



**ALBERTA PRECISION
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Leaders in Laboratory Medicine



UNIVERSITY OF ALBERTA
FACULTY OF MEDICINE & DENTISTRY
Department of Laboratory Medicine & Pathology



POSTDOCTORAL CLINICAL BIOCHEMISTRY FELLOWSHIP PROGRAM

Offered jointly by:

Department of Laboratory Medicine & Pathology, University of Alberta
Alberta Precision Laboratories
DynaLIFE Medical Labs

November 2020

For program-related enquiries please contact clinbioc@ualberta.ca.

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INTRODUCTION

Clinical Biochemistry is the branch of laboratory medicine concerned with the study of the measurement and interpretation of biochemical changes in human health and disease. The University of Alberta Postdoctoral Clinical Biochemistry Fellowship Program is a full-time, 2-year program that offers advanced training at the postdoctoral level for qualified individuals. Trainees will receive specialized training in clinical biochemistry with additional basic training in hematopathology, genetics, molecular diagnostics and microbiology. The program is offered jointly by the University of Alberta's Department of Laboratory Medicine & Pathology (LMP), Alberta Precision Laboratories (APL) and by DynaLIFE Medical Labs (henceforth referred to as "DynaLIFE"). The program is accredited by the Canadian Academy of Clinical Biochemistry (CACB) and start date is July 1st of the admission year.

Since the period of training is two years, the objectives detailed should be considered the minimum required for satisfactory training in this discipline. The Trainee is expected to attend and participate in appropriate rounds of other clinical disciplines and have informal discussions with clinical biochemists and pathologists. At appropriate times during training, the Trainee will also participate in coursework, seminars, and meetings. During the training period the Trainee will gain theoretical knowledge of clinical and biochemical disease, general laboratory procedures, instrumentation, and analytical methods as outlined in rotation objectives. The Trainee will develop competence in the roles of medical expert, manager, communicator, collaborator, scholar, professional, and health advocate. By the end of the two year training period the Trainee will meet all requirements set forth by the CACB's *2013 Postgraduate Training Program in Clinical Biochemistry* syllabus and will be eligible to apply for certification by the CACB.

APPLICATION AND SELECTION PROCESS

Please see Appendix A.

TRAINING SITES AND PROGRAM MENTORS

Through collaboration with government and private laboratories, this program offers a unique multidisciplinary and innovative Trainee-tailored program that provides opportunities to train in both hospital and community settings. Primary training locations will be within Edmonton. Access to external training sites may also be feasible based on Trainee interest and available funds.

The core medical/scientific mentors of this program consist of the individuals listed below. Time spent in hematopathology, molecular diagnostics, genetics, microbiology and elective rotations will allow the Trainee to work with additional mentors not included here.

Site 1: University of Alberta Hospital

Dr. Miranda Brun

Clinical Biochemist, APL

Assistant Professor, Dept. of Laboratory Medicine & Pathology

Dr. Penny Colbourne

Clinical Toxicologist, Alberta Precision Laboratories (APL)
Clinical Professor, Dept. of Laboratory Medicine & Pathology

Dr. Anna Füzéry

North Sector POCT Medical Lead, APL
Associate Clinical Professor, Dept. of Laboratory Medicine & Pathology
Clinical Biochemistry Fellowship Program Director

Dr. Lauren McNeil

Biochemical Geneticist, APL
Clinical Lecturer, Dept. of Medical Genetics

Dr. Joshua Raizman

Clinical Biochemist, APL
Assistant Clinical Professor, Dept. of Laboratory Medicine & Pathology

Dr. Ross Ridsdale

Biochemical Geneticist, APL
Assistant Clinical Professor, Dept. of Medical Genetics

Dr. Kareena Schnabl

Section Chief of Biochemistry, North Sector, APL
Assistant Clinical Professor, Dept. of Laboratory Medicine & Pathology

Dr. Iveta Sosova

Biochemical Geneticist, APL
Assistant Professor, Dept. of Laboratory Medicine & Pathology

Dr. Dylan Thomas

Clinical Biochemist, APL
Assistant Clinical Professor, Dept. of Laboratory Medicine & Pathology

Dr. Albert Tsui

Clinical Biochemist, APL
Assistant Professor, Dept. of Laboratory Medicine & Pathology

Site 2: Urban/Suburban/Rural Hospitals

Drs. Miranda Brun, Joshua Raizman, and Albert Tsui

Site 3: DynaLIFE Medical Labs

Dr. Terence Agbor

Clinical Biochemist, DynaLIFE
Assistant Clinical Professor, Dept. of Laboratory Medicine & Pathology

Dr. Mathew Estey

Director of Clinical Biochemistry, DynaLIFE
Associate Clinical Professor, Dept. of Laboratory Medicine & Pathology

Dr. Victoria Higgins

Clinical Biochemist, DynaLIFE
Clinical Lecturer, Dept. of Laboratory Medicine & Pathology

Dr. Ola Ismail

Clinical Biochemist, DynaLIFE
Clinical Lecturer, Dept. of Laboratory Medicine & Pathology

Dr. Michelle Parker

Clinical Biochemist, DynaLIFE
Assistant Clinical Professor, Dept. of Laboratory Medicine & Pathology

CURRICULUM

PDY-1

The first year of this program emphasizes the building of a solid theoretical clinical and analytical background, understanding how clinical biochemists liaise with their clinical colleagues and laboratory staff, and understanding considerations that go into clinical and laboratory decision making. During a rotation the Trainee will (i) observe day-to-day laboratory activities, (ii) have discussions with medical/scientific staff and laboratory staff, (iii) attend laboratory and medical rounds, (iv) present at laboratory rounds, (v) shadow physicians, (vi) lecture to laboratory staff, and (vii) participate in selected day-to-day activities, laboratory projects, and translational research projects. Mentors will ensure that experience is gained in the performance of List 1, 2, and 3 analytes as outlined in Appendix 1 of the *CACB 2013 Postgraduate Training Program in Clinical Biochemistry* syllabus. Towards the latter part of the year, the Trainee will also be included in the biochemistry on-call schedule and will be first on-call with a back-up medical/scientific staff member available for guidance, questions, and feedback.

The Trainee will be expected to complete the following laboratory rotations in PDY-1:

Rotation	Duration	Location*
Safety	1 week	UAH
Preanalytics	4 weeks	UAH/USR
Quality	3 weeks	UAH/USR
Urinalysis	2 weeks	UAH/USR
High volume general chemistry	10 weeks	UAH/USR/DL
Point-of-care testing	4 weeks	UAH

Method evaluation	2 weeks	UAH
Management and LIS/HIS	1 weeks	UAH
Protein electrophoresis, Hemoglobinopathies	3 weeks	DL
Toxicology, Therapeutic drug monitoring, Trace metals	6 weeks	UAH
Endocrinology, Immunology, Miscellaneous special chemistry	6 weeks	UAH
Elective rotations	9 weeks	TBD

*UAH = University of Alberta Hospital; USR = Urban/Suburban/Rural Laboratories; DL = DynaLIFE Medical Labs; TBD = to be determined

The Trainee will be expected to spend 50% of their time in the laboratory and on their rotation assignments. The remaining time should be spent on:

1. Required coursework;
2. Weekly seminars and monthly academic half-days;
3. Attending, preparing for, and presenting at rounds;
4. Shadowing clinical staff in medical units;
5. Laboratory projects and translational research;
6. Participating in on-call service;
7. Attending operational meetings;
8. Attending scientific conferences.

PDY-2

The second year of this program emphasizes definition of clinical problems in context of the laboratory, interpretation of results, development of consultative skills, and awareness of proper test utilization. The Trainee will receive exposure to the remaining List 1 analytes and also to additional List 2 and 3 analytes as outlined in Appendix 1 of the *CACB 2013 Postgraduate Training Program in Clinical Biochemistry* syllabus. The Trainee will also continue with on-call responsibilities. The remaining time will be filled with elective rotations in sub-specialty areas of interest to the Trainee. Depending on available funds, the Trainee may choose to visit external training sites in Alberta or elsewhere.

Throughout the year, the Trainee will complete brief rotations in mass spectrometry, prenatal and newborn screening, pediatric biochemistry and biochemical genetics, hematopathology, immunology, allergy, tumor markers, molecular diagnostics, and microbiology/virology (see below).

Rotation	Duration	Location*
Mass spectrometry	4 weeks	TBD
Prenatal and newborn screening	12 weeks	UAH
Pediatric biochemistry and biochemical genetics	4 weeks	UAH
Tumor markers	variable depending	DL
Hematopathology		UAH
Immunology		UAH/DL

Allergy	on Trainee interest	DL
Molecular diagnostics		UAH
Microbiology/Virology		ProvLab/DL
Elective rotations	≥ 20 weeks	TBD

*TBD = to be determined; UAH = University of Alberta Hospital; DL = DynaLIFE Medical Labs; ProvLab = Public Health Laboratory

TRAINEE EXPECTATIONS

Rotations

- Spend 50% of time on clinical laboratory rotations.
- Meet at least weekly with supervising mentor.
- Complete rotations with a rating of “Good” or better.
- Gain exposure to analytes, diseases, and methods listed in the *CACB 2013 Postgraduate Training Program in Clinical Biochemistry* syllabus.
- Complete a rotation evaluation at the end of each rotation.

Coursework

- Satisfactorily complete two 3-credit courses available through the University of Alberta.
 - Satisfactory completion requires a passing grade according to the standards set forth by the University of Alberta.
 - Course selection by the Trainee will be done in consultation with the Program Director/Co-Directors, and/or the Clinical Biochemistry Fellowship Committee.
- Successfully complete the online Leadership in Quality Management Certificate Program offered by the Canadian Society of Clinical Chemists (CSCC).

Research

- Participate in at least one (1) large (i.e. multi-month duration) research project per year. Oral/poster presentation of the research results at a national/international scientific meeting is required and publications are highly desirable.
- Participate in at least three (3) small research/clinical projects per year. Duration of such research projects may range from several days to several weeks. While these projects may not lead to publications/presentations, they should have an impact on laboratory operations.
- It is highly desirable for at least one of the Trainee’s projects to be management-oriented (e.g. lab utilization, clinical and/or lab audit).
- It is desirable, but not mandatory, to design at least one (1) research project during the two years of the Fellowship.

Education

- Complete literature searches and textbook readings.
- Present at least one (1) time per year at Clinical Biochemistry Monthly Rounds.
- Present at least one (1) time during the two years of the Program at LMP rounds.

- Present at least one (1) time during the two years of the Program to a non-lab audience.
- Present at least two (2) times per year to laboratory staff or Medical Laboratory Science (MLS) students.
- Obtain mentoring experience.
 - The Trainee may either mentor an MLS student or may choose to develop and lead at least two case discussions in the MLSCI 460 undergraduate course offered by LMP.

Continuing Education

- Participate in weekly seminars and monthly academic half-day sessions.
- Regularly attend a variety of rounds (LMP rounds, Clinical Biochemistry Monthly Rounds, clinical rounds, etc.).
- Regularly attend educational webinars.
- Attend the annual fall meeting of the Alberta Society of Clinical Chemists.
- Attend the annual fall meeting, and possibly the annual spring meeting, of the Alberta Society for Human Toxicology.
- Attend the annual scientific conference of the CSCC or the AACC.

Other

- Assume clinical biochemistry on-call responsibilities, with back-up from a medical/scientific staff member.
- Visit clinical facilities (e.g. Edmonton Clinic, ICU, transplant and dialysis units).
- Attend a range of laboratory meetings (e.g. quality, management, preanalytical).
- Meet with the Program Director/Co-Directors at least once every two months.
- Successfully complete written and oral exams at the end of each year.
 - Following the first year of training, a satisfactory grade for the written exam is defined as 50% or greater. A satisfactory grade for the oral exam is considered as "Pass".
 - Following the second year of training, a satisfactory grade for the written exam is defined as 70% or greater. A satisfactory grade for the oral exam is considered as "Pass".
- Complete any remedial actions deemed necessary by the Clinical Biochemistry Fellowship Committee.

MENTOR EXPECTATIONS

Throughout the fellowship Mentors are expected to:

Prior to a Rotation

- Assist in developing learning objectives for the Trainee's rotations.
- Make the Trainee aware of available resources and suggested activities to facilitate meeting rotation objectives.

During a Rotation

- Meet with the Trainee at least once a week to discuss instruments, reagents, methodology, and quality control as well as matters relevant to the ordering, patient preparation and interpretation of investigations pertinent to each area of the laboratory.
- Discuss with the Trainee all consultation requests related to the area.
- Involve the Trainee in physician/patient/laboratory interfacing.
- Arrange opportunities for the Trainee to visit and observe clinical units.

After a Rotation

- Complete an evaluation of the Trainee's performance during the rotation and review this assessment with the Trainee.
- Send a copy of the completed and signed evaluation form to the Program Director/Co-Directors for review and record keeping.

Mentors are also expected to participate in tutorial of the Trainee through weekly seminars, monthly academic half-day sessions, and by guiding the Trainee in laboratory and research projects. Mentors may be asked to submit exam questions and serve as examiners for written and oral exams to be completed by the Trainee.

EVALUATION

Trainees will be evaluated on an ongoing basis to ensure that they are progressing as expected and to identify knowledge and/or experience gaps that require additional attention. First, Trainees will be evaluated as they complete their rotations. At the end of each rotation, the Mentor will fill out an evaluation form of the Trainee's performance during the rotation and will review this form with the Trainee. The Mentor will then submit the signed form to the Program Director/Co-Directors for review and record keeping. Trainees will also be evaluated semiannually by the Clinical Biochemistry Fellowship Committee. This assessment will help direct learning needs of the Trainee in preparation for the CACB written and oral certification examinations.

In addition to these evaluations, the Trainee will also be asked to complete written and oral exams at the end of each year of training. The exams will be in the format of current CACB exams and will be used to assess the Trainee's knowledge as well as to provide practice in completing such exams.

REMEDICATION

Trainees accepted into this program are expected to meet or exceed all program requirements. Substandard performance will be identified through post-rotation evaluations, informal feedback from mentors and laboratory staff, end-of-year written and oral exams, and semiannual assessments. Examples of substandard performance include:

- (i) Failing to achieve a passing grade in coursework according to the standards set forth by the University of Alberta.
- (ii) Ratings of "Fair" or "Unsatisfactory" after completion of a rotation.

- (iii) Failing to achieve satisfactory grades on the written and oral exams completed at the end of each year of the program.
- (iv) Rude behavior toward mentors and/or laboratory staff.

If a trainee performs below program expectations, efforts aimed at rectifying deficiencies will be initiated by the Program Directors/Co-Directors in consultation with the Clinical Biochemistry Fellowship Committee and, if appropriate, program mentors. Remedial processes will be dependent on the particular deficiency but may include:

- (i) Completion of extra assignments that are related to a particular deficiency
- (ii) Additional rotation time in a particular area of the laboratory
- (iii) Auditing of a failed course or of a related course

Any such remedial processes will be followed up with an assessment of the Trainee's improvement or lack thereof. A Trainee will only receive a certificate of completion at the end of the program if she/he has satisfactorily completed all program requirements including remedial processes.

ACADEMIC DISCIPLINE & APPEALS PROCESS

The University of Alberta has developed a detailed process for academic discipline and appeal. Please consult the University of Alberta's Office of Postgraduate Medical Education (PGME) website for more details.

<https://www.ualberta.ca/medicine/programs/residency/postgraduateprograms/fellows>

SUCCESSFUL PROGRAM COMPLETION

Successful completion of this program entails meeting all of the following requirements:

1. Meeting all of the expectations set forth in this document
2. Demonstration of a solid foundation in the analytes, methods, and skills listed in the *CACB 2013 Postgraduate Training Program in Clinical Biochemistry* syllabus
3. Receipt of an overall rating of "Satisfactory" from the Clinical Biochemistry Fellowship Committee during the final Trainee evaluation

Upon successful completion of the program, Trainees will be issued a Certificate of Completion from the University of Alberta's Postgraduate Medical Education Office.

APPENDIX A - APPLICATION AND SELECTION PROCESS

Individuals interested in the University of Alberta Postdoctoral Clinical Biochemistry Fellowship Program are invited to submit an application package that consists of a completed application form (see last two pages of this Appendix), a curriculum vitae, a personal letter of interest, academic transcripts and documentation of awarded degrees, a TOEFL score (if applicable), and three references.

Applicants will be evaluated by the Clinical Biochemistry Fellowship Committee and possibly additional clinical biochemists and/or toxicologists in Edmonton according to the following criteria:

- (a) The applicant must have educational qualifications in biochemistry, analytical or pure chemistry, or related life sciences and earned a PhD, MD, or equivalent degree from a university belonging to the Association of Universities and Colleges of Canada, from a Canadian school of medicine, or from an equivalent international institution. Credential assessment is required for university degrees from outside of Canada or the USA.
- (b) Knowledge of biochemistry, physiology, analytical chemistry, molecular biology, immunology, and genetics is ideal.
- (c) Exposure to some, or all, of the disciplines of anatomy, pharmacology, toxicology, pathology, hematology, microbiology, biophysics, epidemiology, and biostatistics is helpful.
- (d) Grades in relevant courses and overall average during graduate studies (min B+).
- (e) The applicant must demonstrate ability for independent research and scholarly activity. Research record, productivity, and relevance of publications to clinical biochemistry will be considered.
- (f) Curriculum development or teaching experience.
- (g) Relevant experience in clinical biochemistry is desirable (e.g. medical laboratory technologist, laboratory scientist, research assistant, or research associate).
- (h) Strong leadership skills, interpersonal communication skills, and community service are important secondary considerations.
- (i) Enthusiasm and commitment of the applicant to the field of clinical biochemistry.
- (j) Knowledge of the career is imperative and may be shown through evidence of visits to clinical laboratories, meetings with clinical biochemists or job shadowing.
- (k) Some knowledge of the Edmonton fellowship program and of Alberta.
- (l) Professional career goals fit with the profession of a clinical biochemist.
- (m) Professionalism in working with teams of health care professionals.
- (n) The applicant has Canadian citizenship or landed immigrant status.

A combination of the initial application package, telephone interviews, and/or on-site interviews will be used for selection of the successful applicant to be admitted into the program.

POSTDOCTORAL CLINICAL BIOCHEMISTRY FELLOWSHIP PROGRAM

APPLICATION FORM

Part 1: Personal Information

Last Name:

First Name:

Current Address:

Permanent Address:

Home and Business Phone Numbers:

Email:

Citizenship: Canadian Citizen Permanent Resident

Other (specify)

First Language: English French

Other (provide TOEFL)

Date

Applicant Signature

I permit the distribution of information contained within this application form for the purpose of application to the Postdoctoral Clinical Biochemistry Fellowship Program, University of Alberta, Faculty of Medicine & Dentistry, Department of Laboratory Medicine & Pathology.

Part 2: Personal Statement

On a separate sheet of paper, please state your short and long term career goals. Explain why you are interested in applying to this Postdoctoral Clinical Biochemistry Fellowship Program.

Part 3: Curriculum Vitae (CV)

Enclose a copy of your current CV. Please ensure to include the following information:

- (i) Education
 - Undergraduate and doctoral or medical degrees
 - Postdoctoral training or specialty certifications
- (ii) Clinical experience
- (iii) Teaching experience
- (iv) Research experience
- (v) Other work/volunteer experience relevant to clinical biochemistry, hematology, molecular biology, microbiology, or pathology
- (vi) Publications including papers and abstracts
- (vii) Awards and accomplishments

Part 4: References

Please ask three individuals to send us letters of support to complete your application. Provide the names, positions, mailing addresses and email addresses of three individuals below.

- 1.
- 2.
- 3.

Part 5: Application Package

(send to clinbioc@ualberta.ca)

- Application form
- Personal statement
- Curriculum vitae
- Three letters of support
- Copies of undergraduate and graduate transcripts, medical degrees, specialty certificates etc. If education was obtained at an institution outside of Canada or the United States, an evaluation must be submitted from a credentials evaluation agency.

We thank all applicants for their interest in our program, however, only those chosen for an interview will be contacted.