

Nephrology Research Fellowship

Effective July 2010

Program Director: Sameena Iqbal

Site Directors: Andrey Cybulsky (RVH), Sameena Iqbal (MGH), Mark Lipman (JGH)

Name of Institution: McGill University Health Centre
Type of Fellowship: Research Fellowship
Length of Fellowship: Two years
Number of Fellowship Positions: 2 per year
Academic Affiliation: McGill University
Name of Hospitals involved in Training: Royal Victoria, Montreal
General and Jewish General Hospitals

Research Activity and Potential Supervisors:

Royal Victoria Hospital

Dr. A. Cybulsky is Chief of the Division of Nephrology, and Professor of Medicine

His research interests are summarized below:

1. Mechanisms of immune glomerular cell injury and proteinuria. Role of phospholipases and protein kinases.
2. Role of SLK (a Ste-20-like kinase) in renal ischemia-reperfusion injury. Mechanisms/regulation of kinase activation, signaling effectors, functional effects, including apoptotic pathways.
3. Regulation of protein kinase signaling by extracellular matrix in the glomerulus. Activation of protein kinases, mediators of apoptosis/cell survival.

Recent Publications:

Cohen, D., Papillon, J., Aoudjit, L., Li, H., **Cybulsky, A.V.** and Takano, T.
Role of calcium-independent phospholipase A2 in complement-mediated glomerular epithelial cell injury. *Am. J. Physiol.* 2008, 294, F469-F479.

Ren, G., Huynh, C., Bijian, K. and **Cybulsky, A.V.**

Role of apoptosis signal-regulating kinase 1 in complement-mediated glomerular epithelial cell injury. *Mol. Immunol.* 2008, 45, 2236-2246.

Cybulsky, A.V., Takano, T., Papillon, J., Hao, W., Mancini, A., Di Battista, J.A. and Cybulsky, M.I. The 3'-untranslated region of the Ste20-like kinase SLK regulates SLK expression. *Am. J. Physiol.* 2007, 292, F845-F852.

Dr. T. Takano is an Associate Professor and member of the nephrology division.

Her research interests are the following:

1. Role of Pak in podocyte morphology and function.
2. Role of Rho-GTPases in glomerular permselectivity.
3. Role of protein tyrosine phosphatases (PTP) in glomerular permselectivity.

Recent Publications:

Cohen, D., Papillon, J., Aoudjit, L., Li, H., Cybulsky, A.V. and **Takano, T.**
Role of calcium-independent phospholipase: A₂ in complement-mediated glomerular epithelial cell injury. *Am. J. Physiol.-Renal Physiol.* In Press, 2008.

Zhu, J., Sun, N., Aoudjit, L., Li, H., Kawachi, H., Lemay, S. and **Takano, T.** (2007)
Nephrin mediates actin reorganization via phosphoinositide 3-kinase in glomerular epithelial cells. *Kidney Int.* (advanced online publication Nov. 21, 2007).

Zhang, H., Cybulsky, A.V., Aoudjit, L., Zhu, J., Li, H., Lamarche-Vane, N. and **Takano, T.** (2007)

Role of Rho-GTPases in complement-mediated glomerular epithelial cell injury. *Am. J. Physiol-Renal Physiol.* 293: F148-F156.

Dr. S. Lemay is an Assistant Professor and a member of the Nephrology Division.

His projects for Thesis Supervision are as follows:

1. Role of Eph/ephrin signaling in ischemia-reperfusion injury.
2. Mechanism of EphA2 action and transcriptional regulation.
3. Role of the adapter protein Dok-4 in epithelial cell signaling.

Recent Publications:

Baldwin, C., Bedirian, A., Li, H., Takano, T. and **Lemay, S.** (2007)
Identification of Dok-4b, a Dok-4 splice variant with enhanced inhibitory properties.
Biochem. Biophys. Res. Comm. 354: 783-788.

Baldwin, C., Chen, Z.W., Bedirian, A., Yokota, N., Nasr, S.H., Rabb, H. and **Lemay, S.**
(2006)
Upregulation of EphA2 during in vivo and in vitro renal ischemia-reperfusion injury: role
of Src kinases. Am. J. Physiol. 291: F960-F971.

Bederian, A., Baldwin, C., Abe, J., Takano, T. and **Lemay, S.** (2004)
PH and PTH domain-dependent membrane association and tyrosine phosphorylation of
Dok-4, an inhibitory adapter molecule expressed in epithelial cells. J. Biol. Chem. 279:
19335.

Dr. A. Alam is an Assistant Professor in Medicine. His current research characterizes novel urine and serum biomarkers in those with diabetic and non-diabetic kidney diseases, and examines their association with kidney function decline, cardiovascular events, and metabolic complications, such as anemia and mineral bone disease. These biomarkers will be incorporated into predictive instruments and validated. The goal is to develop new methods to better identify, risk stratify, and eventually impact the care of patients with progressive chronic kidney disease.

Dr. D. Baran is an Associate Professor in Medicine. General research interest is clinical transplantation in areas such as factors influencing kidney allograft survival, and post-transplant patient care. Current funded project is on skin cancer and other malignancies in renal transplant patients. This is both a survey of current practice (surveillance exams, patient teaching) and incidence of skin/other malignancy, treatment, and outcome. The transplant group also has several other research projects underway - these are generally drug trials of immunosuppressive agents, some immune monitoring studies, an ACE inhibitor post-transplant study, and most recently living donor outcomes study.

Montreal General Hospital

Dr. M. Vasilevsky is the MGH site Clinical Director of Nephrology Division and Director of Dialysis Services. His research interests are in the area of Hemodialysis quality of care indicators, particularly bone mineral metabolism and hemodialysis access care. He is actively involved in Aboriginal Hemodialysis Satellite management and has expertise on Telemedicine for remote medical care delivery. He is working on the development of remote care clinics in the area of Chronic Kidney Disease.

Dr. S. Iqbal is an Assistant Professor and the Program Director of the Clinical Nephrology Fellowship. Her research interests include: treatment of chronic kidney disease with early identification and management, particularly among the Aboriginal population. She also has interest in primary care issues among chronic dialysis patients including physical activity promotion in this chronic disease population. She has ongoing projects in areas of acute kidney injury and infections in end-stage kidney disease.

Jewish General Hospital

Mark Lipman, MD

*T-cell rearrangements of graft infiltrating lymphocytes.
Cytokine gene expression in protocol renal biopsies
Mediators of phosphate homeostasis in chronic kidney disease.*

Dr. Lipman is Chief of the Division of Nephrology at the JGH. He has a longstanding research interest in renal transplantation immune-biology but has also made important contributions in the area of phosphate homeostasis. He was the first to clone the full-length human PHEX gene, a key regulator of phosphate excretion.

Dr. Lipman is a graduate of McGill University Faculty of Medicine and did his post-graduate research fellowship training at Harvard University.

S. Nessim, MD

*The role of Vitamin D in the management of patients with chronic kidney disease.
Predictors of peritonitis in the peritoneal dialysis population.*

Dr. Nessim is a newly recruited nephrologist who just completed her Master's degree in Clinical Epidemiology and has strong interests in clinical research. She has specific expertise in the peritoneal dialysis population and general interest in the management of metabolic bone disease in patients with chronic kidney disease.

Dr. Nessim is a graduate of McGill University Faculty of Medicine and did her post-graduate research fellowship training at the University of Toronto.

A. Karaplis, MD, PhD

Osteogenic transformation of vascular smooth muscle cells.

Dr. Karaplis is an endocrinologist and a world renowned expert in bone biology. He was the first to describe the physiological role for PTHrp in normal bone/chondrocyte development. He has made numerous seminal contributions to this field of study over the past 20 years.

Dr. Karaplis is a graduate of McGill University Faculty of Medicine and did his post-graduate research fellowship training at Harvard University and the Massachusetts Institute of Technology.

Ernesto Schiffrin, MD, PhD

Vascular remodeling of resistance arterioles in disease states.

Dr. Schiffrin is Chairman of the Department of Medicine at the JGH and Vice-Chairman (Research) for the Department of Medicine of McGill University. He is a world renowned expert in hypertension and vascular remodeling having pioneered the technique for the study of small resistance arteries. His scientific contributions to his field of research span over 3 decades and are legion.

Applicant Requirements

The applicant must be enrolled or has completed clinical training in nephrology or internal medicine. He/She must be of good academic standing, with working knowledge of English/French. During the application process, the applicant must provide the following documentation:

- 1) Complete C.V. submission.
- 2) Two reference letters, one must be from the previous program director
- 3) The funding source for the fellowship: In general, the candidate is expected to obtain fellowship funding from one of the following agencies: FRSQ, CIHR, Heart and Stroke, Kidney Foundation, Society of Quebec Nephrologists, etc. Foreign candidates who have funding from their local agencies will be considered.

Mission

Our mission is to train and educate fellows in order to provide research skills that will allow them to pursue academic careers in Nephrology. This clinical and research fellowship is structured to provide a rich environment for postgraduate trainees who intend to develop expertise and pursue a career in biomedical research in Nephrology

The candidate will be expected to apply for a Master's degree in Experimental medicine, Immunology or Epidemiology and Biostatistics. This will better equip the candidate on research methodology and application.

Objectives of the Program are as follows:

1. to acquire skills in the area of critical appraisal of medical literature and formulation of a hypothesis to pursue through a research question
2. to obtain medical knowledge in order to understand and formulate study design, implementation techniques and statistical analyses appropriate for the research question
3. to acquire and carry out manuscript writing techniques to prepare for conference presentation and publication of the research question asked
4. the research training plan will be individualized based on the research track the candidate wishes to take ie. Outcome research, Experimental medicine or Immunology

The anticipated schedule for the fellow is to acquire the research methodology and laboratory skills within the first 10 months of fellowship. During this time the clinical research project will be conceived and designed. Research protocols will be completed and Research Ethics Approval will be sought either through MUHC or McGill University. The research project will run for the next 8 months followed by a period of 6 months for data analysis and preparation of abstract/manuscript.

Depending on the supervisor chosen, the research fellow will be provided office space in one of the three hospitals in close proximity to the supervisor.

Evaluation Process

Specifically the candidate will be evaluated on:

- 1) Ability to perform the research methodology and/or laboratory technical skills.
- 2) Ability to formulate a research question and complete the study protocol
- 3) Ability to implement the study protocol and carry out the analyses necessary
- 4) Ability to write a scientific abstract, give an oral presentation on the research results and submit a manuscript.

The fellow's successful completion of the program will be evaluated by the site director.