE SUMMER OF 2007 was not over, and not only because fall is quickly turning into winter! This summer was a truly amazing experience. Although it was my job to inspire you to consider non-traditional studies, I found that you equally inspired me. Seeing your faces light up when you described your research project reignited my own passion for research. It was exciting to hear about all of the diverse studies taking place under "one roof" here on campus, bringing new excitement to the many different possibilities out there for both you and me.

Robyn and I both could not have asked for a better group of students to work with. There are so many fond memories from the summer, from the stories about your labs and residence, to the Great Egg Drop, and of course your "mad golf skillz". However, my favourite memory was without a doubt seeing so many of you decide to choose a career that follows your passion. If anything, this is the greatest lesson to learn from the Summer Research Program.

It was so great to finally meet all of you after pouring over your applications, as well as to watch you grow over the short six-week period of the program. Just think of how much everyone has changed from the first day, where you were anxiously listening to Robyn and I describe the six-week program, to the last day, where we were proudly listening to you describe your research poster. I was proud to see what you could accomplish in the lab in such a short time, as well as to see each of you grow more independent and confident. University, here you come!

I wish you all the best in the coming years. You are all hard-working, intelligent young women and men. I have no doubt that the future is bright for all of you, and that you will excel in whatever you decide to do. Sure, life may throw you a few curve balls – but you have the skills and abilities to land back on your feet. I cannot wait to see where all of our feet have landed ten years from now!





I am truly grateful to have had the opportunity to meet each and every one of you.

THE EXPERIENCE OF A LIFETIME By Robyn Ferguson [WISEST Student Coordinator]

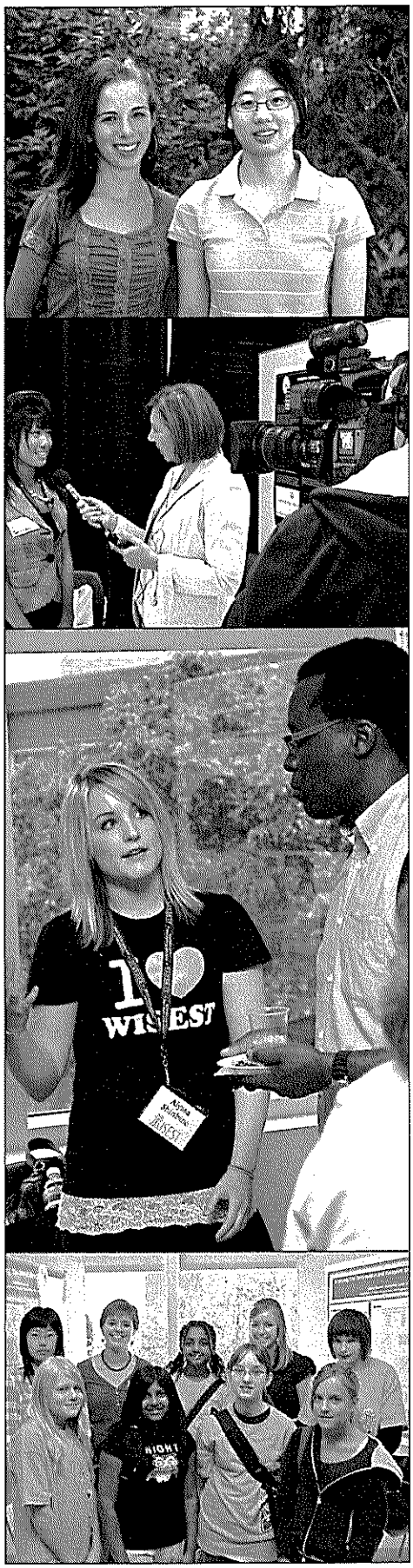
THE 2007 WISEST SUMMER RESEARCH PROGRAM was the experience of a lifetime for me – and I wasn't even working as a part of a research team! You all made this summer an incredible one for me, and I would like to thank you for the memories. From the stories about your research experiences to learning more about you as individuals, from hearing about the stories from residence to watching you compete (although "compete" might be an understatement!) in the Science Olympics, from "smoking golf balls in the woods" to watching you all proudly present your research posters, you all made this summer one that no one will soon forget!

From the time that Natasha and I started reading through your applications, we knew it was going to be a great summer. We couldn't have hoped to have worked with and had the opportunity to get to know a better group of students. We were given the chance to watch you grow and mature over the summer, and you did not disappoint. You all displayed not only a passion for the sciences, but also for excellence. The best part for me, however, was not just that you were exceptionally bright individuals who were always striving to do your best, but that each and every one of you was also such an enthusiastic, interesting, and truly good person. I am truly grateful to have had the opportunity to meet each and every one of you.

I know that coming into the Summer Research Program this year, many of you hoped that you would find your future calling. Although a few lucky individuals may have, from most of the stories I have heard, WISEST has only exposed you to so many more options than you had ever dreamed were available to you. It's important to recognize that that's okay too – in fact, it might actually be better! I think that the more well-informed you are when deciding upon your future schooling and career path, the better chance you will have at finding out what career is perfect for you. Don't worry – you still have plenty of time to make a decision and explore the many opportunities out there that are available to you.

I would like to take this opportunity to wish each and every one of you the best of luck in your grade 12 year and beyond. You are all fabulous individuals with the knowledge and skills to get whatever you want to out of life. Take care, and hopefully I will see some of you around campus next year!

WISEST SUMMER RESEARCH PROGRAM 2007 PARTNERS AND CONTRIBUTORS



Partners

- Alberta Advanced Education and Technology
- Alberta Heritage Foundation for Medical Research
- Alberta Employment, Immigration and Industry (Summer Temporary Employment Program)
- Alberta Ingenuity Fund
- Alberta Education
- Alberta Environment
- Alberta Research Council
- Alberta Women's Science Network (AWSN)
- Allard Foundation
- Canadian Information Processing Society
- Canadian National Railways
- Capital Health, Edmonton Area
- Dow Chemical Canada Inc., Western Canada Division
- Edmonton Glenora Rotary Club
- Elk Island Public Schools Regional Division No. 14
- Enbridge Inc.
- Epsilon Chemicals Ltd.
- GlaxoSmithKline
- Human Resources and Skills Development Canada (Canada Summer Jobs)
- iCORE, Informatics Circle of Research Excellence
- Merck Frosst Canada Ltd.
- Process Solutions Canada
- Suncor Energy Foundation
- Syncrude Canada Ltd.

University of Alberta
- Faculty of Agriculture, Forestry and Home Economics
- Faculty of Engineering
- Faculty of Medicine and Dentistry
- Faculty of Nursing
- Faculty of Science
- Centre for Math, Science, Technology Education
- Department of Civil and Environmental Engineering

- Weyerhaeuser

Contributors

- APEGGA (Association of Professional Engineers, Geologists and Geophysicists of Alberta)

PARTNERSHIP WITH WISEST

- WISEST encourages women in science and prepares them for the future, allowing Alberta to utilize everyone's talents. Careers in the fields of science, engineering and technology are what the Alberta and federal governments call the pivotal jobs for the 21st century. The WISEST Summer Research Program excites young people about these vital areas where there continue to be persistent gender patterns.
- WISEST invites you to become a Partner or a Contributor to the WISEST Summer Research Program. Your donation will allow students to become active members of a research team at the University of Alberta, to learn about research in science and engineering, meet the people who work in these fields and broaden their awareness of the diverse career opportunities.
- Partnerships are $3000 per student placement. More than 90% of the sponsorship goes directly to the students as wages and costs for their student program activities. Official tax receipts are issued to Partners and Contributors by the University of Alberta.
- There are several opportunities for Contributors, including sponsorship of special events, partial sponsorships of student placements, and donations to a separate endowment fund to support rural students who need financial assistance to temporarily relocate to the city for WISEST summer employment.
- Partners and Contributors see the impact of their donations at celebratory functions with the students, in the media, in comprehensive program publications, and in our publicity material (e.g. newsletters and website).
- Please contact us at the WISEST office for further information about any of our initiatives.

Telephone: 780.492.1842
E-mail: wisest@ualberta.ca
Website: www.wisest.ualberta.ca

WISEST
women in scholarship, engineering, science & technology

❑ **Yes, we would like to become a Partner of the 2008 WISEST Summer Research Program.**

We will sponsor _____ student(s) at the $3000 per student.

We would appreciate further information. Please contact us.

❑ WISEST Summer Research Program
❑ Margaret-Ann Armour Endowment Fund for Rural Students
❑ A unique and special event in the Program
❑ Please contact us to discuss possibilities
(e.g. Celebration of Research, Guest speakers, Tours of research facilities, Teachers' Research Day).

Please return form to:
WISEST
295 CAB
University of Alberta
Edmonton, Alberta T6G 2G1

Company Name: _____
Contact Person: _____
Address: _____ Phone: _____
Fax: _____ Email: _____

Women in Scholarship, Engineering, Science and Technology.

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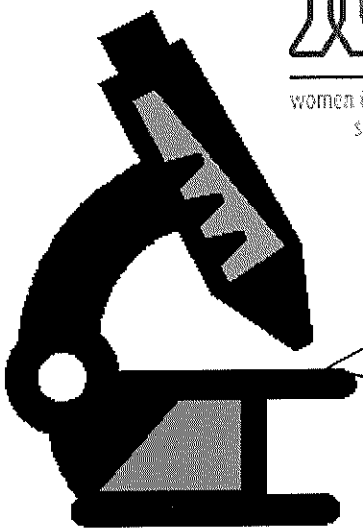
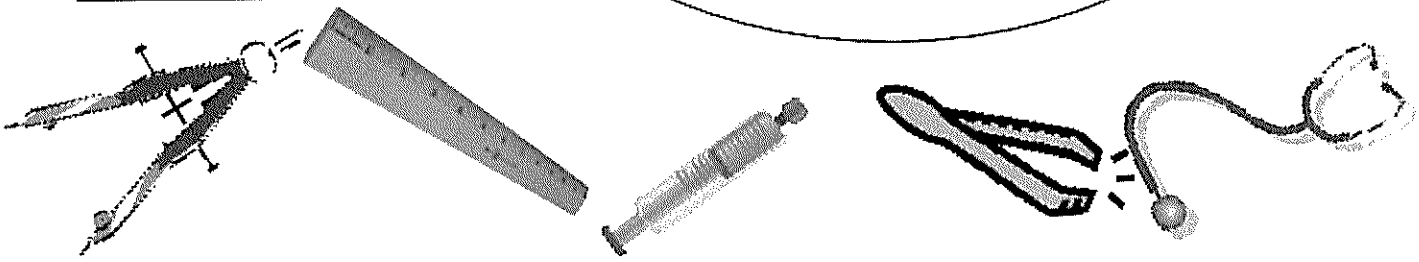


WISEST Events Reports

WISEST Summer Research Program 2007



ORIENTATION TO WISEST SUMMER RESEARCH PROGRAM

By Wenting Wu

IT ALL STARTED ON ORIENTATION DAY, when excitement shot in like a bullet through glass.

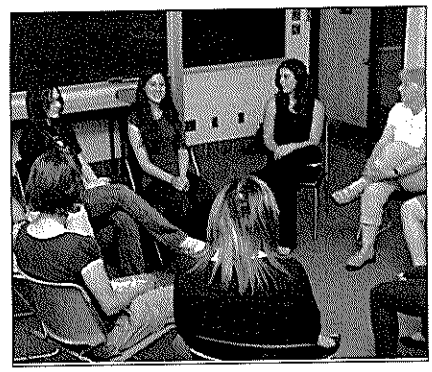
We were introduced to the university campus, the rest of the soon to be familiar faces at WISEST, and a new chapter in our lives. Some felt intimidated, others were nervous, most of us both. Looking back at that day however, there was nothing to be worried about. As we entered the solarium at the Engineering Teaching and Learning Complex (ETLC), Natasha, Robyn and Grace were first to welcome us with cheerful smiles. We all got excited to get our very own WISEST bag, nametag and other freebies.

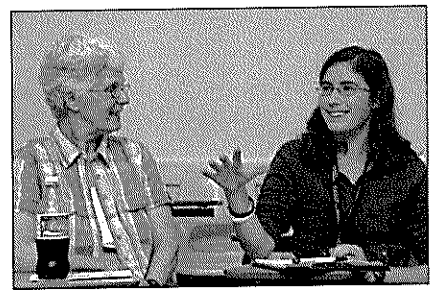
We started off with brief introductions and presentations from the vice chair of WISEST: Gail Powley, the associate vice president of research: Dr. Andy Greenshaw, our WISEST coordinator: Grace Ennis, and the student coordinators: Robyn Ferguson and Natasha Kuzbik. They each took the valuable time out of their schedules to talk to us. We found out more about the program, its purpose, its history and how the rest of the six weeks would go. I still remember the expressions on our faces when Robyn told us that we don't need to ask to go to the washroom.

After a delicious lunch, we got the informative WHMIS training from Dr. Nasrin Dhanani, and the Biosafety training from Dr. Dan Dragon. This made sure that we would be safe in the lab for the rest of the six weeks to come. The presentations included things like the general lab safety, spills, laboratory equipment, hazardous waste disposal, and some of our responsibilities. We received good advice like how you should always keep things away from your mouth, no food in the lab, and mints are considered food so don't chew it in the lab. We also learned interesting facts like how allergens in lab animals or wild animals are also found in pee and poop. It's important therefore that gloves and other protective gear are taken off before going out of the lab. To quote Dr. Dragon, the approximate amount of time to wash your hands for is, "2 stanza's worth of 'Row, Row, Row Your Boat.'"

Many activities occurred consecutively, and for the first time, you can put nerdy and fun in the same sentence to describe the games we played. Although it wasn't very easy to memorize 59 other names, the room was full of enthusiasm. We split in our four different groups for the first time, and played some more games. These groups were to remain the same for the rest of the Wednesday afternoon sessions to come. We were able to get to know the rest of the team better to end the awkwardness. It turned out that we all have a lot in common. Who would've guessed? It's never been so normal to be a science geek. At that point, it was one of those times where you just have a good feeling about what would happen next. As an added bonus, we all got paid for simply being there.

At the end of the day, we anticipated the arrival of our principle investigators and supervisors. No one wanted to be picked up last; it was like gym class all over again. Finally, we each saw our own labs for the first time, and met the rest of the research team. And so the journey began.





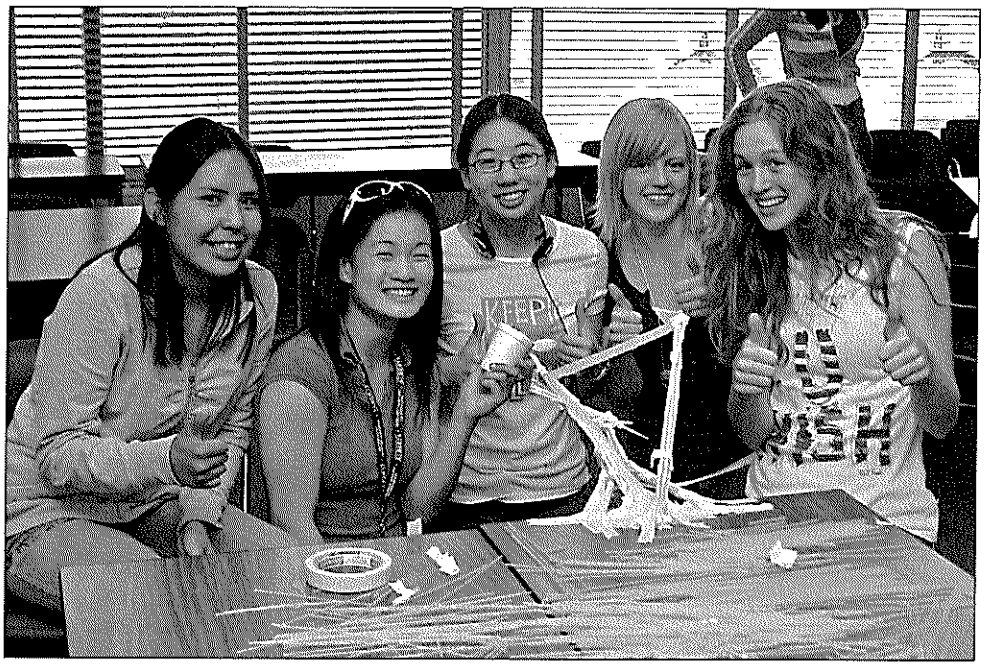
UNIVERSITY 101

By Joyce Lam

UNIVERSITY IS ANOTHER STEP towards our future, and one step closer to achieving our hopes and dreams. As Grade Eleven students, the time draws closer and closer to the moment in which we have to start making decisions of what we want to do with our life, for perhaps the next twenty to forty years. Many of us however, are faced with questions of our life ahead of us. How do we decide what courses we should take? Should I pursue Science or Arts? Who should I approach when faced with academic difficulties? What is the best way for me to deal with my peers in a given scenario? These are all questions that we likely have to deal with now, if not in the near future.

That is where University 101 Wednesday Afternoon Seminar comes in to place, taking into account our anxiety and numerous questions. Through the work of both the WISEST Student Coordinators, and University of Alberta's undergraduate students, we are given the chance to discuss challenges and opportunities that my arise as an undergraduate. All of us are divided into small groups, and are given different common scenarios for each of us to try to solve as a team, and then present our solutions to the other groups. The undergraduate students also took the time to share their own experiences and methods they used in dealing with various issues, as well as the consequences. They also provided us with helpful suggestions and tips, dealing academically, socially, emotionally, etc. In turn, we as participants were given the opportunity to consult and discuss with them about what courses we could possibly pursue, and learn more about the steps they took or are taking, in shaping their own future. The undergraduate students then took us on a tour of campus, showing us specific locations in which we would most likely have our classes in the near future.

Personally, I really enjoyed and valued this experience. It was truly eye-opening and interesting meeting University of Alberta undergraduates, and hearing directly from them their encounters, dilemmas, and choices. The undergraduates successfully made their presentation relevant to the concerns we had, and at the same time made it fun and intriguing. This experience not only taught us about the opportunity to pursue an education in science or engineering, but also provided WISEST students with mentors willing to answer their questions. Though I am still not fully decided on what I want from my future, I have learned that the science and engineering road is a bright possibility, one that I should for sure consider. University 101 is one of the Wednesday Afternoon Seminars you would never want to miss out on, you would really regret it if you did. This experience was definitely one of the best Wednesday Afternoon Seminars and I am glad I was able to make it to this session. I Love University 101!



SCIENCE OLYMPICS

By Jessica Gosselin

WHAT DO Jamie Soleil, David Pelletier and WISEST students have in common? They all got gold in the Olympics!

As one of the many amazing Wednesday afternoon seminars held by our student coordinators, the Science Olympics were a science nerd's dream! There were, unlike the physical Olympics, only three events so it was do-or-die for the participants. Competition was tight, with all four teams eager to win! First, there was the Super Stupendous Spaghetti Suspension, followed by the Survival of the Fittest and finally, the Deadly Egg Drop of Doom.

As the students divided into smaller groups, the race was on. We had thirty minutes to build a structure, with only spaghetti and masking tape, that suspended a styrofoam cup as far off the table as possible. If any team could reach one meter, there were bonus points to be had!

After many trials and tribulations, we discovered the secret of triangles. Being such strong structures, the more, the better! Now, it was only a matter of better design because we all had physics on our side. What better to bring out the engineer in all of us? The boys all had their strategies, but the girls, being better trained engineers by our few weeks' experience, were the best ones to decide upon a plan. By the end of this event, it was still a tight race for 'ultimate science nerd'.

It was time for a Darwin adventure, with the survival of the fittest competition. Each member was working alone but the most members remaining from one team would win the event for their group. As each student was passed a bag and a utensil, either fork, knife or spoon, everyone was wondering what would happen.

We then were told to gather around a pile of straws, string, packing peanuts and corks. When Robyn said 'start' we were all to gather "three energy units". No more and no less than three. An energy unit was either two corks, one packing peanut, three straws or two strings. Now it was up to the fastest and most agile nerds to win. After thirty seconds, if you didn't have the correct amount of energy, that is, if you overate or starved, you were out of the competition.

At the end of a few rounds, only the fittest survived, however the competition was getting stiff. It was going to be a tight race, and with one team clearly ahead of the others, it would be difficult to catch up.

By the final round, it was clear who would win, the fittest group. So, in the grand scheme of things, one team was left a few points ahead of the others. Nothing that couldn't be beat with better skills at the final competition—the Deadly Egg Drop of Doom.

The object of this event was to drop an egg from one story without having it break. Impossible, you think? Not with a bunch of science-inclined people in the room! We had many craft items to work with and only forty five minutes to design our structure before we had to put it to the test.

Most of the teams had different strategies, with a couple using parachutes, and others using just plain physics to help them. By then end of the forty five minutes, a bunch of very different, yet very rational designs were produced. Now, it was only a matter of who would survive the test!

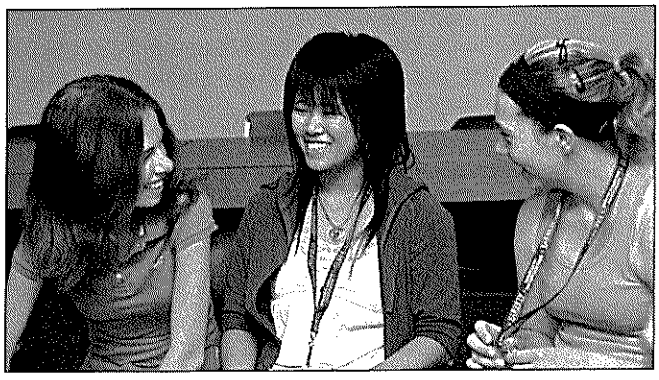
About half of the teams' eggs turned out fine, due both to luck and good design. So, finally, the results were in. The winning team was announced.

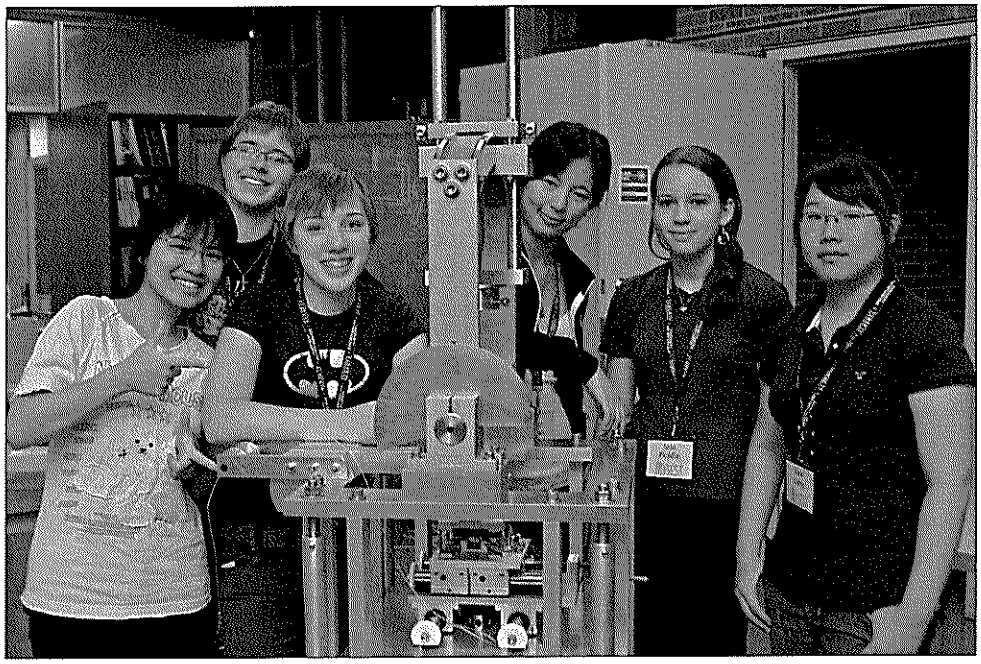
Who won? All of us! With new ideas about triangles, surviving in the wild and impact designs, not to mention a bunch of new friends, we all walked away from this event victorious both at heart and at mind.

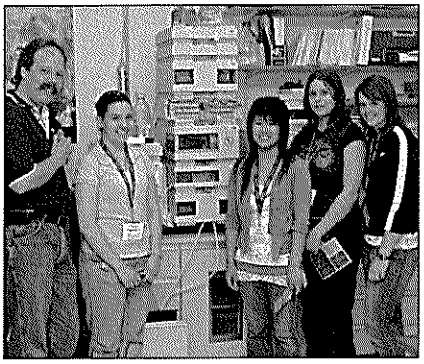
SMALL GROUP DISCUSSIONS

By Kathy Yackulic

ON WEDNESDAY JULY 18 our afternoon session was focused on the importance of mentors. All the students who have passed through this program have gained mentors in the form of their supervisor, the professors, or even the various grad students who worked in the same lab. The afternoon began with announcements and then two short speeches by Margaret-Ann Armour and Grace Ennis about how important it is to have a role model in life. Both ladies spoke to us about their involvement in the WISEST program and about the women in their lives who have given them guidance. After their speeches we were divided into several small groups of four or five students each and sent into separate rooms. About four adults, who would be speaking with us, and one moderator joined us in our group. We had a fun icebreaker game to learn a bit more about the other people in the room, and then we started to have a slightly more serious talk. In my particular group there was a Director of Human Resources, a professor of Agriculture, an engineer and a chemist with a psychology degree. They were all female of course. They spoke about their unique experiences and about the different careers they considered as they tried to discover where they wanted to end up. Most of the women had only a vague idea of what they wanted to do after graduation, just like the students in our group. Several of them switched their majors in university more then once. The engineer told us about working in a field that was mostly male dominant and the professor of Agriculture told us about the different research projects that she was working on. The director of Human Resources told us about networking and the skills you need to deal with people efficiently and the chemist explained why she decided to study the human mind as well as chemistry. They all shared some interesting stories. Then it was time for the students to speak. We shared with each other our goals and speculated on the type of job we were looking for. We tried to decide what courses in University we would be interested in. It was simple to tell that most of us were uncertain as to even what field we wanted to work in. It was reassuring to know that not everyone has their life perfectly arranged. In the end we learned some important lessons from speaking with each other and with the women in our group. They reminded us that we never stop learning and advised us to find a job that constantly challenges us. They showed us that you should never have to give up your social life for a good career. We learned about the people in their life whom they considered to be influential. The other groups of students had similar experiences. We were privileged to meet these women and I thank them for donating their time to speak to us students.







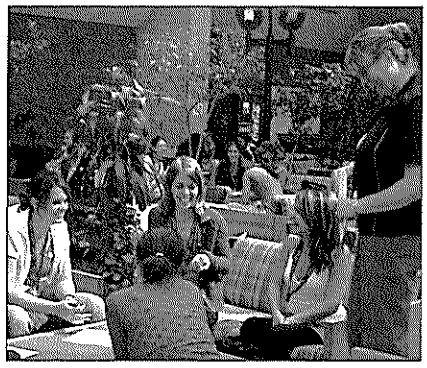
ON-CAMPUS LAB TOURS

By Corrina Murdoch

AFTER THE INITIAL SHOCK of the intricacy of each of our individual labs we were finally able to understand that which we were here to do. Each WISEST student was assigned to a unique research project about which we learned, studied, read, and were taught to appreciate for weeks. This opportunity has been phenomenal for each of us; but, since WISEST is about diversifying our knowledge of the research field, our knowing solely our labs would be unfortunate. However, WISEST had a wonderful solution that gave us an innate and amazing opportunity. We were given On-Campus laboratory tours and were thus able to experience different settings and further expand our horizons within the field of science and research.

Among other groups such as Obstetrics and Gynecology, Agriculture and Forestry, Chemical/Materials Engineering, Mechanical Engineering, Nanotechnology, and Civil and Environmental Engineering, there was Biomedical Engineering; the group in which I was placed. We were given an amazing tour by a truly dynamic woman: Dr. Monica Gorrassini. Her study involved the study of spinal cord injuries and how electric waves of different frequencies could lead to newer recuperation and lifestyle improvement methods. It was truly fascinating to actually have the current passed through your own body and to be able to feel the sensations all while being able to see that which is happening within you register on a computer screen. Further, we were given a chance to experience the ability of an electric current to take control of the motor functions of the hand. It was a fascinating and frightening experience to feel the passing of power from the nerves to a scientific machine as you watched and felt your hand moving without your consent. This really did show me how fascinating science really is and how strong its power can bee when continuously fortified with the intellectual strengths of researchers world-wide.

Everyone that I spoke to said wonderful things about these tours regarding both the passionate people and the fascinating work that they do. These tours showed us so many things including the ever-expanding field of science and its unlimited potential within both ourselves and the world of technology.



IBM PROJECT MANAGEMENT ACTIVITY

By Caitlin Fortier

ON WEDNESDAY, August first, everyone from WISEST walked to the education building for the IBM project management activity. None of us really knew what we were doing that day, so it was nice when the presentation started. The lead presenter showed us a Powerpoint of their aims and some information about the various programs meant to get women into the I.T. field, particularly at IBM. After she told us about herself, the other women from IBM came forward, each telling us a bit about who they were, how long they had worked in the field, what they did and what they liked to do outside of work. Shopping and reading both were very popular activities.

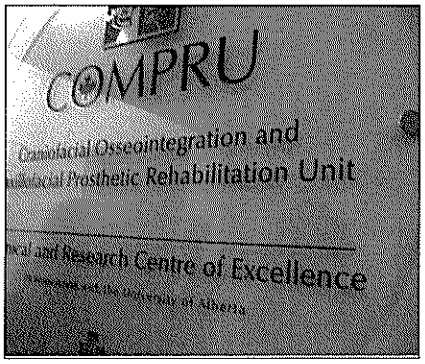
After the introductions, the head of the group filled us in on the day's activity: project management role-playing. We would split off into groups of five and each group would be tasked with coming up with a website for a music download company. Most of us seemed a bit lost, so it's a good thing that the IBM ladies were there to assist us with figuring out what we were doing and, after reading the instructions one more time, we divided up the team into the roles of a project manager, business analysts and the IT designers.

At first, it was slow. We had vague directions on the paper about what the client wanted, but it wasn't really enough to go on. On top of that, we needed to figure out how to put this imaginary website within the imaginary budget. Taking the IBM rep's lead, we started asking her questions (she was pretending to be the client) about what exactly she wanted. Through this, we found out what colours to use, that we needed to make a logo and that she really wanted at least fifteen songs on the front page.

A couple of us started creating a timeline and a budget while we brainstormed ideas for the page design and logo. Halfway through, our "client" changed things, like a new preference for the colour red and budget cuts which forced us to adapt to the new scenario. In the end we came up with something that resembled a usable webpage, as well as a schedule for creating it, testing it out and then launching it. Once you got into it, it was interesting to try thinking of new ways to get around the limitations while still meeting the goals.

Once we got back to the lecture theatre where we started out that Wednesday's activity, several of us got up to present our results as the rest of us filled out feedback forms about the afternoon. Afterwards, a few of the presenters go up to share some of the things they'd like to point out and several students presented questions. As we walked out of the door to leave, though, came the best part: sparkly pens where the glitter moves.

In summary, the exercise in teamwork, although fun, was useful. It was cool to see how some people fitted the job given them, while some people acted like they were in another's role. While not all of us will probably work for IBM (although I am sure it's a very nice company), all of us need to learn to work effectively as a group. I guess the lesson learned is that, even if you don't know exactly what you're doing, all it takes is some teamwork and creativity to get the job done.



RESEARCH IN ACTION: COMPRU REPORT

By Megan Chi

"SO WHAT ARE YOU GUYS DOING TODAY?" asked my brother, referring to our weekly Wednesday afternoon activities, as we approached the university campus.

"Visiting COMPRU."

"And what's that?"

"Prosthetics," I said vaguely. It was more of a question than an answer. I really had no clue. And thus began one of the most interesting days of my WISEST experience.

COMPRU, I now know, is a world class facility that specializes in the reconstruction of head and neck features after the detrimental effects of accidents and diseases such as cancer. The facility includes a team of specialists and researchers whose mutual goal is to improve care and technology for special needs in a wide range of areas: surgery, jaw and facial prosthetics, dermatology, hearing, speech pathology, biomechanical engineering and many more. Lucky for us, we were going to meet this team!

In the afternoon, after a rather uneventful bus ride, we finally reached the Misericordia Community Hospital and were promptly split into three groups, each of which would tour the labs of the Implantable Devices Research Group (IDRG). Not much could have prepared me—and I'm sure most of us—for all that was to come. Our first stop was the speech pathology lab, an important component of COMPRU research. Here, we learned the use of an obturator, a removable plastic prosthesis constructed to fill the caverns created by tissue loss after cancer treatment. The implant allows patients to restore the function of their hard palates for proper speech and swallowing. Research on tongue movement during speech is also being done, enabling speech pathologists to improve patient therapy after surgeries.

We then proceeded to the main lab where we learned much about clinical care and other facial prostheses for eyes and ears. These implants are known as osseointegrated or bone anchored implants. Bone anchored implants are used when reconstruction using the patient's own tissue is impossible. Much to my surprise, specialists in this field require not only a background in science but also an interest in art as the implants have both practical and aesthetic components. By utilizing revolutionary technology, COMPRU can create 3D replicas of facial features and sculpt the implants accordingly to the patient's own wishes. Of course, prosthetics are far from perfection and are continually being innovatively improved to suit the needs of patients. Indeed, our next destination proved to be an eye-opening experience (pun sadly intended)!

A leading complaint from patients is the inability of a prosthetic eye to move. Consequently, one of COMPRU's engineering programs is the development of a movable eye that is responsive to the movement of the other eye. Although the creation of an advanced eye prosthesis is far from complete, seeing the in-progress work was a great highlight to the tour and really quite fascinating.

Our last stop was the technological center of COMPRU where both virtual and physical 3D medical modeling is possible through the use of anatomical data, images taken by MRI and CT scans. With these physical and virtual models, surgeons can visualize and practice exact procedures beforehand using computers as well as the models themselves. Gaping in awe, we were led into a glass walled room where our guide told us that a flawless replication of parts of a skull or an entire face can be constructed by three machines within a couple of hours. Furthermore, the artificial part of the skull can then be inserted into a patient during reconstructive surgery with minimal complications. After much explanation, we then ended our tour by dutifully poking holes into a virtual skull, briefly experiencing how much force was required to end our 10-second careers as pretend surgeons.

The tour of COMPRU was an amazing opportunity to learn about an area of medicine and science that I had not known much about. I must say it was definitely a highlight to the WISEST experience and every second of the tour worthwhile.

RESEARCH IN ACTION: ISOTECHNIKA TOUR

By Shannon Huebert

ISOTECHNIKA IS an international biopharmaceutical company that specializes in the production and commercialization of novel immunosuppressive therapeutics for the treatment of autoimmune diseases and in the prevention of organ rejection in transplants. In our tour, we learned about which processes lead to the development of immunosuppressive therapeutics as well as discovered why an immunosuppressive drug can actually aide your body in recuperation of a disease such as psoriasis.

Before a newly discovered drug compound can be tested on humans it must undergo pre-clinical (in-vitro and animal studies to ensure safe use in the human testing phase) and laboratory research where the results from this stage must be approved by regulatory agencies before it can be tested on humans. In each phase, information is collected and is applied to the next phase to improve the quality of the results. Each process is organized into phases. In phase 1, a small group of healthy human volunteers are examined to see how the drug and human body will interact and to study if any side effects result from the dosage. This process can take several months because the drug is also gradually increased in dosage to investigate if any side effects still persist.

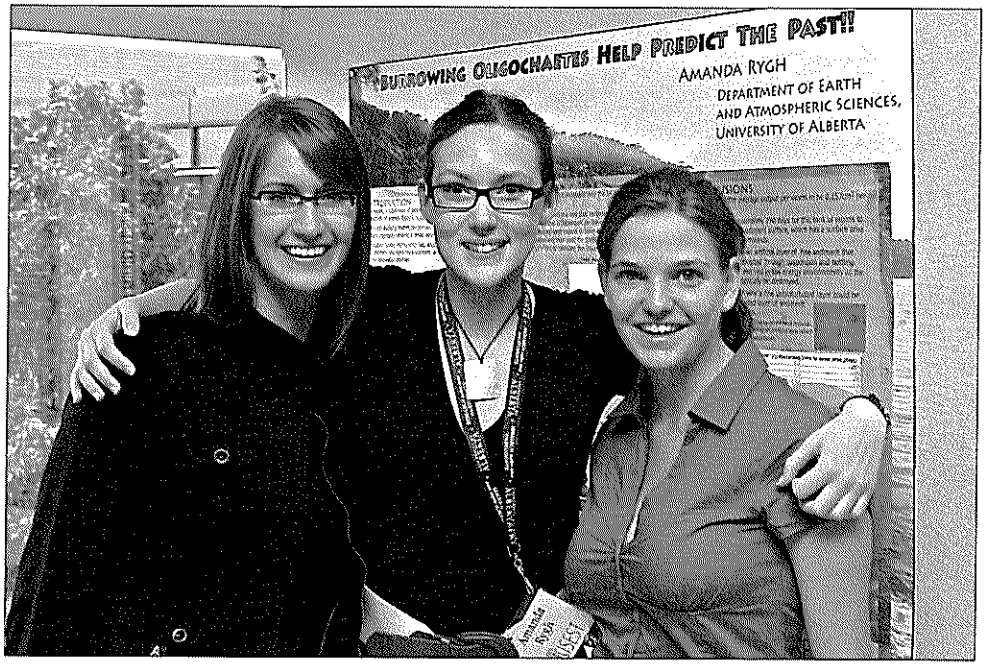
Again, the drug has to be inspected before proceeding to the next phase. In phase 2, the drug goes through extensive testing for efficiency and capability. As many as several hundred humans, who are patients are involved at this stage. Frequently, this phase is further sub-divided into phase 2a and phase 2b. Dosage frequency and dose response are emphasized in this sub-phase whereas in phase 2b, the drug is tested on patients who have the condition and its performance will be compared with an approved drug for the same illness already on the market.

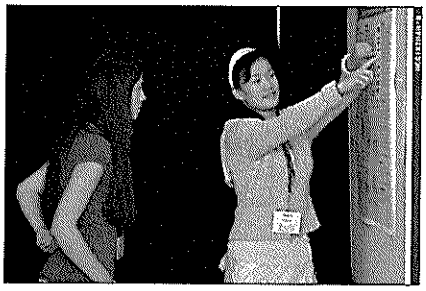
Once the drug is approved for phase 3, it is tested on an even larger study group – ranging from several hundred to several thousand patients over a time period of several years. Information based on the efficacy, benefits, and possible side effects of the drug are gathered. If necessary, phase 3b may be conducted to test the drug using an additional more recent method. A company is then able to request approval of the drug with the completion of phase 3. Further drug testing to compare it with others already in the market may occur in a post-marketing phase.

Isotechnika's latest development, ISA247 is an immunosuppressive compound, that has successfully passed phase 3 and is currently being tested for the treatment of psoriasis as well as for the prevention of organ rejection in kidney transplant patients. Immunosuppressive drugs can be beneficial when an organ is transplanted because the recipient's immune system will recognize the new organ as a foreign tissue and attack it, destroying the organ. If untreated, the recipient could die. Studies conducted on the drug so far suggest that the reason it's effective despite being an immunosuppressive, is that it is more concentrated than drugs that would not suppress the immune system. In addition, it is less toxic than other treatments within the calcineurin inhibitors drug class.

After the tour, we had the chance to ask questions about our tour guides' educational backgrounds and interests in science when they were in high school over donuts and soda. From this experience, we gained insight about the extensive and collaborative research required before a drug can appear on the market. As a group of young research students, this was a wonderful opportunity to learn and experience research in action.

Isotechnika inc.





RESEARCH TEAM THANK YOU SPEECH

By Siwei Chen

HELLO EVERYONE. FOR THE PAST SIX WEEKS, I have had the wonderful opportunity to work in a research lab as a part of WISEST. There are many people in need of thanking, including our sponsors, coordinators, teachers, research teams... the list goes on, but today, I would like to especially thank our research teams. Although without any of the other people I have mentioned, WISEST would not exist, it is the research team with which the students spend the most time.

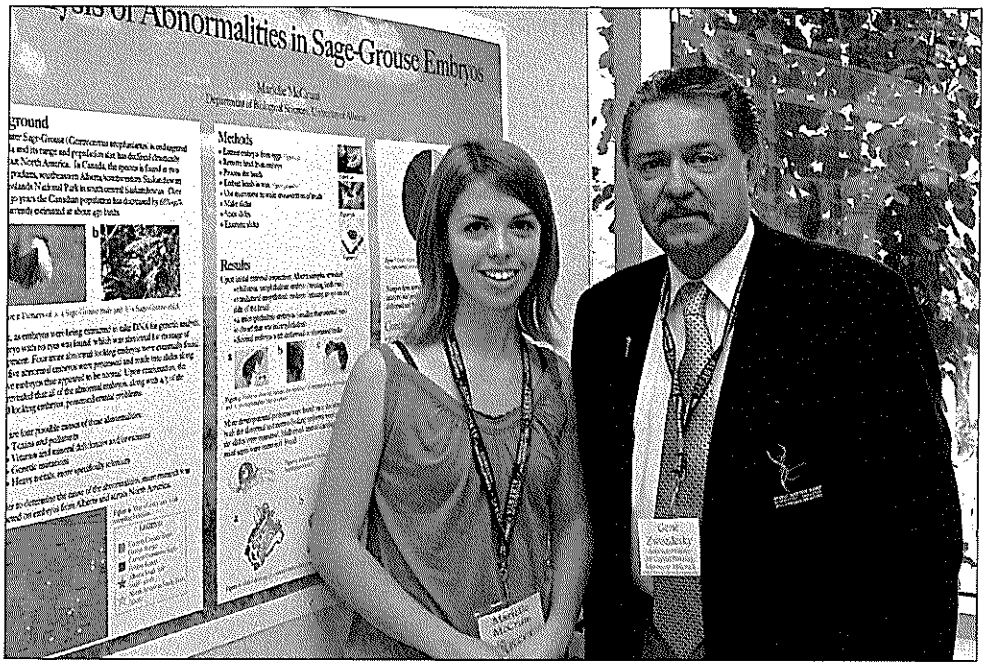
To the principal investigators, supervisors, and other researchers, thank you. You take a leap of faith when you accept a high school student into your lab for a month and a half. And once we arrive, you invest hours of your day teaching and mentoring, answering countless questions all in hopes of guiding us towards understanding and improving our research. You were encouraging when we struggled, forgiving when we made mistakes, and sincerely proud of our accomplishments when we succeeded. You allowed for the potential within each of us to come forward. Where our current knowledge of the research topics left off, you completed with what seemed like a huge database of information that we could access at anytime.

Although we are much younger, greener, and less adept at what we do, you have all shown tremendous patience with our development. I for one would not have understood a single thing I was being told had I not been told repeatedly in a variety of combinations of words, permutations of sentences, and hours of demonstration. In spite of all the work required to mold us into good researchers and scientists, you still welcome us and include us in the lab just like any other university student. In my case, I have experienced high tea at Rutherford House with 'the girls' as well as pointing out my favorite restaurant, Chianti's, for a friend's birthday lunch. It is these events that make the difference in the overall lab experience because, as we all know, it's not all work and no play. I know students this year who have worked in the middle of the night, others who have slept over in another city and even one who acquired a chick that hatched in her lap. There must be countless other stories about the labs that I have not heard but each will be just as unique and memorable as the other. I can only thank the many people involved to provide opportunities for us to see and experience things first hand rather than simply talking about them.

Thank you for sharing your passion for what you do. This passion is contagious, and I wouldn't be surprised if quite a few of us continue with courses that allow us to explore fields similar to what we have done. I know I definitely will! You brought life and purpose to us this summer, and I am proud to have worked alongside great researchers. I am amazed to be my own primary source when all I've ever known is "research" from the library. So thank you, research teams, for bringing us closer to the unknown.

As well, I would like to thank the University of Alberta for letting us use the amazing equipment and facilities. It was quite funny when I was first asked if I knew how to use a pipette. At the University, we use micropipettes where you calibrate, press a button and release to get the measurement of liquid you need. In high school, you use a bulb. Enough said.

Thank you to everyone who supports WISEST and allows women and men to take on what they've never taken on before. I think I speak for all the WISEST students when I say that this was amazing. So on behalf of all my peers, thank you.



CELEBRATION OF RESEARCH 2007

By Kelci Mohr

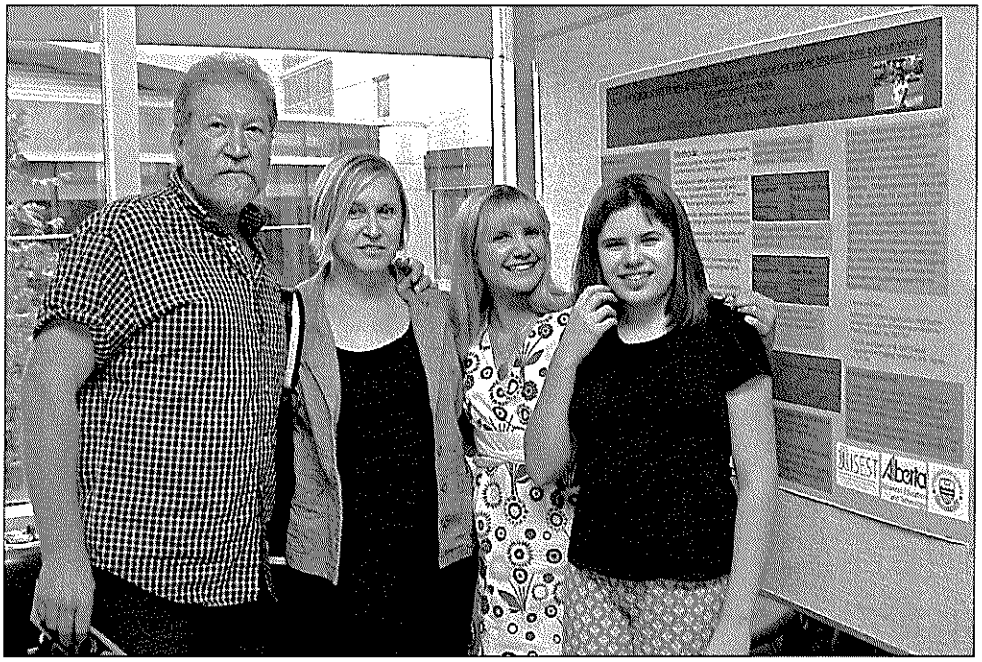
ON AUGUST 15, 2007, the University of Alberta and WISEST celebrated research! Over the course of the WISEST student's six week lab experience, we worked hard to understand complicated scientific papers, collect countless samples and process an endless amount of data. At the end of it all, a magnificent research poster emerged from the chaos! In the ETLC Solarium, the fruit of our labor was displayed for all to see. At this point, I think nearly everyone could agree with me when I say that it seemed almost surreal to be putting up our posters and explaining what we did over the summer. It was finished already?! How did that happen?!

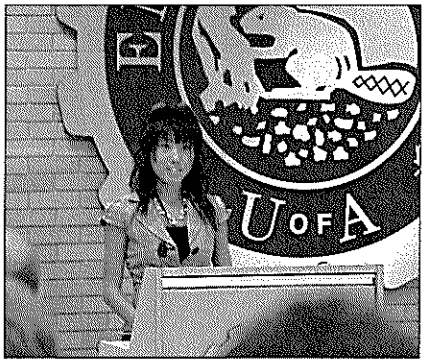
Despite a lingering feeling of mild disbelief, the day progressed without any hitches, thanks to the meticulous planning skills of the WISEST coordinators. Our token photographer, Weiyang Liu, had a busy day capturing the action-packed Celebration with style and prowess. In the morning, we all finally had the opportunity get a scope of what our peers had been researching over the summer months, and to practice explaining our own posters before we had to do it for real! A few moments of slight insecurity and nervousness were quickly quelled after the first couple explanations of our projects. Later, our research teams arrived to check out the finalized versions of our posters, and to discover what other labs were up to. I was surprised to discover the wonderfully diverse variety of researchers that stopped to inquire about my assignment! After everyone had milled about and stopped by the refreshment table, we settled in for a few cheerful speeches. The lovely and articulate Siwei Chen captured the audience with her lighthearted humor and engaging tone, while Natasha and Robyn took to the podium for the last time to give their thanks. Grace Ennis and Gail Powley also expressed their gratitude to the research teams before we all stepped out for one last lunch on campus. This was one of our last opportunities to spend some free time with our research teams and fellow WISEST students with whom we had become close.

After lunch, those of us who were lucky enough to have interested participants engaged in fun-filled lab tours! I had the pleasure of attending another WISEST student's tour, as no one had expressed any interest in seeing my own lab. Aleksa Leszczynski, charming as she is, agreed to take Siwei and I along while she did tour of her lab for several other people. Needless to say, it was very interesting to see the lengthy procedures she had to complete to achieve the chicken intestine data she required.

In the final two hours of the day, the WISEST students accomplished their last hurdle: presenting our projects to friends, family, teachers, and interested supporters of the program. Not to mention the press! Once again, the audience was entertained by engaging speakers who expressed the importance of programs like WISEST and commended everyone who took time to be involved. Congratulations to Tracy Wang, who expertly delivered a captivating speech to a couple hundred people on behalf of the student body! Evidently, the sheer number of people attending the Celebration of Research was indicative of a vast support base for the encouragement of non-traditional gender roles in science. I, for one, am so grateful for this opportunity, and the Celebration wonderfully showcased the virtues of such an exceptional program.

At that, the day wound up with a lot of sad goodbyes, but far more promises of "Let's keep in touch!" I know that I have met friends and mentors here that will stay with me for many years to come. Thank you, WISEST, for an extraordinary summer!





CELEBRATION OF RESEARCH SPEECH

By Tracy Wang

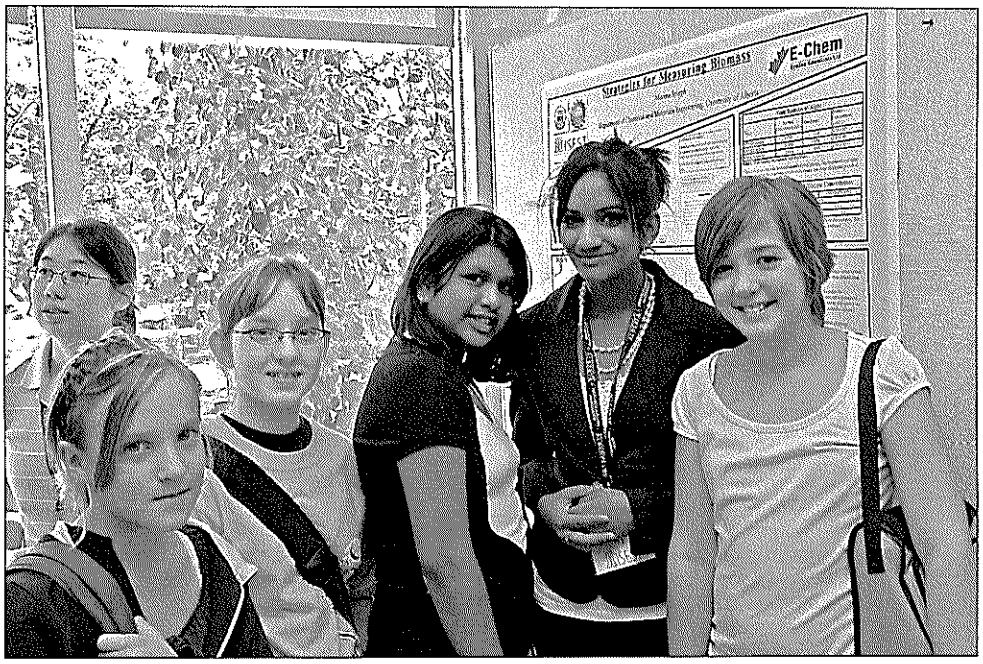
WISEST IS BASED ON engineering and sciences but it exceeds the limitations of an academic program. It's filled with activities and fun but stimulates the mind so much more than any summer jobs are capable of. WISEST is an ingenious program that weaves research, engineering, friends, activities and fun into six weeks of unforgettable summer experience. I feel privileged to be standing here today to share my wonderful experience with you.

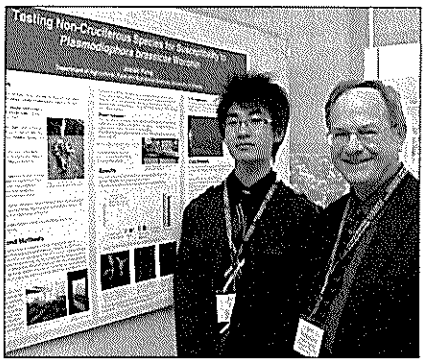
Students, like myself, came from all over Canada to the U of A this summer to gain first hand experience in the fields of sciences, engineering and technology. Six weeks flashed by since orientation and WISEST has opened our inept eyes to the diversity of engineering and revealed to us the difficulties faced in research. Many of us arrived knowing nothing about research and now thanks to the patient support and nurturing of our individual labs we are able to explore the field of research. The fascinating results are the products of hard work, long hours of brainstorming, and numerous experimental trials. I learned that in research you're constantly bombarded with obstacles. Everyday there's an unexpected problem to wrap our brains around, making it a very thought provoking field. Furthermore, not only was working in a lab environment mind-exhilarating but it also gave us a taste the university life we should be expecting next year. Compared to the average high school grind, university is entirely on another page. Through interacting within our labs and the informative Wednesday seminars I believe every student received some very valuable insights; and the bottom line is to work hard and play hard. Through enlightening discussions with respected individuals on campus, we learned the importance to balance our academics with our creative nature. Education is one aspect of university but we were also told to make the best of our university experience. Out of the 60 WISEST students this year, there's only a fortunate few that have pinpointed their preferred career choices. As for the rest of us, we're still struggling to identify our focus. Coming to WISEST I can imagine many students like myself aimed to narrow down a career path, but instead we discovered more possibilities than one can envision. Confused? Yes, but we also learned a very important lesson. We don't have to rush ourselves to pick a career path because we can pursue our interests a step at a time. There is no limitation to education so why should we limit ourselves within the perimeters of a box? Pursuing after our interests is a path that will eventually lead us to where we want to be.

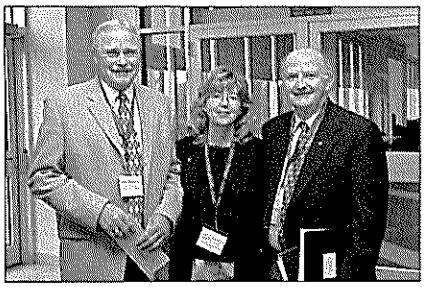
WISEST is a great academic experience but the social aspect of it is immeasurable as well. Aside from work there's group activities such as TGI Fridays where students were give the chance to engage in stimulating conversations with each other and share our lab experiences. There was also the Pitch and Putt, a competitive yet fun game of amateur golfing! Lastly, the Science Olympics, which was my personal favorite; We designed and built a bridge made out of spaghetti, play the game "survival of the fittest", and made innovational egg containers, which had to withstand a fall of about two stories! In the duration of these six weeks, there wasn't a single dull moment. The Isotechnika and Compru tour, the on campus lab tours, the IBM session, and the small group discussions were astonishing and gave us a bird's eye view of all the open opportunities out there.

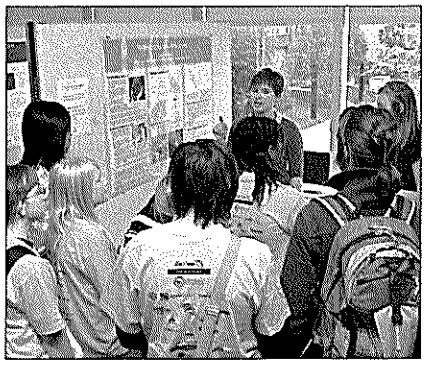
Last but not least, on behalf of all sixty WISEST students I would like to sincerely thank the hard work of the coordinators, the time and patience of the professors and the supervisors! And of course, without our generous sponsors WISEST would not be made possible. The program not only broadened our perspectives in the fields of sciences, engineering and technology but it's provided us with six weeks of unforgettable experience that we'll always treasure. For that I thank you again!

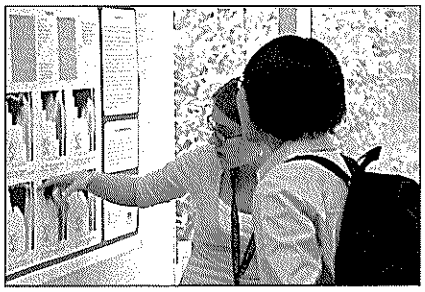
CELEBRATION OF RESEARCH (PHOTOS)

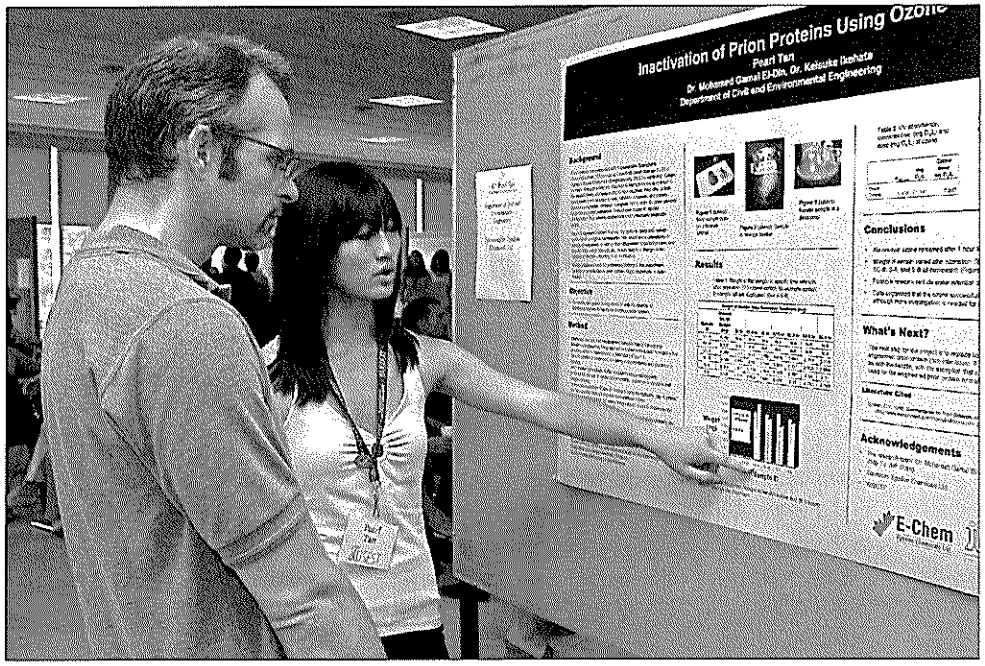


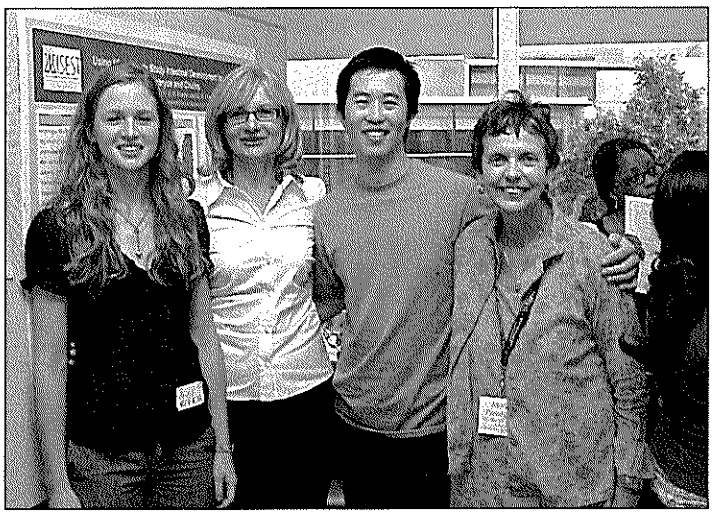


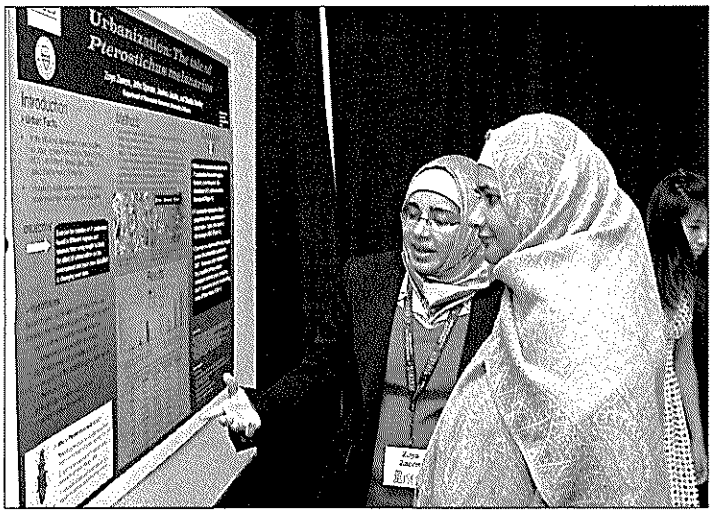


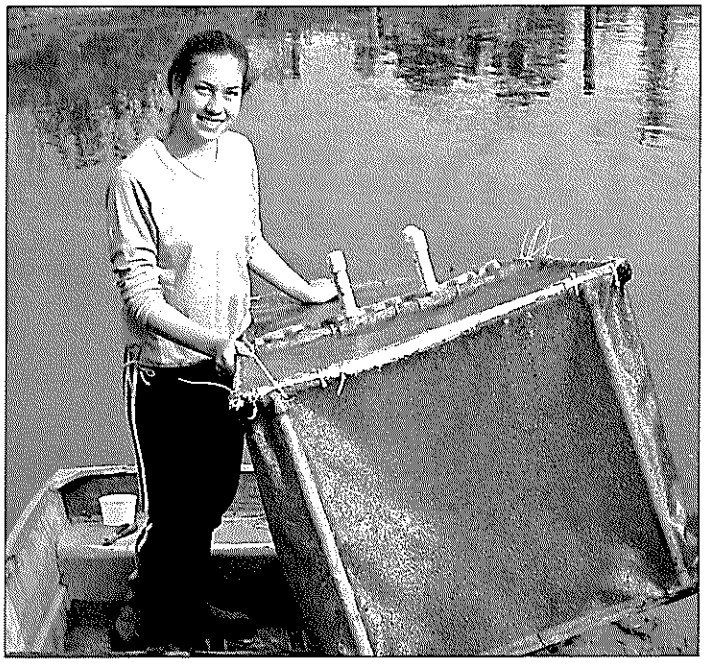












MEANOOK REPORT

By Tara Howatt and Meredith Swytink-Binnema

WHEN YOU FIRST HEAR you will be spending your summer away from home, with a bunch of people you have never met before, it sounds a little intimidating. When we learned we'd be working on a research project with university students way older then us, we were definitely unsure how it would work out. Excited, for sure, but a little nervous. After six weeks here, however, it sure isn't scary, and has turned out to be a very memorable experience. Everyone at Meanook has been so welcoming, and together we've created a kind of mismatched family made out of biology geeks. It really brought science to life, seeing what life is like as an actual biologist.

Living at the place you work at was certainly not the average work experience. It was nice not having to worry about transportation time; we pretty much got up and went to work. At the same time, our hours didn't have to follow such a strict schedule. The researchers here could get up at different times, as long as the days work got done and we put in enough hours. In the evenings we would usually do something, whether it was swimming in the nearby lake, playing volleyball or setting up a sweat lodge. It was interesting that your colleagues become your family and the people you hang out with on the weekend.

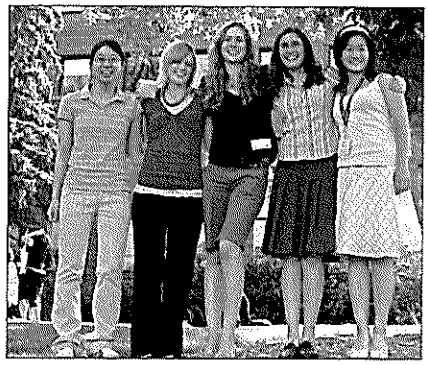
There were only two of us WISEST students up at the research station; everyone else was working towards their masters or PhDs. There was normally about 15 other people here, sometimes a lot more or less, but our cook always had enough cookies to go around. When she went away for the weekend, though, we had to resort to making our own, with a lot of improvisation.

Everyone went on holidays at different times, which meant they would often have a surprise waiting for them when they returned. Some days a big part of our spare time was spent setting up a prank for someone, from putting bats in their room to filling it with balloons and shooting sparkles at them.

We did all kinds of things to keep ourselves entertained out in the middle of nowhere, whether it was inventing a new game or challenging someone to a gymnastics competition, someone was always happy to spend time just hanging out. The people at Meanook were creative and always knew how to celebrate. The well-used couches were a common joke, and many great times were had on them.

We really appreciated getting to know the people that worked on different projects, rather than just the ones in our labs. Even though the two of us, Tara and Meredith, had different projects, we were often able to help each other out, or go along on other researchers missions. This was nice because it meant we could go out to different sites and experience various fields of biological science. Together, we learned how to band birds, calculate carbon fluxes in peat bogs, and sort through parasites, none of which were our actual topic of study. It also gave us a real immersion of field work, and virtually none in the lab.

All in all, it was an amazing experience and the fact that we were away at work for so long only made it more so.



LIFE AT ST. JOHN'S INSTITUTE

By Lucy Yuan

THERE IS NO DOUBT that the WISEST Summer Research Program is an once-in-a-lifetime opportunity. Not only does it give us first hand experience in lab research, prepare us for post-secondary life, and fuel our interest in the sciences, but, for 18 very lucky people, it forged an unbreakable bond and several lifelong friendships. This could not have happened without St. John's Institute.

I'm sure I'm not alone in saying that I was a bit nervous to move into St. John's (now affectionately known to us as Rez) at the beginning of July. The thought of sharing almost every aspect of my life for the next six weeks with a group of strangers wasn't exactly comforting. What if we clash? What if we can't stand the sight of each other? What if my roommate is conspiring to steal my iPod when I'm not looking? But our fears were put to rest once we started talking to each other and discovered similar interests, beliefs, and values. Now, hanging out late into the night and having serious, heart-to-heart conversations (even the boys) come as naturally to us as if we have been close friends for several years.

In no time at all, Rez became our home, complete with meals so delicious we could have sworn our mothers made them. We spent the majority of our time there, eating and hanging out in large groups along with HYRS kids, OSVITA Ukrainian Immersion students, and people working or studying at the U of A. There was hardly a reason for boredom as there were activities organized almost every weeknight. Sometimes there were competitions like the Mario Kart '07 Tournament, Poker Night, and Jeopardy; other times we went to the U of A campus to play football, Ultimate Frisbee, or Capture the Flag; occasionally we'd stay indoors to play charades or Cranium or home-base tag. If we were in a lazy mood, we just simply had movie nights or TV show marathons with plenty of snacks courtesy of the kitchen.

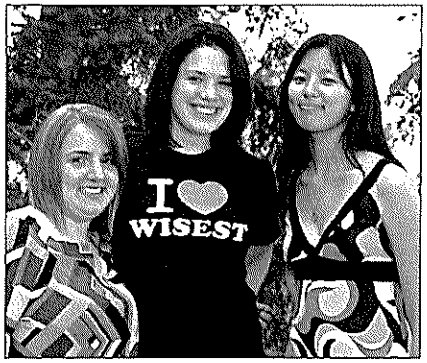
On weekends, you'd think we'd have less to do since half of us were gone, but several fun things happened, such as daylong trips to West Edmonton Mall and a Harry Potter group reading/lobby campout. And, of course, there were plenty of local events to experience, such as Capital Ex and the Heritage Festival.

A huge factor in our enjoyment of Rez was our wonderful Resident Advisor Megan. She kept us updated on events happening in Edmonton and ensured that we got to experience many of them. She's the kind of person who can put up with a group of noisy, frequently nocturnal teenagers and still remain calm and never have to raise her voice. More importantly, she's also the kind of responsible person who will stay up all night just to make sure everyone's home and accounted for. We wouldn't have had as much fun or as much security if Megan hadn't been there for us.

With everything that was happening and all the fun we were having, it was heartbreaking to have to separate when WISEST was over in August. But, provided with each other's Facebooks and email addresses, we knew we would stay in touch. Some of us will even see each other next September at the U of A. Still, it's a sad thought that we cannot recreate the closeness we shared in our time together or somehow make it last a lifetime....

On behalf of the Rez people, I want to give our endless gratitude to WISEST for this great experience. Also, I thank my fellow residents at St. John's Institute for all the wonderful memories of the last six weeks.

People at Rez: Corrina Murdoch, Etienne Rainville, Holly Severin, Jenny Becker, Jenny Ramstead, June Kang, Kristen Kavich, Kolby Olsen, Leia Peddle, Lucy Yuan, Marina Joseph, Mimmy Easwara Murthi, Pearl Tan, Sabrina Nurmohamed, Shannon Huebert, Tiffany Riddle, Tracy Wang, Wenting Wu



RESIDENCE ADVISOR REPORT

By Megan Wagner

AFTER BEING THE WISEST RESIDENT ADVISOR last summer I didn't think I would ever be able to top that experience, but this year was just as much fun. I was delighted when Grace asked if I would like to be the RA again, and so very fortunate to meet an amazing group of funny, bright, and talented 16 and 17 year olds. The six weeks at St. John's Institute with eighteen WISEST students (plus Kait and her four HYRS students) have left me with a summer I surely will not forget.

From a FIFA U-20 World Cup soccer game to sitting in a cramped TV room watching movies, we sure packed a lot in this summer. Here are some of the moments I remember and comments I have as I think back to the best part of my summer:

1. There are other people who enjoy people watching as much as I do. While the group of us who went to A Taste of Edmonton thought the food was good, watching some interesting people dance and rock out to a live band was definitely the highlight.

2. I was glad there were other Pink Floyd fans in Edmonton. Seeing the Pink Floyd laser show at the TELUS World of Science was awesome.

3. Thanks for showing me what bubble tea is.

4. Shakespeare plays can actually be entertaining, as I think most of us enjoyed The Winter's Tale.

5. I really enjoyed the 'What Not to Wear' Party, where everyone dressed up in really tacky outfits. That night, thanks to karaoke, I learned that most WISEST students (though good at many things) can't sing very well.

6. I am amazed by your ability to function (somewhat) on four or five hours of sleep.

7. Girls can be so mean to boys (or rather, one boy in particular). Stealing his room key, hiding his glasses, dunking him in water...

8. There are many different ways to set up six or seven mattresses and then jump on them.

9. Mac.

10. Midget Mud Wrestling. Oh wait, that wasn't real.

I want to thank you all for a wonderful summer and for making the job of RA so interesting and exciting. I have made some great friends and I hope we can keep in touch. Anytime you want to update me on your life or if you will be coming to Edmonton, send me an e-mail or leave a message on Facebook.

I hope you all had a great time and have left with some lasting memories of this summer. I wish you all the best of luck in Grade 12! Be sure to study hard, but also have time for your friends and make the most of your last year in grade school. Enjoy your grad, and I hope to see you at the U of A next year!

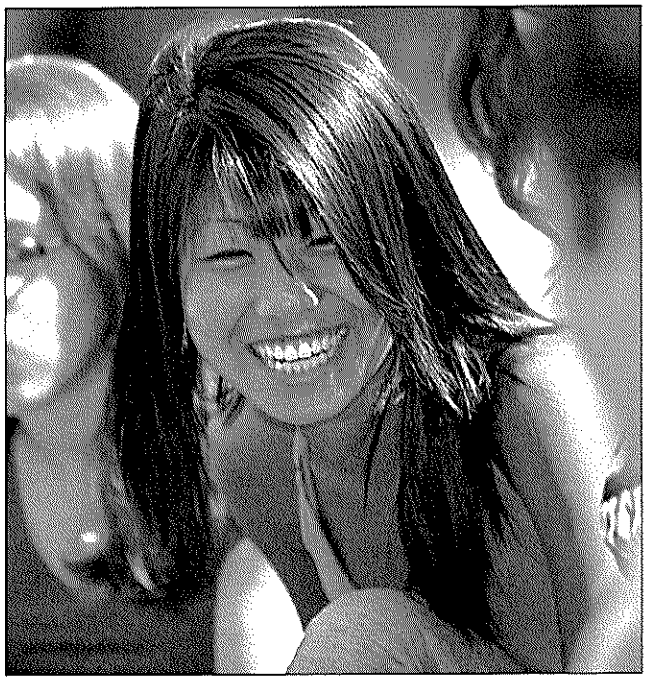
T.G.I. FRIDAYS AND WIND UP LUNCH

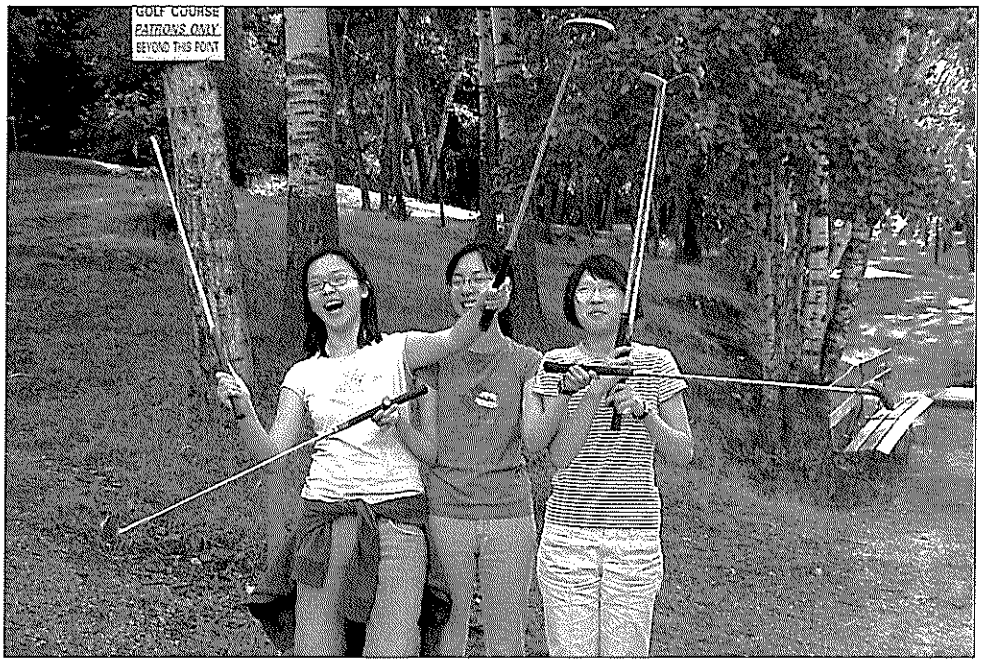
By Giselle Botia-Cortes

EVERY FRIDAY most of the WISEST students would meet up at the "Big Tim Hortons" in CAB and would take our lunch together. It was an amazing way to get to talk to the other WISEST students. It was fun getting to talk to people you didn't really get the chance to on daily basis. It was also a good way to learn about other person's labs and get to know them a little better. It was also an excellent way to talk to Robyn and Natasha, the student coordinators. It was a great social activity, and I know many other WISEST students really enjoyed our T.G.I Fridays lunch. It was an aspect of this summer that made WISEST fun; we would talk, laugh and eat together. It was a great way to spend our Friday lunch.

On Tuesday the 14th , we all went down to Fiore's for Lunch, all 60 of the WISEST students for our last lunch as a group. It was a splendid way to spend a bit of time with the people we got to know for the last six weeks. The staff at Fiore's was amazing, there were so many of us, and yet they welcomed and served all of us with pleasure. It was overwhelming to have the company of all of the WISEST students, these students whom we got to know in so little time, and whom truly made our summer unforgettable. It was also on this occasion that we all got to wear our great "I love WISEST" shirts, and be proud science "nerds". I think that the Wind up lunch was a great way to end this grand journey, our WISEST summer.

The T.G.I. Fridays and Wind up Lunch were events that we all looked forward for. It was an incredible social event where we got to make new friends, and chat it up. I know that me, as well as others won't forget the exuberant times we shared on those occasions. It was truly these occasions that turned WISEST into more than just an old, boring job; but rather an astonishing and cherishable experience.





POTLUCK PICNIC AND PITCH N' PUTT

By Lucia Sui

THE EVENT WAS just as amazing and awesome as the name itself. With nothing academically based, the Potluck Picnic and Pitch n' Putt gave the students a chance to get to know one another and their WISEST coordinators. Throughout the six weeks, WISEST has given us numerous "bonding" activities, and this was definitely one of them.

On Tuesday, July 24, 2007, after a day of work several of the WISEST students met up in Quad for a potluck picnic to kick off our amazing evening. Once we got there, we knew the picnic will be beyond our expectations. The picnic table was filled with food. With a closer look, all of the food fell into three categories: chips, cookies or fruits (arranged in the order of abundance), with the exception of a fought-over plate of rice crispy squares and a random bag of granola bars. After we stuff our face with food high on fat and sugar, and stashing bags of jumbo chips into the WISEST office we head off to part two of our highly organized evening...

We formed teams of three or four people at the Pitch n' Putt. Each team was supposed to have a team theme and dress up according to it. Only one group remembered to do that. They dressed up as the...GOLFERS, each wearing something plaid and looking a lot like rich golfers on an actual golf course. With the shame of forgetting to dress up come and gone, each team headed toward their holes to start their game (I don't remember any team bothering to pick up a score card). After each of us spent a hole or two getting used to our clubs and putters, and making a few hilarious but shameless swings, it was time to bring on the tricks. We tried putting behind our backs, putting after swinging in circles, putting "pool table style", etc. Amazingly some of us, or just me at least, found some of the goofy putting positions better than just regular putting (just to show how amazing our golf skills are). We wrapped the game up without the slightest idea of who had won, but gained a deep understanding of sportsmanship and fair-play. The evening filled with fun and jokes ended after Robyn "smoked" a golf ball into the trees.

The Potluck Picnic and Pitch n' Putt was more than pure fun and laughs...okay it was just that. However, it was a few hours of pure fun and laughs that none of us will forget. It was a well deserved break from our lab work and all the academic Wednesday seminars (however they are still awesome). It gave us something to giggle about the next morning at work. The prizes given out the next day nourished our already growing temptation to plan another event just like this one.

Women in Scholarship, Engineering, Science & Technology

WISEST Summer Research Program 2007

STUDENT REPORTS

WISEST

It's been my privilege and my pleasure to be part of this program. I would definitely encourage others to participate in it.

ABBY MORGAN [Renewable Resources] // **WISEST SUPERVISOR** :: Dr. John Spence
SPONSORS :: Alberta Employment, Immigration and Industry (STEP) / Faculty of Science

MY WISEST EXPERIENCE OF 2007 has been one of a kind. At the outset of the program, I never imagined I would meet so many incredible friends and mentors, learn so much new information, and have my interest piqued in an area I previously knew little about!

I was fortunate enough to be in the lab of Dr. John Spence, Chair of Renewable Resources at the University of Alberta. My direct supervisor was Josh Jacobs, the Spence Lab Technician. Josh has had a profound impact on me. His deep respect for the environment, his dedication to social responsibilities, his intelligence, creativity, sense of humour, experience and expertise in entomology all combined to form a truly inspirational mentor. I would be remiss if I did not acknowledge as well the valuable contributions of the lab staff including Evan Esch. I owe Josh and his colleagues a deep debt of gratitude.

My project involved a study of an introduced species of ground beetle (carabid) named Pterostichus melanarius. The species thrives in urban areas, but has had difficulty invading forested areas in the past. My project's purpose was to determine if P. melanarius has been successful in invading and establishing populations within a forest. We discovered that the invasive beetle has indeed expanded its territory into the deciduous forests. The field site we used was approximately seventy five kilometers northwest of Edmonton, at the George Lake Field Station. Another project that has been underway for over twenty years is the weekly water strider catch and release study. It involved catching and examining all the water striders on a small pond near George Lake. The number, species and sex of the water striders were then recorded before releasing the insects back into their habitat. The number of water striders we caught varied widely, from less than one hundred on one day to six hundred ninety four on another day! My experience taught me many things, including identification of beetles and other insects, navigation, planning and establishing a trap grid, how to set and collect pitfall traps, specialized computer skills, innovative water strider catching techniques and organization of research information.

My P. melanrius traps were out from July 6th until August 1st, 2007. During that time, we collected the contents of the beetle traps twice. We made biweekly field excursions to George Lake to monitor the traps and catch water striders. Opportunities were also extended to WISEST students to attend seminars on Wednesday afternoons- for example, the off-campus tour to a biopharmaceutical company. It was extremely eye opening to see all the groundbreaking research that goes on right here in Edmonton! The WISEST program culminated in the production and presentation of a research poster outlining project details.

Throughout the WISEST program of 2007, my career ambitions have changed. I intend to focus my future studies on forest ecology. After experiencing how rewarding it is to be channeling your energy to a globally worthy cause such as research in entomology, I have made the decision that I wish to be part of this caring scientific community. The research ecologists conduct can potentially help us to better understand the world around us and our role in it. It's been my privilege and my pleasure to be part of this program. I would definitely encourage others to participate in it.

Working on the actual project was amazing, I felt so fortunate to be in a quality lab, working on my own project that would hopefully help the research as a whole and make a difference for blood transfusions.

ABISOLA OJIKUTU [Lab Medicine and Pathology] // **WISEST SUPERVISOR** :: Dr. Jason Acker
SPONSORS :: Human Resources and Skills Development Canada - Canada Summer Jobs / GlaxoSmithKline

SUMMER FOR ME HAS MEANT a time of rest, of sleeping in, vegetating on the couch in front of the TV day after day. It has meant giving my brain a well deserved break from all the hard work done the previous school year. But upon hearing of my acceptance into WISEST I knew my day of vegetating would be no more, instead I would have a summer of learning. I was so happy to know that this summer would be different and filled with excitement.

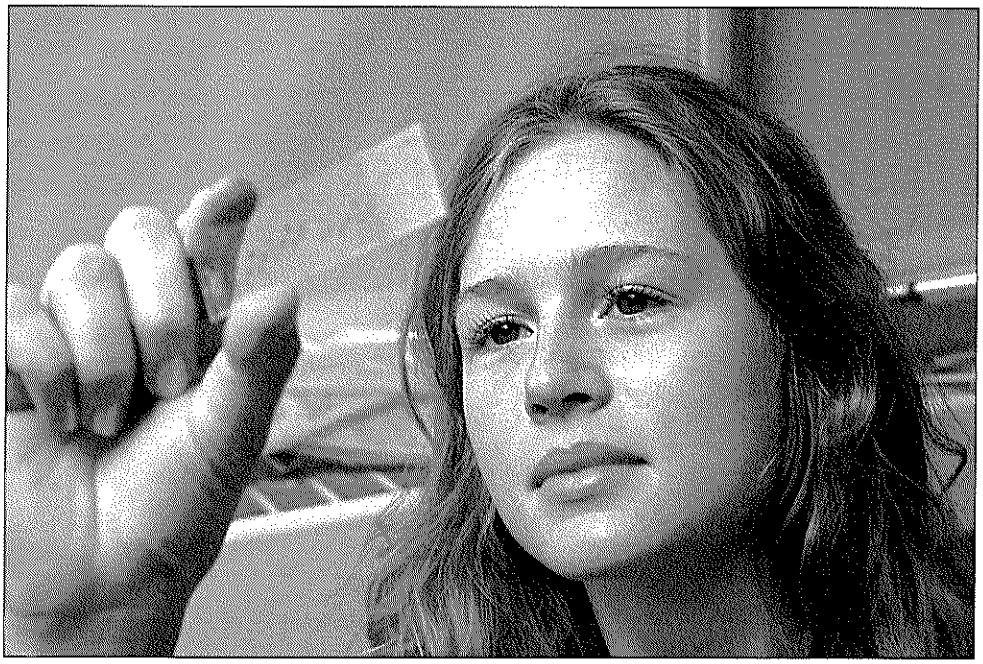
This summer, I was put into Dr Acker's lab at Canadian Blood Services, which made me very excited because I find blood to be unique and interesting. His lab is working on testing the percent hemolysis in various Red blood cell units. I was told I would be helping them sample and test some units but most importantly I would be getting my own project.

My project also, would involve the hemolysis of Red blood cells (RBC) which is the disruption of Red blood cell membranes and the subsequent release of hemoglobin into the suspending medium. Hemolysis of RBC units has been a problem in blood banking and transfusions. Although a natural process that occurs gradually with storage, excessive hemolysis may indicate improper storage, bacterial contamination, or improper processing. Up until this point based on visual assessment some RBC units have been sent for testing for hemolysis rather than being transfused into patients. Results from these tests show that a large percentage of the RBC units have levels of hemolysis that are less than 0.8%, a normal and acceptable range and are therefore suitable for transfusion. The visual assessment of the RBC units is based on the Haemonetics color comparator which is used to visually grade the degree of hemolysis in the supernatants of packed RBC units. The Haemonetics color comparator is made of 8 bands of color each representing a different hemoglobin concentration. These purely qualitative color bands pose a flaw in the method because as there are no corresponding measurements of percent hemolysis some RBC units are not used due to uncertainty and extra caution taken when using the color comparator. The purpose of my project was to validate the use of a color comparator, by creating a new color comparator that not only provides qualitative color bands but also corresponding quantitative measurements of percent hemolysis.

After learning what my project was specifically about, we began developing a protocol of how I would actually carry out the research experiment. Developing a protocol that would work was quite frustrating and as we ventured deeper and deeper into the mechanics of the project, I began to truly realize what research was about. I realized research was about asking questions, which lead to other questions, which lead to the very soul of the research. I found as we started developing the protocol, other details and aspects that we never thought would be a part of the experiment became very much involved. We found ourselves revising the whole protocol about three times before we truly had a strong foundation. After finishing the protocol we ran a couple of practice runs to test the protocol. To my surprise even as we did the practice runs we found ourselves still making changes to the protocol.

Working on the actual project was amazing, I felt so fortunate to be in a quality lab, working on my own project that would hopefully help the research as a whole and make a difference for blood transfusions. This summer I have learnt so much about what research truly is. It is no longer just a foreign concept, but a possible career path for me. I have learned that research is a journey that is filled with both success and failure; we learn from the failures and feel rewarded by the successes.

Although waking up early was quite difficulty for me, I am so glad I was given this opportunity of a lifetime. I am so happy to have gotten the chance to meet so many intelligent, self motivated students and to have learned from them through WISEST activities such as the Science Olympics and small group discussions. This summer has been a very memorable one and I can only hope to have summers as rewarding as this one in the future.



It was a great feeling to be around people just as ambitious and curious as myself.

ALEKSA LESZCZYNSKI [Agricultural, Food, and Nutritional Science] // **WISEST SUPERVISOR** :: Dr. Gaylene Fasenko
SPONSORS :: Human Resources and Skills Development Canada - Canada Summer Jobs / Faculty of Agriculture, Forestry and Home Economics

WHO KNEW THAT SUMMERTIME, learning, working, waking up early and chickens could all go hand in hand? Who knew that this combination could prove to be an exceptionally fabulous time? The fact of the matter is that I sure didn't.

I applied for WISEST because, truth be told, I'm a geek. I knew this summer research program would be a kick start for my science orientated future. I knew it would look good on resumes to come and that I would learn a lot. What I didn't know however, was that it would be a really fun time and, surprise surprise, a totally awesome way to spend my last summer as a high school student.

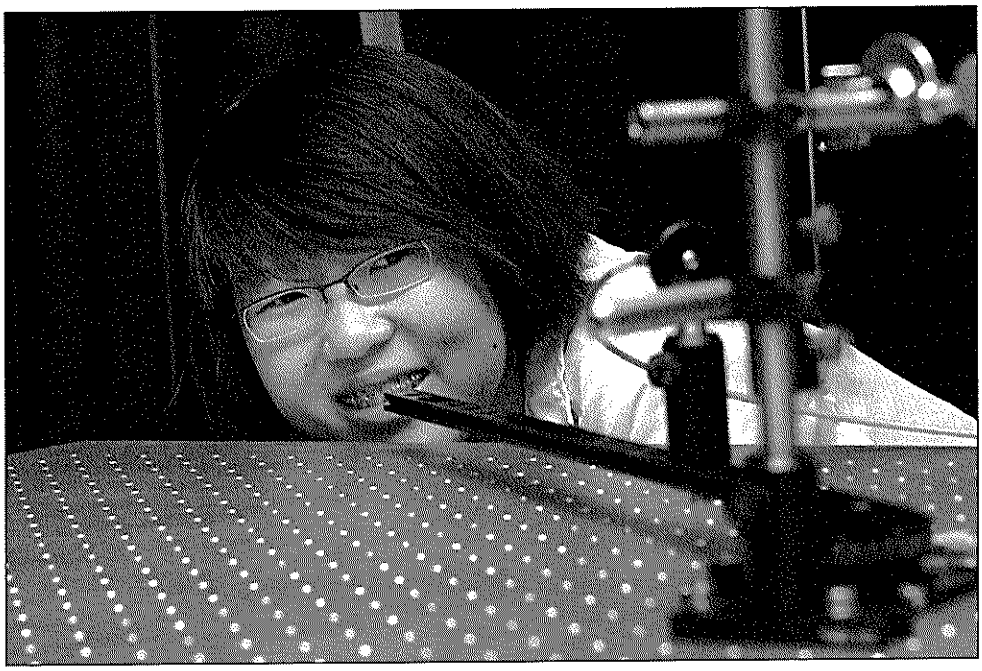
Turns out WISEST was full of surprises.

Specimen A: life at the poultry unit. Sounds thrilling doesn't it? Especially if the thought of squawking, pooping chickens gives you the heebie jeebies. I remember my very first day on the job. It was, as some would put it, a "gong show". It involved weighing birds and then the highlight of it all, collecting semen from the roosters. Lesson one, day one: One must be open minded and willing to look past personal hang ups. Forcing a smile to my face (but still cringing on the inside), I weighed those birds like no other. I am now a believer that one of the crucial fundamentals WISEST taught me is that a positive attitude will get you far in life. Because I was able to swallow my reservations, I earned the respect of my supervisors and work partners. This is definitely a lesson to be remembered and applied to many, MANY challenges to come.

Specimen B: life at the poultry unit actually is thrilling! So many times I have been asked why someone would want to research chickens. I respond with the question "what did you eat for dinner yesterday?" I now have conclusive evidence that often the answer to this question will be "well...chicken". Many of the projects conducted at the poultry research center are working to study and improve the animal that we just love to eat! My project involved dissecting chicks and removing the small intestine in order to study the villi present. We used a process called histology to transform these tissues into samples that could be read using a microscope. It was really cool to perform all the scientific procedures and to finally seeing those precious villi in the microscope was a very satisfying accomplishment. They looked just like they did in the textbook! My supervisors, Ana and Lukas, and the other researchers that I worked with were a hoot! Oh so many laughs and jokes and icecreams were shared. These are the joys of summer that I still was able to enjoy, even though I was spending my vacation unconventionally.

Specimen C: nerdiness can and should be celebrated. I have realized that next time I'm called a nerd it will not be taken as an insult, only a generous compliment. The marvelous WISEST coordinators took this name to a new level and allowed us to embrace it! On orientation day we played the nerdiest icebreaker games they could come up with. At one of the lunches they taught us a game to play at our next high school party that would surely win us points with the cool kids, The Chemistry Spelling Bee. Our WISEST t-shirts featured incredible science cartoons on the back. I remember thinking at our WISEST meetings "these are my people!" simply because we shared interests and values and a thirst for learning! The other WISEST students were also passionate about science. When we went on a tour of COMPRU I was blown away. When I looked around at my friends on the tour, I saw they were equally amazed. It was a great feeling to be around people just as ambitious and curious as myself.

YAY WISEST!



I found many equally excited summer researchers eager to relate their adventures in the lab.

ALISON ZHANG [Electrical and Computer Engineering] // **WISEST SUPERVISOR** :: Dr. Michael Brett
SPONSORS :: Human Resources and Skills Development Canada - Canada Summer Jobs / Process Solutions Canada

I AM REPORTING FROM THE LAND OF ABBREVIATIONS in which I have enjoyed my WISEST research experience. After all, the name of Dr. Michael J. Brett's lab in the Department of Electrical and Computer Engineering includes an acronym.

The GLAD group employs glancing angle deposition (GLAD), which involves condensing particles at an oblique angle while rotating the target, to engineer characteristically columnar and porous nanofilms. This technique uniquely controls the distribution and structure of the posts so that pore size and column shape can be varied. The result is a carpet-like array with a fondness for holding particles in its spaces.

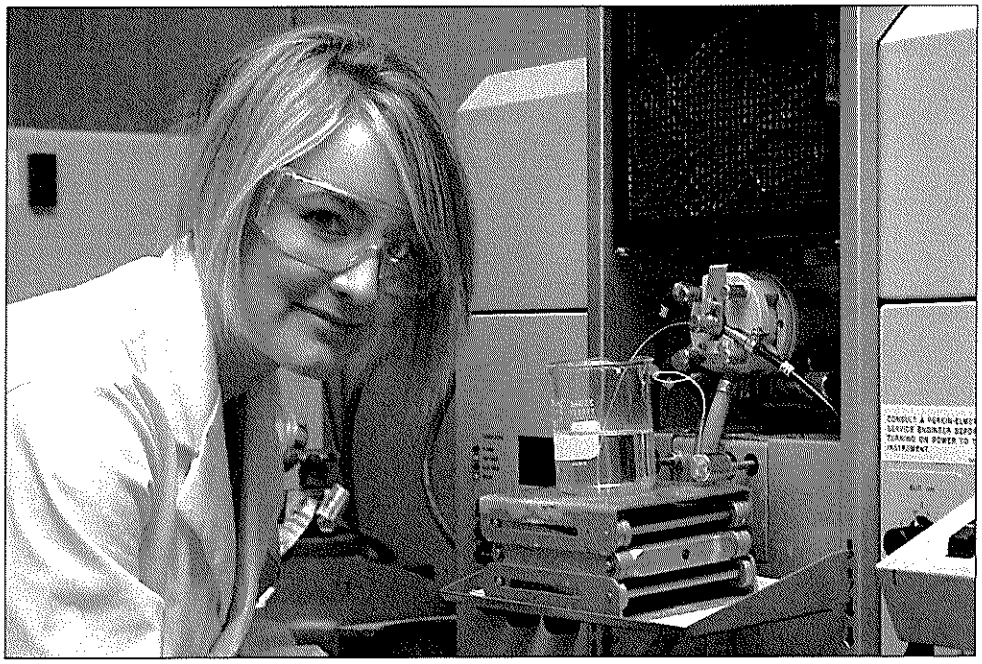
My direct supervisor, Katie Krause, a graduate student led me through the scientific process: the mix of intriguing theory, delicate data collection, search for conclusions in a lap-top's worth of information, and occasional fury at the incompliant software, with a project evaluating the use of GLAD nanofilms as humidity sensors.

I investigated how suitable tracing changes in the film's optical properties as material clogs and dislodges was as a detection method for water vapour. Because water has a higher index of refraction than the air it displaces, at a higher humidity, the transmission spectrum showing the wavelengths of light that passed through the film shifts towards the red wavelengths. I examined how heating and aging would affect the extent that these shift remained consistent. In an application driven field such as engineering, it was a natural step in product development to determine how performance may be affected by different conditions.

What I found most remarkable about this project was that it involved handling an assortment of diverse scientific principles and skills, all of which were needed to address the research question. In completing the testing, I learned how chemical bonding between water vapour and the columns could have permanently altered the film's material properties, how to adjust the ratio of dry nitrogen and water vapour through a network of valves and pipes to modify the humidity level, and how no system is ever over-checked for the lurking presence of procedural errors such as an unaligned light beam. I had expected to focus on electrical engineering; instead covering topics from chemistry to plumbing demonstrated to me the value of a broad spectrum of learning and the overlapping relevance of different fields.

For me, the defining aspect of the WISEST program was the awareness I gained about the demands of research. Though the use of different facilities imparted a sense of awe, I also encountered the realities of lab work. Precision was an absolute for many of the hands-on, technical procedures. Since nanofilms are so fragile, slight brushes are possibly ruinous after days of sample preparation. My time in the lab has not only bolstered my practical knowledge but also coached me to be generous with my questions and effort to seek solutions. Questions helped me to evaluate my understanding of new ideas but also direct my analysis and formulate conclusions.

All of this learning would not have been possible without the incredible people I met this summer. Dr. Brett's lab and Katie were highly encouraging and friendly with their time and explanations. Amongst the sixty WISEST students, I found many equally excited summer researchers eager to relate their adventures in the lab. And the speakers during the Wednesday seminars also contributed to the supportive, informative, and enthusiastic environment of WISEST, while our coordinators ensured the activities were ridiculously fun. As this program reaches completion, my last remark is an excited shriek: EEE! Because thank you WISEST for making this Experience Extremely Excellent!



It has allowed me to eradicate my fear of university and see it as something not vast and overwhelming but something that can thrust me to new potentials and allow me to build a network of strong relationships and even stronger friends.

ALYSSA SHINBINE [Chemical and Materials Engineering] // **WISEST SUPERVISOR** :: Dr. Tom Etsell
SPONSORS :: Alberta Employment, Immigration and Industry (STEP) / Faculty of Engineering

WISEST STANDS FOR Women in Scholarships for Engineering, Science and Technology. Well that is its most literal translation anyways; one could interpret this program in many multifaceted ways. I personally think this program is a medium of exploration; a vortex containing many callings, pursuits and exemplary individuals. Now by exemplary individuals I speak of the select few who are led by passion, laughter and a drive to succeed.

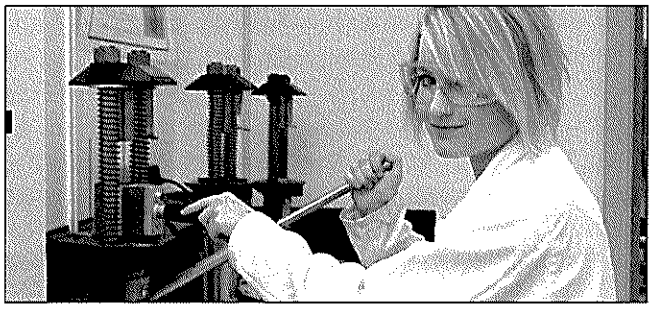
My small journey of exploration began with sixty other WISEST students on an orientation day where I first saw through somewhat tired eyes what WISEST was truly about: People. New people with vibrant young faces mixed together with faces that showed more experience to create a buzzing scene. On that day I met both Patrick Kerr my supervisor and Dr. Tom Etsell my principal investigator. There they explained in better detail the project I would be working on: I would be assisting Patrick Kerr with the extraction of iron from the Iron Ore Peace River deposit in Clear Hills Alberta.

I would do a variety of things in the lab, mostly I got to act as Patrick's sidekick following him about in the lab and trying all the cool machines he liked to employ. I mounted and polished samples of iron ore using bakelite which we later viewed under an SEM (scanning electron microscope). These images were very valuable, as they allowed us to identify certain elements within our sample. As well, we ran CO reduction tests in a tube furnace where we were testing whether hematite would reduce to magnetite in a carbon monoxide atmosphere. Finally, we oxidized some ore sample in the furnace. Lab work fascinated me in all aspects, the thrill of an experiment going well was breath taking; it was here I began to first feel the highs and lows that accompanied research.

Not only did I find the project I was doing utterly fascinating, I thought the Wednesday seminars put on by Natasha and Robyn were loads of fun. Every Wednesday we would explore the university, talk to various students, talk to real life employees of science-focused industries, and even kick it up with a Science Olympics competition. My favourite Wednesday seminar was the off-campus tour, where you could go to either Isotechnika Inc. or COMPRU. I. Going to the latter, I learned about facial and neck reconstruction and began to appreciate this field as an art. Another favourite seminar was the Science Olympics where we got together in teams and put our brains to the test in fun, mind boggling games. I greatly appreciate all the effort and brainstorming the WISEST team had put forth in creating these fun-filled afternoons.

Whether being the exciting Wednesday seminars, lab experience, or even simply the people I met, WISEST has truly been an adventure I will never forget. All in all, WISEST has been truly an irreplaceable experience. It has allowed me to eradicate my fear of university and see it as something not vast and overwhelming but something that can thrust me to new potentials and allow me to build a network of strong relationships and even stronger friends.

I want to thank the volunteers of WISEST, my sponsors, my supervisor and my principal investigator for providing me with this truly amazing experience! I love science!



I will never forget this incredible experience thanks to everyone involved with this program.

AMANDA RYGH [Earth and Atmospheric Sciences] // **WISEST SUPERVISOR** :: Dr. Murray Gingras
SPONSOR :: Alberta Environment

BECOMING "THE WORM LADY!"

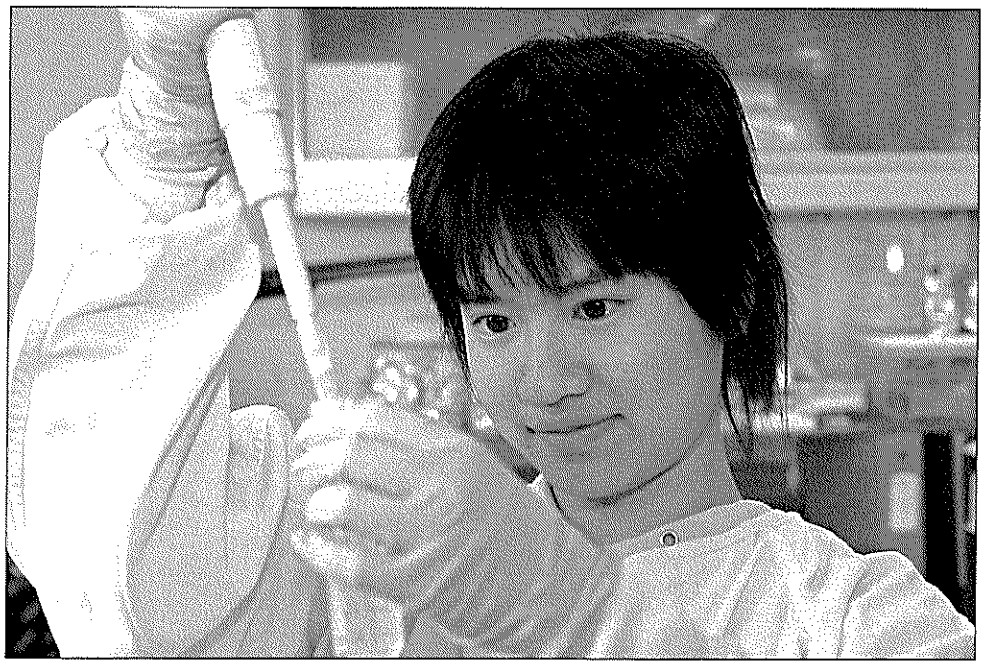
During my six week summer session with WISEST, I was involved in a geology-type project. I had an aquarium of Tubifex worms, that were retrieved from the North Saskatchewan River, to observe their burrowing patterns and the rate at which they bioturbate the sediment. Through studying how modern organisms move through sediment, we can predict how ancient organisms behaved in similar sediment types when looking at their burrow fossils. These worms were approximately two centimeters in length and one millimeter in diameter- so you can imagine how hard they were to see! I took photographs of my tank daily so I could monitor their progression. By measuring the area of their fecal mounds, I was able to determine their burrowing rates. It was fascinating to see the amount of work that tiny organisms can do over the course of only one month!

My lab in the Earth and Atmospheric Science building wasn't a formal 'lab coat' type of job. This made it unique and changed my perspective on what a laboratory is. I learned how to use various computer programs, and got to use a very expensive digital camera. And on top of it all, I had the chance to interact with the amazing members of the "Ichnology Research Group." I never thought that I'd have as much fun as I did working with worms- but the more I found out, the more I felt I was contributing to research. In addition, the time I spent "hunting" for worms with my fancy camera was always an adventure and was extremely rewarding when I was successful. We had time to go down to the river and try to collect more worms for further study. But considering these worms are almost impossible to locate in such a large environment, we came back with no luck, a big bucket of very heavy sand and a tired undergrad student. And through both frustration and success, I eventually created a 'worm chant' about these fresh water worms! Needless to say, they didn't respond in the way that I'd hoped.

On the other hand, my experience in WISEST was so much better than I thought it was going to be- and I already knew that it was going to "rock!" As I previously mentioned, I encountered many passionate and fun people who showed me a different side to research. I was given the opportunity to figure things out through research and observation, ultimately leading me to teach those around me. Most importantly, I learned how to overcome obstacles that weren't expected.

There were also many activities that enhanced my experience with WISEST. Wednesday afternoon seminars allowed me to hear about careers that I had never considered. My favorite one was the off-campus tour to Isotechnika because I got to see the process in which important medication in our society makes its way to the market. When I attended, I also learned that it's way easier to go through open doors than locked ones. I enjoyed meeting new students my age who have the same passion that I do! Hanging out with the other WISEST students, Robyn and Natasha at TGI Fridays also made my experience very memorable. Plus getting to explore the campus embedded me with comfort in making the transition from High School to University. Now I can't wait until I finally get to attend this school and experience the unique life within the university's borders.

In conclusion, this experience expanded my love for science and treated me with experiences that allowed me to laugh until my face hurt! I would like to extend my thanks to Alberta Environment, Alberta Education, everyone involved with WISEST and the department of Earth and Atmospheric Sciences for sponsoring as well as supporting me this summer. And special thanks to my principal investigator, Murray Gingras, for allowing me to be a part of his amazing research team, as well as Lynn Dafoe who was always there to help out and share a laugh with me. I will never forget this incredible experience thanks to everyone involved with this program.



I have learned and grown so much from this experience. WISEST definitely marks a milestone in my life.

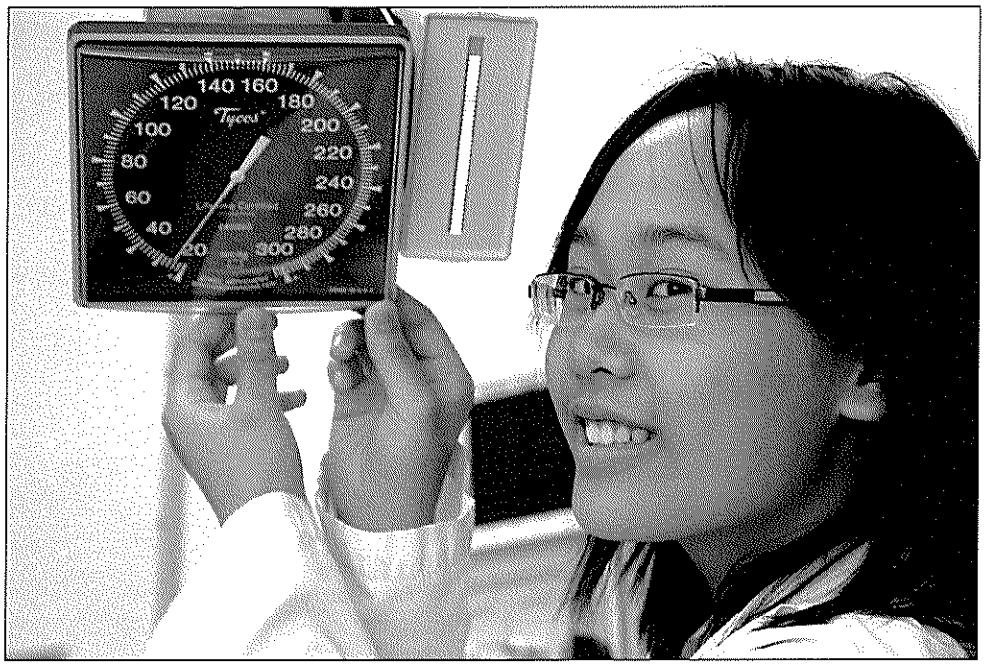
ANLIN FANG [Lab Medicine and Pathology] // **WISEST SUPERVISOR** :: Dr. Imran Mirza
SPONSOR :: Alberta Advanced Education and Technology

I STILL REMEMBER VIVIDLY how excited I was when I knew I was accepted by WISEST. Right from the beginning, I have known that being a part of WISEST not only means a meaningful summer that is apart from excessive sleeping and time wasting, but also a life-changing experience that would help direct me to the right career path. Choosing a career that suits oneself is hard, especially when one has absolutely no idea what it is like and what it takes. When people ask me the universal question "what do you want to be when you grow up", I am speechless, yet I can do nothing. Being a grade 11 student heading to grade 12, I panicked at not having a direction in my life. I realized how little I knew about myself and yearned for a chance to explore that unknown world beyond high school. WISEST is just the bridge that connects me, an ordinary high school student, to this mysterious yet exciting world, university. I am so glad that I took the chance because I know for sure that the person now sitting in front of the computer is no longer the one a few months ago that was unsure about herself. I have learned and grown so much from this experience. WISEST definitely marks a milestone in my life.

This great experience began with the orientation day that's packed with fun and laughter. Everyone was so friendly and we could not wait to know more about each other. With joy, the day flew by and at the end, we were picked up by our supervisors who showed us around where we would be working. I was led to the Molecular Pathology laboratory under the Medicine Pathology department at the university hospital by my principle investigator Dr. Mirza and my wonderful supervisor was Christine Frantz, who had guided and helped me with all her heart during the following six weeks.

Tissues are usually embedded in paraffin to maintain structure and prevent putrefaction after removed from the body. FFPET (formalin-fixed paraffin-embedded tissue) must be deparaffinized before DNA is extracted from it. My project was to compare two methods of deparaffinizing DNA: the CitriSolve method, which is typically used by clinical labs, and the DEXPAT method, which is newly released by a Japanese company. Although the tissue samples deparaffinized using the CitriSolv method produce good quality and quantity of DNA, the method itself is time-consuming and potentially induces contamination and sample loss. By contrast, the DEXPAT method requires a small amount of time, however, the quality and quantity of the DNA produced is unknown. The two methods were performed in parallel on four colon cancer tissue samples, from which DNA was later extracted. In order to compare the methods quantitatively and qualitatively, the extracted DNA was further analysed under quantification, PCR (Polymerase Chain Reaction) and PAGE (Polyacrylamide Gel Electrophoresis). During the six weeks, I was exposed to so many advanced technologies and awesome machines that I truly had a feel of what science was about. At first, the completely new environment was overwhelming to me. But under the careful guidance of my supervisor, I soon got used to it and gradually picked up the basic laboratorial skills. Besides the life-benefit technical skills that I learned, I also acquired a great deal in life; the importance of attitude was one of them. I had made many mistakes (some of them were fatal) and I had times when I felt discouraged; however, from my supervisor I knew that every single scientist, no matter how successful they were now, had at least made one significant mistake—people are allowed to make mistakes! What matters is your attitude—how do you deal with the mistake and what do you learn from it. It is from the mistake that I learned the most indeed. This summer experience would be dull if everything was smooth and no obstacle was involved; so is life.

It is hard to include everything I had learned in WISEST; there is too much to say and some of them are hard to put in words. Above all, I want to thank WISEST for such a great experience and everybody who had helped me in the lab. For people that are hesitating to apply, I would say: come and join us! You don't know what you are missing.



It has broadened my view on the various opportunities and fields that one can enter in University...

BERNICE PUI [Medicine, Division of Neurology] // **WISEST SUPERVISOR** :: Dr. Zaeem A. Siddiqi
SPONSORS :: Human Resources and Skills Development Canada - Canada Summer Jobs / Faculty of Medicine and Dentistry

WHEN I FOUND OUT ABOUT MY ACCEPTANCE into the WISEST Summer Research Program, I was ecstatic. I knew that it was a great opportunity for me to explore more fields and acquire first hand knowledge and experience about research. Being in WISEST, I also had the chance to explore the University campus and find out more about the various programs that the University offers. Moreover, WISEST put on many fun and educational activities for us so that we could meet the other WISEST students and also learn about different fields.

Being placed in Dr. Siddiqi's lab in the Division of Neurology has allowed me to experience the joys of research and meet new people. I even got placed with another WISEST student, Sabrina Nurmohamed, who helped out with this study as well, and it was nice to work with someone who was my age. The people that I met in the lab were awesome people and they helped me a lot with my poster all the while teaching and exposing me to new things.

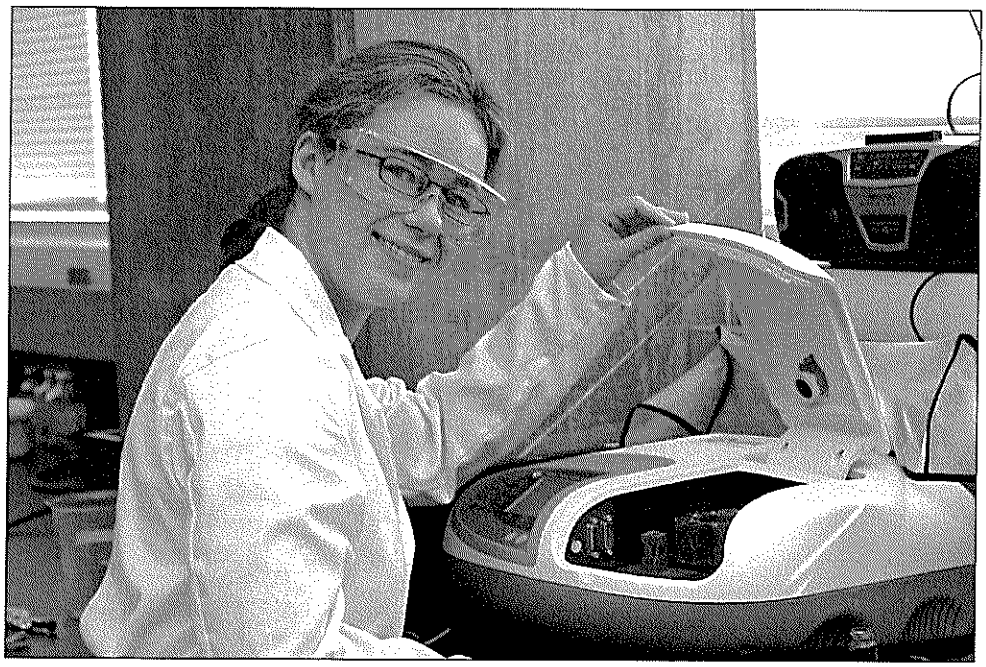
Our study was on the long-term effects of Guillain Barré Syndrome (GBS) on post-GBS patients. At the beginning, it was a bit slow and a lot of it was research and reading in order to be able to understand the project and our objectives. After that, our first steps for the study were to conduct a telephone survey in which the patients were asked to rate their level of fatigue in addition to telling us the extent of their disability by describing whether certain actions were not affected, affected, or prevented. However, our main objective of this survey was to see the incidence rate of fatigue in post-GBS patients.

The second part of this study was to assess the role of autonomic dysfunction in fatigue in these post-GBS patients. In order to do this, tests that assessed the autonomic nervous system (ANS) were performed on some post-GBS patients, some non-fatigued and some fatigued patients. These tests were the Quantitative Sudomotor Axon-Reflex Test (QSART), Heart Rate Deep Breathing Test, the Valsalva Maneuver, the Head-Up Tilt Table Test, the Sustained Grip Test, and the Case IV Test. These assessed the sympathetic and parasympathetic functions by analyzing their responses to the stimulation/scenario. For example, the QSART assesses the sympathetic nerves by stimulating the production of sweat through the application of acetylcholine to the skin through the iontophoresis.

Being a part of this study really taught me a lot about the autonomic nervous system and interaction with patients. I also found it very interesting to learn about the various tests and the equipment used in order to assess the ANS. I was even fortunate enough to be able to learn and set up many of these tests on the patients. There was one time in the beginning where I even got to be the patient and have these tests performed on me so that I could feel what they felt like. Luckily, all of these tests are non-invasive. Otherwise, I think I would have immediately jumped off the patient table if a needle or something was pulled out.

Since Dr. Siddiqi is a neurologist at the University of Alberta Hospital, I had the great opportunity to observe his working with patients in the EMG lab. It was very interesting to see what a neurologist's day of work is like and to learn the ways to diagnose the patients there.

I have made many new friendships and this was definitely a wonderful learning experience. It has broadened my view on the various opportunities and fields that one can enter in University, and has made me think about things that I have never thought about before. This was definitely an amazing way to spend the summer and I will definitely remember these past 6 weeks for the rest of my life.



I met some great people and I saw interesting things, both in my lab and during activities while I was here...

CAITLIN FORTIER [Civil and Environmental Engineering] // **WISEST SUPERVISOR** :: Dr. Mohamed Gamal El-Din
SPONSOR :: Suncor Energy Foundation

LAST APRIL I WAS CONSIDERING MY OPTIONS for summer jobs, and had heard something in the announcements about a medical internship over the summer. I plan on getting into medicine, so I put in my application for the program, but when I handed a form to my Biology teacher, she handed me something back, suggesting that I might be interested: a WISEST handout. The next day, I picked up the registration from my school councilor and filled it out, handing it in just in time for the deadline. Fortunately, I got the call. At first I was just too excited about the news for it to sink in, and it wasn't until the morning of the orientation that I was nervous. Fortunately, icebreakers really do go a long way in breaking the ice. After I got over a bit of initial shyness, I thought orientation day was fun, although I was still a bit mystified about what I'd be doing for the rest of the time period, that is until I met my supervisor shortly before it was time to go and wound up with a group trying to remove something called naphthenic acid from oil sands wastewater. My first day there, he handed me a fairly think stack of information on the project, from which I learned: a) naphthenic acids are toxic; b) they don't break down easily; c) they think they could use ozone to react with these acids and destroy them. The undergrad doing the mini tour also showed where the ozone generator was and how it worked, as well as the rest of the lab. Everything looked so different that I wasn't sure whether I'd get used to any of it!

Despite my concerns, I adjusted to my surroundings quickly. At first, I mostly reviewed the background material, but after a while I began going to the lab. Because the project I was working on was fairly new, it took time for things to get going smoothly, so I helped one of the undergrads work on her project for a bit. I was glad I paid attention in chemistry back in school, as I ended up using a lot of lab techniques I used there. After a while, I and a researcher named Helen started on the naphthenic acids/ozone project, finding out how long it took to make the ozone solution a certain strength and the smallest amount of ozone that one of the lab devices called a stop-flow spectrophotometer could detect. Unfortunately, its minimum detection limit was high enough to cause problems for the experiment, as the general idea was to track the amount of ozone in a mixture of ozone solution and naphthenic acids to see how it reacted over time, but because the amount that could be analyzed at a given time was so small in the stop-flow, the amount of ozone might go lower than the limit.

To solve this, they ordered a new stop-flow part to lower the minimum amount it could detect, and bought a chemical that was similar to the naphthenic acids, but better suited for the device. When the experiments started, I was even allowed to help operate the stop-flow, while Helen controlled the computer hooked up to it that graphed the data. Once things got going, it only took a few days to complete the experiments and get the results.

Despite the problems the project ran into, I don't regret entering WISEST. Sure, it took time for things to run smoothly, but the solutions showed just how important problem-solving and patience are. I also got to do some work with something I liked instead of flipping burgers all summer. I met some great people and I saw interesting things, both in my lab and during activities while I was here, and I would whole-heartedly recommend this to anyone who wants to do something a bit different from the ordinary. Thanks, WISEST!

I get to explore campus during my lunch hour, meet cool people with the same nerdy passions as me and, in turn, learn a little about myself and what I like and which out of those I would like to look seriously pursuing a further education in.

CAMILLE CHALIFOUX [Physics] // **WISEST SUPERVISOR** :: Dr. Bruce Sutherland
SPONSOR :: Centre for Math, Science, Technology Education (CMASTE)

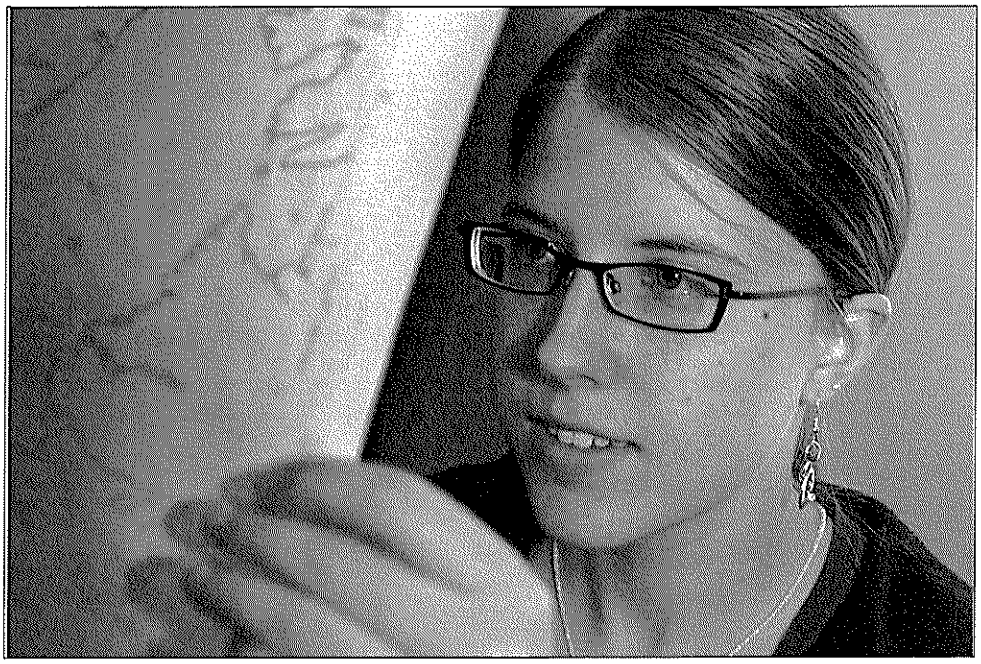
AT THE BEGINNING of another regular day in the middle of another regular week the regular announcements came on as usual, only this time one message caught my attention. The announcement was about a program for people who enjoy science, plan to get a post-secondary education and want to know about the hidden world of research. I was shocked that there was a program for secret nerds like me. This is where the story really begins, I made up my mind and started the hunt for more information on this "WISEST" program. I looked at posters and websites asked teachers and friends and concluded that this program intrigued me.

I admit the prospect of having to make a poster in the middle of the summer and the thought of commuting to Edmonton everyday seemed to be the deal breakers but this program still stuck in my mind. Even with "homework" I found the WISEST program seemed to never leave my thoughts, and so my application process began. I filled out all the forms, signed all the dotted lines and edited my essay a few times and sent my application in. Then many regular weeks later I found the message light blinking on my answering machine. It was the WISEST office telling me I made it into the program and would be working in a physics research group investigating the movement of stratified fluids. Even though I did not know what this exactly meant I was still really excited.

Then it was orientation day. It all flew by in a blur of information and names. Next, came the time to meet my research group, which made me kind of nervous, but I really didn't need to be. All of the labs they were working on were very interesting and everyone I met was very welcoming.

Since then my entire experience here has been an adventure. I have been immersed my lab work and in the university experience in general, except for the impossible due dates I have heard about. I have already learned so much from everyone here about academics, university lifestyle and research in general that I feel I really would have missed a lot had I chosen not to participate in the WISEST program. My summer has been more interesting than anyone I know because of this program. Who else gets their own half a cubicle, gets to run experiments, then tries to brainstorm ways to analyze them to get the needed data, in high school. This lab experience is different than any other I have ever had, there is no outline guiding you through the experiment, there is no set process that works the best, you could get the same answer many different ways and you are the one who has to figure out whether your answer is possible. That is all part the research adventure Beyond that, I get to explore campus during my lunch hour, meet cool people with the same nerdy passions as me and, in turn, learn a little about myself and what I like and which out of those I would like to look seriously pursuing a further education in.

I may have missed a few trips to the beach but I am really happy with what I am doing and learning here, and wouldn't have hesitated in applying if I knew this is what I was getting into.



We learned a little about what the others were doing in their labs and had a chance to tell the others about our own experiences in our labs.

CASSIDY FOXCROFT [Earth and Atmospheric Sciences] // **WISEST SUPERVISOR** :: Dr. Paul Myers
SPONSOR :: iCORE, Informatics Circle of Research Excellence

WHEN I GOT THE CALL FROM THE WISEST office saying that I had a place in the Summer Research Program, I was ecstatic. I now knew what I would be doing during the summer. Having already participated in the other two WISEST conferences, Choices in grade six and SET earlier this year in March, I already had an idea of what I would be doing this summer. I was sure I would love it.

July 4th was Orientation. After a busy day filled with icebreaker activities and presentations on subjects such as WHMIS and bio-safety, I was welcomed into my lab by Dr. Paul Myers, the Principal Investigator for the project I'd be working on and my supervisor. I then had a chance to meet the others in my lab, both grad and summer students, and I was given an overview of the project.

I would be entering and examining historical data from the Labrador Sea with the goal of seeing how it was changing, and why. Was the water in the sea getting fresher (less salty) because of climate change or were the changes simply a part of the ocean's natural variability? By how much was the water freshening?

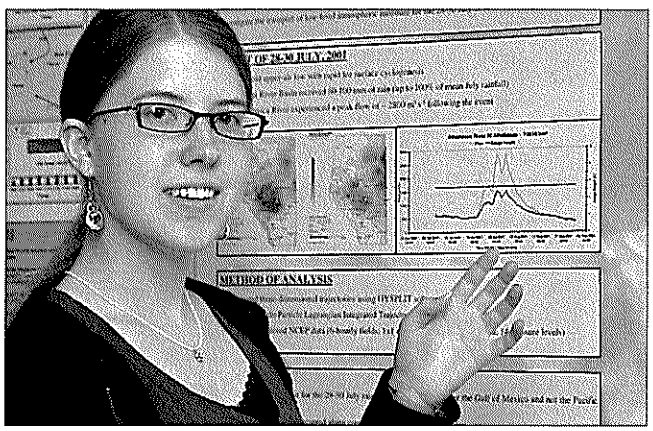
I was working on computers for my project. For the first few weeks, I was plotting graphs for water salinity, temperature, and density from previously entered data. I also read and learned about the oceans and ocean currents. Then, I was comparing the locations of water samples over the years. The results of those comparisons were then used to group data such as calculations of the total water transport and the heat transport. This data was also used to create graphs comparing the depth and length of each section where data was collected to categories such as the aforementioned water transport and heat transport.

The six weeks following that first day were a plethora of experiences. I learned a lot in the lab and grew confident with what I was doing. The weekly Wednesday WISEST seminars offered us all much information. These seminars ranged from topics such as small-group discussions to off-campus lab tours, each with its own benefits to offer. We learned a lot during these seminars. The T.G.I.Friday lunches were an opportunity for all of the WISEST students to get together and simply socialize. We learned a little about what the others were doing in their labs and had a chance to tell the others about our own experiences in our labs. Friendships developed and we all grew to know each other.

My summer here, doing the WISEST Summer Research Program was filled with new experiences and opportunities. I certainly enjoyed some things less than others, but had fun regardless. I had a chance to meet others who love science as much as I do and I certainly learned a lot from this. (Including how to use the city transit system!) The six weeks that seemed monumental at the start of the summer flew by, and it's already the end of the program.

Now, at the end of my six weeks, I have to question: Do I regret devoting six weeks of my summer to this program?

Definitely not. I loved it.



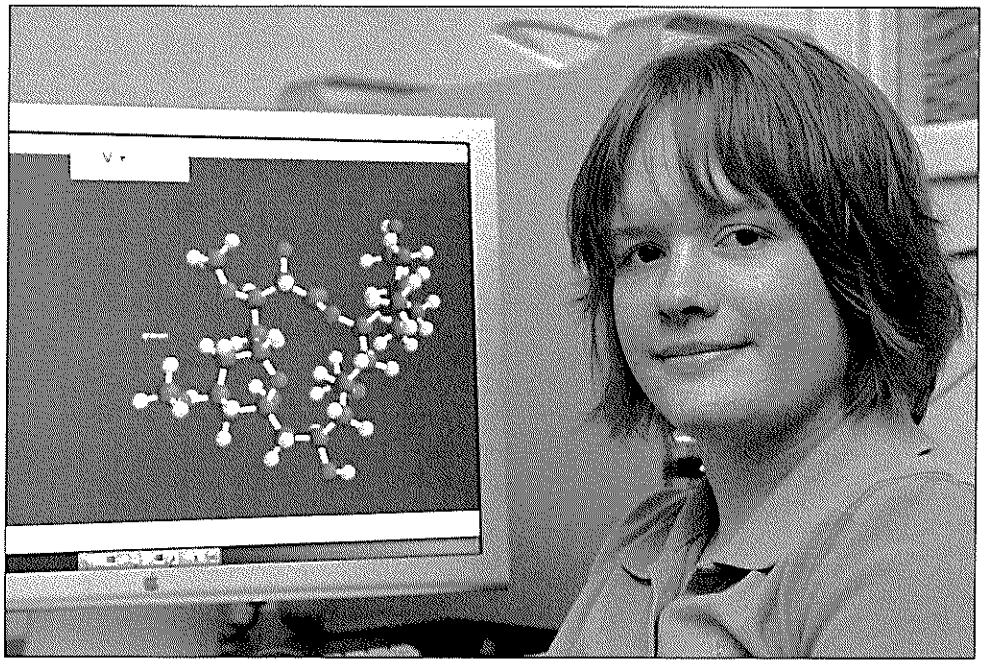
I learnt to work independently while working in a team and that it doesn't matter where you are in the field because you can always call it home.

CHANTAL DINGS-AVERY [Biological Sciences] // **WISEST SUPERVISOR** :: Dr. Erin Bayne
SPONSOR :: Syncrude Canada Ltd.

WISEST has been everything that I ever could have imagined and more. The moment I received the phone call from Robyn I danced and jumped around my house in joy and counted down the days until WISEST started. Robyn told me I'd be working in environmental sciences and I couldn't have been more thrilled. I love biology and the environment what a perfect match for me! I soon found out that this summer would involve lots of field work and I thought I was going to die from excitement my summer would now include camping, it was the perfect summer.

For three of the six weeks that I attended WISEST I made the northern boreal forest my new home. The people in my lab told me we'd be going north and when I asked how far north I got the response "About 4 hours from the North West Territories border." Wow that's pretty far north I thought but it turns out our field camp was parallel to Fort McMurray on the map. I knew the bugs would be bad, the nights cold and the days hot from my life experience living in northern Alberta. Despite the horror stories about the bugs I found that the field work couldn't come fast enough. After the 7 hour drive I got to my new home and couldn't wait to start work the next day. I'd be studying the effects of linear features on small mammals. After a huge storm and getting rained the first day that I was there I just started hoping that the weather would get better and it did. Once things were a little drier we dove head first into a mammal filled plot and started setting up. Battling alder batches and walking through wasp nests we set up our flags and traps. Enduring small mammals trying to bite threw our gloves we checked our traps and tagged our specimens. Thankfully my parents agreed and I got to start handling and tagging the small mammals. In my mind I was going to be the WISEST student that learnt the most and discovered her career. It wasn't all hard work though. Once a week we got to take town trips to shower and do laundry and I have never been so happy to be clean! Not to worry the cleanliness didn't last long. Along with being on the ground checking traps we were also on the ground changing flat tires. I learnt many new skills this summer; how to trap and tag small mammals and I am now an expert at changing flat tires! I may have missed the awesome Wednesday afternoon sessions and the Friday lunches but it was definitely worth it and I wouldn't have changed a single moment weather it be the rainy days, the wasps chasing us or battling the bushes.

I learnt a lot in my days during the WISEST program. In the field there were many woman who I talked to both university students and people who had already finished school. Each one had a different reason for doing field work and they all had so much experience with different animals. They have pushed me towards wanting a career where field work is a must and knowing the impacts of society is the goal. I learnt to work independently while working in a team and that it doesn't matter where you are in the field because you can always call it home. There is help when you need it, support from your supervisors and awesome people to spend the evening with. Overall I spent my summer in the middle of no where with bugs, storms, fighting bushes and trees to get my work done and wild animals. This was the best summer of my life and I can't thank WISEST enough for accepting me. I wouldn't trade this experience for anything in the world!



I met people from all over Alberta who were my age and fascinated by similar things. It was nice to hang around with science people, because the majority of my friends prefer arts and social.

CHRISTINE HUMPHRIES [Chemistry] // **WISEST SUPERVISOR** :: Dr. Mariusz Klobukowski
SPONSOR :: Canadian Information and Processing Society

WELCOME TO MY REPORT ABOUT WISEST and everything involved. My name is Christine Humphries and I worked, in the Chemistry department, in a Computational Chemistry lab under the supervision of Dr. Klobukowski.

I worked and completed two projects during the program. The first involved Peloruside A: an organic compound that stops reproduction of cells. I built the compound in a program called Spartan and then performed calculations on it. The point of my project was to find the conformer, or structure, with the lowest heat of formation. In doing so, the most stable conformer can be employed when this research is used later. It is hoped that a suitable drug can be created that, once injected, will halt the reproduction of cancerous cells. The second project involved quantum chemistry. Four amino acids: glycine, L-alanine, b-alanine, and methionine, were used. My job was to add Na, sodium, to different sites on the compound, like the double bonded oxygen or the nitrogen. The compound would then be minimized and calculations performed to, again, find the lowest energy. The separate energies of Na and the amino acid would also be found and the sum of these two values would be subtracted from the already calculated energy of the compound. The difference represents the bonding energy used or required. The reason behind this project is to add to the research database, and curiosity.

I am entering Grade 12 and, with chemistry as my favourite subject, working in a lab is not a new experience. This type of lab however, was quite different than what I'm used to, as it contains only computers. It was very interesting to learn about how various labs are conducted as well. Many projects and experiments, all contributing to different research, can be performed in the same area. I had a lot of fun working with the people in my lab and Dr. Klobukowski. The atmosphere was, for the most part, relaxed. (Three of them had to prepare for a conference, causing some frustration) All of them were willing to help me if problems arose and offer advice about -shall we say- various topics. I am grateful for the opportunity to meet people who are interested in Chemistry that this program has offered, especially as it has given me experience in what it would be like to work in a research laboratory.

My experience with WISEST was terrible. It was too much fun, way too fascinating and my lab too interesting! I met people from all over Alberta who were my age and fascinated by similar things. It was nice to hang around with science people, because the majority of my friends prefer arts and social. The numerous women in technology that we were introduced to provided helpful information about what a career would be like, along with encouragement to follow through. Unfortunately, some of the Wednesday seminars were not as exciting as I expected from reading the information booklet. When given a tour of the labs, my group's was rather disappointing, and for the IBM session, I had done the project before, so some creativity or variation would have been preferred. The IBM afternoon, along with the rest of the sessions, however, were informative about opportunities available.

Over the course of the six weeks spent at the University of Alberta, I have been exposed to information about women in science and technology. I've enjoyed the experience and am thankful for the opportunity WISEST has aided me in gaining more complete knowledge about the research area, ensuring that I can choose my future well informed...and that is all I have to say :)

I would recommend this to anyone, and if I was allowed, I would redo grade eleven just to experience this again.

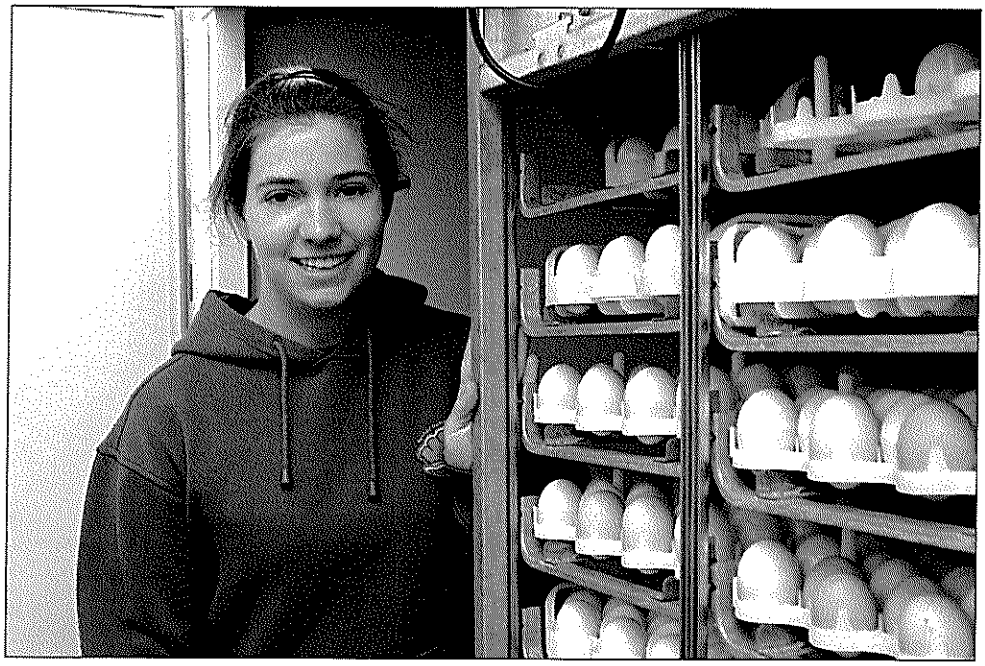
CORRINA MURDOCH [Agricultural, Food, and Nutritional Science] // **WISEST SUPERVISOR** :: Dr. Dean Spaner
SPONSOR :: Alberta Advanced Education and Technology

UPON ARRIVAL AT THE WISEST summer research program, I had not even the slightest clue as to what to expect. I was tense and nervous to meet my roommates, my employers, to see me lab, and anxious to commence the summer. However, upon arriving at the dorm, experiencing orientation, and getting to meet my wonderful supervisor, Allison Nelson, all of this panic subsided. I was placed in the department of Agriculture, Food, and Nutritional Sciences in a research facility on South Campus. I was introduced to the research team and to the project itself, the study of arbuscular mycorrhyzal colonizations within wheat roots. The experiment entailed multi-cropping wheat with a series of combinations of other plants such as: barley, canola, and peas. It entailed understanding the affects that these methods of multi-cropping had on the plants in respects such as their yield, weed resistance, and soil microbiology while still contrasting conventional growth systems to organic methods.

At first, the only part of this project that I could understand was the wheat itself. I had no idea that there were such complexities to the art of farming. There were so many valuable steps taken by researchers before I eat my bowl of Cheerios in the morning. I began by following directly behind my supervisor and observed her and others working as I was unsure what to do and where I could fit in. She was kind enough to help me find material to read, and that furthered my understanding of the project. The confidence from those learnings gave me the confidence to ask more questions; and slowly, without conscious realization, I grew into being able to help out and honestly understand life at the farm. It was a truly beautiful atmosphere on south campus, regarding both the people and the setting. Everyone helped everyone else with any work that they could. The work done outside was often difficult and seemed like a lot to do, however, so many people helped that it was always friendly and truly enjoyable.

So many things about which I was nervous at first seem so silly right now. I was nervous that I would not be able to understand and that I would walk away without having learned very much about the topic at hand. Now, I feel that I have taken in so much information and knowledge this summer, not just in fact, but in actual understanding and appreciation. I was worried about working outdoors as to whether I would enjoy it or be able to keep up. It turned out that not only did I enjoy but my abilities improved and at the end of the day I always left feeling like I had accomplished something tangible and real. In a way I find it amusing because almost all of my presumptions about research were shattered. Research is not one or two individual people making a dramatic breakthrough in one day and having their life goals fulfilled within two hours like movies imply. Research is a step by step process done by not one person alone, but by hundreds of people where every discovery is but a step built on the staircase of knowledge. It is so beautiful how every research predecessor and the knowledge that they attained acts like a hand pulling you along further. Honestly, it is so much more exciting to think that these wonderful discoveries are not made by one person alone but by several people each collaborating at different times, even in different eras. It is truly a display of the best traits that human nature has to offer.

Starting this summer I was worried about so many small things. Petty concerns such as getting to and from work and experiencing public transit for a first time strapped me. I was anxious about living in residence and the people that I would live with for these six weeks. It turned out that life here was not nearly as scary as I thought it would be. I have simultaneously grown in independent ability as well as ability to depend on others. They said that you would make real and true friends here and that you would learn invaluable lessons, but in all honesty I did not fully take them seriously. I knew that I would learn and grow, but not to this extent. This has been a wonderful experience and by far the best summer of my life. I would recommend this to anyone, and if I was allowed, I would redo grade eleven just to experience this again.



The awesome WISEST coordinators set up many WISEST activities so we could get to know each other.

DANICA WUESTNER [Agricultural, Food, and Nutritional Science] // **WISEST SUPERVISOR** :: Dr. Gaylene Fasenko
SPONSOR :: Suncor Energy Foundation

WHEN MY FRIEND FIRST TOLD ME about the WISEST program my first reaction was "This sounds so fun! A job in Science!" My friend and I decided to apply together. We got phone calls around the same time in May telling us we had both got in! I was so excited that we had got in and that we could have a great summer together! But when I heard my project I had second thoughts. I was working on the U of A farm and my project was the affect of rooster age on sperm quality and fertility. I knew nothing about roosters and didn't really want to research rooster sperm, but I figured it would be an interesting experience so why not see what happens! I was to be working in the Department of Agricultural, Food and Nutritional Science for Gaylene Fasenko and my supervisor was Margaret MacKenzie. It definitely turned into an unforgettable summer!!

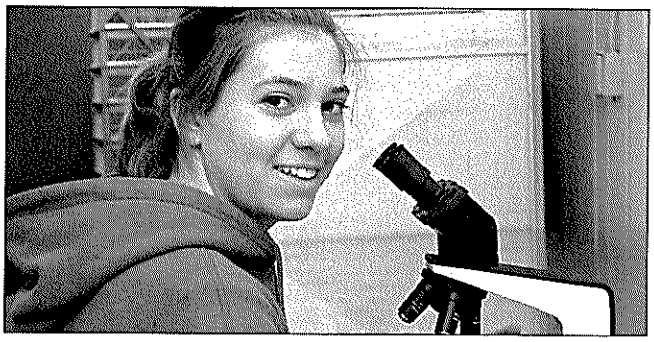
From the very first day I was doing things I never thought I would be doing in my whole life. One thing was weighing the roosters and hens; not very enjoyable, but hey, not everybody can say they've done that! Everything I did this summer was interesting and it greatly benefited me. I learned how to collect semen from a rooster and inseminate a hen (although I never tried myself). I also learned the process involved in finding the concentration of semen, mobility of sperm and how to dilute semen. The semen cannot be out of the body for a too long so all of these procedures had to be done in the barn, not in a lab.

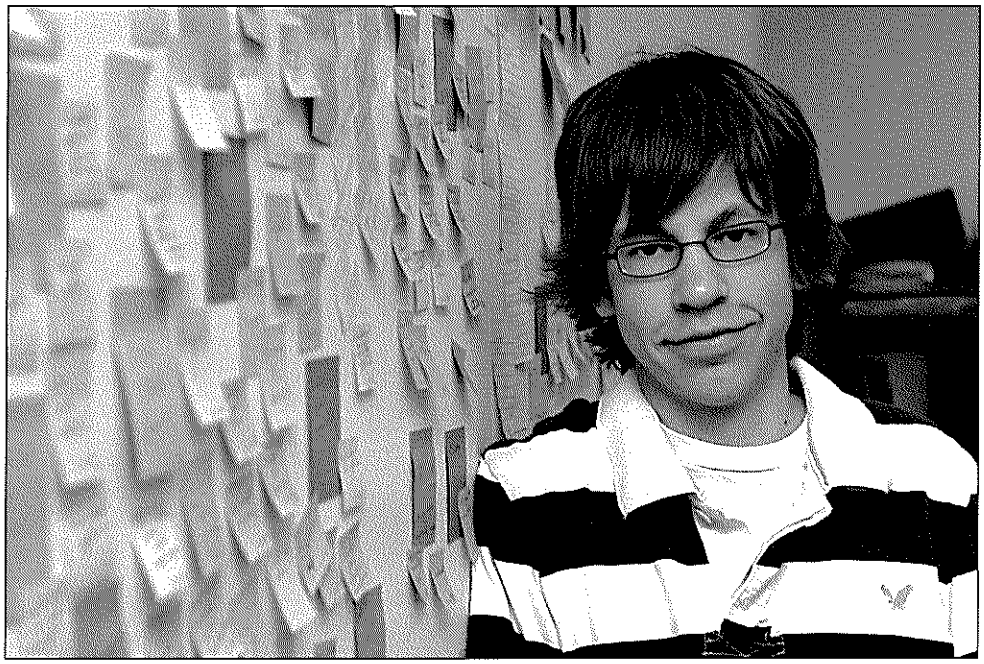
When I was in the lab this summer, I used a microscope to count the number of sperm holes on a sample of membrane that surrounds the yolk of an egg. This tells us how rooster age affects the fertility of the eggs produced by the hens. Another thing I did in the lab was, under the microscope I counted the number of live, live abnormal and dead sperm in a sperm sample. Working in a lab at the university was a great experience and it gave me the advantage of knowing how things work in a lab, which will be useful for when I actually go to university.

One good thing about this program was that we were able to visit other WISEST student's labs and see what other people were doing. So when I had some free time I was able to work with the other WISEST student at the farm and her supervisors. I learned how to dissect embryos and newly hatched chicks, which was a little sad but I would have to say a little interesting.

Even though this program is a job and it involves a lot of work, it does not seem like work at all, it's almost like we are getting paid to have fun! Aside from working on your project, the awesome WISEST coordinators set up many WISEST activities so we could get to know each other. There were the weekly Wednesday activities, the Science Olympics, T G I Friday lunches, the potluck and pitch n put and the wind-up lunch (which is still yet to come).

The program went by so fast; it's hard to believe I have been here for almost six weeks already. Although I had doubts at the beginning I was able to work through them and have fun learning many new things and meeting many new people. Margaret MacKenzie, Gaylene Fasenko and Robyn and Natasha (the student coordinators) helped make this happen and I am very grateful to them. I had an amazing summer and I will never forget it!!





I'm pretty sure given the chance to participate again next year I'd take up the offer.

ETIENNE RAINVILLE [Nursing] // **WISEST SUPERVISOR** :: Dr. Priscilla Koop
SPONSOR :: Faculty of Nursing

I WAS WORRIED. Three other people from my school had applied to WISEST plus me... did I have a chance to make it into the program how many from one school would they accept? What was my back up plan...working at Boston Pizza all summer? And yet my worries disappeared one night when I got the phone call saying I had been accepted into the program.

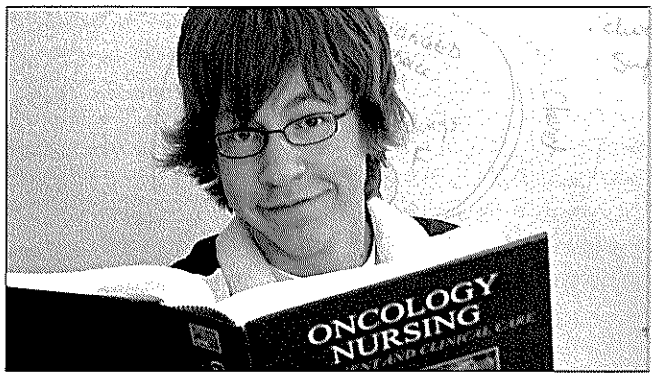
From the night of that phone call I could not wait for school to finish, and this had nothing to do with plans to lounge around all summer. I had expected to tell you here what I thought Wisest would be like comparing it to how it was, but honestly the two aren't comparable, this has been way better. So instead let me tell you about my job and residence.

I moved in to residence on the 3rd of July, that was an awkward day. Meeting new people is always awkward but I think this was more then most. Talking to people now most of them admit they had a picture in their mind of really "intellectual" people coming to the program. And that's where the illusion is shattered; although everyone at residence is quite smart like all the people in the program none of them let it override their personality. I guess this is my way of saying that the people at residence are way cooler and "funner" people then I had expected. Now only a of third of people in the Wisest Program go to Res. so let me explain so of the things that make this such a great place to be (aside from the people): Intense games of cards, biking, conversations till 6 in the morning, the food, movie nights, mattress slides/surfing, the HYRS kids, the RAs, American gladiator, parties (What Not To Wear Party themed), Whyte Ave, soccer, football, jackpot and capture the flag, debating, and so much more. I'm not going to look forward at all to moving out from my "home".

Residence life is only one 3rd of the experience the 2nd is my job. As a male I was placed in the "non-traditional" gender role of research nursing. The specific field I was placed in is palliative care nursing an area I was initially a bit apprehensive about. Truthfully I love my job but defining it is a little hard. The overall goal is to define and quantify how caretakers achieve respite and use that information to help improve it. The tasks I worked on are all over the map; I did data mining from interviews, coding them into a computer program, writing a prospectus, making pedigree charts, cleaning transcripts, I went to an ethics board hearing, a seminar on nursing, and even some of my professors classes. Overall it provided a broad range of things to do and was very worth while.

The final 1/3 of the WISEST experience for me was the social activities/seminars. The only negative with these things were that the people from residence where so close they tended to stay together instead of meeting new people. I tried to get away from this whenever I could but wasn't all that successful. The actual content of the seminars I really enjoyed although understandably most were aimed towards females.

Really this summer was awesome; I'm pretty sure given the chance to participate again next year I'd take up the offer. Sadly it's almost over, but I will have some good friends and good memories to remind me of my time here.



The Wednesday seminars gave me the chance to talk to other women in science and technology fields, and really opened my eyes to what kind of things I might want to do with my life.

EVELYN MANKOWSKI [Chemical and Materials Engineering] // **WISEST SUPERVISOR** :: Dr. John Shaw
SPONSOR :: Syncrude Canada Ltd.

AFTER HEARING ABOUT THE WISEST PROGRAM through my parent's friends, I decided to check it out. I couldn't believe that I, a mere grade eleven student, would get the chance to work in an university lab, for six whole weeks. I applied, with excitement, and got accepted. I was placed in a Chemical and Material lab, with Dr. John Shaw, and my summer was looking good.

A few weeks before the program started, I got a few doubts in the back of my mind. How was I going to like living in Edmonton, a five hour drive from my hometown of Fort McMurray? What if Dr. Shaw didn't like me? All my doubts vanished after the first two days of working in the lab, once I realized how much fun it is to be in a lab atmosphere and how nice Dr. Shaw was.

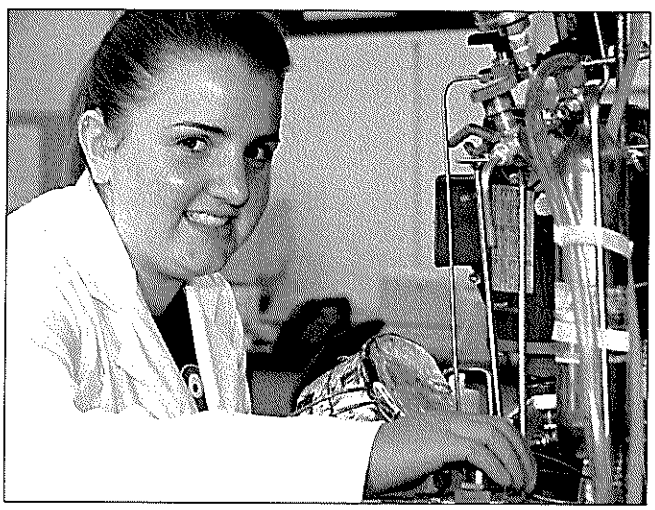
I was given the task of measuring the density of Maya Asphaltenes (an oil fraction) in a toluene solution at different temperatures. It was exciting because the work I was doing was contributing to information that Dr. Shaw had, which would be used to learn more about Asphaltenes. The results seemed a little bit weird, until we came to the conlcusion that the density meter wasn't working properly. A mechanic came in, I redid all the measurements, and finished my poster in record time.

Who cares about the density of asphaltenes? Since they can make up a large part of the oil, most of the major oil companies want to know all they can. I found it really interesting because it related to me a lot. Being from Fort McMurray, my life has kind of been centered around the two major oil plants, Syncrude and Suncor. It was cool to see what things are done in a research lab that can have such a large impact on the place I come from.

I would definitely recommend this program to anyone else interested in science. I learned so much about engineering and researching, and am definitely now considering doing a masters, and possibly even a Ph.D. There are also other things to do in the WISEST program, like the Wednesday seminars, and TGI Friday lunches. These activities gave me the opportunity to make friends with the other WISEST participants, and learn about other aspects of science.

The Wednesday seminars gave me the chance to talk to other women in science and technology fields, and really opened my eyes to what kind of things I might want to do with my life. I also had the opportunity to take a tour of the pharmaceutical company of Isotechnika, and made me realize that a Chemical engineers can work in more than one place, there are jobs everywhere. I am so thankful for WISEST giving me the chance to do what I enjoy.

This summer was a once in a lifetime opportunity, and I am always going to remember it. Giving up my summer is nothing compared to the friends I made, things I learned and the memories that will be with me forever. If another chance to work in a lab came up, I would take it, with absolutely no hesitation. Although six weeks sounds long, it flew by and I wish it would never end.



I have learned a lot and had a lot of fun too in this exciting program.

FREDA GON [Civil and Environmental Engineering] // **WISEST SUPERVISOR** :: Dr. Tim Joseph
SPONSORS :: Human Resources and Skills Development Canada - Canada Summer Jobs / Association of Professional Engineers, Geologists and Geophysicists of Alberta (APEGGA) / Alberta Advanced Education and Technology

I'm a grade 11 academic student at Chief Jimmy Bruneau High School. I come from a small community in the NWT called Gameti with a population of 300 people, and an opportunity like the WISEST Summer Research Program rarely happens. I wanted to participate in this program because this is a once in a life-time experience for me. Not only did I want to learn about science, I wanted to experience life at a university and live independently before I graduate from high school.

I'm really interested in science, because you get to learn about the human body and how it works. I hope to have a career in a scientific field or anything that relates to engineering, mechanics, and heavy equipment operator. There are many things I plan to do in my future, and I feel that this program helped me decide what I want to do.

I wanted to represent the Tlicho people and show the younger generation what is possible, because I want to show them that if you have a chance to do something, then you must seize the day and do it. Not only did I represent the Tlicho people, I also represented my home community, which I feel honoured about. I want to inspire other young females to do these types of careers as well. There are no Tlicho females that have a career in engineering and I would be very proud to be the first, and there are hardly any mechanics and heavy equipment operators. We are the future.

I have learned a lot and had a lot of fun too in this exciting program.

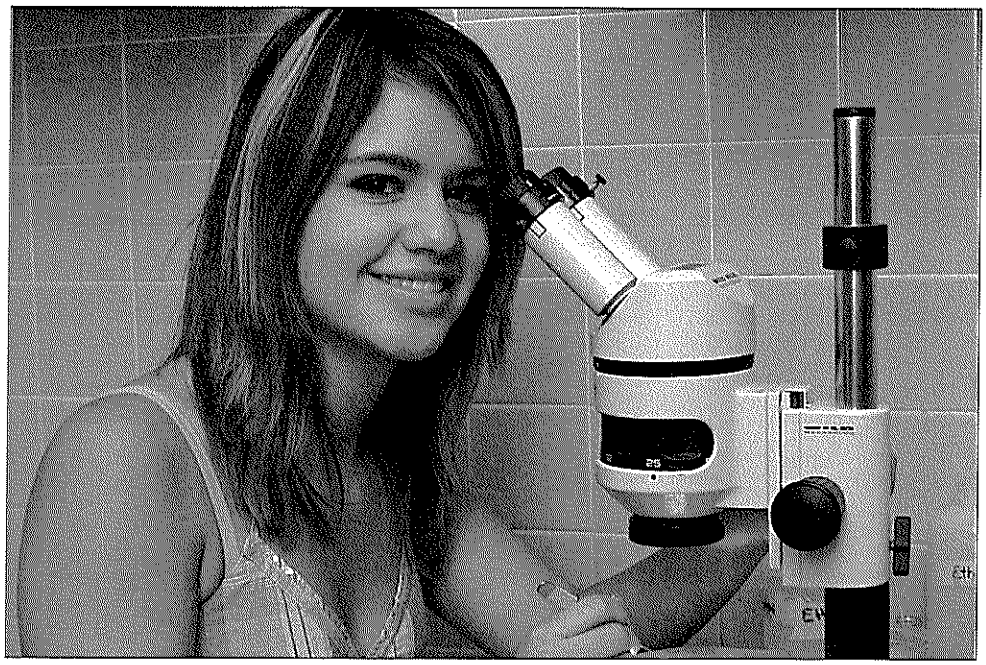
The WISEST Summer Research Program

The WISEST Summer Research Program is a hands-on research experience for Grade 11 high school students. The young woman and men work for six weeks in the summer as a member of a research group at the University of Alberta, within disciplines that are less traditional for their gender. For young women these areas include engineering, science, and technology. For young men, it includes the areas of nursing, human ecology and nutrition.

To qualify for the Program, students must have an 85% average in the Grade 11 math and science courses, strong recommendations from teachers and an essay on an assigned topic. Application forms and information about the Program is sent at the end of January to the science department of each high school in north-central Alberta and NWT. Detailed information, as well as application forms, can be found on the WISEST web site: www.wisest.ualberta.ca

The WISEST students who participated in the summer of 2007 are also great people to talk with for more information about the WISEST Summer Research Program.

WISEST
women in scholarship, engineering, science & technology



It was a summer where I learned about careers in the sciences field, University of Alberta, university life, research, and ecology.

GISELLE BOTIA-CORTES [Biological Sciences] // **WISEST SUPERVISOR** :: Dr. Bill Tonn
SPONSOR :: Alberta Advanced Education and Technology

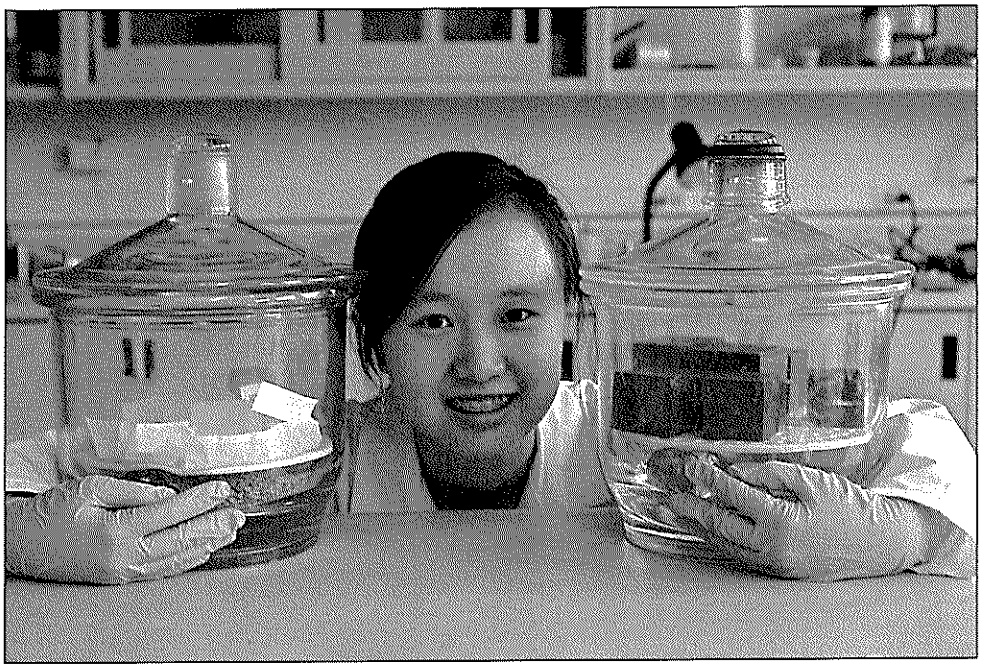
MY WISEST SUMMER WAS ABSOLUTELY AMAZING. At first I was scared and I was feeling a little bit overwhelmed by all the new things that I had to learn and do. Also, I didn't know any of the WISEST students. But by the end of my summer I felt more confident and I can say that this is an experience I will never forget.

This program has truly enabled me to get familiar with the university setting. Once I graduate I would love to attend University of Alberta, and having the opportunity to visit the buildings of the university, even before I graduated was great. Everyday for the first week I would take a new path to get to the Biological Sciences building, mainly because I would get lost, but also to see different parts of the campus. It was an awesome way to look at all of the buildings and to get used to the campus.

In addition, this summer I got to meet a lot of great people. Starting with Dr. Bill Tonn, he's an extremely nice man. He is really passionate about his work, and it was really interesting getting to talk to him. It truly was an honor to meet him. Also, Leslie Nasmith, my Principal supervisor, was great. She was very kind and really took the time to explain things to me. I really learned a lot by working with them. I got to meet WISEST students that are truly extraordinary, I'm sure that we will stay friends, long after this experience. The WISEST coordinators, Robyn and Natasha, were splendid; they were always full of energy and always ready to help. All of these people truly made this summer very enjoyable.

As far as learning goes, I learned a lot more than I thought I would. I got to learn about ecology, since my research was in that field. My research was about the effects of trout stocking and aeration on invertebrate fauna. At first, I actually didn't think this project would be interesting, but it was fascinating. It required a lot of repetitive work, but it was all worth it once we got some results back. I enjoyed my work in the lab, but I enjoyed even more my Meanook experience. It was breathtaking to be working with nature, getting to catch frogs, to fix traps and to catch dragonfly larvae. I also got to learn about other careers in the fields of sciences thanks to our Wednesday seminars. I really enjoyed learning about these different careers. I really liked our Isotechnika visit, and now I'm looking into a career in a pharmaceutical field. I'm still not sure what path, career wise, I'll take; but after spending my summer in the WISEST research program I'm more aware of the choices that there are.

My WISEST summer was packed with fun, learning and growing. It was a wonderful way to spend my summer. I don't regret it one bit, even though I didn't get to sleep in, it was all worth it. It was a summer where I learned about careers in the sciences field, University of Alberta, university life, research, and ecology. I had the opportunity to meet wonderful people, whom I admire. It was one of the greatest experiences I've had, and a memory that I will always cherish.



Now I feel a lot more prepared for grade twelve and university, and the things I've learnt from this experience will always be with me wherever I go.

HELEN GU [Physics] // **WISEST SUPERVISOR** :: Dr. Douglas Schmitt
SPONSOR :: Alberta Research Council

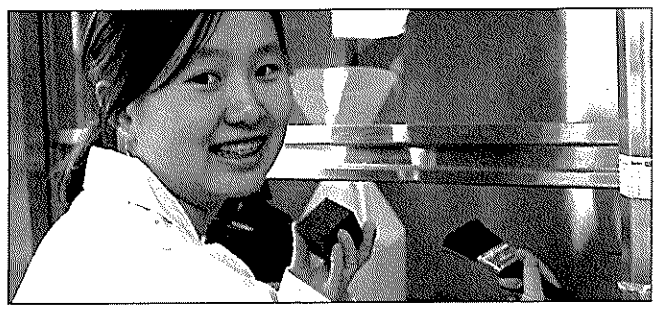
IT'S TRUE THAT TIME FLIES when you're doing something you enjoy. I remember walking towards the CEB building back on the first day of WISEST, filled with anticipation and preparing myself for an experience that should end at a future time far ahead in my mind that marks the end of six weeks, and now that it's almost over, I find myself counting the last days and hoping for them to slow down.

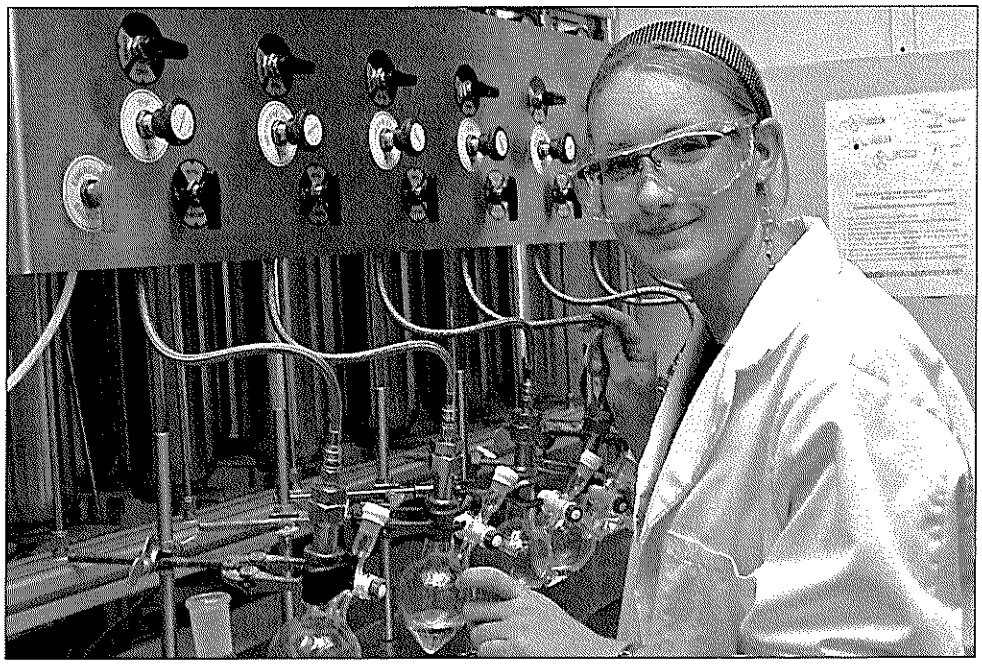
While still in grade 11, I found myself enjoying physics classes the most so I've always wanted to see where I can go in this field. I was thrilled to be offered a position to do research in geophysics, which wasn't a very girly field, but I was glad to be given the chance to do something outside of my boundary and I've benefitted in ways unparalleled to any program experience in the past.

I had the opportunity to be mentored by Dr. Schmitt, and my direct supervisor was his post-graduate student Sanaa Aquil. The whole research team was very welcoming, and I've first met them on the orientation day in a meeting. I was shown around the lab, and everything was explained to me so I knew what I was doing. The WISEST coordinators also did a very good job with introducing us to the university on the first day, so I also knew what to expect when meeting the professor for the first time. Throughout my research, all members of the team were very welcoming and always there to help when I ran into difficulties.

My research contributes to the application of a technology called "Ground Penetrating Radar" (or "GPR" in abbreviation), which uses electromagnetic radiation in the microwave band to look into shallow earth. This technology detects reflected signals from subsurface structures and can be used to study soils and rocks underground and makes it possible to perform undestructive testings to the underground. I was given a number of metamorphic rock samples and what I have done is having measured the speed of light in these in different directions using a new piece of equipment in Dr. Schmitt's lab. This equipment is connected to a computer, which I use to trigger measurements on the rocks and obtain the dielectric constants of the rock at different frequencies. The equipment applies microwaves in different frequencies to the area of the rock I appoint its contact with, and it gives a listing of real and imaginary dielectric constants on the computer. I then take the data and process and analyze it. I've measured my samples in a grid fashion, making twenty-five measurements on each face of the cubically-cut rocks for better quality in results.

This summer broadened my view and showed me the reality of research, as opposed to some assumptions I've had coming into the program. I never knew a project that sounds really simple could actually take a very long time to do, simply because of the materials, work, planning, and timing that all goes into the experiments. Also, I did not foresee problems that could interfere with the progress of one's experiments – even something as minor as running out of distilled water. This program taught me many valuable lessons such as: organizational skills, importance of time management, communication skills, problem solving ability, and data gathering techniques that were good assets to have in school but are essential when working with research. Now I feel a lot more prepared for grade twelve and university, and the things I've learnt from this experience will always be with me wherever I go.





To be able to try out research before attending university was a once-in-a-lifetime opportunity that I will always be glad I took.

HOLLY SEVERIN [Chemistry] // **WISEST SUPERVISOR** :: Dr. Todd Lowary
SPONSOR :: Alberta Ingenuity Fund

MY PLACEMENT FOR THE SUMMER was in the Department of Chemistry as part of Dr. Todd Lowary's research group, under the direct supervision of Alissa Cheung. Our project was the synthesis of collagen cross-linkers for use as components of corneal implants. Current common treatment of blindness due to damage or disease of the cornea is transplant with human donor tissue. Due to an aging world population and a shortage of available donor tissue, there is an increasing demand for synthetic materials that can support cell growth and regeneration to be used for transplants. Collaborators at the University of Ottawa Eye Institute reported a successful implant material, and in order to mimic keratin sulfate, the naturally occurring collagen cross-linker, we attempted to synthesize an activated ester by coupling 1,3'-diallyl lactose and two molecules of 6-thio-D-glucono-1,5-lactone. My target, the diallyl lactose, was attained by peracetylating -lactose, glycosylating that product with allyl alcohol, deprotecting the new product under basic conditions and finally achieving selective monoallylation using dibutyl tin oxide.

If I had been asked what my summer plans were a couple of months ago, I would have replied with "Working at Co-op." Until, of course, I got a message from the WISEST coordinators. Which was good, because I could play it over and over again to make sure it was real. And when I finally came to the conclusion that I was not crazy, I knew I wouldn't be working at Co-op. I'd be working in an organic chemistry research lab at the University of Alberta!

When I arrived at St. John's Institute before WISEST officially began, I didn't realize that it was to become more than just my home-away-from-home for the next six weeks. It was where my friends and super good times were. It was so cool to meet people like me, with similar interests and goals. Movie marathons, Mario-Kart tournaments, karaoke parties, long nights of playing cards and talking, shopping excursions, playing sports in the park, wondering about the "randoms", and trips to Edmonton's many summer festivals were all great opportunities to have tons of fun and get to know new people and make lifelong friends.

WISEST Orientation introduced me to the rest of the amazing people in WISEST who weren't staying in residence. Icebreakers were played and if after learning sixty names and receiving six hours of new information wasn't enough, I met my direct supervisor, Alissa, whom I would be working with for the next six weeks. She was kind enough to give me a campus tour (because I wasn't confused before!) and then I finally got to see my lab. I met Professor Lowary and everybody else in the lab and knew immediately that my decision to participate in the Summer Research Program was a good one. I just hoped I'd remember how to get there the next morning.

And then work began. Before I could really do anything in the lab, had to do some reading so that I would better understand what my project was. That was an awesome opportunity to learn about the theory behind organic chemistry, at a university level, which was obviously something I'd never done before. I couldn't believe how much I was learning in such a short time.

The chemistry that I did taught me techniques and terminology that are employed in university labs, so I'll have a heads-up when I attend university next year. I performed a variety of tasks, including using the rotovapor machine, running columns, measuring out and adding reagents, recrystalizing compounds, using a sonnicator, neutralizing reactions, preparing my samples for mass spectrometry, infrared spectroscopy, or nuclear magnetic resonance spectroscopy, and, of course, perfecting my pipetting skills. There was always something to do and something to learn.

I expected to learn a lot this summer, and I definitely did. To be able to try out research before attending university was a once-in-a-lifetime opportunity that I will always be glad I took. My experiences in the lab, at residence, and on off-campus industry and on-campus research lab tours have exposed me to options and careers I hadn't considered or didn't know existed. The multitude of things I have learnt this summer will undoubtedly help me as I finish off high school, make plans for post-secondary education, and be a huge asset for any future endeavors.

I felt the WISEST summer research program was an unforgettable experience, which I would do all over again if I were to have the chance.

JENNIFER RAMSTEAD [Renewable Resources] // **WISEST SUPERVISOR** :: Dr. Scott Chang
SPONSOR :: Alberta Ingenuity Fund

MY EXPERIENCE IN THE WISEST 2007 summer program was a beneficial and adventurous right from the moment I heard about the program. One midwinter day my sister had told me of a summer program that would allow me to stay in Edmonton and work in a lab at the University of Alberta. I immediately begin to think how the program would be extremely beneficial for academics and extracurricular activities that I would participate in the summer. I soon begin the application process; I did not want to miss out on such an ideal opportunity. It was easy for me to get reference letters; my teachers gave me complete support. All I had left to do was to wait for a phone call from the WISEST coordinators in order to guarantee that I would indeed have a summer full of learning and fun activities. The anticipation had subtly driven me tenser as the school year went on. Finally one day while coming home from a normal day of school I had received a message on the phone. It was Natasha, one of the WISEST coordinator, saying she is from WISEST and she would like to talk to me. I felt immediate excitement for the summer I was about to embark upon. Soon after I had arrived at Saint John's Institute and I was unpacking my clothes, ready to make new friends and experience a summer of learning.

My first day at Saint John's institute was calm and slow. It consisted of meeting 19 other students who would be staying at Saint John's Institute while participating in the summer research program. We played several ice breakers and I soon got to know everyone's name and where they were from. My roommate, June, and I had instantaneous friendship, and spent several nights talking passionately to each other about our project, each trying to outshine the other on what we had done that day in their research lab. My stay at Saint John's Institute was unforgettable. All the students got along very well; there was never a tense conversation or arguments among the group, only fun times. Even when the day seemed boring as if there was nothing to do, once we would group together we would always find new ways of entertainment, that were always inventive yet innocent and somewhat sophisticated, such as Karaoke. I created several strong bonds with the students I meet while staying at rez. I also learnt about the different cultures and lifestyles that the students had come from. My stay at Saint John's was stupendous, I only wish I could do it all over again.

My experience working my laboratory in the Earth Sciences Building at the University of Alberta was like no other job I have ever had. The project I was helping with composed of many aspects I felt passionate about and grateful to be a part of. In the project I was aiding in seeing the affects an industrial wood biosolid would have on nitrous oxide emissions when applied in a hybrid poplar plantation. I came in half way through the project, thus I only helped yet I used many new machines and got to experience the atmosphere when working in the lab. I got along well with my supervisors and coworkers, and found it a joy to work there. Tasks I would perform include things such as evacuating tubes, sieving soil, grinding foliage and learning about the project. I saw some graphs from last year and learnt expected results and why. Working with my project also allowed my to experience several field days. In the field I would travel to a hybrid poplar plantation north of Edmonton, where I would aid in taking gas and soil samples. I enjoyed meeting and talking to my coworkers and the experience of working in a lab extremely.

I felt the WISEST summer research program was an unforgettable experience, which I would do all over again if I were to have the chance. I am very grateful to my parents for the allowing to participate in the program. I would also like to thank my supervisor, Sarah Pattison, for being a joy to work with, teaching me about her project and helping me with my poster.

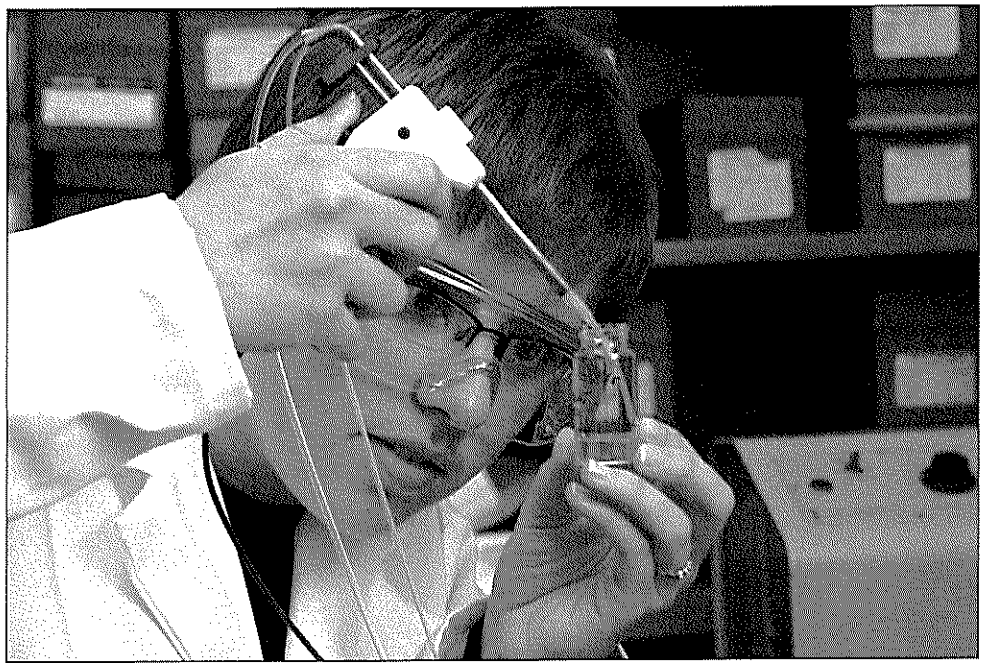
Our Wednesday seminars allowed us to explore all aspects of science and engineering. It gave us a chance to get firsthand knowledge from mentors and students who seemed to really relate to us.

JENNY BECKER [Civil and Environmental Engineering] // **WISEST SUPERVISOR** :: Dr. Tim Joseph
SPONSORS :: Human Resources and Skills Development Canada - Canada Summer Jobs / Department of Civil Engineering and Environmental Engineering

WHEN I FIRST APPLIED FOR WISEST I determined that it would be an awesome opportunity to gain some exposure in the areas of science and math. I had to do some soul searching on whether I was prepared to give up my summer at the beach and hanging out with friends in exchange for this opportunity. I hoped that I would be placed in an area dealing with chemistry or some type of general engineering based on my strengths and interests. When I received the phone call from Natasha it was somewhat of a surprise that I had been placed in the field of Mining Engineering, I didn't even know there was such a thing. I remember just pausing and then answering "oohh". I was extremely thrilled (and honored) and still really nervous, but the idea of mining engineering started to grow on me. I convinced myself that regardless of what happened it would be an amazing experience, and I had no doubt it would be very worthwhile.

My partners, Katherine Liu and Katherine Lucki, and I were placed under the supervision of Dr. Tim Joseph. He had set up three research projects that we would work on together. For our first project, we started with a set of data for a 10" and 111" tire. We were to find a constant scale factor that could be used to find the area and deformation for all tires. With the data we collected for a 10" tire we created / extrapolated data for a 151" haulage truck tire. We then compared the extrapolated data with actual data taken from a real haulage truck tire. Our second project consisted of analyzing the pressures and forces acting on a mining shovel. From tables and graphs presented to us in the data, we were responsible for figuring out if short exposures to high pressures or long exposures to average pressures would cause the least amount of metal wear on the teeth of the shovel. Our final project was to test the rolling resistance of tires. Our tests were conducted on no material, sand, and gravel, and with varying slopes.The most interesting and beneficial part of the experience in mining engineering were our onsite visits. Our first tour was of the Suncor mine in Fort McMurray. We got to look at the inside and outside of the HUGE equipment used on the site. We got to experience a "load and dump" in the cab of a 797B haul truck, which has a 400 ton payload capacity. Our second visit was to the Highvale mine just west of Edmonton. It happened to have poured rain that morning and after spending most of the day outside, we were just a little dirty to say the least. Our tours of the mines allowed us to get a firsthand look at what a mining engineer might do and see on a daily basis. Also, it allowed us to talk to a diverse group of people and discuss how they contribute and enjoy their various jobs around the mine.

Reflecting back on my last six weeks I cannot imagine it any other way. Having the opportunity to stay in the St. John's Residence gave me freedom and independence that most grade 11 students would never get the chance to experience. The "res-kids" all bonded into one big family, forming friendships and memories no one will ever forget. Events such as the FIFA soccer game, the What Not to Wear and the Hawaiian Parties, the Street Performers Festival and tanning at the "Leg." were just a few activities we got to experience. Between activities at the residence and planned events at WISEST my summer shaped up to be more fun and educational than I could have ever imagined. Our Wednesday seminars allowed us to explore all aspects of science and engineering. It gave us a chance to get firsthand knowledge from mentors and students who seemed to really relate to us. The Science Olympics, and TGI Fridays allowed for bonding time with other students and resulted in many laughs and memories. I realized my options in science and engineering are unlimited and WISEST is only the beginning of a long and exciting journey. My WISEST experience was more than worthwhile and I thank everyone who had a part in the organization of this outstanding program.



Overall, this research program has given me an opportunity unlike any other. Its benefits are endless!

JESSICA GOSSELIN [Chemical and Materials Engineering] // **WISEST SUPERVISOR** :: Dr. Tom Etsell
SPONSORS :: Human Resources and Skills Development Canada - Canada Summer Jobs / Faculty of Engineering

"**JESSICA GOSSELIN TO THE OFFICE PLEASE**, Jessica Gosselin." Oh great. What now? So, I walked down the stairs of Morinville Community High School to the main office. There, I saw my chemistry teacher waiting for me with a look of anticipation on her face. "Hi Jessica! Thanks for coming here right away!" she beamed. "Since you've got such a passion for science, and the grades to match, I wanted to tell you about this summer program that the University of Alberta is holding."

Gulp. Me, University? But I'm only in grade eleven!

She continued, "It's a great research opportunity! But the best part is that it helps educate students about non traditional job opportunities for their gender! So they'd probably put you in an engineering field. Here's the package, if you're interested. You just need an average over 85% in the sciences, two reference letters and an entry essay. But, no sweat, you have a month to do it."

She then proceeded hurry out of the room to prepare for her next class, leaving only a big smile and a package of papers labelled 'WISEST' behind. I didn't know what this program entailed, but the word "university" drew me in. I picked up the package and headed back to class.

Later that night, after dinner and homework, I decided to pick up the package again and read through it. Apparently, WISEST stood for Women in Scholarship, Engineering, Science and Technology. Also, there was one crucial thing that my teacher forgot to mention: we get paid. It astounded me that a person could get paid for learning and having fun! So right there, my decision was made. I was going to apply for this program. Nothing could stop me!

Sure enough, two reference letters and an essay later, I got a phone call.

"Hi, Jessica? This is Natasha calling from WISEST. I'm pleased to let you know that we've decided to accept your application, if you're still interested..." If I was interested?

Of course I was! The rest of the phone call went in a blur. All I remember hearing was the party taking place inside my brain. I was going to university!

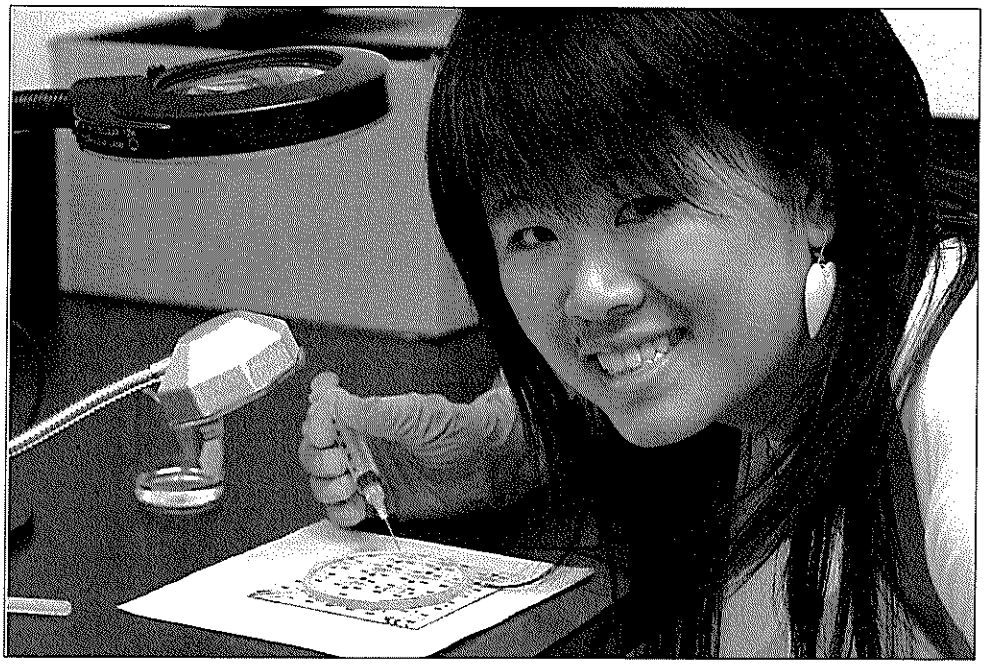
The first day of WISEST was beyond welcoming. The student coordinators, Natasha and Robyn, made us feel like family. It was great to know I'm not the only science nerd who's willing to spend my entire summer behind a microscope! There were always fun activities to take part in and they welcomed us to let them know if we had any problems.

For the last hour of orientation day, we got to meet the people we'd be spending the rest of the summer studying beside. My direct supervisor, that is, the lady who'd be telling me what to do, was named Heather Kaminsky. My principal investigator, also known as my boss's boss, was Dr. Tom Etsell. Heather is, if it's even possible, a bigger science nerd than me—which is a compliment, I might add. While Dr. Etsell is a kind hearted man, who has too many things to do for his own good!

With him busy all the time, it was up to Heather to "raise" their little WISEST student. They showed me into the lab and helped me to get familiar with my surroundings. Then, out of nowhere, came a face that was all too familiar. One of my WISEST family members, Alyssa, came in with her supervisor, Patrick. Much to my delight, I found out that I'd be working with them too!

Weeks of fun passed in the blink of an eye. I was working on solving diffraction patterns, perhaps the nerdy-est of science topics, in order to figure out what lies in the depths of the oil sands wastage. Then, hopefully, we would be able to separate the secondary resources for more profit! Although, the oil companies don't need any more profit, it would help to lessen the amount of tailings being held in giant ponds up north.

Overall, this research program has given me an opportunity unlike any other. Its benefits are endless! I walk away from WISEST with new friends, new knowledge and best of all, a new outlook on life!



I walk away from WISEST with new friends, new knowledge and best of all, a new outlook on life!

JILLIAN WONG [Mechanical Engineering] // **WISEST SUPERVISOR** :: Dr. Walied Moussa
SPONSORS :: Human Resources and Skills Development Canada - Canada Summer Jobs / Faculty of Engineering

I WAS SO HAPPY TO GET ACCEPTED INTO WISEST, knowing that all the hours I stayed up to fill out my application and write my essay were not wasted. I picked up the phone and was greeted by an extremely perky voice, which happened to be Robyn haha, and I of course accepted. Weeks later, I dragged myself out of bed on August 4 to go to orientation, against my will, but I was really glad I did. Everyone was really nice and interesting to talk to. We played games and for the most part, we got paid to just sit there and we got a bunch of free stuff and food!

The next day, my partner, Lucia Sui, and I started working. I worked in the Mechanical Engineering Department at the National Institute of Nanotechnology. I worked with the Hydrogel team under Dr. Moussa, with my direct supervisor being Sebastian Hanula. My research project involved the mechanical characterization of hydrogels. Hydrogels are cross-linked polymers that swell in water. They also swell or shrink in reaction to stimuli such as electricity or changes in pH. To characterize a hydrogel, the constants of mechanical properties are found. The mechanical properties include swelling ratio, Poisson's ratio, and Young Modulus. Respectively, these measure how much a hydrogel swells, the ratio between perpendicular deformation to parallel deformation and how stiff the hydrogel is. It is important to characterize hydrogels before and after the application of a stimulus to know the distance a certain hydrogel will swell and adjust distances accordingly in micropumps or microvalves, which is where they are planned to be used.

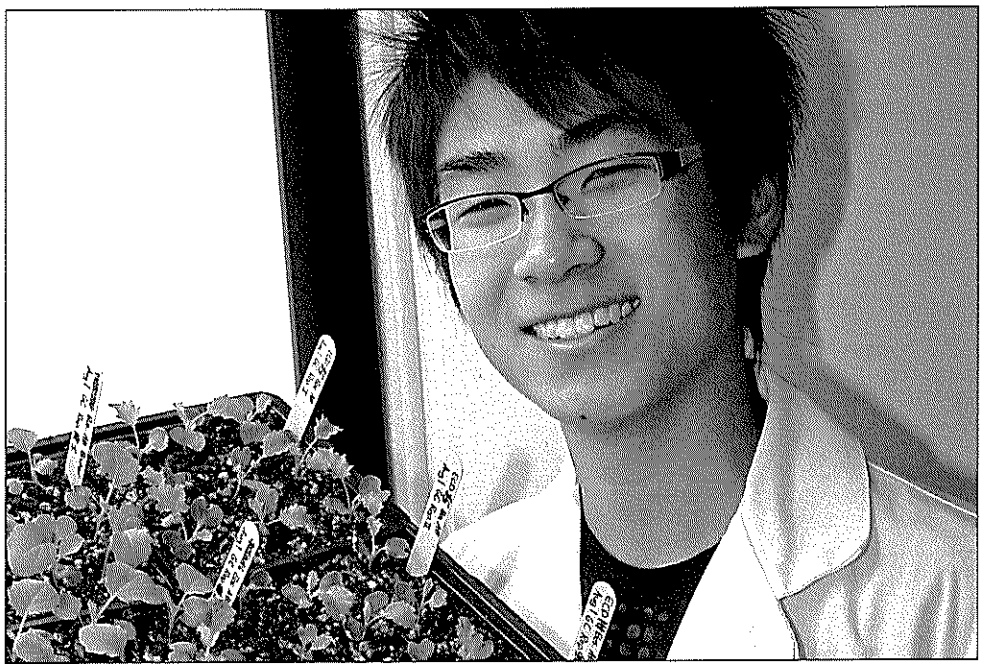
My role in this investigation was to use an Exfo Anticure 4000, a machine that emits ultraviolet (UV) light, and a proximity sensor to test how the intensity of UV light changes with increasing distance. A layer of polydimethlysiloxane (PPMS) was put over the sensor and the effect on the intensity of light was tested was investigated with the PDMS layer on and off. Normally, a layer of PDMS surrounds hydrogels to protect them against corrosive fluid and external pressure. Therefore, this second part of the experiment was necessary to see if the PDMS would make a difference in the UV light intensity.

As distance increases, the UV light intensity increases. With the use of an equation formulated from the results of the experiment, the approximate UV light intensity can be calculated to aid researchers use a certain intensity to create a hydrogel

with specialized mechanical properties. For example, with greater UV light intensity, a stiffer hydrogel is created with a greater Young's modulus.

Most of the time, we were given assignments that comprised of...shopping! I spent a lot of time on online sites looking for the best deals on fluorescence cameras and carbon nanotubes, researching which specifications were most useful to be applied in hydrogels. Through this, I learned a great deal about things I did not even know existed. A fluorescence camera was needed as the almost transparent hydrogels need fluorescent dyes to be seen and a fluorescence camera would be able to excite the fluorescent dye and capture the fluorescent images. And carbon nanotubes wanted to be added into the hydrogel to see if it could make it stronger.

Through WISEST, I had a lot of fun researching and learning about things I had never even heard of. I didn't even feel like I was working and the activities we had each week were fun, but mostly informative, giving me information on how to deal with not only university, but my career and my future. All the people I got to meet in the research team showed me incredible kindness and the friendships I made are unforgettable. I want to thank my supervisor for putting up with me. Also, I cannot thank Dr. Moussa, my sponsors, and WISEST enough for allowing me to experience such an opportunity.



Although I was paid for the six week program, the monetary remuneration was far outweighed by the value of the plethora of experience and knowledge I gained this summer.

JOSIAH FUNG [Agricultural, Food, and Nutritional Science] // **WISEST SUPERVISOR** :: Dr. Stephen Strelkov
SPONSOR :: Alberta Advanced Education and Technology

UPON FINISHING THE LAST FINAL of the school year, I stepped out of the exam room, eagerly anticipating a well deserved break. I did manage to catch a few moments of relaxation but before I could fall into the laid back routine of my past summers, the break was over. Within a week of my last exam, WISEST had begun. However, my six week experience was incredible. Unlike the energy draining, unending stretch of a school year, WISEST opened my eyes to different elements of research and to opportunities that lie ahead of me.

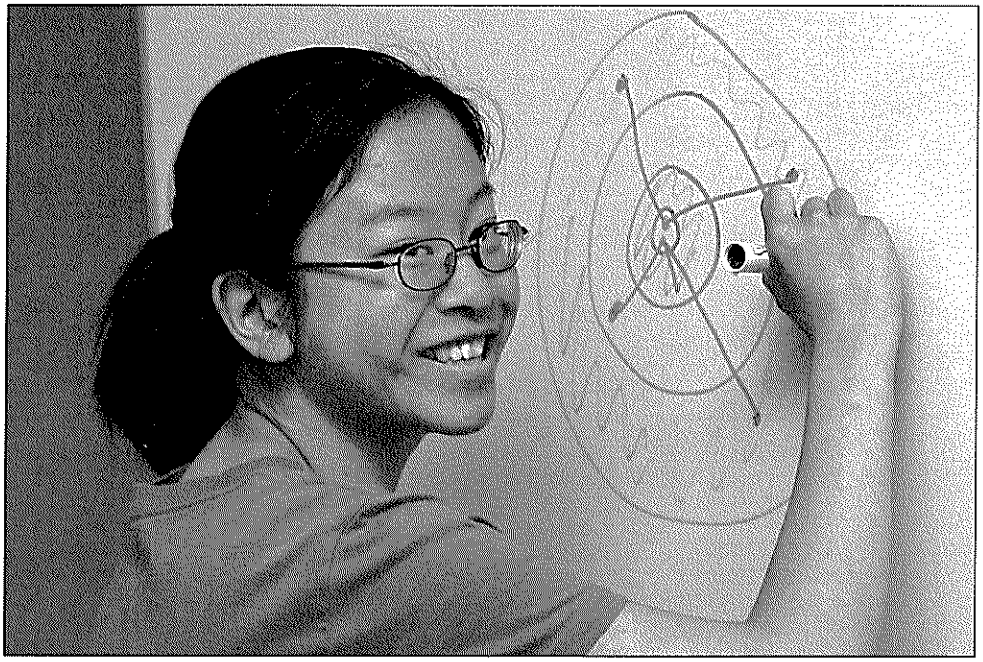
During the program, I was privileged with the opportunity to work in Dr. Stephen Strelkov's plant pathology lab. Under my supervisor, Victor Manolii, I learnt of a serious disease of canola and other mustard family plants called clubroot. Caused by an obligate parasite called Plasmodiophora brassicae, this disease causes the normally free roots of these plants to swell forming club-shaped galls which inhibit the nutrient and water transport capabilities of the host. These infected plants yellow, whither and have a significant yield loss. Clubroot is spread by soil-borne spores that, unfortunately, can survive without a host for more than seven years. First discovered in Alberta in 2003 and spreading at an alarming rate, clubroot has now been declared an official pest in Alberta.

After spending the first few days piling through long-established and recent publications concerning clubroot, my involvement immediately escalated. Along with my main project, I helped out with various other projects including the investigation of a disease affecting Albertan elm trees and of the virulence of P. brassicae in soil that had grown infected barley seeds. These projects provided a chance to gain experience on the process of research including learning about many new machines and protocols. My project involved testing for the suspected susceptibility of non-cruciferous, or non-mustard, plants to P. Brassicae. I had germinated 900 plants, with 720 of them inoculated with spore suspensions, and grown them in the greenhouse and growth cabinets. Consequently, I faced labour intensive work including the process of exposing each plant's roots for disease assessment and washing massive amounts of glassware. Although the visual assessment and PCR assay came up with negative results for the susceptibility of the experimented hosts, I felt a great deal of achievement as I sent the research poster to the plotter.

What astonished me the most this summer was the diversity of work a plant pathology researcher has. On any given day, he or she may be visually assessing plants for disease rating, extracting and amplifying plant DNA, or even out on the field getting back to his or her roots...literally. I was given the opportunity to join Victor on several of these field outings and I discovered the physically demanding side of this stereotypically 'white collar' job. The 'weeds' I had to pull out could be regarded as bushes considering that they were all nearly a metre tall!

Being one of the four male students in a female dominated program did produce a few awkward situations but through the many seminars and social events such as the T. G. I. Friday lunches and the pitch and putt, I was able to make new friends and many acquaintances. These events helped make the WISEST program more fun and enjoyable on a whole. As well, through the seminars and discussion sessions, I was able to learn from the perspectives of men and women already involved in science and from other students. These discussions opened my mind to the wealth of opportunities and paths after high school.

WISEST had truly been a 'once in a lifetime' opportunity. Although I was paid for the six week program, the monetary remuneration was far outweighed by the value of the plethora of experience and knowledge I gained this summer.



It is great, because though we are all different in many ways, we also have many similarities, such as our interest and curiosity about science and our fun-loving nature.

JOYCE LAM [Computing Science] // **WISEST SUPERVISOR** :: Dr. Eleni Stroulia
SPONSOR :: iCORE, Informatics Circle of Research Excellence

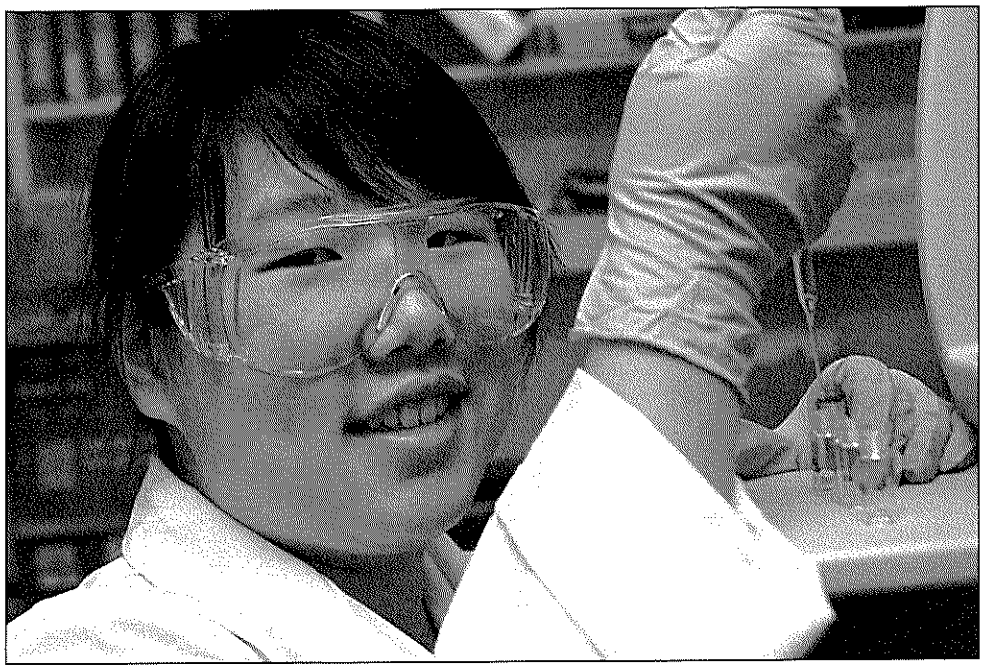
WHEN I FIRST HEARD FROM WISEST that I was being offered a research position within the Department of Computing Science, I was both ecstatic and puzzled. What kind of research can you do in Computing Science? My stereotypical definition of research was experimenting within the fields of physics, chemistry, and biology, but within computing science? What would you be testing with a computer? Those were some questions that raced through my mind.

I admit I was a little skeptical about what research would mean in the Computing Science Lab. The project my Principal Investigator and Supervisor had set up for me however, indeed involved research, just not exactly the type of research that had first come to my mind. My project was to analyze the relationship between users of a wiki page and come up with statistics concerning mainly their postings and editing on a page. I was first taught how to use a variety of programs such as Moodle, Java Eclipse, and much more. I was then given an existing project being used to analyze the user statistics, and taught how to make it more efficient and effective. It was a very unique and fun experience, being able to play around and test so many different software and applications.

Within my period of research in Comp Sci (Computing Science), part of our time involved the opportunity to talk to a variety of specialists from many different backgrounds. I was given the opportunity to attend a field trip to the Bioware Company, in which I got to see examples of how research is applied to creating real life products: video games. My learning also came from the contributed teaching of a range of people with diverse backgrounds and perspectives. I have learned a great deal from technicians, interns, grad students, undergrads, pH D students, and professors alike. I had a really friendly research group in which we collaborated our work in completing our projects, and made time to joke around and have fun.

The WISEST Student Coordinators have worked hard to expose us to as many different career fields as possible. I was given the chance to listen to undergraduates at the University of Alberta talk about their first year in University, and give us useful tips and advice. We were also given the chance to participate in interesting on-campus lab tours. I had the opportunity to see Dr. Monica Gorassini's Biomedical Engineering lab. Her research dealt with spinal cord injury, and as participating students, we were given the chance to try out the different technologies used, and see their experiments on rats in the lab. On our off-campus lab tour, I was given the opportunity to see the COMPRU department in the Misericordia Hospital. There I was able to see the work of a diverse group of people, in helping people reconstruct facial features, after a terminal illness or accident. In total, it was extremely interesting, and one of the most unique experiences.

Through WISEST I have also had the opportunity to meet so many awesome people from a large variety of places and different backgrounds. It is great, because though we are all different in many ways, we also have many similarities, such as our interest and curiosity about science and our fun-loving nature. WISEST has helped us bond through activities like the Science Olympics, Pitch 'n' Putt, and T.G.I. Lunch. Of course, we have also bonded through shopping trips, the use of email, and just plain hanging out with one another. We have all grown so close to one another. My time in WISEST has gone so quickly and I wish that this program would run longer. I will miss my WISEST friends, but this is one of best summers of my life. WISEST is ?! :)



WISEST was a great opportunity to explore various careers and fields of studies related to science and engineering.

JUNE KANG [Chemistry] // **WISEST SUPERVISOR** :: Dr. Charles A. Lucy
SPONSORS :: Human Resources and Skills Development Canada - Canada Summer Jobs / Faculty of Science

I WAS STANDING IN FRONT OF MY DOOR, searching through my bag for my house keys. No one was home, and that day wasn't really the best-day-ever. As soon as I stepped into my house, the phone rang, and phone calls that you get as soon as you get home aren't really pleasant when you are in a bad mood, usually. I picked up the phone, spat out a dull "hello", and there it was, the phone call that made my day! It was Robyn, one of the WISEST student coordinators, telling me that I have been accepted to the WISEST program and that I was placed in the department of Chemistry. My bad mood was long gone. Instead, I was left with excitement and surprise. Time just flew after that; my final exams were coming up, and I had to mail my other forms to WISEST. I somehow managed to rush everything in and soon it was time to pack up and get ready to move into residence; a great summer was about to start.

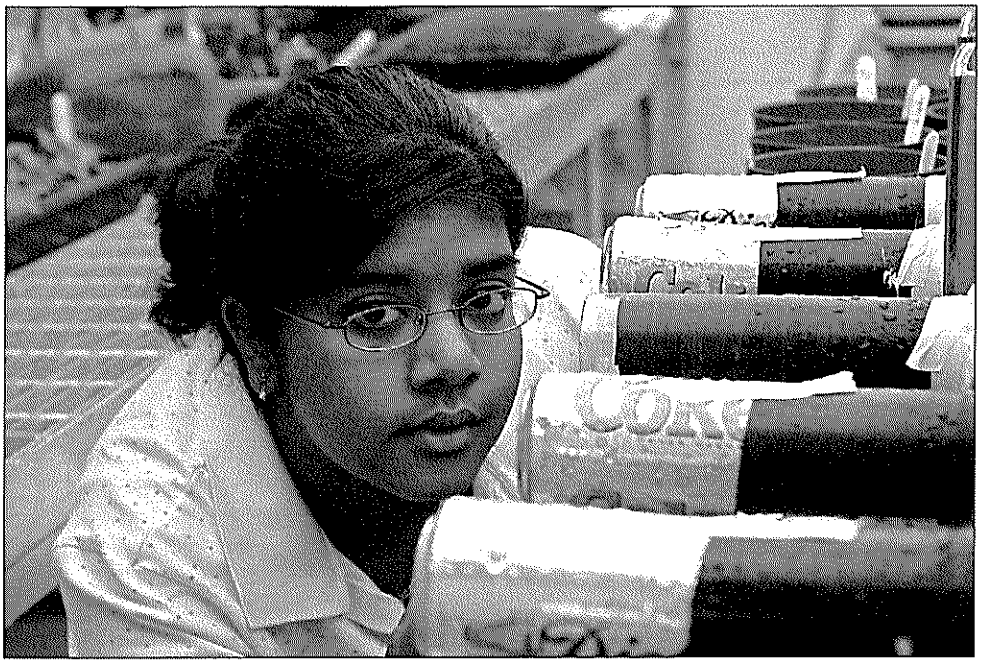
After the orientation, which was the first day of WISEST, I met my principle investigator and my supervisor; Dr. Charles Lucy and Donna Gulcev. They gave me a quick tour of the lab, briefly explained what was happening in the lab currently, and introduced me to these great people who were also in the lab.

My project had to do with Capillary Electrophoresis (CE), which is a modern analytical technique that allows for rapid and efficient separation of charged components present in a sample. In a CE experiment, a sample to be analyzed is run through a capillary with a buffer. Then, a voltage up to 30kV is applied in order to separate the analytes. The separation can be observed as peaks in an electropherogram. However, a problem occurs as the analytes, such as proteins, adsorbs onto the negatively charged silica surface of the capillary. In order to solve this program, a phospholipid bilayer coating was used; a 1, 2-Dimyristoyl-sn-Glycero-3-Phosphocholine (DMPC) coating was used for our study. I was to find out at which condition the DMPC coating was optimized. For this purpose, I manipulated the pH of the buffer, while keeping the ionic strength constant, and the concentration of the DMPC solution. Of course, I couldn't start with experiments right away since I did not have much basic knowledge about Capillary Electrophoresis. During the first and second week, I spent most of my time reading textbooks and papers, asking questions, and learning basic lab techniques. It was after that when I started the actual experiments. It was rather overwhelming at first, as I could only understand little parts of the reading, and the "basic" lab skills weren't really easy as they sound. However, I soon got to know that I was not expected to understand everything, but to get the general idea. Eventually, I got used to most of the things; being in the lab was now a part of my every day life.

WISEST not only provided me with a great experience of working in a university research lab, but also gave me an opportunity to meet great people and to visit interesting places. We had science Olympics, small group discussions, university 101, on-campus lab tours, an off-campus tour to COMPRU, and T.G.I Friday lunches. The social activities let us to get to know each other, and the tours and seminars provided us with very useful and interesting information.

Living in residence was also a fantastic experience. There were about 20 people from WISEST, and we had a great time together. Entertainment was always available; or, if it wasn't, we could always create some.

WISEST was a great opportunity to explore various careers and fields of studies related to science and engineering. It also gave me the experience of working in a university research lab and a chance to meet great people in the field of science and engineering. Closing, I would like to thank my sponsors, Canada Summer Jobs and The Faculty of Science, U of A, for their help and support of the fantastic experience, my supervisor, Donna Gulcev, my principle investigator, Dr. Charles Lucy, and the Lucy group for letting me work in the lab and helping me greatly.



I learnt so much about research and what it entails. WISEST has provided me with so many opportunities.

KAMALASHRI (MIMMY) EASWARA MURTHI [Biological Sciences] // **WISEST SUPERVISOR** :: Dr. James Cahill
SPONSOR :: Weyerhaeuser

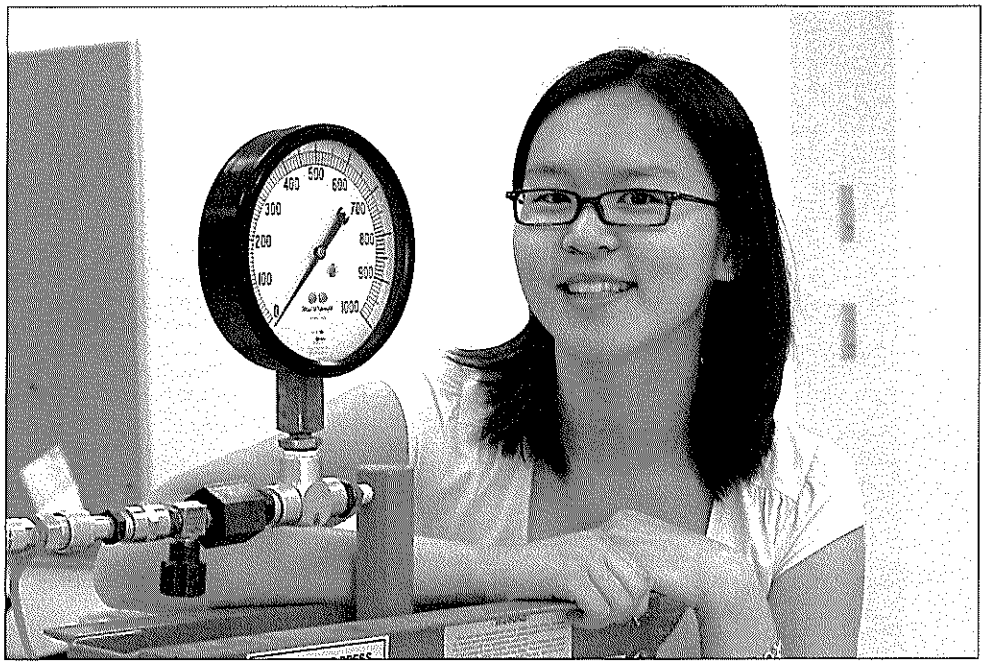
WHEN I FIRST RECEIVED THE CALL from WISEST regarding my acceptance, I was ecstatic. I could hear Robyn, one of the student coordinators, laughing on the other end of the line as I was frantically calling for my sister to find me a pen and a piece of paper. Questions poured into my head. What was my project? Would I be working all by myself? Did I manage to get into residence? I forced myself to calm down as Robyn answered most of my questions. I found out that I would be working with Dr. James Cahill and his research team in the Botany Department of the Biological Sciences Building in the University of Alberta. After frantically writing down more information about the program and what my job for the next 6 weeks of summer would consist of, I hung up the phone. Then the excitement began to mount. Honestly, I was a little nervous at the same time. This was my last summer of high school and I would be spending it away from my friends and family in a whole new environment. However, as July 5th quickly approached, all my uncertainties faded away as I became determined to make my summer at WISEST one that I will never forget.

A few weeks later, I found myself at the ETLC Solarium nervous but enthusiastic to meet everyone. I looked around as one by one the room filled with other young girls (and four boys) who seemed just as excited. I stepped towards Robyn and Natasha and took my folder. Then the journey began.

JC Cahill and his research team were very welcoming and friendly on the first day of work. As the days passed, we met the rest of the research team. Over the next 6-weeks, we focused on many projects. These included the effects of competition and soil heterogeneity on plant foraging, the effects of soil patch location on plant foraging, and a climate change project based in Kinsella, Alberta. To record data for the various projects, our duties often consisted of recording the number of leaves on a plant and the length of the largest leaf on a plant, taking pictures of roots and sorting various biomass samples. Some days were spent helping a PhD student in the Earth and Atmospheric Sciences building filtering soil.

I have to say that learning new knowledge about this area of science was not the only highlight of WISEST. I met so many good friends with similar interests as me both inside my lab and outside that I will remember. During my stay in Edmonton this summer I stayed in St. John's Institute. Here I met 18 other amazing WISEST students with whom I have become very close to. Countless nights were spent in the lobby reading, listening to music, wasting time on our laptops or just simply talking to each other about work, our friends, and our family. We enjoyed many evenings and weekends exploring Edmonton and attending the many festivals and events such as the Street Performers, Taste of Edmonton, Capital X, the Harry Potter Party, and many strolls down Whyte Avenue. At the same time, I experienced what it would feel like to live as a university student and taught me to relay on myself more than others.

Overall, WISEST was an incredible experience. I learnt so much about research and what it entails. WISEST has provided me with so many opportunities. I learnt how it was to work in a university lab and I received a sample of university life after high school. I am so glad that I was able to participate in the WISEST Summer Research program this year. It was an amazing experience and a fantastic way to spend the summer. It truly was a summer that I will never forget.



My experience with WISEST was unbelievable. I have met wonderfully nerdy people like myself and have the chance to explore the vast world of research.

KATHERINE LIU [Civil and Environmental Engineering] // **WISEST SUPERVISOR** :: Dr. Tim Joseph
SPONSOR :: Dow Chemical Canada Inc., Western Canada Division

THIS IS DEFINITELY A SUMMER TO BE REMEMBERED. The past six weeks was filled with excitement and amazing experiences that will be etched into my brain. I was lucky enough to have the chance to work with Dr. Tim Joseph in mining engineering. Coincidentally, I have met him before WISEST when he came to my school to speak to us about mining engineering and about the WISEST program. Back then, I have never given much thought about mining engineering and I was in for a shock when WISEST contacted me.

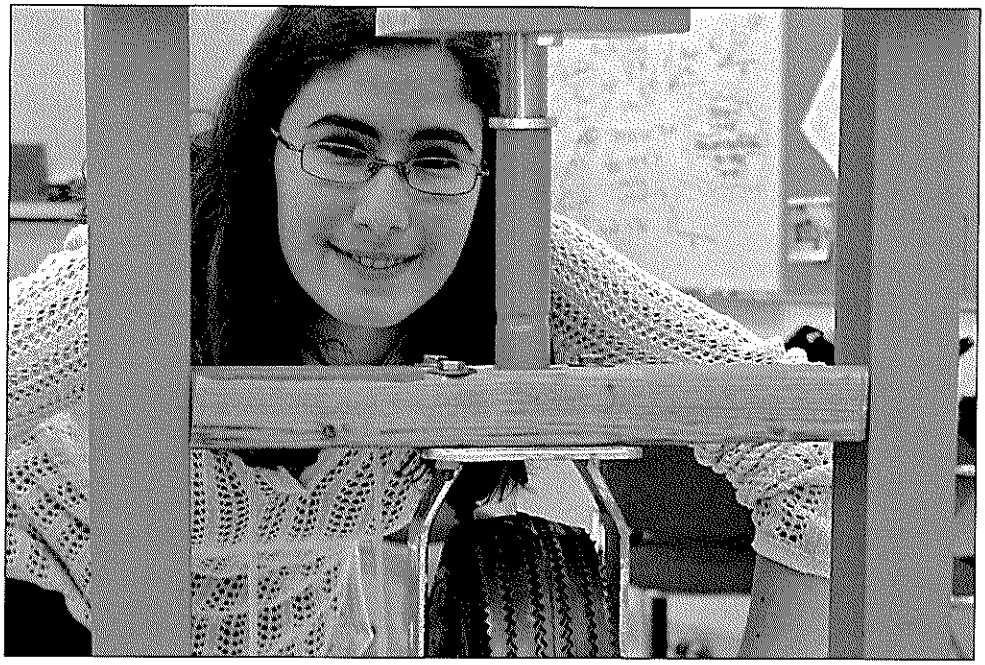
My wonderful experience with WISEST began when a friend told me about WISEST in the beginning of my grade eleven year. When March rolled around, I completed the application and sent it in to WISEST. After weeks waiting and nail-biting, Robyn called. Unfortunately, it was the Friday before the long weekend and I was at an orthodontist appointment and came home to a message on the answering machine. So eventually I called back and to my surprise, I was placed in mining engineering along with two other girls, Katherine Lucki and Jenny Becker, and we will be working with Dr. Tim Joseph.

I was thrill and nervous about being accepted because I had no idea of what mining engineering was like. But I discovered that I wasn't the only one. Over the six week period, I worked with two girls on our three projects. Our first project was data analysis of tire performance which allowed us to calculate a scale factor that we could use for our second project. The second project was one that did not involve previously collected data and in turn the most fun. We did our test on an unbelievably heavy testing frame and model truck of which we had fun playing around with. These apparatus were used to test the rolling resistance experienced by the model truck while travelling up the incline of the testing frame. The results of our findings were then compared to the value industry presented us with which we were able to conclude our research. Our third project was by far the most interesting. It involved the force and pressure analysis of an electric shovel. In this piece of research, we analyzed separately the average digging force and the high, peak pressure digging force. Hours of calculations later, we ended up with two numbers that actually made sense. The two numbers represented the number of digging cycles under each condition and we concluded that a higher number of digging cycle would yield under peak digging force.

Stepping aside from all the research, I had tremendous amounts of fun and good times in mining engineering. My favourite moment has been the trips to the mine and the late night partying (just kidding). The visit to the mines gave me wonderful experiences. I was lucky enough to go for a ride in a 797B haul truck in Fort McMurray, and be drenched in mud at the High Vale mine. We also had the chance to visit the Oil Sands Discovery center and we were thrilled to learn about the oil sands and how they are processed. One of the most memorable moments was when we played like little kids and took over their toys in the Discovery Center. While in Fort McMurray, we met Anne Marie Toutant who is the vice president of mining at Suncor. She has told us about her experience in mining and all the good things that comes with being a mining engineer. Other fun moments included shopping for shoes ...safety shoes, to be precise. We along with Robert Anusic and Tim went shopping and laughed at the weird boots they had on display and how unsafe they were.

My experience with WISEST was unbelievable. I have met wonderfully nerdy people like myself and have the chance to explore the vast world of research. This has changed my perception of mining engineering. It is not just a hole in the ground, in fact it can become quite complex. Now when my friends ask me what I did over the summer, I am able to say "I did research at the University and proved industry that they are wrong. What did you do?"

Reflecting back, this has truly been amazing, THANK-YOU WISEST.



This experience was everything I thought it would be and more and I want to recommend it to everyone out there as a great way to spend your summer.

KATHERINE LUCKI [Civil and Environmental Engineering] // **WISEST SUPERVISOR** :: Dr. Tim Joseph
SPONSORS :: Alberta Employment, Immigration and Industry (STEP) / Process Solutions Canada

WHEN I HEARD about the WISEST Summer Research Program, I thought it would be a great way to spend, my otherwise unplanned, summer. When I found out that I was going to be working in a mining engineering lab, I had absolutely no idea what I was going to do and I wasn't too keen on the idea. I thought that I should give it a chance anyways and I am so glad that I did.

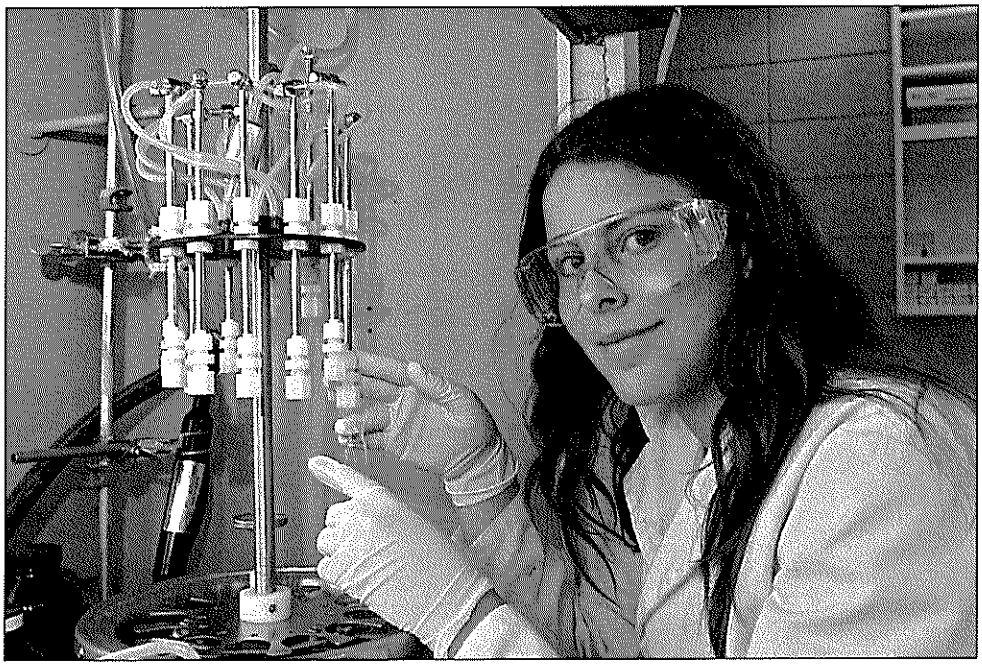
I got to work in Dr. Tim Joseph's lab with two other girls, Katherine Liu and Jenny Becker, doing research in, more specifically, mining mechanical engineering. This meant that rather than looking at the refining process or the engineering required to create a mine, we got to work with the giant mining machines, if even only in theory sometimes.

Together, we had to complete three projects, one for each of us to have to present. The first was an assignment using previously collected data to create a conversion factor. This factor could then be used to predict how a larger tire should behave under the same conditions in relation to a golf cart tire. This allowed us to do our following project as it would be applicable to the larger tires.

For our second project we used a model truck, with the golf car tires, on a large plane that we could fill with different materials and raise to different angles. We measured the force required to pull the truck up the slope with no material and then sand and then gravel. From the data we collected we were able to calculate the rolling resistance of the substances. This may not seem important, but this data helped us prove that the rolling resistance stays constant, and means that the total force acting on the truck will be the sum of the resistance due to slope and the resistance due to the material.

The third and final project had us doing theoretical work with once again previously collected data, but this time it was for the mining shovel. We were able to calculate the forces that acted on the shovel during its digging cycle and found that there were long stretches of an average pressure and short periods of peak pressures. These values we then used to determine that to have more peak pressures for short periods of time is in fact better than having long periods of an average pressure. Once again this doesn't seem that important, but the opposite of our findings has been a widely held belief in the industry and we have just proved the belief wrong.

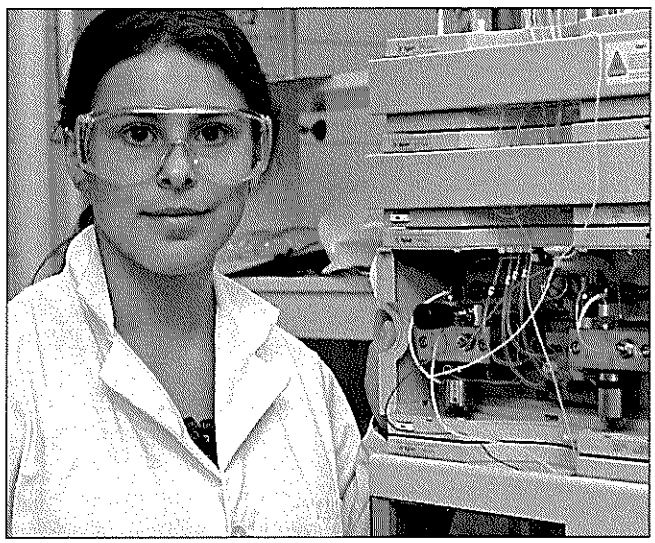
Now on top of completing our three research projects, we had the amazing opportunity to find out a little bit more about mining as a whole. We traveled to the Suncor mine in Fort McMurray. The day we arrived we took a trip to the Oil Sands Discovery Center where we learned about the oil sands, their history, the extraction process, and the possibilities for the future. We stayed overnight in town and the next morning traveled out to the mine to have a tour. It was great to be able to actually see the machines with which we were dealing in our research. I never had an idea of just how big these trucks are; it is one thing to be told about a truck that is the equivalent of a three storey house, but it is an entirely different thing to see it with your own eyes. We even got to go on a ride along on one of the trucks, which is an experience I will never forget. The final thing we did before heading back to Edmonton was to meet with the Vice President of Mining of Suncor Anne Marie Toutant. She is one of the few women in the field of mining at a senior position and is a wonderful role model for any woman wanting to make it in an industry that tends to be male dominated. This experience was everything I thought it would be and more and I want to recommend it to everyone out there as a great way to spend your summer.

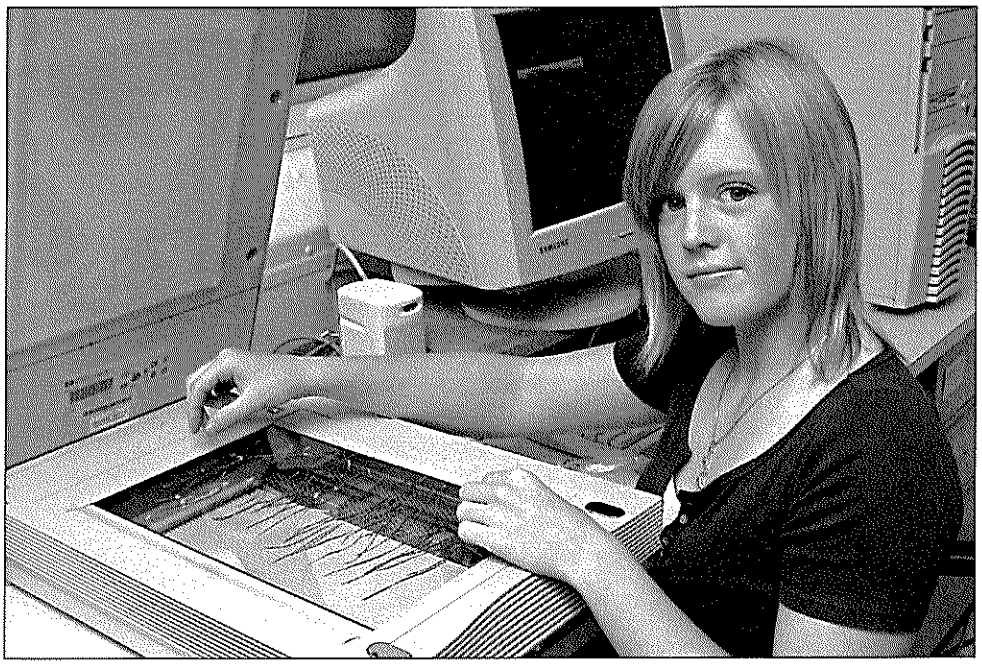


We learned our way around the university and learned about some important projects that were going on in other labs.

KATHY YACKULIC [Chemistry] // **WISEST SUPERVISOR** :: Dr. Charles S. Wong
SPONSOR :: Alberta Women's Science Network (AWSN)

OVER THE PAST SIX WEEKS I have been caught in a torrential rain/fog/lightning storm, crushed zebra fish, breathed the sweet smell of untreated sewage and thrown an egg off a balcony. This was all in the pursuit of knowledge. I doubt that there is another summer program that I can get paid to do all that. Earlier this year as I was eagerly anticipating the coming summer, I had no idea of what to expect from WISEST. I had read the student report books of the past year, yet all I could think about was the vague explanation that I had received with my telephone call posing the following; "We've put you into Environmental Chemistry, are you alright working with dead fish?". As it turned out I only spent one day with the dead fish and I had a very interesting summer. I had the opportunity to work on several projects centered on polychlorinated biphenyls (PCBs) and pharmaceuticals. The one that I spent the most time on was focused on sampling soil and air near Swan Hills for PCBs. This project was designed to investigate whether there are PCBs being emitted from the Swan Hills Treatment Center. We took a trip up to Swan Hills to collect some air-sampling units that had been deployed earlier in the year. This trip consisted of locating the units on a GPS and then we followed colored tape through the forest to find a metal container resembling an alien space ship hanging in a tree. The units filtered air through polyurethane foam discs that we were later able to extract PCBs from. Our trip to Swan Hills included the fog and lightning storm mentioned earlier, which made the trip quite exciting. Later on I went to Lac la Biche with a researcher who was examining the treated and untreated water from the sewage treatment center. That trip was much less exciting and smelled slightly unpleasant but it was still interesting to learn about why this project was important. She was looking for pharmaceuticals in the sewage, which could cause negative effects on the watershed that the treated water drained into. Over the summer I learned a lot about chemistry and I even learned how to use and clean a mass spectrometer (an instrument that analyzes a compound based on the mass of its ions). I also had the chance to sit in on a practice oral presentation done by a grad student who was preparing for his PhD candidacy defense. Although I spent most of my time in the Chemistry department, I was able to spend one day in the Biological Sciences building. One of the teams in Dr. Wong's group is working with zebra fish, and so I spent an afternoon grinding tiny frozen fish into powder with a mortar and pestle. Luckily, since it was frozen, it smelled better then the untreated sewage. Aside from the hours I enjoyed in the lab, we also had extra activities to do with the other WISEST students. We made cup holders out of spaghetti, fought to survive in a game of strings and corks, and made elaborate parachutes and holders to keep an egg safe as we launched it from the main floor to the basement of Central Academic Building. We learned our way around the university and learned about some important projects that were going on in other labs. This has definitely been one of my most interesting summers.





I absolutely loved the fact that I could identify with nearly everyone in the program; they all had the same perspectives, fears and aspirations as me!

KELCI MOHR [Renewable Resources] // **WISEST SUPERVISOR** :: Dr. Victor Lieffers
SPONSOR :: Alberta Women's Science Network (AWSN)

IT WAS A HECTIC WEEK IN APRIL when I finally got the phone call. Two, in fact. Within a day of each other, both the WISEST and HYRS program coordinators had called to offer me a place in their programs. Needless to say, I was torn. After talking to the wonderful Robyn on the phone, and discovering that two of my classmates (including my very good friend Aleksa) had also been chosen to participate, I followed the wise words of my fabulous teacher Mr. Ainslie O'Connor: "Go with the party." I'm so glad I did. WISEST has proven to be a wild summer ride, complete with actual lab research, fun times in the field, and information overload. (Just like university, only less stressful!)

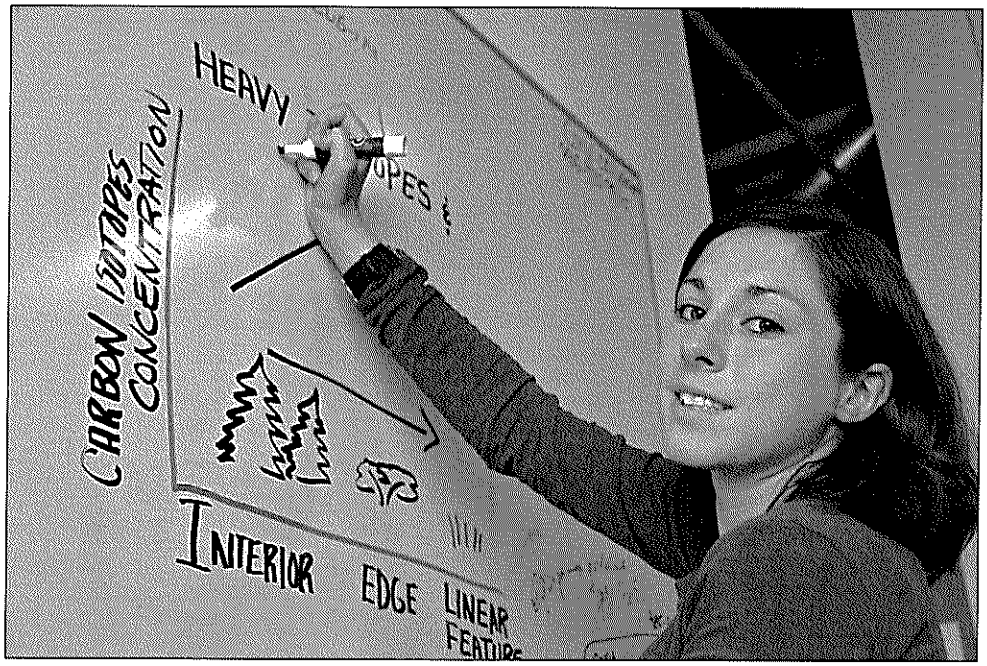
Before WISEST, I have to admit I really had no idea what was going on in the wide world of research, nor did I have any concept of what it would entail to pursue a career in science. However, WISEST has shown me the way! Over the course of a month and a half, I have been exposed to a wide range of scientific fields, spoken to many mentors currently involved in technical endeavors, and participated in various activities that have given me insight into the vast realm of science.

Needless to say, I took the plunge straight into the department of Renewable Resources, directly supervised by the amazing Amanda Schoonmaker. The Silviculture Lab's specialty? Trees! For awhile, my WISEST experience consisted of helping the graduate students with their sample processing, and I got a sense of the immense amount of effort that is needed to carry out a project. I had always thought research was more glamorous than it actually is; I had always assumed that people received results quickly and with little complications. It had never occurred to me that there would be endless proposal-writing, sample-processing and result-interpreting before any glory could be achieved from publishing significant findings. What an eye opener!

My project specifically concerned the differences in hydraulic conductance of white spruce and lodgepole pine growing in the light and in the shade. I had the opportunity to do fieldwork on plots near Grande Prairie, Whitecourt and Ellerslie. When the weather decided to behave, it was ideal to be working in the great outdoors! I got to use a device called a porometer to measure the amount of water moving through a plant, and assisted in the use of a pressure chamber to calculate water potential of the shoots.

After the data had been processed, I was exposed to statistics for the first time. I like to call them "sadistics". (Can't wait to face that in university!) All in all, my lab experience was great; I gained tons of insight into real-world research, and got to hang around with cool people all day!

As much fun as my lab was, WISEST would not have been complete without the Wednesday activities or the fun-filled Friday lunches. In the middle of the week, we had the opportunity to tour cutting edge facilities, talk to current university students and mentors, and socialize with our fellow WISEST peers. I absolutely loved the fact that I could identify with nearly everyone in the program; they all had the same perspectives, fears and aspirations as me! It felt marvelous to know that I was surrounded by fellow geeks who would understand my nerdy jokes and wouldn't laugh at me for loving science. Most of all, I feel honored to have been given a chance to participate in the WISEST program. Three cheers for nerd camp!



I am now more open to new experiences, more comfortable with meeting new people and am ready to try something new.

KELSEY GOTTFRIED [Biological Sciences] // **WISEST SUPERVISOR** :: Dr. Erin Bayne
SPONSOR :: Alberta Women's Science Network (AWSN)

TWO MONTHS AGO when I was filling out the application forms for WISEST, I could have never imagined how great an experience the program was going to be. From a lab in Bio Sci to the boreal forest of northern Alberta my adventures in the WISEST program have opened my eyes to a world of possibilities.

I was placed in Dr. Bayne's lab in the ecology department of sciences. I, along with another WISEST student, Chantel, started the program with not much of a bang. We were given the tasks of watching song-bird video footage and entering data from the field. For everyone who has ever had to enter data for a week and a half straight they would agree with me and say that data entry is a repetitive task. However, there was some excitement to be had when a nest was predated (i.e. all the baby birds died). I know this sounds strange that anyone would enjoy watching a baby bird being eaten but watching a squirrel trying to be sneaky and acting undercover is extremely funny.

By the time I felt I could watch no more birds and enter no more numbers, Chantel and I were on our way up to the Chinchaga research field camp. The drive up to the camp was long and tiring but exciting and nerve racking all at the same time. We were going to be spending two weeks at the camp. Upon first glance the camp didn't have much charm. There was no running water, electricity, and the kitchen was outside. How, on earth was I going to survive this? I am a city girl who loves long showers, hates bugs and can't stand sleeping on the ground.

I did survive and I was completely wrong about what camp life was really all about. We worked hard every day, setting and checking traps, doing and collecting vegetation and taking soil samples. The work was never boring and I learned so much being out in the field. Everyone at the camp was great. They welcomed us as if we had always been a part of their research team. I was able to not only see what real camp life was all about but also got to talk and get to know people that had been doing with research for years. Having the opportunity to live and learn from my fellow camp mates will be invaluable in the future. I now have a better understanding of career opportunities and an idea of the different avenues in which science and research can take a person who loves science.

My WISEST experience was unique. I didn't get to take part in many of the WISEST activities, which I heard were fantastic, but I am going home with no regrets. I have changed quite a bit over the summer. I am now more open to new experiences, more comfortable with meeting new people and am ready to try something new. I am returning home proud of all that I have accomplished, with a better sense of what I want to do in the future, with great memories and one pair of very dirty hiking boots.

The experience I gained was priceless and hopefully I use it to its potential.

KIM STEINBRING [Renewable Resources] // **WISEST SUPERVISOR** :: Dr. Sylvie Quideau
SPONSOR :: Edmonton Glenora Rotary Club

WITH SUMMER APPROACHING the thought of "what am I going to do during summer?" kept coming up. I had a friend from Fort McMurray who was in WISEST and she encouraged me to apply for it. For a brief moment I thought "do I really want to work full time during the only 2 months off of school?". I filled out an application form and sent it in anyway, and didn't think about it anymore.

When I got the call from Robyn saying I was accepted into WISEST in the area of Renewable Resources, I was flying high! It wasn't till later on when the fears started to hit me. Me, in a university lab? Me, with expensive machines? Me, with dangerous chemicals? I only just finished grade 11! What did I get myself into?

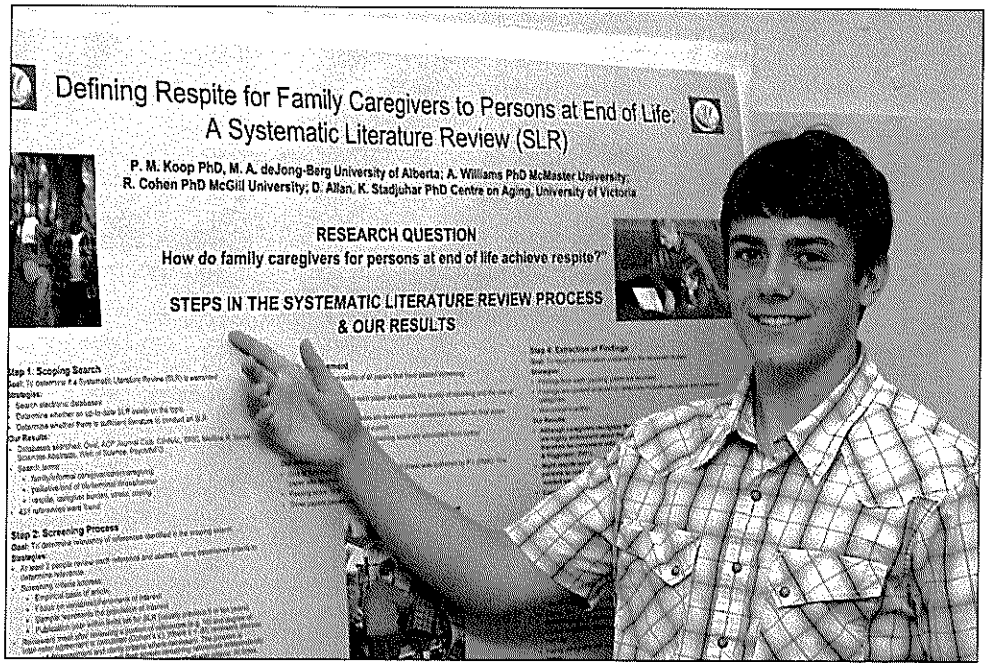
First day, orientation day, I was both extremely nervous and excited. When I walked into the Solarium I scanned the room, and found that I knew no one. So I sat down at a random table. Right away Robyn and Natasha, with their high-energy attitudes, got people talking, interacting and making friends. We also were given safety talks, what we should do in the lab and what we shouldn't do. Talking to other students in WISEST I learned that I wasn't the only one who was terrified to begin this journey! Everyone was scared of ruining someone's life project or burning down the lab.

When I met my supervisor, Jennifer Lloyd, for the first time, she led me to the Earth Science Building. As she walked with me, I felt like I didn't belong. I knew the university campus was massive, and while I was walking through it, it felt ever larger (if that is even possible!). When we got to the lab I met everyone who was working in the lab. Everyone in my lab was so welcoming and supportive.

In the lab, I was given my own independent research study. This again thrilled and terrified me, but everyone was always there to give a helping hand, give advice, or answer my questions. My project worked with different soil types and different substrates to see how the microbial communities found in the soil reacted. The study is trying to help reclaim oil sands, and reduce the time needed to return to normal levels. When I wasn't doing my project, I helped out others with theirs. I found myself doing lots of dishes. Who knew a lab could use up so many dishes in such a short period of time? Also, who knew there were so many steps in washing dishes? Wash with soap and water, then put them in the acid bath, then rinse three times with normal tap water, then rinse three time with distilled water, and then some get muffled.

I learned a lot during my six weeks at the university. I learned that the word "dirt" is commonly misused and that for the most part you should use the word "soil". Dirt is what you call soil when it is in places you don't want it like under you fingernails or on the floor. I learned that Robyn said, "I'm going to smoke these golf balls in to the woods!" not "Let's smoke these in the woods!". I learned that what we are taught in school in the area of science, barely scratches the surface of the numerous areas found in science. The experience that WISEST gave me was remarkable, and I was very privileged to get accepted into such a program.

Overall my six weeks spent in WISEST are times that I will never forget. The experience I gained was priceless and hopefully I use it to its potential. The people I met during the program I will never forget, either. Thank you for everyone who made WISEST happen.



I was excited and nervous at the possibility of working in a real research lab.

KOLBY OLSEN [Nursing] // **WISEST SUPERVISOR** :: Dr. Priscilla Koop
SPONSOR :: Allard Foundation

WHEN I FIRST HEARD from my chemistry teacher Mrs. Jaffray about the wisest summer research program, I knew I had to apply. I have always enjoyed science and I thought this would be a great opportunity to meet other students with similar interests as myself. When Robyn called and offered me a position in the Faculty of Nursing, I was excited and nervous at the possibility of working in a real research lab.

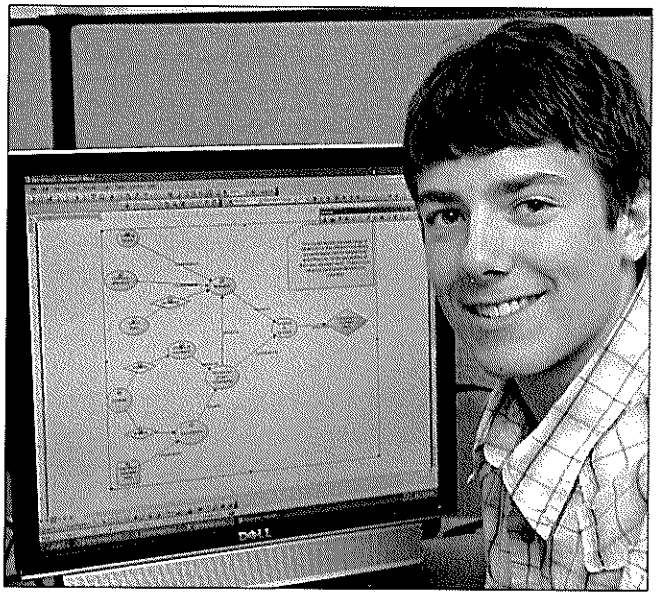
I was placed in the research lab of Dr. Priscilla Koop working on "Respite II". This project involved qualitative data analysis of caregiver interviews to find ways that caregivers could achieve more meaningful breaks. This research is important because caregivers who experience large amounts of stress due to lack of breaks are often susceptible to healthcare issues of their own.

My first few days were involved with reading caregiver interviews and practicing to code them. This involved categorizing research material as outcomes, definition's, anti-respite, proximity, stage of illness, scheduling, and self/others. Through doing this exercise I learned that in qualitative research, there is rarely one definite answer. Once coding of the research material was complete, it was entered into a qualitative computer program called NVivo. Now that the coding has been completed, it will be divided into subcategories on NVivo to find ways to improve formalized homecare services and offer ways that caregivers can achieve more successful breaks.

When I wasn't working in the lab, I was hanging out with other wisest students at St. Johns Institute where we played capture the flag, argued about social issues, and explored Edmonton. St. Johns Institute was an amazing part of wisest because the wisest students staying there all became the best of friends.

On Wednesday afternoons we enjoyed going to seminars and listening to amazing speakers who developed successful careers in various fields of science and engineering. These people motivated everyone in wisest to continue to strive for excellence and to pursue fields in engineering and science. One of my favorite afternoon tours was a tour of Isotechnika, which is a lab that is designing an improved version of a drug that prevents organ rejection in patients who have recently undergone an organ transplant. Other activity's that were a highlight of the program included university 101 and "science olympics" which were fun and applicable to everyone in the program.

Now that we are at the conclusion of WISEST I would like to thank Grace, Robyn, and Natasha for running the WISEST summer research program. Thank you to Marge de Jong Berg for teaching me different lab techniques required for qualitative research. Thank you to my mentor Dr. Priscilla Koop for teaching me about research and preparing me for a future in whatever career path I may choose.



This program really opened up my eyes to the endless career paths you can take in science, engineering, and technology.

KRISTEN KAVICH [Chemical and Materials Engineering] // **WISEST SUPERVISOR** :: Dr. Fraser Forbes
SPONSORS :: Human Resources and Skills Development Canada - Canada Summer Jobs / Faculty of Science

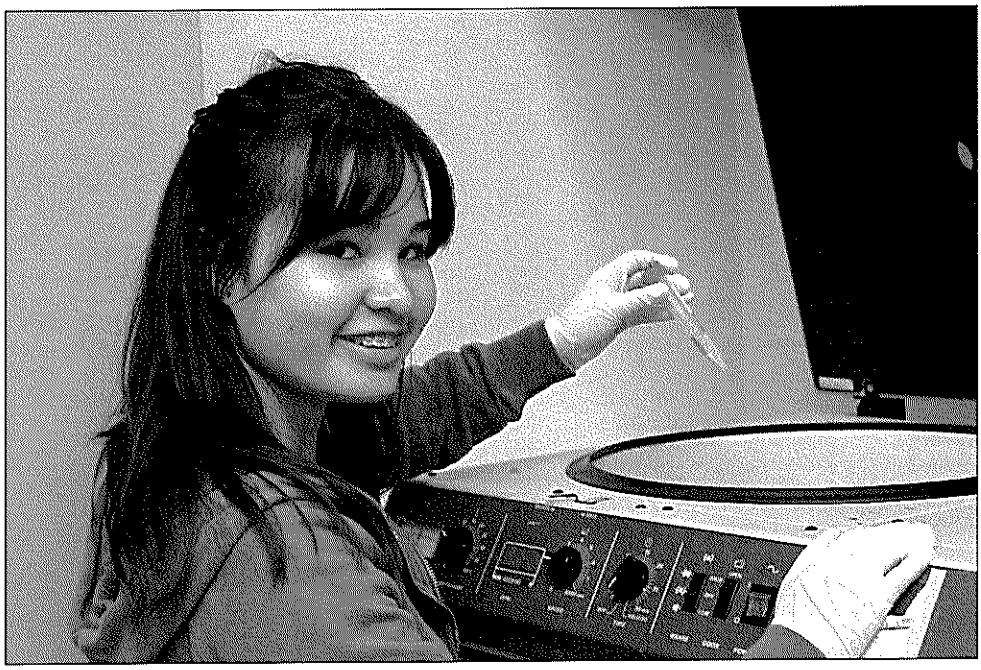
THE ALGAE MONSTER. What mad scientist wouldn't want to create one? Luckily for me, I did. Well, sort of. I did grow algae this summer, but it never turned into a monster, instead it turned into biofuel. This summer I worked in the Chemical and Materials Engineering department under the supervision of Natalia Marcos on a research project that involved growing algae and extracting its lipids to make biodiesel. We started off by preparing solutions for our algae to live in, each being slightly different so we could figure out which suited the algae best. Over the course of two and a half weeks, we watched our algae grow and prosper in the little home we created for it. At the end of the project, we removed the algae cells, freeze-dried them, and extracted the lipids. This was the overall project of the research team, but my mini-project was to monitor glucose and nitrogen concentrations throughout the algae's growth.

For the main project, I worked alongside another WISEST student, Marina. We both shared our awesome supervisors, Natalia and Hector, with whom we had a blast. The project I worked on entailed lab work for the majority of the time, and I thoroughly enjoyed all of the hands on work. I learned many useful techniques in the lab, and I also learned how to operate the machines and equipment in the labs. I was responsible for carrying out procedures, collecting and organizing my data, and then displaying it in a graph format. It was a very challenging and interesting summer, with something new to learn every day.

The workweeks were made more interesting by doing fun activities known as Wednesday Sessions. Some of these included games, such as the Science Olympics, and some were more educational, such as the COMPRU tour. Spending five days a week on campus also gives you a good lay of the land, and now I know my way around most of campus, especially the engineering area.

The WISEST Summer Research Program was such an amazing experience, but the people I met made the six weeks even more enjoyable. I lived in residence at St. John's Institute, with eighteen other WISEST students and four students from the HYRS program. Residence was a little intimidating at first, but I soon found out that everyone was really nice and easy to get along with. Living at residence definitely made the six weeks go by faster because we had so much fun and were always so busy doing crazy activities including: capture the flag on campus, residence hide-and-go-seek, Mario Kart tournament, poker night, Karaoke night, luau party, Harry Potter Party at Chapters, movie marathons, numerous festivals, card games, and everyone's favourite: debates. There were many late nights (actually the majority of them), but no one could surpass the supernatural powers of the 4 A.M. Club.

I applied for the WISEST Summer Research Program because I thought it would be a valuable experience and hoped it would help me to decide what I want to do in the future. This program really opened up my eyes to the endless career paths you can take in science, engineering, and technology. After participating in this program, I have a better idea of what I would like to do in the future, and am fairly certain that it will involve engineering. Overall, this summer has been a rewarding and exciting experience, and I look forward to my future years at university.



I had the opportunity to interact with people of a variety of ages and educational backgrounds, all of whom I have learned from.

LAUREN EASTMAN [Obstetrics and Gynecology] // **WISEST SUPERVISOR** :: Dr. Denise Hemmings
SPONSORS :: Human Resources and Skills Development Canada - Canada Summer Jobs / GlaxoSmithKline

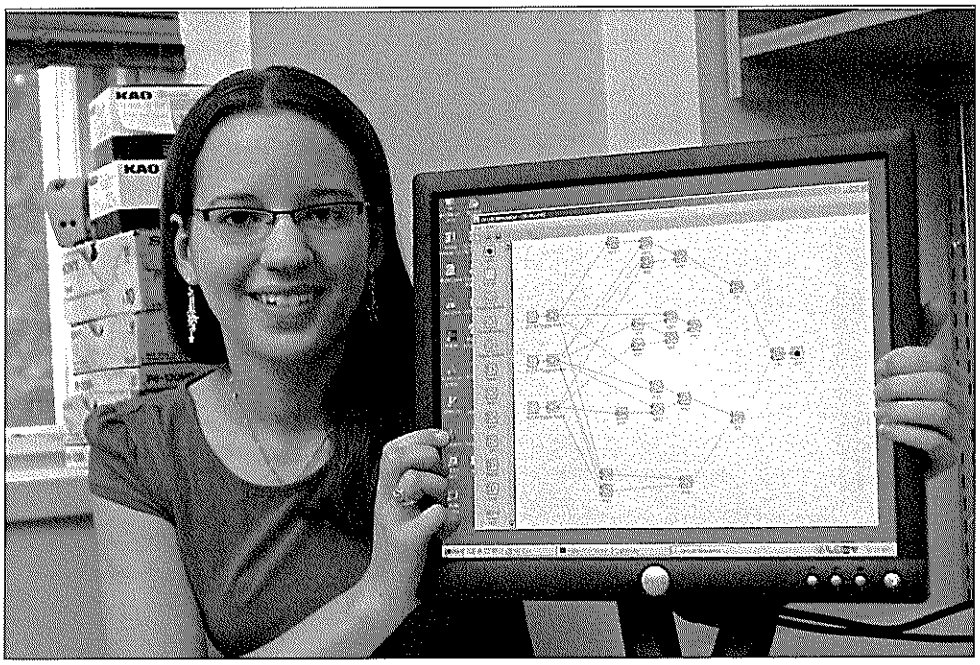
ACCORDING TO THE OXFORD ENGLISH DICTIONARY science is "the activity encompassing the systematic study of the natural world through observation and experiment". Such a curious notion has been instilled in me since I was a child, so when presented with such an opportunity as the WISEST Summer Research Program, there was no doubt in my mind that I wanted to participate.

I had the privilege of working with Dr. D. Hemmings in the Gynecology and Obstetrics Department in the Heritage Medical Research Centre. Medicine has always seemed a potential career for me, but helping other women, which thankfully I specified in my application, in a field such as gynecology was more like a dream. Dr. Hemmings is working with cytomegalovirus (CMV), a strain of herpes virus that is asymptomatic in healthy individuals. CMV is able to hide within the confines of the placental villi, and not only cause congenital abnormalities, but Dr. Hemmings has proposed is also the source of a devastating condition in pregnant women called pre-eclamsia. By binding to receptors within arteries, CMV inhibits the release of nitric oxide to arterial smooth muscle cells, which normally causes vasodilation. This results in mounting blood pressure.

Essentially, my particular experiment involved infecting cells with CMV, along with variable treatments then counting the number of CMV infected cells to determine the effect on infection of a particular treatment. I began by culturing trophoblast cells, part of the placenta in culture plates. I performed two experiments on the trohphoblasts, each with differing treatments. The first experiment was static, meaning I did not centrifuge the trophoblasts once infected with virus. I treated the trophoblasts with virus, virus and heparin and virus and PEG, and upon incubation of infected cells for various durations, separated the cell lysates and supernatants to infect HEL (human embryonic lung) cells later. In the second experiment, after treatment with PEG and virus, virus, virus and heparin and virus and heparin in a higher concentration I centrifuged the trophoblasts. They then incubated for differing durations before being frozen, supernatants and cell lysates together, for infection of HEL cells. Following this the cells were fixed with methanol, and stained with the aid of a red substrate, which through a multiple step pathway, recognizes an antigen produced by virus infected cells. Now all I had to do was count the number of red fibroblast cells in the culture plates!

There were many occasions in which I was able to venture outside of my own laboratory work. Some of the most fascinating work I have seen this summer was that of the graduate and post-doctorate students working in the same laboratory as me. From culturing HUVECs from freshly delivered umbilical cords to watching live dissections of rat hearts, nothing ceased to amaze me this summer. The gynecology and obstetrics department also held regular meetings, some to discuss what researchers were working on in the lab and others to analyze medical journal articles. It was nice to see what familiar faces in the laboratory were doing, although I soon realized what little knowledge I have of biology! On Wednesday afternoons, the WISEST students would also get together for seminars. I immensely enjoyed the 'small group discussions' seminar as I have heard so much about post-secondary education lately, but never in such an intimate setting. Plus, seminars were always a much needed break from counting cells.

The WISEST Summer Research Program is unlike any other job. I have acquired laboratory skills, enriched my understanding and knowledge of biology, and gained insight into the field of biomedical research. Talking to fellow WISEST students about their own experiences has broadened my perspective on science as I have found areas outside of biology just as intriguing. Most memorably, this summer I had the opportunity to interact with people of a variety of ages and educational backgrounds, all of whom I have learned from. WISEST is hard work, but the growth that one experiences is worth it.



This has been a priceless experience for me, and I encourage all those other people out there to give WISEST a try. I guarantee that it will be worth your while.

LEIA PEDDLE [Computing Science] // **WISEST SUPERVISOR** :: Joe Culberson
SPONSORS :: Alberta Employment, Immigration and Industry (STEP) / Alberta Advanced Education and Technology

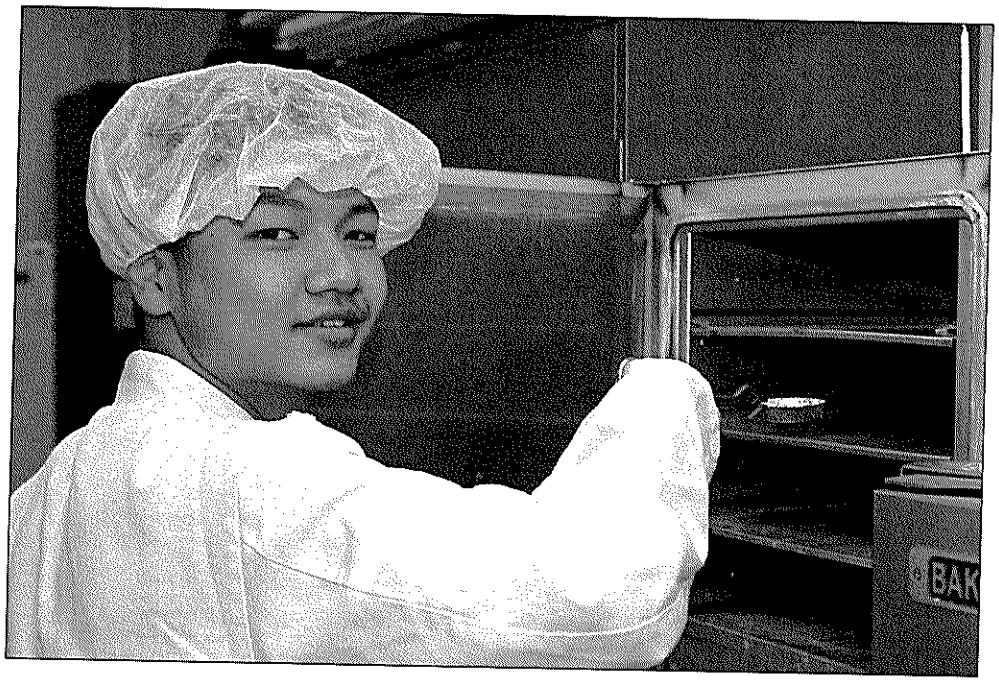
I HAVE SPENT THE PAST TWO SUMMERS working a simple job at a Hardware store, but nothing compares to what I did this summer. I spent this summer involved in research through the WISEST Summer Research Program, but not all of my research was performed in my lab. I am adept with computers and mathematics, and thoroughly enjoy using programming codes like HTML to create web pages and other related programs. WISEST placed me in the Department of Computer Science, and I couldn't have been better matched. I had the immense pleasure of being under the excellent guidance and friendly support of Janelle Harms, an Associate Professor and my direct supervisor, and Joe Culberson, an Undergraduate Professor and my principal investigator. Working with them and a few other very important people, such as Nafeesa Mohamed and Renée Elio, I was to go through the first year Computing 101 university course and evaluate all its different aspects. I worked on many programs, including Finite State Machines, Logic Circuits, the C++ programming language, and the new edition to the course, Guido van Robot.

I learnt much through the six week experience, but as I said before, it was not only in my lab where I learnt. When I graduate from High School, I am planning on going to the University of Alberta, but am undecided on which course I should take. I am thinking of either taking a bachelor in Computer Science Honours or in Software Engineering, but am unsure of which I would prefer. I talked to Janelle Harms, and she directed me to James Hoover, who is a Software Engineering Professor at the University of Alberta. Through him I learned the differences between Computer Science and Software Engineering, and am much better informed because of it. Now I will be able to make a more educated and knowledgeable decision when it comes time for me to attend University.

I live on an acreage in Vegreville, about an hour east of Edmonton, so for me there was also the experience of living in St. John's residence. I met lots of people and was able to share my passion and my ideas with other talented individuals. Not only did I meet other WISEST students, but I also met people from the HYRS program, a sister program to WISEST. I learned what it was like to live alone, that there is a mix of excitement and homesickness, and that there are other people who are as interested in math and technology as I am. Living in residence was lots of fun, especially with Megan Wagner the WISEST residence advisor, and Kaitlyn Wall, the HYRS residence coordinator. They often combined their efforts so that we could all have good times, watching movies, painting ceramics, singing karaoke songs, and much more.

The WISEST experience was like a giant birthday cake given to an orphan, meaning that it was a greatly appreciated once-in-a-lifetime experience. The research in my lab was the filling of this cake. It was exciting, challenging, I learned something new every day, and I enjoyed every single moment of it. For me, residence was the icing on the cake, sugary sweet and full of awesome experiences. The giant candle was all the people I have met, and all the friends that I have created in this short period of time. The candle is alight with all the wonderful memories that I will take with me throughout my life, because I am proud to call myself a WISEST student.

In conclusion, it can be simply stated that the wisest thing that I did this summer was to partake in the WISEST Summer Research Program. This has been a priceless experience for me, and I encourage all those other people out there to give WISEST a try. I guarantee that it will be worth your while.



I have had the opportunity to work alongside graduate students on their project, become familiar with the U of A campus through the campus tours and meet many new people.

LEO TANG [Agricultural, Food, and Nutritional Science] // **WISEST SUPERVISOR** :: Dr. Wendy Wismer
SPONSORS :: Human Resources and Skills Development Canada - Canada Summer Jobs / Faculty of Agriculture, Forestry and Home Economics

IT ALL BEGAN ON A NICE SUMMER MORNING when 60 young explorers gathered at the ETLC to get ready to add something to their life-experience map. Ahead of them is unexplored territory, and of course, excitement. And six weeks later... the young explorers were all filled with experiences of a lifetime, each of them unique. What have they discovered? It was the experience as a university researcher.

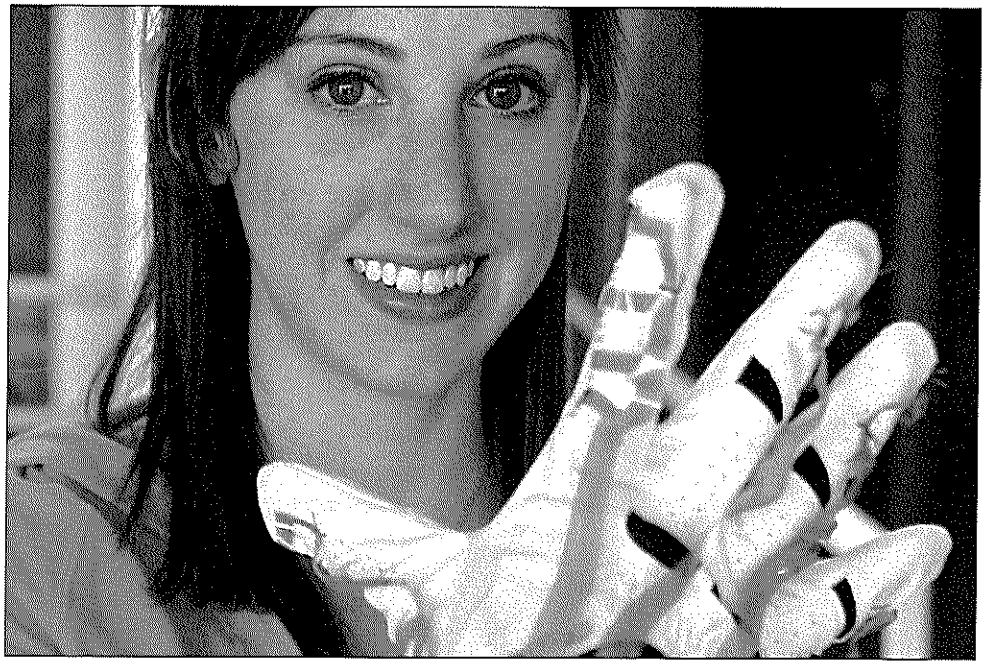
The explorers were not alone. As one of them, I was accompanied and lead by very intelligent and kind-hearted people, I was very fortunate to be placed in Dr.Wismer's research team along with Lauren Comin, a graduate student in the Faculty of Agricultre, Forestry, and Home Economics. The project we worked on was taint assessment of Walleye (a type of fish) caused by naphthenic acid in oil sands tailings water

To began my research experience, I was informed of the project's background by reading many papers and article related to the field of sensory science such as: the properties of naphthenic acids, the effect of taint on food products, and standard practices for evaluating odor contaminants. As oil sands industry is booming in Alberta, it also leads to problems such as fish tainting. Taint is an odor that is not distinct to the original product. As naphthenic acids accumulate as a byproduct accumulating in tailings pond, some of the water happens to leak into and pollute natural water sources such as lakes and rivers, thus giving the fish in it a distinct asphalt smell.

Our goal was to determine the human olfactory threshold level for the naphthenic acid taint. The presence of taint can be detected using the technique of sensory threshold testing. This technique determines the minimum concentration of compound present required for its detection. During the first part of the project we tried to determine whether the presence of naphthenic acids in Walleye can be associated with fish tainting, at what concentration they can be detected, and we assessed the effect of common cooking methods on the naphthenic acids taint. I am sure you are wondering by now, cooking fish in a lab? Yes, indeed. But this was only the preliminary steps for the sensory tests. In the second part of the testing we tried to compare two common methods of sensory analysis for the detection of fish taint: the triangle test and the olfactometer, the latter is a computer controlled device often used for testing olfactory acuity when dealing with environmental odors. Volatiles collected from the tainted fish samples will be pumped through the device at ascending concentrations, in which the lowest two correctly identified concentrations by the panelists would be the threshold. The second part of the project will continue on until the end of the year.

Outside our lab, we also had a variety of some real campus exploring planned by our coordinators. On Wednesday afternoon seminars, activities like the Small group discussions with enlightening role models, On-campus research lab tours, and a tour of COMPRU, which is a world class head and neck reconstructing facility. These activities not only opened further university life and high-level research to us, but were also inspirational on future careers.

From these six weeks of research and fun, I have had the opportunity to work alongside graduate students on their project, become really familiar with the U of A campus through the campus tours and meet many new people. I would like to sincerely thank my sponsors and WISEST for giving me this opportunity, and also especially to Dr.Wismer, Lauren, and the others on the research team for guiding me through the project, it is an experience I will always cherish.



Being in a lab with many grad students gave me the chance to learn what they were doing, because they were always willing to tell me about their project and answer any questions I had.

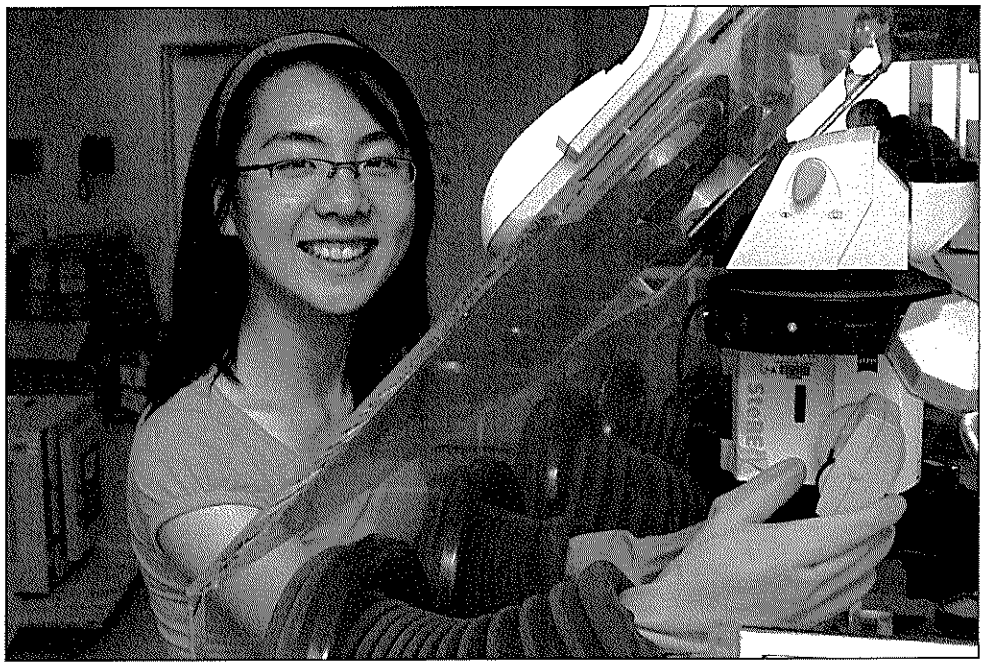
LISA CAMERON [Mechanical Engineering] // **WISEST SUPERVISOR** :: Dr. Jason Carey
SPONSOR :: Suncor Energy Foundation

NORMALLY I WOULD SPEND MY SUMMER hanging out with friends, staying up all night, shopping, or sleeping, like any other typical 17 year old girl. However, this summer I was given the opportunity to spend my summer working at the University of Alberta with my supervisor, Alessandro Vena, in Dr. Jason Carey's lab. It was an amazing way to spend six weeks of my summer. I feel like I have actually accomplished something, and at the same time I was able to experience campus life, and the independence that comes with it. I also learned what engineering actually is, because before this summer, I was very confused about what an engineer does, even though my dad is one. These past six weeks have shown me more about engineering and the atmosphere at the University than I ever imagined they would.

I worked in a lab in the Department of Mechanical Engineering. Along with my supervisor, I worked on his motion capture lab. The purpose of this lab was to study the accuracy of measuring high-speed rotational motions and small translational motions with various sampling rates. After countless visits to the machine shop for parts and for the use of the CMM (coordinate measuring machine) our apparatuses were ready to test. This was done was by using eight high speed cameras in a lab, at the Glenrose Rehabilitation Hospital in Edmonton. The cameras put out infrared rays that reflected off of our passive markers (light reflecting) that we had placed on both the translational and the rotational apparatus. These markers would reflect light back to the charge coupling device (CCD) in the camera. The cameras used their infrared technology to determine the distance between the markers on the apparatuses at the different settings. Then we compared the numbers that we received from the cameras with either the measurement on the micrometer for the translational apparatus or the control distances on the rotational apparatus (measured by the CMM), to determine whether the sampling rate was too high or too low, or just right. This procedure was repeated many times, changing the orientation, displacement, device placement and heights to make sure that our data was precise and accurate. However, when we went to the Glenrose we encountered problem after problem, starting with how to transport the devices, how to modify the rotational device so that it would work properly with the program, and finally how to stay in the time frame we had. We only had enough time to test one apparatus so my results are not as complete as I would have liked, but at the same time, I now know that a real researcher's day does NOT always go according to plan.

Besides working on that main project, I had to opportunity to gain knowledge by doing small side projects with another WISEST student, attending seminars and a PhD candidacy practice exam, working on another WISEST student's project, and learning about the grad students' projects in the MechE lab. An advantage I had working in this lab was being able to attend a spine seminar with some Biomedical Engineering students. This gave me an opportunity to learn about the biomedical side of engineering and also show me what a research team is like. Being in a lab with many grad students gave me the chance to learn what they were doing, because they were always willing to tell me about their project and answer any questions I had. Throughout my WISEST experience I periodically worked with Tracy and her supervisor on their project working with a bovine tibia.

In addition to meeting some incredible people, and some intelligent and helpful grad and undergrad students, my experience at WISEST gave me much more. All the hands on learning that I gained from WISEST topped anything I could have achieved at my usual summer job as a cashier. I also gained experience and knowledge about Engineering and the University. I was able to visualize what it was like being a student at the U of A, making me want to attend here next fall more than ever.



The Wednesday seminars not only kept the 60 WISEST students in touch but introduced us to both the working world and the world of university.

LUCIA XIAOPENG SUI [Mechanical Engineering] // **WISEST SUPERVISOR** :: Dr. Walied Moussa
SPONSOR :: Elk Island Public Schools Regional Division No. 14

IT ALL STARTED WHEN Robyn, my WISEST coordinator, called me during the May long weekend with an offer to work with mechanical engineers under Dr. Moussa, inside the National Institute of Nanotechnology. Upon my acceptance I knew these six weeks will be nothing like any summer. As the starting date got closer, the reality of it all started to hit me. When people asked me what my plans were for the summer just days before orientation day, I confidently described to them the proposed project with a big satisfactory smile. But to be honest, I had no idea what I signed up for.

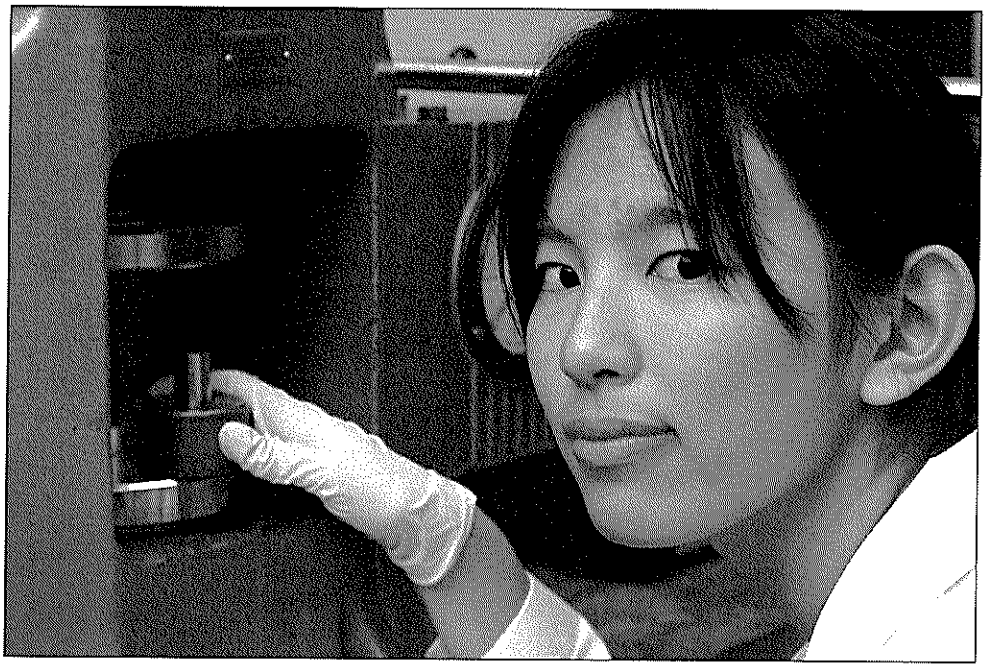
As I walked into the ETLC Solarium (after getting lost on campus), my stomach started to get butterflies. Fear of doing something wrong, not meeting expectations, or having no friends hit me like a heat wave. After a round of ice breakers and realizing that many of the students there were in the same position as I was, I felt more relaxed. Orientation day flew by and before I knew it I was picked up by my direct supervisor to be, Sebastian, to go meet the team. For me, that was when this joyous rollercoaster began.

After a few days, I, along with Jill, the other WISEST students I was working with, became a part of the "Hydrogel Team". This team consists of J. Ryan Saunders, Taznuva Khaleque, Sammy Abu Salih, and my direct supervisor, Sebastian Hanula. Hydrogel is a gel made of polymers cured by UV light that have mechanical characteristics that make it useful to engineers and scientists. Each team member has got his own part and goal. The goal of one project is to make hydrogels swell and de-swell using electricity. This swelling action will either create a peristaltic pump to transport microfluids or as a valve that closes and opens. Another project characterizes the bending of hydrogel fibers. Everything is done in a nano-scale. Hydrogel will become an important material in biomedical research in the future. Although the team has already devoted two years to this project, it still is in its baby stages. At this point in the project, the team are working together to find the properties of the hydrogel. I was given several tasks: research about various equipment and materials needed to test the properties of the hydrogels (such as a fluorescence camera), test changing UV intensity, and reading papers on the characteristics of hydrogels.

I was thrilled to work with such high technology. I learned so much about a field of study that is way above me. I feel honoured to be given this opportunity – an opportunity that I am not going to encounter again for many years. Coming into the program I hoped to gain a clearer idea of my future career goals, and this experienced did just that. I now feel a newly found passion for engineering.

The lab work made up only half of my WISEST experience; the other half was fulfilled with "social events" arranged by our awesome WISEST coordinators, Natasha and Robyn. The Wednesday seminars not only kept the 60 WISEST students in touch but introduced us to both the working world and the world of university. We had a chance to meet some truly amazing people and visit cutting-edge research labs. Not all the activities were academically based – we had an amazing time together during our picnic and golf evening and during our Friday lunches. Every activity was more memorable than the next.

This program was a learning experience, both academically and socially, mixed with loads of fun. I made bunch of new friends throughout the program. I learned so much about life and work in university and the working world. For the first time, I pulled myself out of a high school environment and plunged into "the real world" and had a glimpse of the hopeful future. What was my favourite part? I don't have one. Every moment of the past six weeks was priceless. Thanks to everyone in WISEST and everyone who I worked with me for this experience of a lifetime!



The lessons I have learned, the friends I have made, the memories I have accumulated, they could not have been made a part of me if it wasn't for this program.

LUCY YUAN [Chemical and Materials Engineering] // **WISEST SUPERVISOR** :: Dr. Jingli Luo
SPONSOR :: Syncrude Canada Ltd.

TO THIS DAY, I'm still dazed and amazed by my good fortune at being accepted into the WISEST Summer Research Program. I received that momentous call at the end of May and was informed that I'd been placed in the Department of Chemical and Materials Engineering to work on preparing fuel cell membranes with the goal of developing an efficient alternative energy source. My first reaction was excitement, because this topic greatly appealed to the environmentalist in me. That was my first indication that this summer was going to be one of the best in my life.

Like I predicted, my job at WISEST was fantastic. I worked at the National Institute for Nanotechnology (NINT) in Dr. Jingli Luo's research team. From the start, every day was a crash course in advanced chemistry, and I would not have been able to keep up if it hadn't been for the excellent tutelage of my wonderful supervisor, Dr. Jinxia Li, who taught me a lot about fuel cell technology and helped me understand all the concepts I'd never learned before. She placed a lot of trust in my abilities and, soon after I started working, let me get hands-on experience in the process of creating fuel cell membranes. She showed me how to make accurate mass measurements of crystalline solids on the scale, put reactive solutions in the ball mill for mixing, use the 30-ton press to make membrane pellets out of powder, grind and sieve coarse grains into a fine dusty powder, and many other tasks. Her friendliness and knowledge quickly made me comfortable in the lab, and we shared many laughs while we waited for results.

As if work wasn't exciting enough, there were also the Wednesday afternoon seminars and T.G.I Friday lunches. Every Wednesday, we got the chance to meet women in scholarship, engineering, science, and technology (hey, that's the name of this program) and learn what they do and how they got into their current careers. These tours and seminars opened my eyes to all the possibilities out there and how there are more than just science-related positions in fields like prosthetic surgery rehabilitation and computer software. Also, there were the Science Olympics, which were so much fun (educational too, of course) and an excellent way for us to bond. The Friday lunches were great opportunities to get to know the other WISEST students, the lovely and helpful Student Coordinators Robyn and Natasha, and to enjoy the beautiful weather.

The second indication that this would be an awesome summer was Rez. I shared St. John's Institute with HYRS people, Ukrainian students, U of A students, "randoms", four fellow Fort McMurrayites, and 14 other WISEST people who started out as strangers but, by the end, had become among my dearest friends. We did all sorts of fun (sometimes crazy) things together, from watching an entire season of a Chinese TV show to playing table tennis to laptop parties to Karaoke to filming live wrestling matches. The entertainment never stopped at Rez. I felt extremely blessed to live there, and I will never forget the people I've become friends with. For the first time since I can remember, I've met people who truly understand my values in life and who share my liberal opinions. Also, this is the first time I've met people who have the same eclectic, frequently atypical tastes in music, movies, and TV as me. I swear we could be related.

WISEST is such an amazing program. I count myself among the lucky to have been chosen to participate. It is the perfect model of university life and, as a result of being in it, I feel confident that I will thrive in a post-secondary environment. The lessons I have learned, the friends I have made, the memories I have accumulated, they could not have been made a part of me if it wasn't for this program. Thank you so much!

I love WISEST!

I was able to speak with a former WISEST student, and was even lucky enough attend the Celebration of Research in 2006.

MARIELLE MCCRUM [Biological Sciences] // **WISEST SUPERVISOR** :: Dr. Cindy Paszkowski
SPONSOR :: Alberta Ingenuity Fund

I HEARD ABOUT the WISEST Summer Research Program over a year ago. Posters announcing this exciting opportunity were displayed outside the classrooms of my enthusiastic science teachers. I was able to speak with a former WISEST student, and was even lucky enough attend the Celebration of Research in 2006. So when application forms were sent out this year, I thought it might be a good idea to apply. Apparently, every now and then, I get something right.

The WISEST Summer Research Program has been a wonderful six weeks that have allowed me to learn more about the intricacies of research and see past the stereotypes that litter the science world. I was always under the impression that those involved in science were quiet and serious people, focused solely on their research. This misconception was proven false upon the first contact I had with WISEST. Robyn, one of two student coordinators, happily told me that I had been accepted to the program. In later conversations, she even wished me a happy birthday.

On Orientation Day, I met many more people who proved this stereotype wrong. The eager young men and women who were the other WISEST students were full of energy and very personable. Everyone seemed happy to meet one another. To get to know each other, we raced relays and did chicken dances, hardly the quiet conversations I had envisioned. From Newton's Minions to my very own Bio-Buddies, everyone was excited about what lay ahead.

When the time came to meet our research teams, I was once again pleasantly surprised. My principal investigator, Dr. Cindy Paszkowski, greeted me with a friendly smile. The welcoming environment grew as I was introduced to my supervisor Krissy Bush and her group of assistants.

My primary duty as 'assistant's assistant' was to prepare slides of Sage-Grouse embryo heads. These were then examined for evidence of abnormalities which prevented the embryo's hatching. This information may help better understand the reasons for the relatively low population of this bird in southern Alberta. Working in this lab allowed me to learn how to use various lab equipment and taught me about this endangered species of which I had no previous knowledge. Doing this work, I experienced certain moments marked by a sense of accomplishment. For example, it was quite exciting to realize that I finally knew what I was looking at when examining the slides and could identify an abnormality.

My time with WISEST went beyond my daily duties in the lab, though. I was given many opportunities to see what others were doing within my lab, including some of their genetics work. Dr. Paszkowski was also kind enough to arrange a day-trip to the Meanook Biological Research Station for a fellow WISEST student and myself. Dr. Bill Tonn provided much insight into the local ecology on our trip up to Athabasca and the day gave us a fascinating look into the daily proceedings of field work.

Of course, there was even more to the WISEST Summer Research Program than just work, as interesting as it was. Friday lunch hours were a great chance to become better acquainted with the friendly peers I met on the first day. There were also social events, such as an evening of golf at the Pitch n' Putt. Even though everyone had been encouraged to dress up, only the brave souls of Pure Golf were willing to do so. Dressed in as many plaids, stripes and sweater vests as we could find, we attempted golfing. The results: a few close calls and an evening full of fun!

I would like to thank all those who proved that those involved in science are passionate, welcoming and very interesting people. So many people, from the WISEST organizers to my research team, and the 59 other students in the program have made this summer an unforgettable one, and have added to this amazing opportunity that has taught me so much.

"I now have a much clearer understanding of university life, I have attained loads of lab skills and knowledge, and I have learned that there are many different career paths and options today.

MARINA JOSEPH [Chemical and Materials Engineering] // **WISEST SUPERVISOR** :: Dr. Amos Ben-Zvi
SPONSOR :: Epsilon Chemicals Ltd.

"**THE MORE YOU LEARN** the more you realize how little you know." (Anonymous) This quotation clearly illustrates WISEST; a program which definitely encourages you to expand your knowledge, acquire new skills and discover new possibilities. After these short six weeks it is safe to conclude that an incredible amount of invaluable information has been gained along with a growing awareness of diverse opportunities.

I was placed in the Department of Chemical and Materials Engineering, and quite frankly I wasn't exactly sure what engineering entailed beyond the general idea that this field of work involved a bit of Math and a bit of Science. Now, after six weeks I have a much better understanding of what really goes on in the Engineering world.

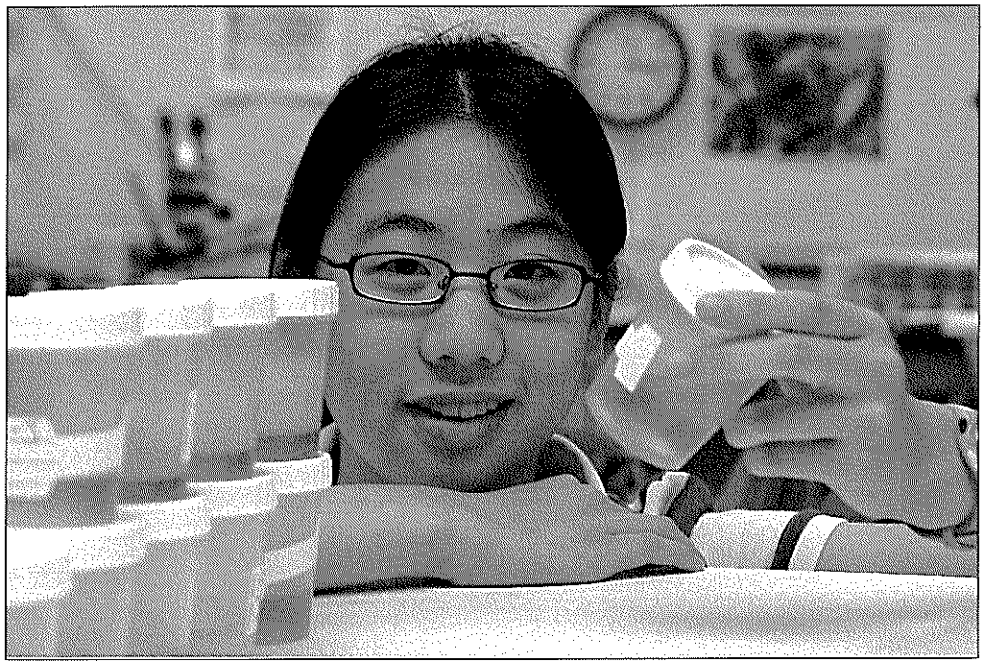
The overall goal my project was to grow Chlorella prototheocoides (algae), which produces lipids and then convert these lipids into biodiesel. The key factor investigated was the correlation between the growth of algae and the amount of oil produced in solutions over a period of time in mediums such as glycine, ammonia and urea. Monitoring biomass, (a variable in the bioreactor) allowed us to create a model to predict the connection between the growth of algae and the optimum amount of oil produced.

Various methods were employed to determine the concentration of biomass which include Spectrophotometry, Dry mass cell Filtration and Cell counts. The three methods used gave us comparable results. We found that the amount of algae (cells/L) increases with the initial concentration of glycine (the medium in which the algae grew in different concentrations). Most importantly we found that for the range of glycine concentrations tested; oil production increases with increased initial concentrations of glycine.

In the lab I met so many fantastic people who were always entertaining to talk with and extremely helpful in giving advice on the task at hand and university. Working with another WISEST student (Kristen) was so much fun; we had so many laughs and we even created an algae monster. Our supervisors and principal investigator were awesome; they taught us endless lab techniques and they helped us to become masters with the equipment we worked with. Their continuous patience, enthusiasm, insight and assistance was absolutely remarkable. In addition, they were able to expose us to different areas of science apart from Chemical Engineering; thereby showing us that there are many different career options available and so it is not necessary to limit yourself to only one.

Living in residence was equally cool and exciting. It definitely gave you the chance to truly experience university life and make tons of new friends. Arriving at residence was perhaps a little daunting; however, you soon find that everyone is really friendly and extremely easy going. Together we played epic games, shopped till we dropped, had magnificent movie marathons, played crazy card games, went to some pretty fun festivals, had some cool parties, dressed up in some pretty wicked costumes, had a Harry Potter reading extravaganza, and who can forget those insane late night discussions (the 4 A.M. Club).

These past six weeks have been particularly enriching and it has definitely been a unique and memorable experience. I now have a much clearer understanding of university life, I have attained loads of lab skills and knowledge, and I have learned that there are many different career paths and options today. Thank you to my sponsor (Epsilon Chemicals Ltd.), WISEST, my supervisors and my principal investigator for providing me with this excellent opportunity to be apart of this truly incredible research project.



Without WISEST, I would never have gained so much insight into research and all the different career choices open to me.

MEGAN CHI [Biological Sciences] // **WISEST SUPERVISOR** :: Dr. Heather Proctor
SPONSORS :: Human Resources and Skills Development Canada - Canada Summer Jobs / Canadian National Railways

THE PHONE RANG AND I PICKED UP. The news that followed filled me with a mixture of excitement and wonder. Well, firstly, I had been invited to join the WISEST Summer Research Program and, secondly, I realized that I might actually be doing something useful this summer. True, I was skeptical about waking up early during the mother of all holidays but, seeing that my personal research experiences have been minimal, I decided to accept. Besides, I have always considered science as a possible career choice and WISEST seemed like a good start.

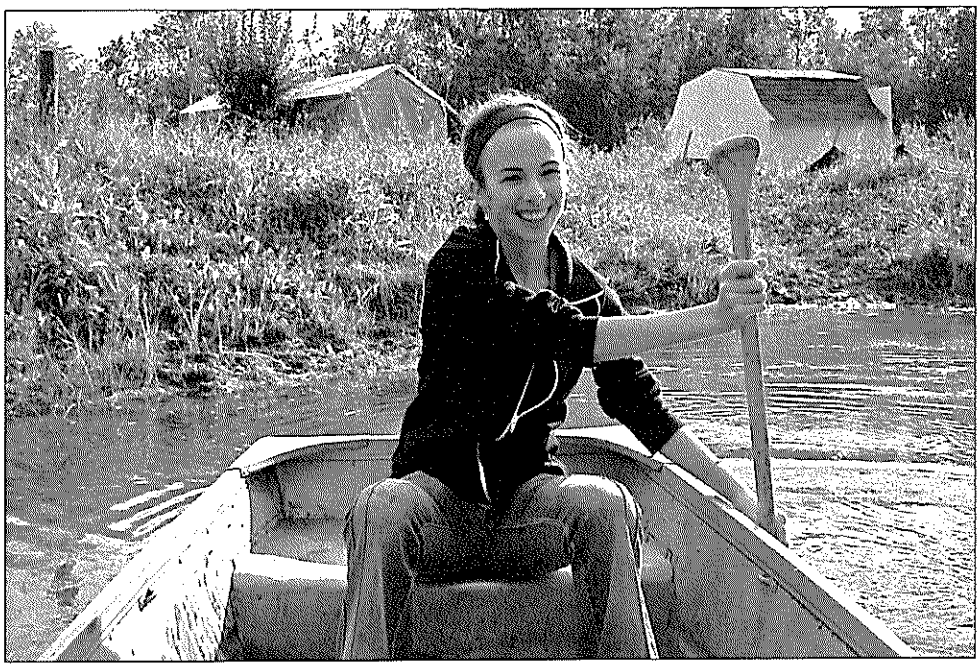
I had been placed in the Department of Biological Sciences under Dr. Heather Proctor whose main research interests focus on mites and other invertebrates. I also had the opportunity to work with her students, Kylee Pawluk, Katie Williams, Wayne Knee and Bronwyn Williams. Naturally, the first few days filled me with uncertainty. I found insects interesting to look at but vertebrates had always peaked my interest to a greater degree. Consequently, I knew next to nothing about insect indentification and the differences between diptera and hymenoptera or syllids and nereids. Thankfully, a fellow WISEST student, Sarah Nowicki, and I were gently introduced to the realm of invertebrates that we would soon be accustomed to; our first task: maintaining the zoology museum down the hall. Admittedly, it was not the most enthralling of assignments but after several hours we definitely became re-vialing machines. We learned that repetition was a staple of research and only patience and perseverance could lead to results. The mission was accomplished within three days and we were happily promoted to our second project.

Under Kylee's careful guidance and instruction, we began an exploration into corraline algae and the marine invertebrates living among their highly branched structures. We were designated the task of counting and picking out polychaetes (marine worms) and caprellids (tiny crustaceans) found in samples of the algae. Here, we were taught the structures differentiating two polychaetes, syllids and nereids. We also learned how invertebrate assemblages are affected by abiotic factors such wave exposure and ocean depth.

Later, I began my own project, an investigation of the mites and other invertebrates found in nests of white-tailed sparrows in British Columbia. The nests had been collected by Dr. Scott Ramsay of Wilfred Laurier University in 2004 and had come from the area of Prince George. Our main question was whether invertebrate assemblages differed between nests that were successful in which the birds had fledged and those that were unsuccessful in which the birds had been depredated. We set up kerosene floatations, allowing easier removal of mites and invertebrates from samples as kerosene appears to cling to the smooth bodies of insects rather than to plant detritus. Afterwards we identified the invertebrates and conducted statistical analyses on the computer. Although, in the end, we found no significant differences between successful and unsuccessful nests, it was a great experience anyway and I learned many research techniques including how to set up "kero-floats" and the ability to coordinate while picking through nest debris and algae for microscopic critters.

Of course, work was not always centered around the trusty microscope. There were also fun trips to Hawrelak Park for Bronwyn's crayfish feed, the Fish and Wildlife Forensic Lab where we were shown many different animal skulls and even to the gelato cafe around the block.

Without WISEST, I would never have gained so much insight into research and all the different career choices open to me. The program has allowed me to gain a greater familiarity to a future in university and science and I have been extremely glad to be a part of the program. I have learned quite a lot and the early mornings were definitely worth it. Besides, what can be better than being able to say: "Mom, I think you killed a Hymenoptera, not a mosquito. Yeah, I was picking them out of samples today."?



My experience was different than a lot of others, because I was living at the place I worked the whole summer, except when I was on holidays.

MEREDITH SWYTINK-BINNEMA [Biological Sciences] // **WISEST SUPERVISOR** :: Dr. Susan Hannon
SPONSORS :: Human Resources and Skills Development Canada - Canada Summer Jobs / Canadian National Railways

WHEN I FIRST HEARD about the WISEST program, I thought it sounded like a fun idea, but I had no idea it would be such a highlight of my summer. I went through everything like everyone else did, asking teachers for a reference, handing in the application, and waiting nervously for a phone call. Even when the phone call came, I wasn't sure working on something that sounded so much like school would be the most exciting summer.

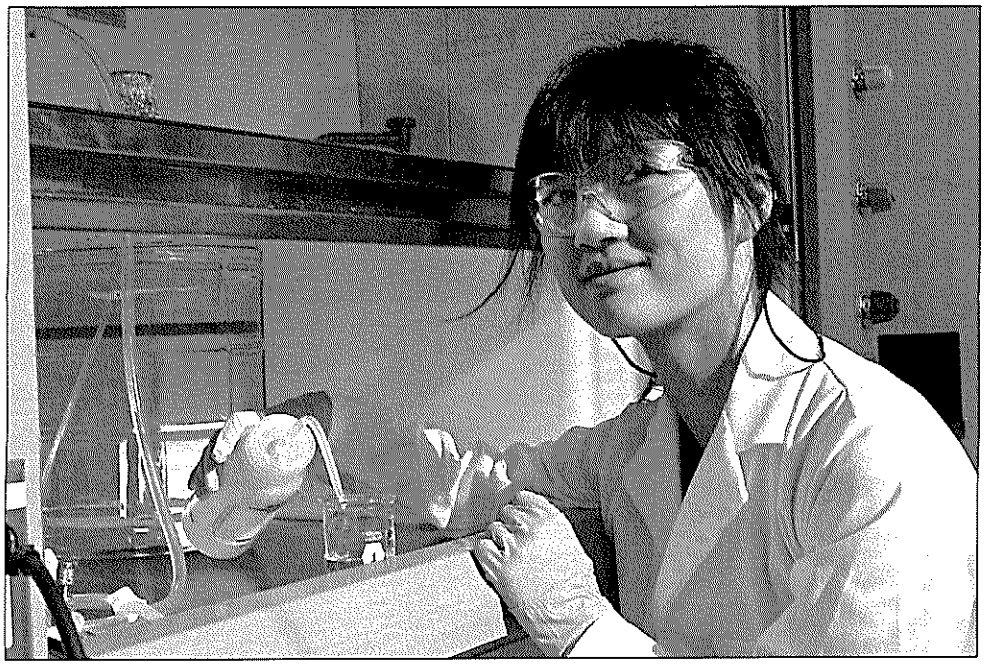
My experience was different than a lot of others, because I was living at the place I worked the whole summer, except when I was on holidays. This really gave me an immersion in what it would be like to work as a field biologist. It was great to sit around a campfire at night, or run into other people working on different projects and be able to learn from them about their work or masters projects. I learned lots from everyone about what to look for in a biology career or summer job, never mind all the interesting biological facts I picked up over the weeks. It was sure different than what I'm used to at school, where everyone is focused on different things, and still unsure of where they are headed after graduation. It was like the Wednesday seminar a day in the life of a graduate student, except it went on for the whole program.

My project was called RANA, researching amphibian numbers in Alberta, and it was a monitoring program to see how many frogs and toads there are in our province. We used pitfall trapping with one trap every ten meters on each side of a plastic fence. The first few days were slow, while I was setting up traps to catch the frogs. I had to staple plastic to wooden stakes around a pond, and pull up the traps on either side of it. There was a covering on them that was raised a few inches off the ground, and I put moss in the bottom to hold the moisture and a stick for rodents to run up.

Each morning, I would go out and check the traps. I would add a little water to keep the frogs alive until I found them, and make sure there was nothing besides frogs in them. When I found a frog, I would weigh it, measure it, identify its age and type, and check for deformities. I would also check if it had a mid-dorsal stripe. I would record all this on a clipboard, and then, when I got back inside, transfer the information to the computer.

Being out of town so much, I missed a lot of the fun activities where I could meet other WISEST students. This was too bad, but it sure wasn't all work up at Meanook! We had some great times in the evening, usually trying to have at least one activity each night, playing games or just getting to know each other. People's talents there sure aren't limited to biology. There were some great musicians and we all enjoyed playing various instruments around a campfire, trying to figure out which songs we all knew. I even tried to teach myself a little guitar, though I don't know how successfully! We also had a costume party, where everyone dressed up as a different cartoon character one night. We all have lots of great pictures and memories from that night.

There were so many different parts of the WISEST summer research program, and they all combined to make an amazing summer. I am grateful to everyone who helped make it that way!



Although working in the lab and the Wednesday activities were a big part of my experience at WISEST, I was also given the opportunity to live in residence with a group of amazing people.

PEARL TAN [Civil and Environmental Engineering] // **WISEST SUPERVISOR** :: Dr. Mohamed Gamal El-Din
SPONSOR :: Epsilon Chemicals Ltd.

WHEN I GOT THE CALL SOMETIME IN MAY, I remember hearing a cheerful voice chirping "Hey Pearl!" through the phone. I automatically assumed it to be one of my friends who had a similar happy, bubbly voice. Embarrassingly, it wasn't. After that slightly awkward introduction, I was told that I had been accepted into the WISEST program and placed in the Department of Civil and Environmental Engineering under Dr. Mohamed Gamal El-Din and Dr. Keisuke Ikehata. I would be staying in St. John's residence for the duration of the six week period. Needless to say, I was ecstatic.

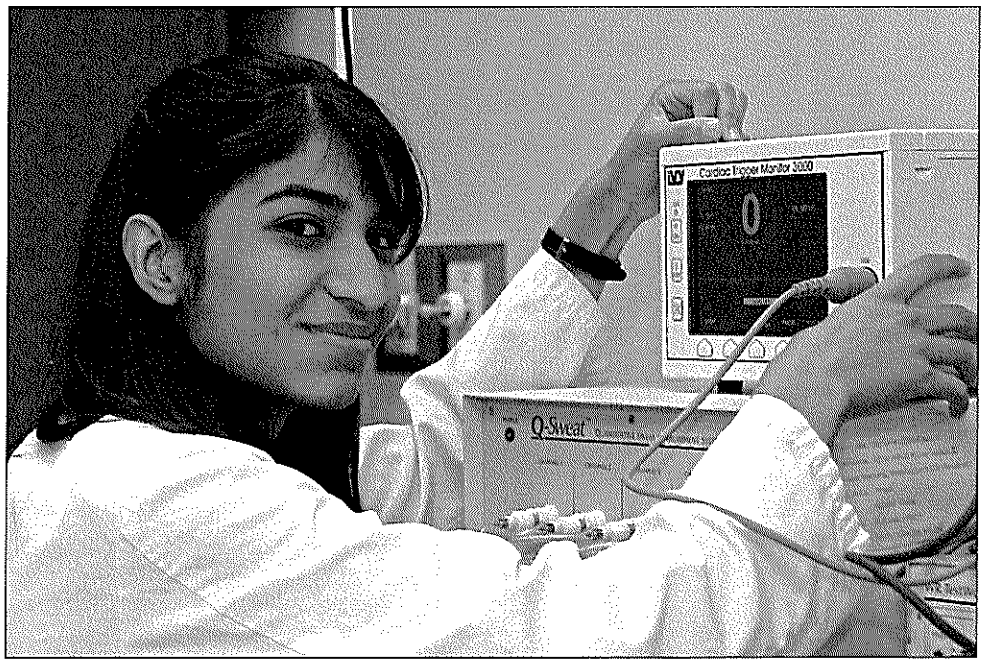
My project involved the inactivation of prion proteins using ozone. Prion proteins are associated with a family of diseases called Transmissible Spongiform Encephalopathies (TSEs), which include Bovine Spongiform Encephalopathy, or Mad Cow, which is the most well known form of TSE, and Scrapie, which affects sheep. Prions, though categorized as proteins as a result of their precise amino acid structuring, are different from other proteins in that they seem to be resistant to many agents that usually cause protein inactivation, such as heat, enzymes, radiation, and protein denaturing chemicals. Thus ozone, because of its ability to alter amino acid sequences by breaking carbon-carbon bonds, is being viewed as a possible route to inactivate prions.

Because the project was only in its beginning stages, I mainly worked with keratin protein (found in such things as animal hoofs and fingernails), which is similar to prion, to do preliminary testing. Although preparation of the sample (animal hoofs) was quite tedious, I must admit that it really gave me insight into what research is all about: roughly 99.99% hard work and 0.01% 'Eureka!' type moments. Nevertheless, I still managed to learn so much, from something as simple as learning to be extra precise and careful about everything while in the lab (I'm sure I'm not the only one who has found that to be harder than it sounds) to challenges such as trying to decipher graduate level biochemistry vocabulary terms (even harder).

The Wednesday afternoon sessions were always a big part of my week. Not only did I get time off work, but I got to experience different careers and cutting edge research AND get paid at the same time. Who wouldn't like that? Thanks to these sessions, I now have a better idea of what to expect in post secondary and feel less frightened and more excited about the university experience that is headed my way.

Although working in the lab and the Wednesday activities were a big part of my experience at WISEST, I was also given the opportunity to live in residence with a group of amazing people. Late nights and early mornings meant no sleep but loads of fun! There was always something to see or do at rez, whether it was something stereotypically nerdy, such as debating about pretty much every topic imaginable (literally), or things that were quite simply silly, such as wrestling nights, playing home-base tag inside the building, or playing pranks. Residence completed my WISEST experience and made it just that much more special.

Many people will look at WISEST and say "it's just another six weeks of school". For me, I believe that WISEST was more than that: it was an opportunity to learn, to meet people with the same interests as me, and an opportunity to do something different than the average fast food summer job, while still having a blast at the same time. If someone asked me to do this all over again? My answer would be, without a question, a loud and definite YES!



I can't think of a more nurturing environment for ambitious teens interested in science, engineering, and technology.

SABRINA NURMOHAMED [Medicine, Division of Neurology] // **WISEST SUPERVISOR** :: Dr. Zaeem A. Siddiqi
SPONSOR :: Faculty of Medicine and Dentistry

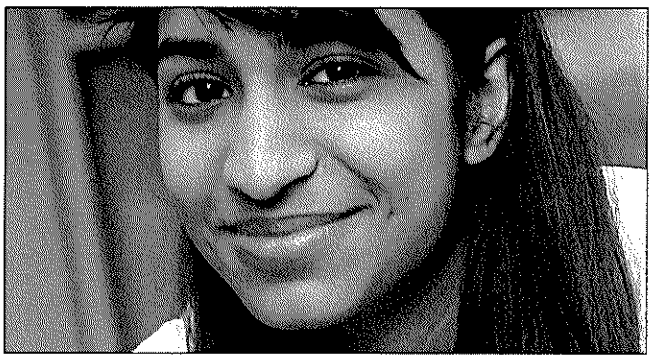
THE WISEST SUMMER RESEARCH PROGRAM has far exceeded my expectations. When I received the acceptance call in April, I was excited about the chance to work at a university research lab but had other plans in mind. Moreover, not having heard much about the program, I had some strong reservations about leaving my home and Toronto for six weeks to work. I decided to come to WISEST because of the unique job offer it provided, but expected nothing more than a work arrangement. It was a great leap of faith to come all the way to Edmonton and I am so glad that I took it.

I don't think I'll forget my first WISEST experience anytime soon. Despite reading all of the WISEST mail and booking my own flight and accommodation, I showed up for orientation a day early. Frustrated and confused, I was convinced it was an early sign of an awful summer. However, with the help of Ms. Rabel from the Faculty of Engineering, I was able to meet with Ms. Ennis and the student coordinators Natasha and Robyn before the day was over. The WISEST staff was friendly and welcoming and made me look forward to participating in the program.

My work placement was at the Division of Neurology in the University of Alberta Hospital. I have spent the past six weeks at the Autonomics Lab in the ABACUS/MR Centre under the supervision of Dr. Siddiqi. At the lab, we would assess the nerve damage of patients with autonomic neuropathies (abnormalities in the nerves in the autonomic nervous system) through series of tests. My partner Bernice and I were involved in setting up and conducting the routine tests, which included a sweat test, tilt test, and heat/pain sensitivity test. We were also responsible for monitoring blood pressure and heart rate values of patients and helped graduate student Asif Jamil carry out a follow-up on patients who had Guillain-Barré Syndrome, an acute autoimmune peripheral neuropathy. My time there was a real eye opener to how important dealing with people is in the medical industry and to how the nervous system is so integral to the functioning of the human body.

WISEST has been so much more than a work experience for me. Besides the many opportunities to learn from professionals about multidisciplinary and non-traditional careers in science, engineering and technology, I was able to meet so many new people from all over Western Canada. The most rewarding decision I made this summer was to stay in residence at St. John's Institute on Whyte Avenue. I have made lasting friendships with 17 other WISEST students (and four HYRS students) with whom I have every intention of keeping in touch with. We have shared so many conversations, made so many memories, and learned so much about ourselves. Whether we spent our time playing sports, going to West Ed, enjoying the district attractions and festivals, or watching our favourite shows and movies on the best TV ever, we always had fun with each other.

My time with WISEST has been very worthwhile. I can't think of a more nurturing environment for ambitious teens interested in science, engineering and technology. WISEST has truly put me at an advantage for entering the university world. I only wish that my city could be part of such an amazing program! Thank you to everyone who made it happen!



What I found so appealing about the tour of the COMPRU laboratory was learning about the incredible practical applications of research discoveries ...

SARAH NOWICKI [Biological Sciences] // **WISEST SUPERVISOR** :: Dr. Heather Proctor
SPONSOR :: Alberta Education

I FIRST HEARD OF WISEST in grade 10 from my fantastic science 10 teacher. She recommended the SET program to me, but I was disappointed to learn that it had been scheduled for a date when I had a prior commitment. So when the same teacher suggested that I apply for the WISEST summer research program, it wasn't a hard decision. It was difficult to find the time to write the application essay during the hectic final months of grade 11, but I could not be more pleased that I took the time to do so.

Even though I also applied to the HYRS program and Capital Health internship, I knew from the beginning that these were both a backup. So when one of the WISEST student coordinators called and told me that I had been accepted, I was ecstatic.

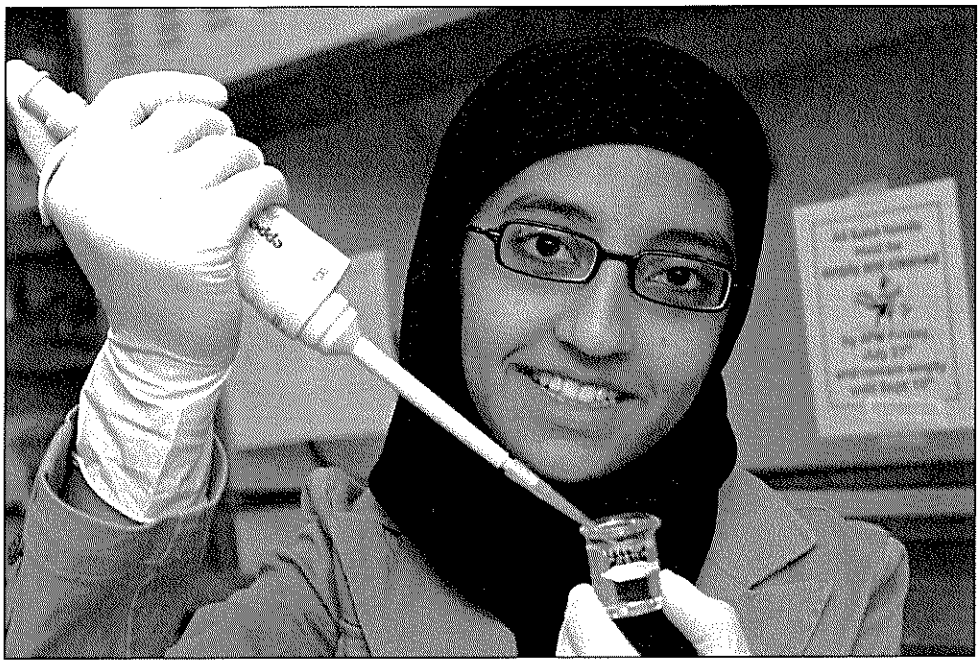
When I arrived at orientation on July 4th, I was unsure of what to expect. I did know that I had been accepted to work the biological sciences department on a project involving coralline algae and marine invertebrates with Kylee Pawluk in Dr. Heather Proctor's lab. After nearly a full day (8:30 to 3:30) of getting to know my fellow WISEST students, I met Kylee and Dr. Proctor and toured what would be, for the summer, my lab. I also met the other student who would be working in the lab, Megan Chi. Even though I had known that this lab is devoted to the study of mites, I did not realize that it was actually an entomology lab (having also not known that mites are arthropods – related to spiders).

The part of WISEST that I found most difficult to adjust to was the hours. While a thirty-five hour workweek (seven hours per day) is easier than the traditional full time of forty hours per week, I found it hard to get used to leaving at a similar time in the morning as I would for school (in the summer!) and consistently being the last member of my family to arrive home at the end of the day. Increasing the difficulty of this issue is the length of commute – a bus ride of one hour from home to the university.

Although the lab work started off slowly, with Megan and I doing what seemed like endless maintenance work for the museum of freshwater invertebrates, I grew to love the atmosphere and even the actual work itself, even though certain scientific processes tend to be repetitive and monotonous. The collective excitement of each person in the lab for his or her projects, mites, and science itself was inspiring. I found that spending time around this magnitude of enthusiasm encouraged me to go to university so that I too may find my passion.

One of our Wednesday afternoon activities that I particularly enjoyed was the off-campus lab tours. What I found so appealing about the tour of the COMPRU laboratory was learning about the incredible practical applications of research discoveries, but also I particularly enjoyed hearing about some unusual careers and areas of study.

In short, the WISEST program was, in part, a fantastic experience for being involved of the realities of doing research and of working in an actual lab, and an amazing opportunity to discover more about alternate career paths.



It was really exciting because I learned how to identify various follicles in an ovary and determine from that whether the ovary was healthy or unhealthy.

SHAHNA TARIQ [Agricultural, Food, and Nutritional Science] // **WISEST SUPERVISOR** :: Dr. Donna Vine
SPONSOR :: Alberta Advanced Education and Technology

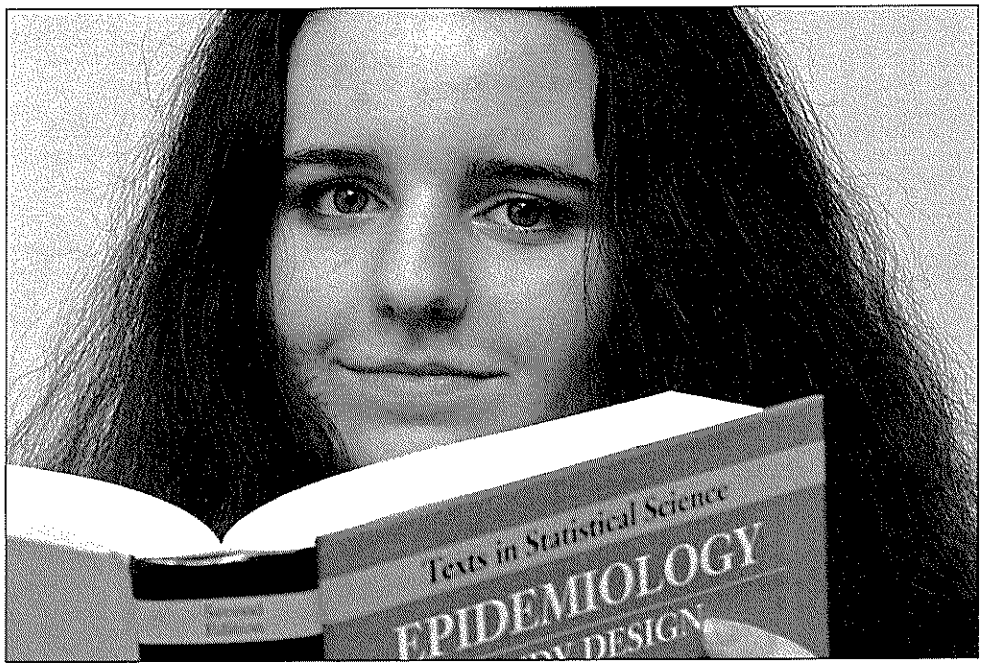
THE SUMMER IS ACTUALLY OVER! It seems like just yesterday that Natasha and Robyn called my house informing me of my acceptance into the WISEST program. I admit I was a little skeptic at first to be working in the Department of Agriculture, Food, and Nutritional Science. My first thought was actually "Agriculture...as in farming!?" In reality I had been placed in the lab of Dr. Donna Vine researching polycystic ovarian syndrome in a spontaneous rodent model. My next thought then was "Whoa! That's a lot of big words!" Over the last six weeks I have learned so much through the lab and the Wednesday seminars that I feel so fortunate to have been a part of this amazing program.

Over the last few weeks I have been researching ovarian pathology and intestinal dyslipidemia in the JCR:LA-cp rodent model of polycystic ovarian syndrome (PCOS). Confused? That's exactly how I felt my first day in the lab. The first two weeks in the lab I spent most of my time reading the piles of articles (trust me there was a lot) my supervisor had given me to understand the research we were doing. Polycystic ovarian syndrome affects a lot of women worldwide and is one of the main causes of infertility. Women with PCOS often have enlarged ovaries, abnormal ovulation patterns, and excessive androgen (ex. testosterone) levels. PCOS is also associated with features of the metabolic syndrome like obesity, insulin resistance (pre-diabetes) and dyslipidemia (abnormal lipids in the blood). It is also thought to increase the risk for cardiovascular disease. So basically my research involved studying a JCR:LA-cp rodent model (naturally obese rats) to see if it could be a model for studying PCOS, the metabolic syndrome, and cardiovascular disease together.

There were two parts to the research that I did. The first was testing the control (lean) and PCOS (obese) rodents for intestinal dyslipidemia. To do this, we collected samples of lymph from the rats using surgery. The lymph collected was tested for triglycerides, cholesterol, and protein. The assays that we used to test the lymph required a lot of pipetting and I've gotten really good at using a pipette for microliters. We also tested the lymph for the size of particles using a laser particle sizer. Collecting the data through these experiments was fascinating but then the work got a little bit tedious. A lot of time was spent compiling and analysing the data in spreadsheets so that we could understand the results. I also spent a lot of time at a light microscope studying cross-sections of rodent ovaries. It was really exciting because I learned how to identify various follicles in an ovary and determine from that whether the ovary was healthy or unhealthy. We got to take a ton of pictures using Metamorph. I had an amazing time in my lab this summer.

Not all my time was spent helping with my supervisor's research. I did have some free time in which I got to observe the other grad students' research in my lab. I saw some immunochemohistology where slides were stained using proteins to identify objects. I helped my principal investigator set up another lab and I got to make a solution. It was amazingly fun watching the solution get diluted because it looked like a tornado in a flask. Of course, I went to the Wednesday seminars, which were very interesting. We got to learn about a lot of different aspects of research while still being able to hang out with our friends and have fun.

The WISEST Summer Research Program was one in which there was never a dull moment. It definitely was way more exciting than going to summer school or working as a cashier. The WISEST program was a very unique experience for me and I won't ever forget it as long as I live. Thanks WISEST for giving me this opportunity!



I am very thankful that I had the opportunity to meet and learn from distinguished members of the scientific community.

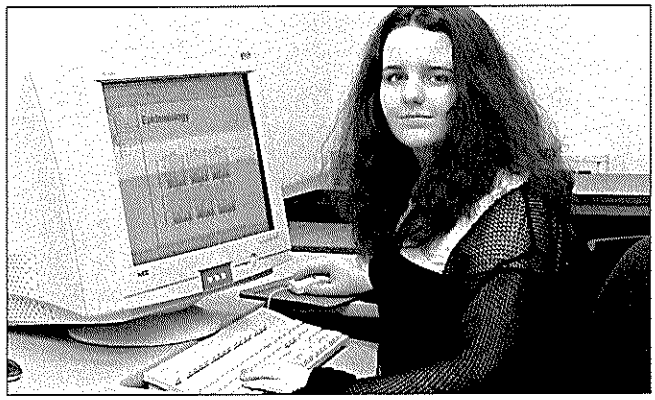
SHANNON HUEBERT [Pediatrics] // **WISEST SUPERVISOR** :: Dr. Rhonda J. Rosychuk
SPONSOR :: Alberta Heritage Foundation for Medical Research (AHFMR)

I WAS ECSTATIC when I first received the phone call from WISEST notifying me that I had been accepted. As a student coming from Canada's North, this was an excellent opportunity to apply what I had learned in classroom settings in a research environment. I had always been interested in pursuing a career in medicine, specifically in the area of pediatrics. Learning that I had received a position working in the Department of Pediatrics was exciting. I studied the epidemiology (the study of the determinants and distribution of disease frequency) of pediatric-based illnesses. After several weeks of being immersed in epidemiological studies, I would leave with a greater understanding of its importance in the medical community.

My project focused on the regional variation of asthma across Alberta. I focused on identifying clusters of 15-17 year old Albertans presenting to the emergency department asthma. A cluster, or geographic area that has higher rates than would be expected, is then analysed to determine what factor or reason can explain its increased rate of asthma cases. Most of my research was centered on my computer, analyzing data by means of statistical software. The data I used was based on the patient's age, gender, and areas of residence for both the number asthma cases and population. Once I found more presentations, I met with my supervisor to discuss potential factors as to why certain areas are showing computational skills while attaining a new perspective of studying medical sciences both geographically and mathematically.

I experienced plenty of "firsts" in the WISEST program. Not only did I work in my first research job, but I stayed in a residence for the first time. On the first day of living in 'rez', I was thrilled to meet other students who shared the same passion of science and academics, but I was posed with another research question of its own: what would happen if sixteen girls had to share two bathrooms for six weeks? In my results, I found we all got along beautifully. As a group, we enjoyed many festivals and malls. While in the 'rez', we created ways to keep ourselves entertained while establishing many friendships. Not only did we each improve our skills in our various fields, but be also met and became friends supportive of each others' current work and career aspirations.

I believe, that the quality that makes the WISEST program successful in encouraging students to pursue the sciences, is that WISEST incorporates social activities with the research program. While the activities were fun in general, they were also a great chance to meet with all WISEST students and possible future career or university colleagues. In addition, I am very thankful that I had the opportunity to meet and learn from distinguished members of the scientific community. I am particularly grateful to Dr. Rhonda J. Rosychuk for her support and guidance throughout my term at the University of Alberta. Due to this experience, I feel that my career options have been greatly broadened, yet I was also able to narrow down the field which I enjoy most, specifically, pediatrics in the health sciences. Being a part of this research project has definitely been the highlight of my academic career, so far.



I have also realized that there are numerous programs and possibilities out there at the university.

SILVIA MA [Biological Sciences] // **WISEST SUPERVISOR** :: Dr. James Cahill
SPONSOR :: Edmonton Glenora Rotary Club

WHEN I FIRST HEARD ABOUT THE WISEST PROGRAM, I was eager to apply and I wanted to learn more about it. In May when I had received the acceptance call, I was ecstatic and I could not wait to start! I could finally be involved with a hands on experience dealing with science!

On the first day, I woke up extra early and I was very nervous. It was a good nervous though, I knew I would be having lots of fun and at the same time I would be learning tons of information. This of course was true, my summer at WISEST was well spent. My WISEST coordinators did a great job in planning a welcoming and fun orientation for us. It was a good way to relax and meet the other people in the program.

I was very fortunate to be working with Dr. James Cahill and his research team in the Biological Sciences Building. My daily responsibilities consisted of sorting vegetation, taking pictures of plant roots with a very expensive camera (The Minirhizatron Camera), and washing roots. The camera was really cool and heavy! My research project dealt with looking at the effects of nutrient patch location on plant foraging. We took pictures in order to see if the plants were responding to the different treatments. While my research project was going on, I also helped with other on going projects. I assisted with another project dealing with plant competition, helped out at the Earth Sciences Building, and did some field work at Kinsella, Alberta. At Kinsella, I help out with taking gas samples from the ground to measure if the types and concentration of gases were affected in different treatments.

WISEST is not all about working, every Wednesday afternoon we got the opportunity to go to sessions and social events. These sessions were fun, educational, informative, and I learned a lot from them. We got the chance to talk with university students, engineers, professors, and many more people. We also got to visit other research labs of our own choice. In addition, we went to visit the Compru program at the Misericordia Hospital. At Compru, I learned a lot about their mission, about different careers in the medical field, and received the chance to see some really awesome equipment. These sessions were a great opportunity to learn more about different professions, the reality of university, and explore the University campus. I also managed to learn the short cuts at the university and I was able to become familiarized with where everything was.

WISEST is truly a wonderful program, where I learned a lot of valuable skills and made many friendships. The program opened my eyes and I had learned so much about myself as well. It was really interesting and valuable to see what really goes on in a research lab. I have also realized that there are numerous programs and possibilities out there at the university. In addition, my research team had taught me a lot on how to use lab equipment, things about plant ecology, team work, and much more. The six weeks were extremely fast, time just flew by. The WISEST program was a very enjoyable, beneficial, learning experience that I will always remember. I would like to thank my research team, sponsors, WISEST coordinators, teachers, and anyone else who helped with the program.

I made some great new friends and discovered a lot about myself and what I want to do with my future. WISEST changed my expectations and then exceeded all of them.

SINEAD O'CARROLL [Lab Medicine and Pathology] // **WISEST SUPERVISOR** :: Dr. Roger Leng
SPONSOR :: Merck Frosst Canada Ltd.

WHEN I FIRST FOUND OUT I had been chosen to participate in the 2007 WISEST summer research program I was standing at a Booster juice on my cell phone talking to the happiest phone voice I had ever heard. Robyn (my student coordinator and the happy phone person) explained that I would be working with Dr. Roger Leng, in the Lab Medicine and Pathology Department at the U of A. It sounded very intimidating and I must admit it caused a sudden sense of panic to wash over me. I wasn't sure that spending 6 weeks in a lab was my idea of a great summer, but nevertheless I was up and ready for orientation. From the start at orientation everyone was talking nervously and trying to make friends. We had some corny icebreakers that, although felt painful, really did work and some speakers who taught us lab safety and SIMDUT (or WHIMIS for all those not in French immersion). Once our supervisors arrived we gave a nervous wave to our friends and walked off to our labs. My lab was a quick walk from where orientation was being held and in that time I managed to get to know my supervisor Alex and realise that maybe this summer would be different from what I had previously imagined. And honestly, the experience was far from the intimidating, stuffy summer I imagined. From day one at my lab I felt comfortable and there wasn't a singly moment where I felt stressed out or in over my head. I had no idea what I would be doing exactly and for the first couple of days I didn't do anything but read some background information about the project and became worried that however, comfortable and welcoming my lab experience was it may be...boring! But as soon as I had finished the reading my idea of the lab changed drastically. Instead of an individual project it was my job to work alongside of my supervisor on his project. The project involved the identification and analysis of Pirh2-interacting proteins using a yeast-two hybrid system. We incorporated complimentary DNA into yeast and E. coli to identify any positive interactions between a library protein and the protein of interest Pirh2. Pirh2 works in a negative feed back loop with p53, which happens to be a tumour suppressing gene, so it was a rather interesting project. The project will take three years, or more so I wasn't able to see any final results, however I was able to identify some preliminary positive interactions, such as yeast and E.coli growing successfully, positive samples turning blue during the ß-galactosidase assay and other fun observations. Over the course of the summer I must have made 1 000 plates of media, grown billions of colonies of yeast and E.coli and made a good 50 trips to the autoclave. Not to mention that during the autoclave cycle I became a mean foosball player. I learned what life at university is like, both from my supervisor and other on campus students I was in contact with, and had loads of fun at the WISEST activities and the awesome tours of other labs. Pitch n' Putt was by far my favourite...dressing up in gorgeous golf gear and joking that Robyn could sit on my Oreos smoking balls while Natasha tried to kill us all with her swing, were moments that I won't forget. (And even if I wanted to forget the embarrassing pictures won't let me!) I made some great new friends and discovered a lot about myself and what I want to do with my future. WISEST changed my expectations and then exceeded all of them. It was a welcoming, fun, and crazy experience and I'm really thankful that I had the opportunity to participate. I would highly recommend it and I thank all those who had a part in it, for giving me an unforgettable adventure of a summer.

After being part of WISEST, I now know that research is a lot of work where things go wrong and all you can do is restart or try something else.

SIWEI CHEN [Physiology] // **WISEST SUPERVISOR** :: Dr. Chris Cheeseman
SPONSOR :: Capital Health, Edmonton Area

FROM JULY 5 TO AUGUST 14, almost every one of my working weekdays was spent in Dr. Cheeseman's lab on the seventh floor of the Medical Sciences Building. My first day was nerve-wracking. I could not remember my topic and did not believe it would have helped anyway because comprehension seemed impossible. The letter I had received in June alluded to hexose transporters, mouse cardiac tissue and, more ominously, xenopus laevis. Needless to say, I felt quite intimidated.

Fortunately, my direct supervisor, Adam, answered all of my questions with great patience; and the first day closed with two pieces of reading material and, already, results for my poster. At this stage in the game, however, I did not yet understand and, thankfully, neither was I expected to. I had plenty of time to become familiar with my research, and, inevitably, I slowly began to grasp the previously petrifying terms.

Hexose transporters, more commonly referred to as glucose transporters (GLUTs), are proteins in the plasma membrane of an animal cell that facilitate transport of glucose (or fructose or galactose). Cardiac muscle is able to metabolize not only glucose but fatty acids as well. As for xenopus laevis, it is simply a species of frog that I did not do very much research with in the end.

The project deals with glucose and fatty acid metabolism in the heart of, in this case, mice. It was found that when CD36, an important mediator for fatty acid transport and metabolism, was removed (knocked out) in mice, they lived longer than the wild type (WT) or what is seen as "normal" mice. The problem was knowing which of the fourteen GLUTs were expressed in the tissue because only GLUT1 and GLUT4 were expected to partake in glucose transport for metabolism. As well, I needed to find out what happened to the GLUTs' relative levels when CD36 is knocked out.

The first full day of experimentation was on a Thursday. I learned how to conduct RT-PCR (Reverse Transcriptase Polymerase Chain Reaction), a semi-quantitative reaction used to isolate a segment of genetic material from the rest of the genome so that it can be amplified enough to be seen on an agarose gel. The experiment was conducted on cardiac muscle from WT adult and old mice in hopes of seeing a difference in GLUT expression levels between the ages, but due to the semi-quantitative nature of RT-PCR, I was unable to say exactly of what significance those differences were, therefore requiring further experimentation.

As well, I needed to get CD36 knock out (KO) cardiac tissue in order to compare their GLUT expression levels to the WT. Unfortunately, I never received the tissue; instead, I received mouse skeletal muscle tissue of WT as well as CD36KO. After experimenting, I saw that GLUT2 was not present in the WT mouse, but its expression level was high in the CD36KO mouse. Further experimentation would be required to quantify that difference between the two types of tissue in skeletal and cardiac muscle.

Although I was able to get conclusive results, something could easily have gone wrong where I did not receive the tissue I needed or there really was no difference at all. After being part of WISEST, I now know that research is a lot of work where things go wrong and all you can do is restart or try something else. This has opened my eyes to realities that I was never aware of like how the hours of work depend on the rate of your results; it is definitely not your average nine to five.

I enjoyed this experience and will treasure the lessons it has taught me. I would like to thank WISEST and everyone involved that made this program so memorable and amazing.

I thought it would be a lot of fun to go and help with a research project.

TARA HOWATT [Biological Sciences] // **WISEST SUPERVISOR** :: Dr. Bill Tonn
SPONSOR :: Elk Island Public Schools Regional Division No. 14 Human Resources and Skills Development Canada - Canada Summer Jobs

WHEN I HEARD about the WISEST Summer Research Program I thought it would be a lot of fun to go and help with a research project. I also figured it would be a good experience and assist me in deciding what area I would want to pursue in University.

I was very excited when I received the phone call that I was accepted into the summer program. I was to be working at the Meanook Biological Research Station just outside of Athabasca assisting Jen, my supervisor, with her masters' project on the effect of the risk of predation on the fathead minnow populations.

At first I was nervous since I would be away from home for ten days at a time and be home for four. I feared of missing my friends and family, but the people at Meanook were very welcoming and made the stay very enjoyable. The days passed by so fast that the ten days felt like three and when the six weeks was over I couldn't believe it.

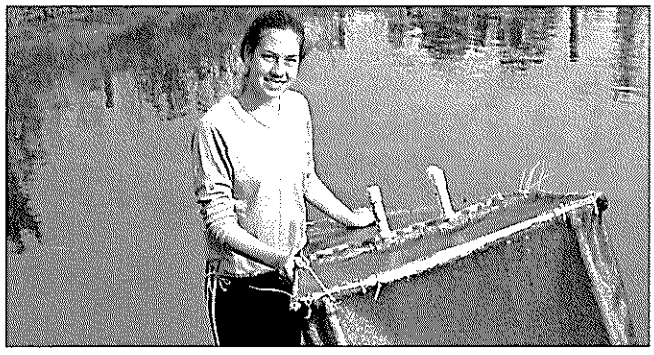
Life out at Meanook was very relaxed in the sense that we had breakfast but everyone got up at a different time, the fish people (the group that I worked with) would generally start at 8:30. We would then end the day around 4:30 depending on what time we started and how much stuff we had to do that day. It was nice to be at the station where there are many projects going on, and we could go and help another group. Sometimes I would help Meredith with RANA, band baby birds, or go with the Americans to their site taking Carbon readings. After work we would do many activities including volleyball, crib, a campfire, or learn to play the guitar.

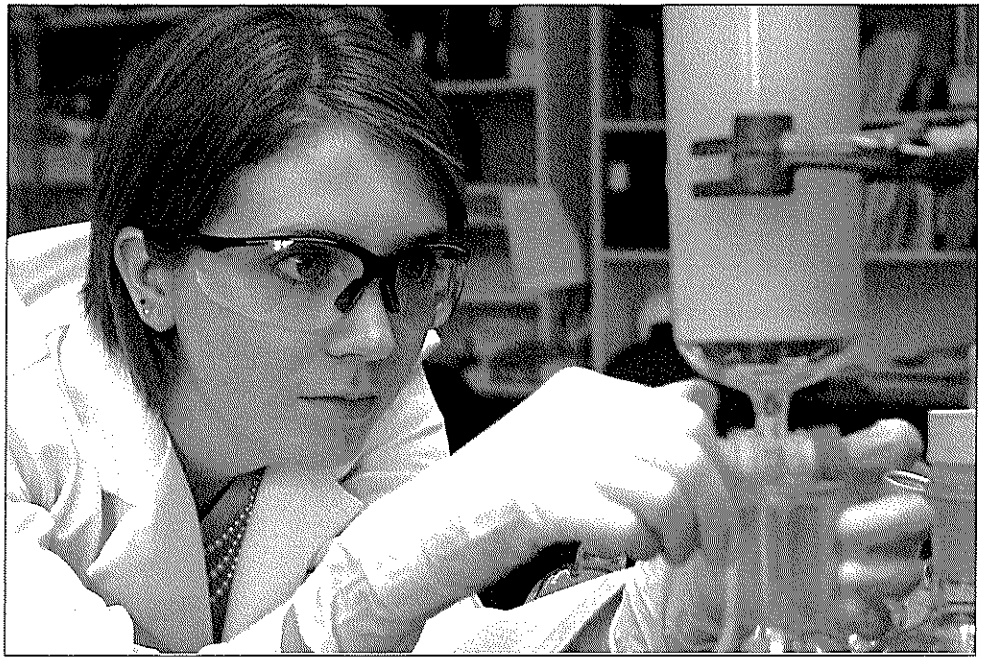
My project, as I explained before, is the effect of predation risk on fathead minnows. Every morning we would feed the fish in the tanks and take the temperatures of the ponds and count eggs on the nest boards. The beginning of my six weeks we had a lot of nests to count it would take about four hours, but only a few days later and the amount of nests declined and after two weeks there were only a couple nests left to count.

After egg counting there would be a variety of tasks to be completed depending on the day. Some days we would sweep and seine (a large net that is pulled across a portion of the pond) for the young of the year and later they would be measured. Every four days we would do a treatment of the ponds, in ponds one and six we would put in a pike into a cage along with alarm substance, in ponds two and four would be a control so we would only put in water, and in ponds three and five we would only put in the alarm substance. A couple days before the treatment we would make the alarm substance which is five centimetres of ground minnow skin diluted in 50ml of water and frozen. Almost every time we would forget to take out the alarm substance from the freezer, and would have to wait for it to thaw in hot water.

We started up a new project in the second half of the summer using dragonfly larvae instead of the pike and young of the year minnows instead of the adults and seeing how this threat affects their growth. We had set up some tanks inside of the garage and did pretty much the same thing with the alarm substance.

Over all I can definitely say that I have had an unforgettable summer and would like to say thank you to all of those who are involved in organizing this program and to Jen, Dr. Tonn, and last but not least to those at Meanook.





This experience has given me a chance to meet a lot of new people who are interested in the same things as myself...

TIFFANY RIDDLE [Chemistry] // **WISEST SUPERVISOR** :: Dr. John Vederas
SPONSOR :: Alberta Advanced Education and Technology

THE PAST FIVES WEEKS OF MY LIFE here in Edmonton have been a bit surreal. It feels as if we have just started but already WISEST is coming to an end. If I was told six months ago that I would be living on my own and working full time in a graduate organic chemistry lab, then I wouldn't have believed it. But thanks to WISEST, I was able to have this unique experience.

Coming from a small town, working in a lab and being introduced to such a large environment was overwhelming at first but my supervisors and principle investigator made sure that I felt comfortable in the lab. Most people said that for the first couple of days, they had to sit down and read a textbook to find out what their research project was on. This wasn't at all the case for me. On my first day I was working in the lab, and my supervisor was explaining chemistry reactions and instruments that normally "I wouldn't learn about until third year at university."

As a lot of bacteria and diseases are becoming resistant to the more commonly used antibiotics there is a high demand for new cheap and effective antibiotics. Nisin A is a lantibiotic peptide that has been proven to be very effective at low dosages against a range of gram-positive bacteria and has been used as a food preservative for the past 40 plus years. The ultimate goal of our research was to chemically synthesize analogues of a potential new antibiotic nisin A. While most of the amino acids that nisin A can be built from by solid phase peptide synthesis are commercial available, it also contains two novel amino acids lanthionine and methyllanthione that are not. My role in the project was synthesis of a molecule that would eventually be used to prepare methylanthionines. During my time in the lab I learnt how to run chemical reactions and purify compounds by column chromatography. There were also many tests that we had to run to make sure that we had made the right product and nothing went wrong in the reaction. One of the machines we used regulary was the NMR (Nuclear Magnetic Resonance) machine which basically measures where protons are with a huge magnet and helps us to deterime what the compound looks like. We also used the MALDI (Matrix-assisted laser desorption/ionization) mass spectrometer which can be used to measure the mass of a compound but instead of using magnets, it uses a high powered laser beam. We also tested some lantibiotics against gram-positve and gram-negative bacteria to see if they had any antibacterial activity. To finish up my time here at the University, we purified some naturally occuring nisin A by HPLC (high pressure liquid chromatography). In order to make sure we had the right compound we used MALDI. In my lab, because I had two supervisors, I was able to gain an insight into two diferent types of chemisty. I was able to experience the synthetic aspect with Steve Cobb and the biological side of things with my other supervision Clarissa Sit.

I would definetly recommend the WISEST summer program to anyone who is interested in anything to do with science or engineering. This experience has given me a chance to meet a lot of new people who are interested in the same things as myself and are as excited as I was and still am to be here, and to work with awesome mentors aswell. This has been an unforgetable summer and has no doubt helped me decide what I want to study in University.

This program encouraged me to think outside the box – demonstrate creativity and follow my passion.

TRACY WANG [Mechanical Engineering] // **WISEST SUPERVISOR** :: Dr. Jason Carey
SPONSOR :: Alberta Advanced Education and Technology

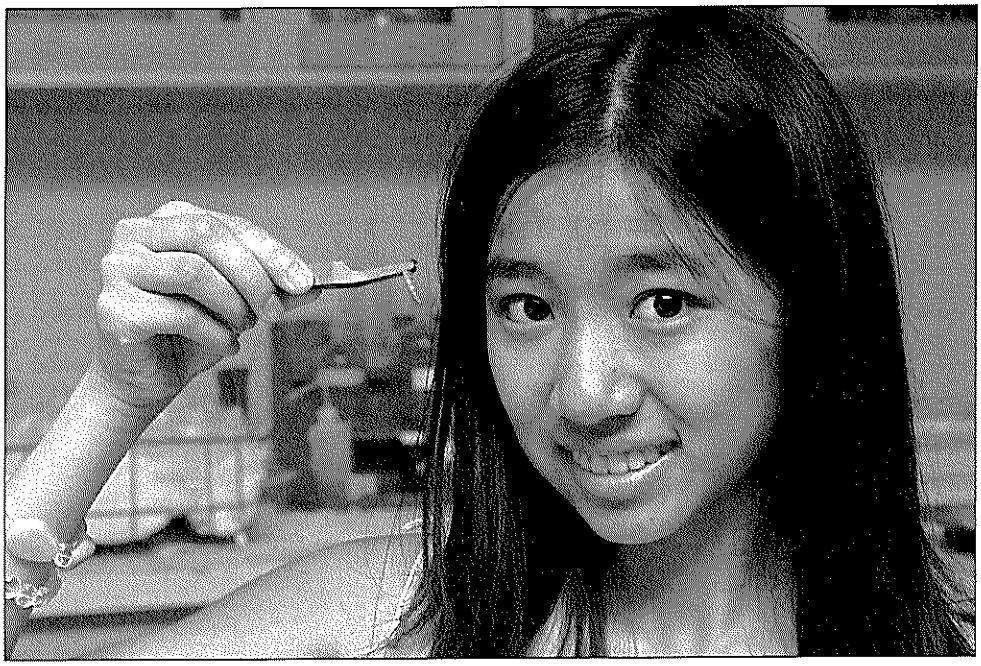
BEFORE EXPERIENCING THE LIFE as a WISEST student, "summer" to my knowledge was endless hours of shopping, tanning, and staying up all night. WISEST opened my eyes to a whole new perspective of what a fulfilling summer is all about. For six weeks, I woke up at 7:30 am without a word of complaint because I just couldn't wait to get my day started. Work was mind-exhilarating; a drastic contrast to my mind-numbing experience as a cashier! WISEST provided me the opportunity to explore the fascinating fields of engineering, to have a blast at residence, and to take full advantage of my independence. It's all inclusive! WISEST is everything I enjoy compacted into one ingenious program!

I was accepted into Biomechanical Engineering under the research team of Dr. Jason Carey. I interacted with many grad students in the lab and I was enthralled by their projects. Cagri, a PHD candidate, is researching the impregnation of composite braids for the production of more ideal catheters. Jon was constructing a computerized spinal chord model for scoliosis and observing the effects of mechanical loading. My supervisor, Jena Dressler, was fun and informative. We thawed, smashed, and sawed (manually!) a cow tibia to obtain the two different types of bone: cortical and cancellous, which we then placed into a Micro-CT scanner. It's fascinating how chromatic laser beams can slice through the bone and spit out a micro-scaled 2-D image, which then can be used to create a 3-D computer model of the bone. An experiment was then conducted to determine the density of each specimen. To complete my lab, compression tests using a MTS material testing apparatus were done on the specimens to determine the elastic properties of the bone. The numerical data I obtained through my experiments can be used to assist both Jena and Anthony Au, a PhD student, in understanding the properties of bovine bone.

During the process, it struck me that every characteristic and property of the bone have a crucial purpose. Bone's unique lamellar orientation gives its material properties and its ability to model and remodel itself promotes growth. The structural properties of bone correspond to mechanical loading during a process called mechanotransduction. At work, I was so engrossed in my lab project that every minute flew by. Around 3:30 pm, while the sun is still sizzling hot, my shift was already over.

The academic side of WISEST is compelling, but the life management aspect of the program is just as valuable as any learning opportunity. Staying at residence gave me the independence that I yearned for, but it didn't come without some responsibilities. Aside from endless hours of socializing I also had to make time to do my laundry. Keeping track of my belongings has always been a downfall. Over these six weeks, I cannot recall how many times I've lost my cell phone, room key, camera... etc. But gradually (after numerous instances!), I learned to take care of my possessions. Furthermore, WISEST is packed with activities. From the day I settled in at St. John's Residence I was constantly on the go whether it was group activities or festivities; it was endless! Living at St. John's allowed me to really get to know other WISEST students who shared my interests and hopes for the future. Through stimulating conversations and heart-to-hearts, I found people that I can really relate to; from there, long lasting friendships were built.

WISEST is an invaluable summer experience. I'm honored to have encountered so many influential people. Whether it's from small group discussions or from a day to day basis, they enlightened my perception of sciences and engineering. Going into WISEST I wanted to narrow down my interests, but ironically WISEST opened up more doors of possibilities. This program encouraged me to think outside the box – demonstrate creativity and follow my passion. I would like to sincerely thank everyone in my research team, especially Jena Dressler and Dr. Jason Carey for taking the time to explain and plan my lab activities. And of course the WISEST coordinators and my sponsors for making this unforgettable experience possible!



The program has not only made an unbelievable change in my life now, it's also going to affect my future endeavors by looking pretty on my resume and university applications.

WENTING WU [Biological Sciences] // **WISEST SUPERVISOR** :: Dr. Maya Evenden
SPONSORS :: Human Resources and Skills Development Canada - Canada Summer Jobs / Faculty of Medicine and Dentistry

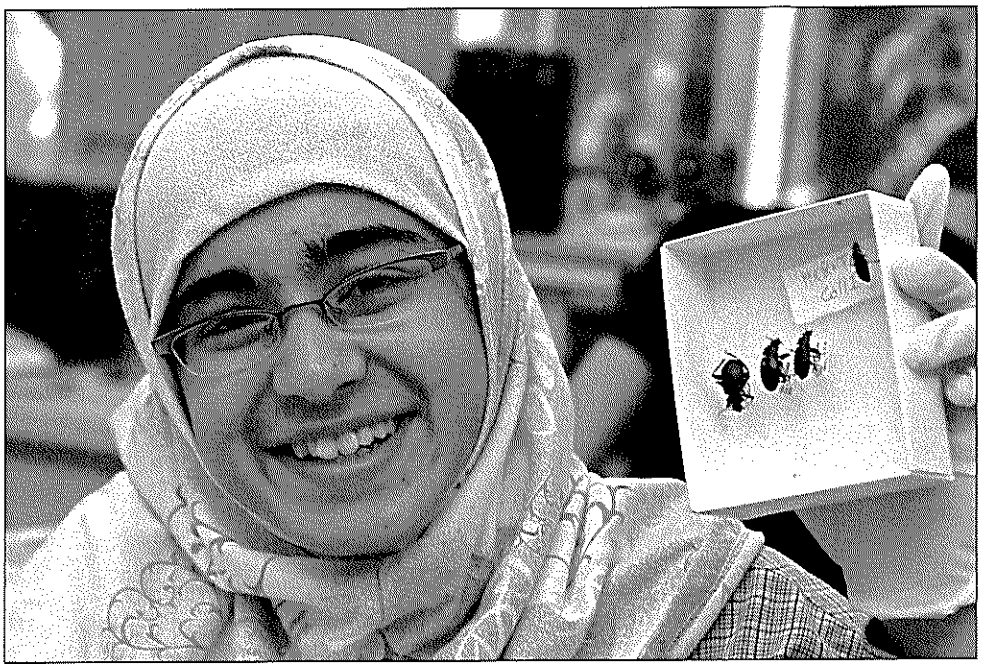
FROM ORIENTATION TO the Celebration of Research, the WISEST program has been nothing but fun. These past six weeks have passed by exceedingly fast, but at the same time the memories that have been created would last forever. I remember the process of reading the "WISEST 2006 Student Report Book", applying for the program, and waiting for the call. It doesn't seem to have been that long since, but now here I am writing my own report.

I was fortunate enough to have been placed in Dr. Maya Evenden's Entomology lab in the department of biological sciences. My project revolves around the wing size of moths called the large aspen tortrix (LAT), Christoneura conflictana. The insect is an important native defoliator of trembling aspen, Populus tremuloides. The LAT undergoes population cycles and at outbreak phases, larvae can defoliate large tracts of aspen forest. A female produced sex pheromone signal for mate attraction has been identified for this species (Evenden and Gries 2006). Synthetic copies of this signal were used as bait traps to capture the moths used in this study. My objective was to determine the variation in wing area with flight season and population density. Over the course of the six weeks, I've collected data from the captured moths by removing the right fore wing from fifty moths per site per collection date. It seems to be never-ending, but it's also that much more exciting to see the results in the end. It's fascinating to see all the factors in the environment that are interconnected with these miniature insects.

Aside from my project, I have also been able to become involved with everyone else's projects to some extent. I remember the times when Joelle and Chris took me to the greenhouse to see all the interesting plants, and when Maya and Ellis brought me to the oversized U of A farm. It was a lot of fun when I worked alongside Chris and Matt with Canola plants, trying to find the diamondback moths (DBM). I've also helped Joelle and Ellis on their projects, looking through the ash leaf cone rollers (ALCR). Maya, Brad and Christina helped out a lot with my research poster, without them it would've taken twice the time. I was treated as a member of the research team instead of a high school student new to the lab environment. We listen to awesome music and have interesting conversations everyday. What else would you need in a lab? Everything's a lot more fun when you're surrounded by amazing people. If I had to choose a lab and a research team, it wouldn't have been any different.

On top of our remarkable experiences in the lab and the fabulous WISEST activities (like the Science Olympics, small group discussions, and lab tours), living at St. John's Residence only added to the adventure. After just one week, we all became so close, mostly because of our shared interests. There was something to do and somewhere to go to everyday. With so many festivities and other events, every weekend was filled with exhilaration. Even at times when we stayed in, we would do something fun, like movie nights or theme parties. We've had so many facebook moments to laugh at. The entertainment was constant, and the fun endless. The residence experience has only made it that much harder to say our last goodbyes.

Research, as we all know, is all about answering questions, and WISEST was able to show us what it's like to work in the field. The program has not only made an unbelievable change in my life now, it's also going to affect my future endeavors by looking pretty on my resume and university applications. I would like to thank Grace, Robyn, Natasha, my fellow WISEST students and all the lovely people on my research team for making this summer one of the best.



Seeing all the equipment and man power that goes into making a single drug was an eye-opener for me.

ZOYA ZAEEM [Renewable Resources] // **WISEST SUPERVISOR** :: Dr. John Spence
SPONSOR :: Edmonton Glenora Rotary Club

AT THE START OF SUMMER, people said that I had gotten myself stuck into working during my vacation and that I would get bored of spending six weeks in a lab. Neither did I regret how I spent my time this summer, nor were my six weeks spent in a lab. Let me give you an idea of what the WISEST experience was really like...

I was placed in an Entymology lab working with beetles and other insects. My supervisor's name was Josh Jacobs and he was working with me and my partner around the clock. My project focused on the effects of urbanization on the Pterostichus melanarius beetle. The study consisted of setting up pit-fall traps in nine sites around Edmonton: three rural, three suburban, and three urban. Pitfall traps consisted of cheesecloth, ethylene-glycol (preservative and killing agent), a wooden slab as a roof (to prevent flooding in the trap), a yogurt can, and an inner cup. Afterwards, we counted the number of P. melanarius caught and examined their wing length. As a region became more urbanized there were more P. melanarius caught, but fewer of these individual had long wings. This is because beetles with long wings can fly, so they commonly take off into rural areas. My project was a re-sampling of a previous study done by Dustin Hartley. Thus, we had data from 1998 with which to compare. Surprisingly, the number of P. melanarius has decreased over the years when, in fact, urbanization should have led to there being greater numbers of the beetle. One possible explanation for this is that a natural phenomena (eg. flood) decimated the population of P. Melanarius in some of these areas. The most important thing I learned as a result of WISEST was that research does not guarantee the results you want. One can have set predictions and thoughts about a certain study, but their experiments will not necessarily yield the results they expect. I realized that my conclusions were nothing like what I expected would happen. My supervisor taught me that this is okay, though. He said that this teaches us that nature is not "cut and dry", rather it works in its own (excuse the cliché) mysterious ways.

Our projects required a lot of fieldwork and minimal lab work. Frankly, we might have spent about 2-3 weeks in a lab while the rest of the time was spent in the great outdoors. What, might you ask, would we do if not work in the lab? Well, three days in the week were usually spent in setting up traps or collecting them. Tuesdays we would go up to George Lake to hunt for water-striders (insects that can walk on water). We walk waist-deep in the lake (wearing a hydrophobic suit) and use long nets in order to catch the evasive water-striders. This process is somewhat similar to jelly-fish hunting in Spongebob Squarepants. After a hard day of work, we would stop for a slurpie on our way back. If this is what work is, I want school to go by fast so I can get a job that requires me to work just as much. :D

Natasha and Robyn's goofy humour, the Wednesday seminars, and the fun events along the way have caused time to go by so fast. My favourite part of WISEST was going off campus to Isotechnika, a pharmaceutical company. Seeing all the equipment and man power that goes into making a single drug was an eye-opener for me. I hope WISEST is still around for many more years to come, so other sets of young adults can undergo this program and make new friends, learn new skills, and understand the effort that actually goes into research.