

---

# News from Biochemistry Departments

---

## University of Alberta

### Department of Biochemistry

Correspondent: Brian Sykes



(From left to right) David Stuart, Carlos Fernandez-Patron, Andrew MacMillan, Kevin Wilson, Luis Schang, Leo Spyropoulos, Mark Glover and Howard Young.

Institute) and Bob Hodges (Director of Structural Biology at the UCHSC in Denver). These people were, and are, icons on the Canadian biochemistry scene, and leave a legacy of excellence behind. On the other hand it has been a time of renewal in the department, and we have hired 8 active young investigators whose presence has added new vitality and breadth to our program. A recent picture of this group includes (from left to right) David Stuart, Carlos Fernandez-Patron, Andrew MacMillan, Kevin Wilson, Luis Schang, Leo Spyropoulos, Mark Glover and Howard Young. Their research is highlighted below.

**Andrew MacMillan** (Ph.D., Harvard, 1992; PDF, MIT, 1993-1996)

We use the techniques of organic synthesis as well as other biophysical approaches to investigate the mechanisms of gene regulation at the RNA level. Research in our laboratory is focused on the chemistry and biochemistry of nucleic acids with an emphasis on biologically important reactions involving RNA. Large RNAs and complex ribonucleoprotein machines such as the spliceosome and ribosome play a key role in constitutive and regulated cellular processes and in the life cycle of viral pathogens.

**Carlos Fernandez-Patron**

(B.Sc./M.Sc., Dresden, 1988; Ph.D., University of Havana, 1995; PDF, University of Alberta, 1997-2001)

My laboratory is characterizing novel roles played by matrix metalloproteinases in the regulation of vascular tone, cardiovascular remodeling and blood pressure. We are applying interaction proteomics to substantiate our pharmacological observations. In addition, we plan to map the cardiovascular proteome and characterize its dynamics in hypertension, as opposed to normotension.

**David T. Stuart**

(M.Sc., University of Waterloo, 1986; Ph.D., University of Alberta, 1991; PDF, Scripps Research Institute, 1992-1998)



Andrew MacMillan

New Look Biochemistry at the University of Alberta!

The Department of Biochemistry at the University of Alberta has undergone tremendous change over the last decade. On the down side we have seen the retirement, promotion elsewhere, and/or departure of a number of stalwarts of the department - people like Cyril Kay and Larry Smillie, Neil Madsen and Bill Bridger (Head of Alberta Ingenuity), Vern Paetkau (Dean of Science at Victoria), Doug Scraba and Dick Morgan, Carol Cass (Acting Head of the Cross Cancer



Carlos Fernandez-Patron



Mark Glover

My lab studies the mechanisms that regulate DNA replication and chromosome division during meiotic differentiation. We focus on the budding yeast *Saccharomyces cerevisiae* as sporulation in this organism is an excellent model for mammalian spermatogenesis. We also study the function and activity of meiosis-specific kinase Ime2. We are using contemporary proteomic and microarray analysis in our program to gain further insight into the mechanisms that regulate meiotic differentiation.

**Howard Young** (Ph.D., University of Connecticut, 1994; PDF & Instructor, New York University School of Medicine, 1995-2002)

Calcium is an important signalling molecule, particularly in heart muscle where abnormal calcium signalling contributes to hypertension and end-stage heart failure. ATP-dependent calcium transporters play a primary role in the regulation of cytosolic calcium. Regulation of these transport processes provide a dynamic calcium metabolism that is coupled to precise physiological responses. My research utilizes the tools of structural biology to reveal fundamental aspects of calcium transport regulation implicated in heart disease.

**Kevin Wilson** (Ph.D., University of Oregon, 1995; PDF, University of California (Santa Cruz), 1995 - 2000)

My lab is studying fundamental mechanisms of translation, involving the ribosome and universally conserved translation factors. Our research focus is on the mechanism of translation initiation. We have recently developed a novel method for watching the assembly of translation initiation complexes, involving the 30S and 50S ribosomal subunits, fMet-tRNA, a model mRNA, and bacterial initiation factors IF1, IF2, and IF3. We are currently investigating the roles of the three initiation factors in the assembly of the initiation complex, making use of recently determined x-ray structures of the ribosome.



Howard Young



Kevin Wilson (right)



Leo Spyropoulos



Luis Schang (center)



Chris Bleackley



Michael James



Ronald McElhaney



Marek Michalak

**Leo Spyropoulos** (Ph.D., Manitoba, 1996; PDF, University of Alberta, 1996-2000)

The research focus of my laboratory is to gain an understanding of biological functions carried out by proteins and their complexes, and the kinetics, dynamics, and thermodynamics of proteins and protein-ligand interactions using nuclear magnetic resonance spectroscopic techniques. Our current objective is to elucidate the mechanism of protein ubiquitination at the molecular level by studying the structure, interactions, and dynamics of the human UEV-Ubc13 protein heterodimers.

**Luis Schang** (DVM, University of Buenos Aires, 1987; Ph.D., University of Nebraska-Lincoln, 1996; PDF, University of Pennsylvania, 1997-2000)

We study the roles that cellular proteins play in viral replication and pathogenesis, especially the roles of cyclin-dependent kinases in the replication cycle of herpes simplex viruses. The three areas of current research interest of the lab are: the mechanisms whereby cellular cyclin-dependent kinases regulate expression of viral genes, the effects of neuronal expression of proteins involved in cell-cycle progression, and the possibility that pharmacological cdk inhibitors may be useful as antiviral drugs against HSV, HIV and other viruses.

**Mark Glover** (Ph.D., University of Toronto, 1991) My lab investigates fundamental molecular mechanisms that regulate the expression of genetic information. We have determined the 3D structure of the BRCT domain of the breast cancer-associated protein, BRCA1. This domain is a critical transcriptional activation domain that is essential to the tumour suppressor function of BRCA1. We are probing the structure and function of a novel RNA-based mechanism that controls the conjugative transfer of genes involved in antibiotic resistance and virulence between bacteria. We have determined the structure of a key regulator of meiosis in yeast, Ndt80.

The 'old guard' have also been active and successful, and carry on the tradition of excellence of our department. Our faculty have continued to garner many honours and awards in recent years. **Chris Bleackley** was awarded the 2001 Robert L. Noble Prize of the National Cancer Institute and was reappointed as a Howard Hughes International Scholar. **Marek Michalak** won the Astra/Zeneca Award in Molecular Biology. **Ronald McElhaney** received the 2001 Avanti Award in Lipids from the Biophysical Society. **Brian Sykes** won the Gerhard Herzberg Award of the Spectroscopy Society of Canada, and **Michael James** and **Joel Weiner** have both won the G. Malcolm Brown Award of the Canadian Federation of Biological Societies. In addition, **Chris Bleackley** and **Carol Cass** join nine other members of the Department as Fellows of the Royal Society of Canada and **Brian Sykes** joins **Michael James** as a Fellow of the Royal Society of London. **Chris Bleackley**, **Carol Cass**, **Michael James**, **Brian Sykes**, **Dennis Vance** and **Joel Weiner** have been appointed Tier 1 Canada Research Chairs and **Mark Glover** has been recently appointed a Tier 2 Canada Research Chair.

---

# University of Calgary

## Department of Biochemistry and Molecular Biology

Correspondent: Leon Browder

The Department of Biochemistry & Molecular Biology in the Faculty of Medicine at the University of Calgary is very diverse, with members belonging to ten different interdepartmental Research Groups. At the present time, 46 faculty members hold primary or secondary appointments in the department. Two new members will join the department in January. There are three Emeritus Professors and 13 adjunct appointees. Our research activities are supported by a number of excellent core facilities, including UCDNA Services, the Peptide Synthesis Facility, the Southern Alberta Mass Spectrometry Facility (SAMS), the Southern Alberta Microarray Facility (SAMF), the Embryonic Stem Cell/Targeted Mutagenesis Facility (ESTM), the SACRC Hybridoma Facility & Cell Bank and the Bio-NMR Centre and most recently the Sun Center of Excellence for Visual Genomics. The department offers graduate training leading to Ph.D. and M.Sc. degrees in Biochemistry and Molecular Biology.

### Faculty Transitions

**Dr. Phyllis Luvalle** has relocated to the University of Florida in Gainesville. She remains associated with us as an Adjunct Associate Professor.

**Dr. Randy Johnston** is President and Chief Executive Officer of Genome Prairie. Randy remains a member of our department and has an active research laboratory.

**Dr. Jonathan Lytton** and **Dr. Joe Goren** have assumed the roles of Co-coordinators of the graduate program in Biochemistry & Molecular Biology.

**Dr. Frank Jirik** was awarded a Tier 1 Canada Research Chair. Frank has a diverse functional genomics research program involving using cell

biology, biochemistry, and transgenic approaches.

**Dr. Jim McGhee** was awarded a Tier 1 Canada Research Chair. Jim studies gut development in *C. elegans* (the Nobel Prize-winning worm).

### New Members of our Department

**Dr. George Chaconas** has recently returned to Calgary as a Professor and Alberta Heritage Foundation Medical Scientist. George obtained his Ph.D. in Calgary with Bob Church and Hans van de Sande before embarking on a very successful academic career at the University of Western Ontario. George studies telomere resolution, DNA replication and mechanisms of pathogenesis in *Borrelia burgdorferi*, the Lyme disease spirochete.

**Dr. Yang Yang** joined the department as an Assistant Professor in July. Yang holds a prestigious Career Development Award from the Juvenile Diabetes Foundation International. His research focuses on T cell immunology and autoimmune diabetes.

**Dr. Justin MacDonald** joins us in January, 2003 as an Assistant Professor and as recipient of the first PENCE Chair in Protein Sciences Research. Justin has been a Postdoctoral Fellow in Tim Haystead's lab at Duke University. Justin conducts proteomic investigations on smooth muscle function.

**Dr. Shirin Bonni** also joins the department in January, 2003 as an Assistant Professor. She has been a Postdoctoral Fellow in Jeff Wrana's lab at Sick Kids Hospital and the Samuel Lunenfeld Research Institute of Mount Sinai Hospital in Toronto. Shirin studies signalling and the regulatory mechanisms downstream of the TGF $\beta$  receptor.

**Dr. Jens Coorsen** has his primary appointment in the Department of Physiology & Biophysics. Jens recently moved to Calgary from the NIH and has established a functional proteomics research program.

**Dr. Peter Vize** has become an Adjunct Associate Professor in our department. His primary appoint-

ment is in the Department of Biological Sciences. Peter came to Calgary from the University of Texas at Austin. He studies kidney development in *Xenopus laevis* and has a major interest in bioinformatics, particularly in correlating gene expression with development, both chronologically and spatially.

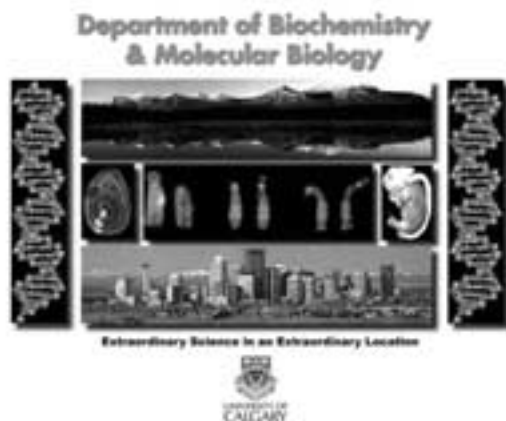
**Dr. Chris Brown** has his primary appointment in the Department of Medicine. His research involves physiological and pathological analyses of hematopoietic development and function.

**Dr. Mike Surette** has his primary appointment in the Department of Microbiology & Infectious Diseases. Mike studies bacterial signal transduction and physiology within the context of the individual cells and in interacting populations of cells. Mike has been awarded a Canada Research Chair (Tier II).

#### Training Opportunities

Members of the Department of Biochemistry & Molecular Biology conduct exciting, leading edge research, are well funded by international, national and provincial agencies, and publish extensively in the very best journals. We invite potential graduate students and post-doctoral fellows to give Calgary careful consideration. Not only do we offer excellent training opportunities for young scientists, but the natural beauty surrounding Calgary is breathtaking, providing year-round recreational opportunities.

We invite you to visit our website at  
[www.ucalgary.ca/bmb](http://www.ucalgary.ca/bmb).



## University of Calgary

### Division of Biochemistry, Department of Biological Sciences, Faculty of Science

Correspondent: *Raymond J. Turner*

The past couple of years have seen some significant personnel changes in our division. Dr. **Peter Tieleman**, a computational biologist, has joined our division in 2001 whereas Drs. **Barry Phipps** and **Leslie Tari** have now both left to pursue careers in industry. Furthermore, Dr. **Susan Lees-Miller** has reduced her role in the Division to be able to contribute more actively to proteomics developments with the Department of Biochemistry and Molecular Biology in the Faculty of Medicine. The summer of 2002 saw the addition of two new protein crystallographers, Drs. **Marie Fraser** and **Kenneth Ng**, and the membrane biochemist Dr. **Elmar Prenner**. The stability of the faculty positions in our division has been significantly improved by the promotion of our two senior instructors Drs. **Robert Edwards** and **Elke Lohmeier-Vogel** to tenure-track positions. Moreover, tenure and promotion to associate professor was granted to Drs. **Raymond Turner** and **Greg Moorhead** as well. This results in the following makeup of our division: six AHFMR scholars/scientists, two tenured instructors, two tenured associate professors and one tenured full professor (Dr. **Gene Huber**). The division is currently being captained by an AHFMR scientist, Dr. **Hans Vogel**.

The addition of the new faculty members was possible through their success in obtaining Alberta Heritage Foundation for Medical Research Scholar positions and establishment awards. Research in our division is well funded by NSERC and CIHR operating grants as well as support from the Heart & Stroke Foundation and the Alberta and Canadian Cancer boards. Members of our division have also been very successful in obtaining infrastructure support from CFI and the Alberta Network for Proteomics Innovation. Additionally, some of our faculty members are

---

actively involved with the Alberta Synchrotron Institute, which contributes to the development of the Canadian Light Source in Saskatoon.

Research in the division is largely focused on structural biology and membrane biochemistry, with some activities in the area of control of metabolism. Our research interests range from purely theoretical molecular dynamics calculations, protein structure determination by NMR spectroscopy and x-ray crystallography, proteomics and bioinformatics, to the characterization of enzymatic catalysis and membrane function and architecture. Additionally, emphasis is being placed on various biophysical approaches such as protein-chip technology, microcalorimetry, fluorescence and infrared spectroscopy and stop-flow kinetic studies. The Division's Bio-NMR center has recently been enhanced by the incorporation of Canada's first NMR cryoprobe and the installation of a new 700 MHz NMR.

Our faculty is responsible for the undergraduate degree program in Biochemistry at the University of Calgary graduating an average of 35 Biochemistry majors, with ~40% being honours students. In addition to the training of biochemistry majors, our members also contribute significantly to the teaching of more general undergraduate programs in BioScience and Natural Science. A high level of research activity is maintained by undergraduate project students (averaging 20/year), summer students (16-20/year), graduate students (21 presently), and postdoctoral fellows (14 presently).

A more detailed description of the Division of Biochemistry and the research programs of its members can be found at [www.ucalgary.ca/UofC/faculties/SC/BI/biochem](http://www.ucalgary.ca/UofC/faculties/SC/BI/biochem).

---

## University of Guelph

### Biochemistry Group, Department of Chemistry and Biochemistry

*Correspondent: Frances Sharom*

Preparations are well advanced in support of the construction to start on Phase 1 of the Science Complex, the second part in the SuperBuild Growth Fund enhancements to the University of Guelph campus. The Classroom and Science Complex total over 400,000 square feet of new facilities and is one of the biggest construction projects in the University's history. The new science complex will accommodate many of the biological science units, including Molecular Biology, Biochemistry, Microbiology, Botany and Zoology, under one (large) roof. Partial demolition of one wing of an existing building took place in Fall 2002, and construction on the first phase of the project is slated for early 2003. Although the project will be disruptive for several years, everyone is looking forward to moving into well-planned modern research lab space 2-3 years down the road. The complex will also include completely new teaching lab facilities for biochemistry, molecular biology, and microbiology undergraduate students.

This has been another successful year for the group:

**Alan Mellors** is taking early retirement after 34 years in the Department of Chemistry and Biochemistry. He joined the Department in 1968. Previously he had obtained his degrees from the University of Liverpool, followed by a Fulbright Scholarship at the University of California, Davis, and a research appointment with Canada Agriculture, Ottawa. In 1975-76 he was a Nuffield Scholar on sabbatical leave at the Institute for Animal Physiology, Babraham, U.K. Subsequent sabbaticals were spent at the Hospital for Sick Children, and at the Toronto Hospital. Alan's research encompassed a broad range of topics, all connected with the interface between membrane components and enzymes. His interests in lipid

---

biochemistry included antioxidants, cannabinoids, and phosphoinositides. He studied phospholipases from sources as diverse as mammalian lysosomes, lymphocytes, and African trypanosomes. He and his students described an enzyme from *Mannheimia haemolytica* which is still the only known glycoprotease, that is, a proteolytic enzyme specific for a narrow range of O-sialoglycoproteins or O-sulfoglycoproteins. Alan hopes to be fit enough to fritter away his retirement years hiking, skiing and canoeing.

**John Dawson** joined the biochemistry group as of July 2002. John obtained his B.Sc. at Laurier (Honours Biology & Chemistry) and moved out west to Edmonton in 1992 to do a Ph.D. in the Department of Biochemistry at the University of Alberta. There, he was the first graduate student of a new professor, Dr. Charles Holmes. John studied protein phosphatases and a handful of natural toxins that specifically inhibit them. As part of this work, he used *S. pombe* and *E. coli* expression systems and also learned how to culture marine dinoflagellates. John met his wife Amanda in Edmonton and one month after they were married, they moved to California. His protein biochemistry background was put to good use in the laboratory of Dr. Jim Spudich in the Biochemistry Department at Stanford University, where he began postdoctoral work in 1998. There, he was exposed to a multidisciplinary group that studied molecular motors using a variety of innovative and powerful techniques. John began to study actin, because its ability to self-assemble into long filaments is the core problem hindering the production of atomic resolution pictures of the actomyosin complex. In Jim's lab, John set up a very productive collaboration with Drs. Sablin and Fletterick at UCSF, and together they determined the crystal structure of an actin trimer; the first crystal structure of an F-actin derived fragment ever produced. As with many research projects, this work has led to unexpected and exciting avenues of study which John is pursuing here at Guelph, including the cell biology of yeast strains that harbour significant actin mutations, and the effect of nucleotide hydrolysis on the structure and

regulation of F-actin. John has already obtained an NSERC Discovery Grant, and is working on CFI New Opportunities and CIHR applications.

**Marc Coppolino**, who arrived in the department in May 2001, was awarded a CIHR New Investigator Award, a CIHR Operating Grant, and an NSERC Discovery Grant. He has also been awarded CFI New Opportunities funding for a confocal microscope. Marc's group is currently studying the molecular mechanisms of cell motility. Specifically, they are analyzing the proteins that control the membrane remodelling (SNAREs), the actin reorganization (paxillin), and the adhesion (integrin-linked kinase) that are required for cells to spread upon or migrate over extracellular matrices.

#### **Frances Sharom**

The Sharom group is continuing their studies of membrane proteins, including the P-glycoprotein multidrug transporter. Fluorescence spectroscopy now plays a central role in the life of the lab in general, and has led to some exciting insights into the interaction of the protein with its substrates, and its mechanism of action. Another project looks at the structure, function and membrane interactions of various GPI-anchored enzymes and adhesion proteins. Collaborations with research groups in Granada (Spain) and Lyon (France) led to the visit in Fall 2002 of two Ph.D. students, Paco Muñoz and Olivier Dalmas, both supported by European exchange scholarships. Together with Miguel Lugo, a visiting professor from the University of Caracas, Venezuela, on a 2-year fellowship, they greatly added to the multinational nature of the laboratory. Both returned to warmer climes before Christmas, but have promised to return when it warms up next summer. Frances is looking forward to a reciprocal visit to both European locations.

#### **David Josephy**

The focus of the Josephy laboratory is on chemical mutagens and carcinogens, especially the aromatic amines. These chemical are used industrially and they also occur as natural products in the environment. Potently mutagenic heterocyclic

---

amines are formed by the grilling of protein-rich foods, especially meat and fish. Analytical chemistry approaches are used to investigate the kinds and amounts of these substances present in the environment and in human biofluids, where they may be biomarkers of human health risk. Another area of interest is in the metabolism and bioactivation of carcinogens, especially the development of animal-free experimental systems. Recombinant human enzymes, such as P450 1A2, which metabolize carcinogens and other xenobiotics, are being expressed in bacteria. This work has led us to a detailed study of the structure and function of P450 and other enzyme proteins. Another system which we are investigating is the BigBlue transgenic rodent mutagenicity assay, which allows us to study the genotoxicity of carcinogens in cultured mammalian cells.

#### **Rod Merrill**

The Merrill lab is involved in several projects related to protein structure-function and protein folding, especially as it relates to membrane-targeted toxins, such as the colicins. They are also seeking to elucidate the mechanism of mono-ADP-ribosyltransferases using a combination of molecular biological, biochemical, and biophysical techniques, especially fluorescence spectroscopy. They are currently investigating the mechanism of an enzyme produced by the human pathogen, *Pseudomonas aeruginosa*, known as Exotoxin A (ETA). An NSERC Major Equipment Grant was awarded to Rod this past spring for a Fluorescence Lifetime Fluorimeter, which Rod's research group is now putting to good use. One of Rod's graduate students, Susan Yates, received a Canadian Cystic Fibrosis Ph.D. Studentship in April 2002 to work on a CCFP project to characterize competitive inhibitors of *Pseudomonas aeruginosa* exotoxin A.

**Dev Mangroo's** research projects include identification and characterization of novel proteins involved in nucleocytoplasmic export of RNA in *Saccharomyces cerevisiae*, as well as translational control of gene expression in eukaryotes and bacterial protein initiation. Dev is currently on

sabbatical leave, and has been spending time in the labs of various collaborators in the US and Canada. **Bob Keates** is continuing his very productive collaboration with Dev, involving prediction of the protein domain organization, structure and folding from amino acid sequences. His insights are allowing members of the Mangroo lab to test various hypotheses by site-directed mutagenesis.

**Fred Brauer's** group is using nuclear magnetic resonance (NMR) imaging and spectroscopy to elucidate the mechanisms of altered energy metabolism in the livers of intact, living animals non-invasively. NMR imaging can provide information, in spectacular detail, about the anatomy of an organ within the body. Localized *in vivo* NMR spectroscopy can, at the same time, provide valuable biochemical information from any defined region determined from the NMR image. These techniques are used to study the effects of classical hepatotoxicants such as bromobenzene, the halocarbons, and chronic ethanol administration on rat liver. They are also investigating how these toxic compounds alter hepatic water, lipid and electrolyte distribution, bioenergetic status, and the liver's ability to metabolize test compounds. High resolution multinuclear one- and two-dimensional NMR spectroscopy of *in vitro* tissue extracts are used to complement the *in vivo* studies, and as an independent analytical technique.

---

## **University of Guelph**

### **Department of Molecular Biology and Genetics**

*Correspondent: David Evans*

The last eighteen months have been busy in the Department of Molecular Biology and Genetics.

Four new faculty have joined us: **Joe Colasanti** (plant molecular biology), **Dick Mosser** (heat shock), **Andrew Bendall** (developmental biolo-

---

gy) and Ray Lu (herpes virus) and all have succeeded in attracting funding from the Federal granting councils. Dick, Andrew, and Ray are also to be congratulated for their recent success with a CFI application. The new microscopes they will be purchasing will significantly improve the advanced imaging capabilities in the department. MBG also welcomed Steven Rothstein back to the department. Steven left the University in 1998 to take up a posting at Pioneer-Hybrid in Iowa. Upon his return to Guelph he was appointed a University Research Chair in plant molecular biology.

In the last year we also noted the retirement of Dr. Stan Blecher. A long-time member of our Faculty and co-founder of the biotechnology company Gensel, Stan is a medical geneticist and one-time Director of Guelph's Human Biology program.

On the teaching front the Department was recently awarded funding from Agilent under their Colleges and Universities Grant program. The first award of its kind in Canada, the funds have permitted the purchase of several advanced pieces of instrumentation including a capillary electrophoresis system and LC-Mass spectrometer. This equipment will dramatically improve the quality of our advanced undergraduate instruction as well as meet many of the separation and analytical needs of our researchers.

The department has also been working to bring into full operation DNA chip fabrication facilities and a MALDI-TOF mass spectrometer funded with the assistance of the CFI and the Ontario Research and Development Challenge Fund. Two new research technicians have been hired to operate these facilities, Ms. M. Howes and Dr. D. Brewer, and as a result of their capable management both operations are now fully functional. Readers interested in accessing these services are invited to contact this correspondent at [dhevans@uoguelph.ca](mailto:dhevans@uoguelph.ca).

---

## University of Lethbridge

### Departments of Biological Sciences, and Chemistry and Biochemistry

*Correspondent: Marc R. Roussel*

At the University of Lethbridge, research in biochemistry and cell and molecular biology is spread over two departments, namely Biological Sciences and Chemistry and Biochemistry. The two departments have a close working relationship. Among other things, this benefits our graduate students who often have substantial interactions with faculty members in both Departments.

Good things happening in one department are often cause for rejoicing in both. We were thus doubly pleased to celebrate the appointments of our colleagues Stewart Rood (Biological Sciences) and Randall Weselake (Chemistry and Biochemistry) to University of Lethbridge Board of Governors Research Chairs last year. These Chairs provide Randall and Stewart with reduced teaching loads to enable them to focus more of their attention on their highly successful research programs.

Stewart's work on gibberellins is probably known to many readers of the Bulletin. Stewart's recent work in this area has focused on the involvement of gibberellins in the control of shoot dormancy. Stewart also has an active research program on the ecophysiology of river valley cottonwoods, with particular emphasis on the effect of the water table both on individual trees and on cottonwood populations. The multidisciplinary approach which Stewart takes to these complementary research areas creates a vibrant training environment in his lab to which students are strongly drawn, with good reason.

Randall's research, which is again probably not unknown to many readers of the Bulletin, focuses on triacylglycerol biosynthesis in oilseeds and in cattle. On the plant science side of his operation, Randall has been focusing on oil formation in canola and flax seeds. He is interested in increasing seed oil content and in modifying the fatty acid composition of oil by altering the expression and properties of key enzymes in the oil formation pathway. He is also investigating the effect of environmental stresses, such as low temperatures and drought, on oil formation in developing seeds. In his research with cattle, Randall has spent a number of years investigating intramuscular fat deposition in an effort to develop predictors of the marbling trait which is an important determinant of flavor. In recently initiated research, he has also been studying aspects of milk fat production. This extraordinarily active research program has attracted more than £300 000 in funding in the current year alone from the Alberta Agricultural Research Institute, the Alberta Crop Industry Development Fund, the Dairy Farmers of Canada, the Flax Council of Canada, Genome Prairie and NSERC. Randall believes in a multidisciplinary approach and has a number of collaborations both locally, notably at the Agriculture and Agri-Food Canada Lethbridge Research Centre, and within the broader research community across Canada and around the world. These collaborations create opportunities for students to travel and to experience first-hand the research culture of other regions of the world.

We have hired a number of talented scientists in both Departments in recent years. All have received operating grants from NSERC, and there have been a number of successful equipment grant applications as well. In addition, **Igor Kovalchuk** received an Alberta Ingenuity Establishment Grant of \$230 000 in April for his research on pathogen-induced plant genome instability. Igor used some of this money to purchase a plant growth chamber and a gel imaging system. The rest will pay for a postdoc and for

some students. Igor joined the Department of Biological Sciences in 2001.

**Steven Mosimann's** macromolecular X-ray diffraction system became operational this year. This is a \$500,000 Bruker-Nonius instrument which was funded by the Alberta Heritage Foundation for Medical Research and by the Canada Foundation for Innovation New Opportunities Fund. The installed system includes a 6 kW rotating anode X-ray generator with confocal Osmic optics, an Oxford Cryostream cooler, a 4-circle goniostat, and a CCD detector built around a 135 mm actively cooled chip. Steven's group is using this equipment to investigate the structure and function of RNA processing enzymes. Steven has been with the Department of Chemistry and Biochemistry since the Fall of 2000.



Stewart Rood



Randall Weselake



Igor Kovalchuk



Steven Mosimann

---

## University of Manitoba

### Department of Biochemistry and Medical Genetics

*Correspondent: Spencer Gibson*

**Dr. Jane Evans**, Head, has accepted the Chair of the Manitoba Health Research Council.

**Patrick Frosk**, graduate student of **Dr. Klaus Wrogemann** (Professor) discovered the gene for limb girdle muscular dystrophy type 2H (LGMD2H). This muscular dystrophy is common in the Hutterite population. The gene, TRIM32, has the structure of an E3-ubiquitin ligase. Patrick also discovered a second gene for LGMD in Hutterites, the FKR1 gene, causative for LGMD2I. Klaus was invited to speak of these findings at the ENMC workshop on limb girdle muscular dystrophies in Naarden Holland, at the Xth International Congress on Neuromuscular Disease in Vancouver and at the 7th International Congress of the World Muscle Society. Patrick also was selected to give a platform presentation at the Congress in Vancouver in July of this year.

**Dr. Jim Davie**, Professor and Director of the Manitoba Institute of Cell Biology, has received funding from CFI to establish the Manitoba Breast Cancer Research Centre to be housed on the 6<sup>th</sup> floor of the CancerCare Manitoba building. The mandate of the Centre is to identify biomarkers in the early detection of breast cancer. State of the art platforms in advanced cytogenetics, gene profiling, proteomics and functional genomics will be featured in the Centre. Pivotal to this endeavor is the Manitoba Breast tumor bank, established and operated by **Dr. Peter Watson**, which will be housed in the Centre. Dr. Davie received invitations at NIH and at the DFG sponsored meeting called "Growth Factors, Tissue Repair, and Cancer", Cadenabbia, Lake Como, Italy to present his research on the role of signal transduction pathways in modifying the structure and function of chromatin.

**Dr. Davie**, as Editor of Biochemistry and Cell Biology, continues to support the Society's Winternational Symposia. The journal now has electronic submission and review processes in place. The journal welcomes manuscripts and minireviews. The journal would be particularly pleased if members of the Society would cite the timely reviews in members' research areas.

**Dr. Dakshinamurti**, Professor Emeritus, gave a keynote address entitled "Hypertension and Micronutrients" at the 4th Food Data conference of the Food and Agricultural Organization (FAO) at Bratislava, Slovak Republic, August 24, 2001. He was a member of the International Scientific Advisory Board of the triennial 5th International Symposium on Vitamin B6, Carbonyl Catalysis and Quinoproteins organized under the aegis of the International Union of Biochemistry and Molecular Biology at University of Southampton, U.K. (April 14-19, 2002). He gave an invited talk entitled "Neuroprotection by pyridoxine" and also chaired a Session at this Conference. He was invited by the Russian Academy of Sciences to give a Commemorative Address celebrating the 100th Birth Anniversary of the noted Russian Biochemist Akademician Alexander Braunstein at the Special Session of the Academy (May 28-31, 2002). His address given on May 30th was entitled "The Pharmacology of Vitamin B6 and Beyond". He has been invited by the Editors of the "Encyclopedia of Molecular Cell Biology and Molecular Medicine" (with an Editorial Board of eight Nobel Laureates) to contribute a review chapter on "Vitamin Receptors" to the 2nd Edition. He was a contributor to the 1st edition of this encyclopedia as well.

**Dr. Spencer Gibson**, Assistant Professor received a grant from the Cancer Research Society to study the role of growth factors in prevention of apoptosis. He presented his work at the 44<sup>th</sup> Annual Meeting of the American Society of Hematology and at the Annual Meeting of the American Society of Cell Biology. Dr. Gibson was also selected to represent Manitoba Medical Researchers in the newly organized Health Researcher Society of Canada that will advocate medical research in Canada.

---

Dr. Sabine Mai, Associate Professor in collaboration with Drs. B. Betty and J. Squire edited and co-authored the first textbook on FISH and molecular imaging (Oxford University Press, 2002). The C.I.H.R. Strategic Training Program Grant entitled “Innovative Technologies in Multidisciplinary Health Research Training” was awarded to Dr. Mai as the principle applicant. The first workshop was held on “Principles of Microcopy and Imaging”. Participants came from France, Germany, Thailand, and Canada and enjoyed the multidisciplinary training atmosphere. Dr. Mai also spent a three month research study leave at the German Cancer Research Centre in Heidelberg, Germany to study proteins that interact with telomeres. Dr. Mai presented her research on c-Myc and genomic instability (“Les nouveaux aspects de l’instabilité génomique induite par c-myc”) at the Congress de la société française d’hématologie, Paris. She presented new imaging tools at the Euroconference on Quantitative Molecular Cytogenetics in Stockholm and presented a workshop on TLS and genomic stability in Vancouver. Finally, she was invited to speak about “Novel aspects of c-Myc dependent genomic instability” at the OCI in Toronto.

Dr. Geoff Hicks, Associate Professor received renewed funding for his Functional Genomics Centre at Manitoba Institute of Cell Biology from C.I.H.R. He was also Chair for the CIHR Institute of Genetics New Principle Investigators Priority and Planning Committee. This committee successfully organized the first New Principle Investigator Meeting held at The Briars Resort and Conference Centre at Jackson’s Point, Ontario. By all accounts it was a successful meeting and will hopefully be repeated in the future. Dr. Hicks has presented his research on TLS regulation of transcriptional activation at the Ewing’s Sarcoma 2nd International Symposium in Dartmouth College, USA and conducted a workshop on large scale sequence-based screens in mouse embryonic stem cells at the 2nd International Gene Trap Workshop, Frankfurt, Germany.

---

## McGill University

### Department of Biochemistry

*Correspondent: David Y. Thomas*

The past year has been a very productive and exciting one for the Biochemistry Department. There have been new recruits, major successes in funding, and an expansion in the number of graduate students.

The Department of Biochemistry of McGill University has 20 faculty members and 21 associate members from other McGill departments and from hospital research institutes. There are major links with McGill Cancer Centre (director **Michel Tremblay**) and the Molecular Oncology group (director **Vincent Giguere**) and most of the members of these groups are also members of the Biochemistry Department. There are also 13 adjunct members of the Department who are located mainly in the biopharmaceutical research industry and research institutes. There are close scientific ties with new Montréal Genomics (director **Tom Hudson**) and Proteomics (director **John Bergeron**) building and with the McGill Centre for Bioinformatics (director **Michael Hallett**). There are presently 35 post-doctoral fellows and 142 graduate students in the Department, and operating grant funding is approximately \$7.5M dollars per year. The Department has 350 undergraduate students who may enroll in the faculty, major or honors programmes.

Research in the Biochemistry Department covers a wide variety of areas in which specialized training for graduate degrees may be obtained. The Department is well equipped, and with the planned expansion. Major areas are Molecular and Cell Biology, Proteomics and Genomics, Chemical Biology, Cancer, Regulation of Gene Expression and Translation, Neurobiology, Lipid Biology, Enzymology, the Function of Membrane Proteins, and Structural Biology. Montréal has a dynamic and highly interactive

---

life sciences research community and a large number of biopharmaceutical companies. Montréal is a unique city combining North America with European cultures to generate an unmatched lifestyle and with its 5 universities has a large student community.

The Biochemistry Department plans to expand its capabilities in Structural Biology, Chemical Biology and Genetics.

Prospective recruits, post-doctoral fellows and graduate students should see our website for details <http://www.medicine.mcgill.ca/biochem/>

### **Kudos**

We wish to share some of the achievements of our colleagues.

**Dr. Rose Johnstone**, a former Chair of the Biochemistry Department and now Professor Emerita, has prepared a fascinating history of the early years of the Biochemistry Department, with many interesting facts and insights into the development of Biochemistry at McGill University in Canada. She was recently persuaded to present a lecture to the James McGill Society and will publish this history soon.

The Biochemistry Department held its very successful research day in May organized, by the Department Associate Chair **Peter Braun** and the graduate students. The keynote lecturer was Lee Hood from the Institute for Systems Biology in Seattle. Pictures of the event are on our website.

**Philip Branton** a former Chair of the department who is the Director of the Cancer Institute of the **Canadian Institutes of Health Research**, has been elected Fellow of the Royal Society of Canada.

**Morag Park**, **Nicole Beauchemin**, and **Michel Tremblay** were all made full professors.

**Albert Berghuis**, **Imed Gallouzi**, **William Muller**, and **David Thomas** were all awarded Canada Research Chairs, together with the associated Canadian Foundation for Innovation awards.

**Philippe Gros** was appointed as a Distinguished Investigator of the CIHR.

**Jerry Pelletier** and **Morag Park** were appointed as Senior Investigators of the CIHR.

**Anne-Claude Gingras**, a graduate student from the Sonenberg laboratory, recently graduated, and was awarded the Governor General's Gold Medal and the award of les Grandes Montrealaises. She is now in the laboratory of Ruedi Aebersold at the Institute for Systems Biology in Seattle.

**Nahum Sonenberg** was made a James McGill professor, a Distinguished Investigator of the CIHR, a Howard Hughes International Fellow, and has also been awarded the Robert L. Noble prize of the National Cancer Institute of Canada for his achievements in determining the mechanism of the initiation of protein translation and its control.

### **Recent Developments**

New colleagues in the Department are

**William Muller** joined the Molecular Oncology Group at the MUHC and is a full member of the Department. Bill is a former McGill graduate student welcomed back to Montréal by old friends and new. William and his mice come to us from McMaster University.

**Arnim Pause**, a former graduate student from many years ago, joined the Cancer Centre and Biochemistry Department after a post-doc with Rick Klausner, a post at the Max-Planck at Martinsreid Munchen, and a stint as the group leader at Boehringer Ingelheim.

**Imed Gallouzi** joined us from the laboratory of Joan Steitz at Yale. He has a CRC chair and was also awarded a FRSQ chercheur-boursier.

**Karine Auclair** is a new associate member of the Biochemistry Department with a primary appointment in Chemistry. She joins us from post-doctoral training at Stanford and has research interests in chemical biology.

---

**Michael Hallett** is a new associate member of the Biochemistry Department with a primary appointment in Computer Science. He was trained at the University of Waterloo and at the ETH Zurich. He has research interests in Bioinformatics and is acting director of the McGill Bioinformatics Centre.

New adjunct professors are **Enrico Purisima** of the National Research Council of Canada, who has interests in macromolecular structure modeling, and **Prabhat Arya**, also of the NRC, who is a leading chemist who is interested in combinatorial methods and is collaborating with several members of the Department.

In addition to the continued success in operating grants and salary awards competitions, there were also successes in renewing our infrastructure and research capabilities.

**Dr. Kalle Gehring** led two successful applications to the Fonds de la recherche en santé du Québec (FRSQ) and the Canadian Foundation for Innovation (CFI); the first application together with colleagues at the Université de Montréal for a 600 MHz and 700 MHz NMR machines, and the second together with colleagues at the University of Ottawa, Université de Montréal, Sherbrooke, Laval and Dalhousie Universities for an 800 MHz NMR installation to serve Eastern Canada. This latter instrument will be installed in the old Paprican building on the McGill campus, which is presently undergoing extensive renovations.

A successful application to the FRSQ and CFI for establishing the McGill University Life Sciences Complex was led by **David Y. Thomas**. This was a joint application with the Faculty of Medicine, the Faculty of Science and the McGill University Health Sciences Complex, and together with a generous gift from Dr. Francesco Bellini, the new Bellini Life Sciences Building (BLSB) will join the venerable McIntyre Medical Sciences and Stewart Biology buildings to form the McGill University Life Sciences Complex. The new BLSB will house about 50 principal investigators and over 500

staff. There will be thematic research pursued by researchers from the participating departments in the areas of chemical genetics, cancer, the genetics of complex traits, and cell information transfer systems. The BLSB will also house an extensive mouse transgenic facility, chip fabrication facilities, and high throughput screening laboratories. The BLSB planning is overseen by the steering committee of **Michel Tremblay** (Cancer Centre & Biochemistry), **Paul Lasko** (Biology), **Alvin Shrier** (Physiology), **Hans Zingg** (MUHC) and **David Thomas**, and completion is planned for 2004.

The Biochemistry Department collaborated with the Département de Chimie and Département de Biochimie at the Université de Montréal in an application led by William Lubell to the Valorisation-Recherche Québec (VRQ) for the Québec Combinatorial Chemistry Consortium. This has enabled the director **Jerry Pelletier** to expand our chemical libraries and set up our screening facility which is now in cramped operational quarters.

The Biochemistry Department led an application to the CIHR for a Strategic Training Programme in Chemical Biology. The objective of this programme is to produce graduate students who pursue focussed research projects in chemical biology while receiving training in the broader set of disciplines needed to study the interaction of small molecules with proteins. Mentors for this programme are in the Departments of Biochemistry, Chemistry, and Pharmacology and the Director of the programme is **John Silvius**.

Finally, last but not least, **Albert Berghuis** is directing the approval of the McGill Structural Biology Centre through its initial development and approval.

We hope that during the 2003 **International Congress of Biochemistry and Molecular Biology (IUBMB)** to be held July 20-24, 2003 in Toronto, Ontario, that many former colleagues will take the opportunity to visit Montréal and the Department.

---

## Memorial University of Newfoundland

### Biochemistry, Molecular and Cellular Biology

*Correspondent: Dr. Sean Brosnan*

The past year has been one of new hirings and some departures.

The Biochemistry Department saw the arrival of three new faculty members. Two of these (**Rob Bertolo and Janet Brunton**), who came from the University of Alberta, work in the area of Nutritional Biochemistry, which has long been a strength of the department. Rob joins us as a Canada Research Chair in Human Nutrition. Both Rob and Janet use the piglet as a model for the human neonate for their work on amino acid metabolism. **Kaushik Nag** has joined us from the University of Western Ontario, as a CIHR New Investigator. Kaushik works on the physical biochemistry of membrane lipids and lung surfactant. A fourth faculty member (**Ross McGowan**) will arrive this July from the University of Manitoba. Ross is a developmental biologist who uses zebra fish to study DNA methylation and gene imprinting. **Bill Driedzic**, formerly director of Memorial's Ocean Sciences Centre and head of the NCE in Aquaculture, has been awarded a Canada Research Chair in Marine Biochemistry, which he will hold, jointly, in the Ocean Sciences Centre and in the Department of Biochemistry.

In addition to these new arrivals, some of the old hands have also been busy. **Sean Brosnan** was appointed Chair of the Advisory Board for CIHR's Institute for Nutrition, Metabolism and Diabetes as well as a CIHR Senior Investigator. **Sukhinder Kaur** (hardly an old hand) was appointed a CIHR New Investigator. **Margaret Brosnan**, **Gene Herzberg** and **David Heeley** serve on CIHR grants committees. **James Friel** left us to become the Chair of the Department of Nutrition at the University of Manitoba. **Garth Fletcher**

(who, together with **Choy Hew**, discovered arctic antifreeze proteins at Memorial) retired. Happily, he continues his activity via AFP, the Biotech company that exploits this protein.

The Division of Basic Medical Sciences has also attracted new faculty. **Bob Gendron** and **Helene Paradis**, who work on angiogenesis and developmental biology, have been recruited from the University of Cincinnati. **Jules Dore** has arrived from the Mayo Clinic to work on TGF-beta signalling. **Mishuru Hirosawa** and **Ken Hirosawa** will soon arrive from the University of Calgary to work, respectively, on neurobiology and rhea viruses.

On the Biotech front, Newfound Genomics opened its new laboratories. Newfound's scientific director, **Proton Rahman**, will exploit the genetic resource provided by the Newfoundland founder population to search for genes and polymorphisms associated with complex diseases such as obesity, Type 2 diabetes and arthritis.

---

## Université de Montréal

### Département de Biochimie

*Correspondent: Jurgen Sygusch*

In 2001, our department introduced the first undergraduate program in Bioinformatics, which was followed up by a M.Sc./Ph.D. program commencing in September 2002. By Fall of 2003, we also hope to have in place a professional Masters' program in Biochemistry. This program is intended to respond to the high demand for M.Sc. graduates by the biotechnology and pharmaceutical sector in Montreal. In addition to the theoretical courses, special emphasis will be placed on developing instrumentation and entrepreneurial skills.

Over the course of the last three years, the department has seen an infusion of young researchers with the arrivals of **Pascal Chartrand**, **Mounib Elchebly**, **Gerardo Ferbeyre**, **Nikolaus Heveker**

---

and **Alain Moreau**. **Hervac Philippe**, who obtained a Canada Research Chair in Bioinformatics and Genomic Evolution, was our latest addition as associate professor. **Sylvie Mader**, also associate professor, was recently awarded a CIBC Research Chair in Breast Cancer. Another Canada Research Chair in Integrative Genomics went to associate professor **Stephen Michnick** while **Michel Bouvier**, our chair, obtained a Canada Research Chair in Molecular and Cellular Pharmacology.

Faculty size in the department increased during this period with only two retirements: **Margaret Mamet** leaving in 2000 and **Rejean Morais** in 2001. The continuing pressure on additional laboratory space by our department is starting to bear fruit, and the department has been able to expand by 25% in recent years. However we still covet broom closets as potential lab space. The department is particularly pleased with its high performance in the university survey of per capita research funds obtained.

---

## Queen's University

### Department of Biochemistry

*Correspondent: Albert Clark*

**Dr. Glenville Jones** became Head of the Department of Biochemistry on July 1<sup>st</sup>, 2002, replacing **Albert Clark**, who had been in the position for 7 years (2 years as Acting Head plus a 5 year term). **Dr. Jones** has been a member of the Department since 1984. He has been a major world player in the field of vitamin D metabolism research. He is a member of the CIHR Institute of Nutrition, Metabolism and Diabetes Advisory Board. **Dr. Clark** remains in the Department as an active teacher and Coordinator of Graduate Studies.

Recent faculty changes include the appointments in 2001 of **Dr. Stephen Smith**, and in 2002 of **Dr. Andrew Craig** as Assistant

Professors. **Dr. Smith** is a graduate of the University of Western Ontario, Department of Biochemistry following which he undertook post-doctoral studies at Oxford University in England. He brings protein NMR spectroscopy expertise to the Department. **Dr. Craig** is a graduate of the McGill University Department of Biochemistry. He then pursued post-doctoral work with **Dr. Peter Greer** in the Cancer Research Laboratories at Queen's University. He brings cell biology expertise to the department.

Two new Adjunct Assistant Professors have been appointed - **Dr. David Hyndman**, who supervises the Protein Function Discovery equipment facility and **Dr. Sonoko Masuda**, who is a Research Associate with **Dr. Jones**.

**Dr. Geoff Flynn**, a former Head of the Department, retired in June 2002 after 33 years in the Department, but is still seen regularly. He is CEO of **Cardiomics**, a venture capital supported company developing therapeutic and diagnostic products for cardiovascular disease. **Dr. Eileen Walters**, an Associate Adjunct Professor, also retired after 33 years in the Department. **Dr. Walters** had coordinated and supervised the teaching laboratories, coordinated the Coop stream and taught the Biochemistry course for nursing students.

**Dr. Alan Mak** is Director of the recently formed Protein Function Discovery Group, a multi-disciplinary group crossing departmental and faculty boundaries, formed in relationship to installation of new equipment funded through the Canadian Foundation of Innovation and Ontario Innovation Technology funds in the amount of \$9 million. The new equipment includes a 600 MHz NMR spectrometer, a mass spectrometer, and various other items which will be used for protein function discovery research. The departmental shared equipment was also updated significantly as the result of a successful CIHR multi-user equipment application.

Two successful CIHR training program applications will have an impact on the

---

Biochemistry Department graduate program - training programs are being initiated in Protein Function Discovery and in Cancer. A new stream has been initiated in the Honours undergraduate program - a major program which has less emphasis on laboratory work in fourth year and is primarily designed for those who don't plan to undertake graduate work. This adds to the Subject of Specialization stream which emphasizes laboratory based research and the Coop stream.

---

## University of Saskatchewan

### Department of Biochemistry

*Correspondent: Suzanne Laferté*

The Department of Biochemistry extends a warm welcome to five new faculty members.

**Dr. Kathy Hamilton**, a biochemist and nuclear magnetic resonance spectroscopist, is currently undertaking studies aimed at understanding the mechanistic details of protein ubiquitination, an important post-translational modification implicated in the regulation of many cellular processes, including cell cycle control and tumorigenesis.

**Dr. Hong Wang's** research focuses on the molecular and biochemical mechanisms of cell cycle regulation in plants, with a current focus on a family of plant cyclin-dependent kinase inhibitors. He is also interested in elucidating the differences in cell cycle regulation between plants and animals as well as understanding the relationship between the cell cycle and other plant developmental processes.

**Dr. Ron Geyer** will focus his research efforts on developing novel approaches and tools for analyzing signal transduction pathways. More specifically, he will use peptide-based reagents (peptide aptamers) to analyze the activities and interactions of proteins.

**Dr. Yu Luo's** research program is aimed at studying signal transduction in the bacterial SOS response to DNA damage. Using molecular and structural approaches, including x-ray crystallography, Dr. Luo hopes to shed light on the molecular mechanisms underlying the bacterial SOS pathway and provide rational targets for designing antimicrobial compounds.

**Dr. Stan Moore's** research program will map out interactions between components of the flagellar export pathway of the bacterium *Helicobacter pylori* by X-ray crystallography. In light of the importance of *Helicobacter pylori* in gastric disease, this research will provide pioneering insights about the function of the multicomponent protein export machine in bacteria as well as provide crucial information for the development of novel anti-bacterial agents.

The Department congratulates all of our new members for their success in the recent HSURC (Health Services Utilization Research Commission) grant competition. Each faculty received a two-year grant of \$40,000 per annum with an additional \$30,000 for equipment. In addition, Drs. Geyer and Wang have received \$465,000 and \$150,000, respectively, from the Canadian Foundation for Innovation.

---

## Université de Sherbrooke

### Département de Biochimie

*Correspondent : Marcel Bastin*

Récemment, le Département de biochimie a recruté deux nouveaux professeurs. Le docteur **Simon Labbé** s'intéresse à l'identification et à la caractérisation moléculaire de composantes qui contrôlent l'entrée d'ions métalliques comme le cuivre et le fer. Le docteur **Martin Bisailon** étudie le mécanisme moléculaire des protéines impliquées dans la synthèse de la coiffe des ARN messagers.

---

# University of Toronto

## Department of Biochemistry

*Correspondent: David Williams*

### Faculty News

We are very pleased to announce that **Reinhart Reithmeier** commenced a 5 year term as Chair of the Department beginning July 1, 2002. Reinhart previously held his primary appointment in the Department of Medicine and is a member of the CIHR Group in Membrane Biology. He takes over from **Peter Lewis**, who led the Department since 1991, and **David Isenman**, who served as Acting Chair from January - June 2002.



Reinhart Reithmeier

**Peter Lewis** continues to assume a leadership role within the University as Vice Dean of Research in the Faculty of Medicine, a position he assumed July 1, 2002.

**Bibudhendra (Amu) Sarkar**, who led the Division of Structural Biology and Biochemistry at the Research Institute of the Hospital for Sick Children for the past 12 years, has announced that he is stepping down as Head as of December 31, 2002. **Lynne Howell** has been appointed as



Peter Lewis

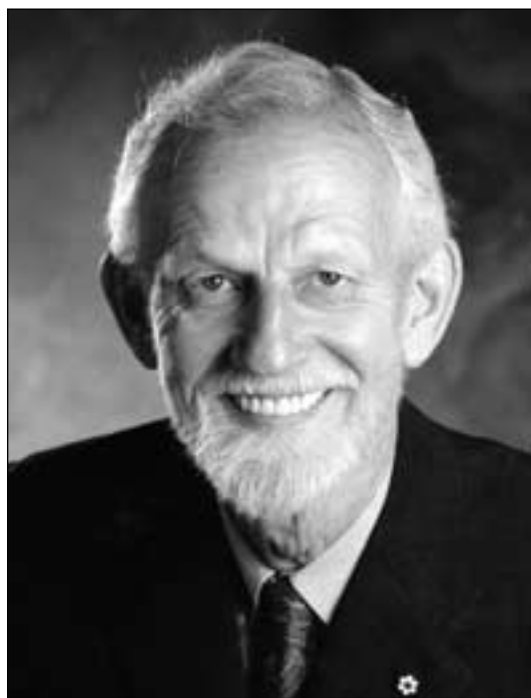
Interim Head. **Hugh Lawford** retired from the Department this year and we all wish Hugh the best for the future. **Theo Hofmann** continues to enjoy an active retirement, dividing his time between his two passions: in the lab studying aspartyl proteinases, and in the field, birding. He is currently Regional Coordinator in the collection and processing of data for an Atlas of the Breeding Birds of Ontario.

**David Williams** became Graduate Coordinator for a three year term beginning Nov. 1, 2001. He succeeds Jacqueline Segall, who did a terrific job in this position from 1999-2001.

On November 5<sup>th</sup>, 2001, the Department lost a longtime colleague and friend in Dr. Dorothy (Dorrie) Johnson. Dorrie was a Lecturer from 1972-1976, during which time she was very active in running our advanced laboratory course for biochemistry specialists. She was subsequently a Research Associate at the Hospital for Sick Children, and maintained her interests in science well beyond retirement. She was an enthusiastic participant at the CSMBCB Winternational meeting at Mont Ste. Anne in 2001 at the age of 79! We all fondly remember Dorrie's warm nature and good humour.

---

Several faculty were honoured with awards in the 2001-2002 academic year. The Royal Society of Canada recognized the scientific accomplishments of two of our colleagues. **Lewis Kay** received the Flavelle Medal, which is awarded every two years to a Society Fellow for “an outstanding contribution to biological science during the preceding ten years, or for significant additions to a previous outstanding contribution to biological science”. **Sergio Grinstein** was awarded the McLaughlin Medal, which is bestowed annually to recognize “distinguished achievement in medical science in Canada”. We were also pleased to learn that **Emil Pai** and **David Clarke** were named as Tier 1 Canada Research Chairs this year. **Amira Klip** was honoured with the University of Toronto Dales Award, which is awarded to “a U. of T. investigator of outstanding calibre whose research has had a substantive impact in the areas of basic or clinical sciences or community health”. A Premier’s Research Excellence award went to **Gil Privé**, and **Emil Pai** was a joint awardee of a CFI-International Joint Venture grant.



David MacLennan

Our congratulations also go to **Chris Hogue**, who was named by the Globe and Mail as one of this year’s “Top 40 Under 40”. Selection is based on the criteria of “vision and leadership, innovation and achievement, community involvement, impact, and strategy for growth”.

#### Events

A symposium organized by Reinhart Reithmeier was held to honour **David MacLennan’s** lifelong scientific contributions, as well as his role as mentor to many young scientists who continue his tradition of excellence in research. Attendees, including MacLennan alumni from around the world, gathered on October 3-4, 2002 to pay tribute to David’s many accomplishments. David also was honoured this year by being named an Officer of the Order of Canada. Our congratulations go to David on this exceptional achievement.

#### Appointments

We are pleased to welcome **Avi Chakrabartty**, a Scientist at the Ontario Cancer Institute and Assistant Professor in the Department of Medical Biophysics, who was cross-appointed to the Department of Biochemistry. Avi’s research is in the area of protein folding and design, with particular emphasis on amyloid fibril formation and the design of polypeptide mimics of helical cytokines.

We are also happy to announce that **Gil Privé**, also a Scientist at the Ontario Cancer Institute and Associate Professor in Medical Biophysics, has accepted a cross-appointment in the Department of Biochemistry. As a crystallographer interested in protein-lipid interactions, Gil is pursuing the structures of membrane proteins and exploring the use of lipopeptides as detergents.

**Professors Lilianna Attisano, Annelise Jorgensen and Vitauts (Vic) Kalnins**, formerly of the Department of Anatomy and Cell Biology, have accepted primary appointments within the Department of Biochemistry. Lilianna’s lab studies molecular mechanisms underlying TGF $\beta$  superfamily signalling using biochemical and molecular genetic approaches. Annelise is inter-

ested in the structure, function, and biogenesis of calcium-storage-release sites of the sarcoplasmic reticulum in adult and developing cardiac and skeletal muscle cells. Vic's interests lie in the organization and function of different components of the cytoskeleton and the centrosome. We are delighted to welcome them all to the Department.

Our congratulations to Hue Sun Chan, who received tenure, and to Lynne Howell and Julie Forman-Kay, who were promoted to the rank of Full Professor.

### Graduate Studies

The Department held its annual graduate student poster day on May 31, 2002. The poster day took place in conjunction with the annual Theo Hofmann Lecture which was presented this year by Dr. Nahum Sonenberg of the Department of Biochemistry, McGill University. Dr. Sonenberg's lecture was entitled: "Signalling to the Translational Machinery".

As usual the judging was difficult but with Dr. Sonenberg's help the following winners (who receive cash awards) were chosen:

Winners in the Ph.D. category were: **FIRST, Arianna Rath** (Davidson lab): "*In vitro* analysis of Abp1p SH3 domain substitutions that alter peptide binding specificity"; **SECOND, Tony Mittermaier** (Kay and Forman-Kay labs): "Studying excited states of proteins by NMR spectroscopy"; **THIRD, Roberto Botelho** (Grinstein lab): "Diacylglycerol-dependent Ras stimulation during Fcγ receptor-mediated phagocytosis".

Winners in the M.Sc. category were: **FIRST, Urszula Wojtyra** (Houry lab): "One piece of the puzzle: Role of the zinc binding domain of chaperone ClpX"; **SECOND, Jennifer Marles** (Davidson lab): "Significance of ligand binding specificity of the SH3 domain for HOG pathway function"; **THIRD, Linh Van** (Siu lab): "Exploring the mechanism of neurite outgrowth from L1-v3 interaction".

### Additional Graduate Awards:

The winner of the Beckman Paper of the Year



John Wang with judges Grant Brown and Nahum Sonenberg

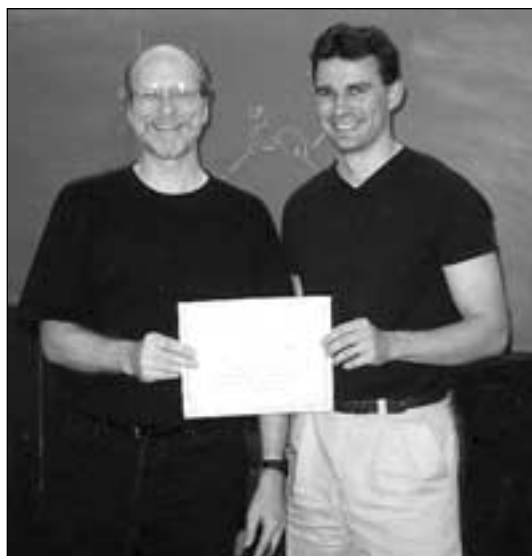
Award for 2001 was **Christopher Lemke** (Howell lab) for his paper entitled "The 1.6 Å crystal structure of *E. coli* argininosuccinate synthetase suggests a conformational change during catalysis" published in *Structure* (2001) 9(12):1153.

The annual David Scott prize for outstanding all-round graduate student was shared this year by **Paul Yip** and **Tony Harris** (both members of the Siu lab).

Congratulations to all winners for their achievements.



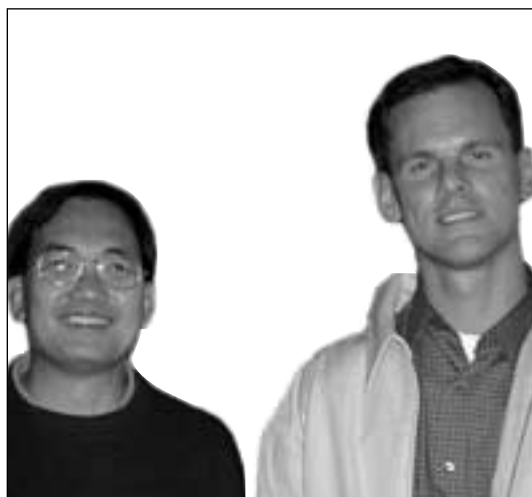
Happy winners from left: Urszula Wojtyra, Tony Mittermaier, Jennifer Marles, Chris Lemke, Arianna Rath, (David Isenman), Linh Van & Roberto Botelho



Beckman Paper of the Year winner Chris Lemke with Grad. Coordinator David Williams



Paul Yip with supervisor Chi-Hung Siu



Tony Harris with supervisor Chi-Hung

---

## University of Waterloo

### Department of Chemistry

*Correspondent: John Honek*

Gary Dmitrienko's research group is involved in the design, synthesis and enzymology of inhibitors of bacterial zinc-dependent beta-lactamases as well as the development of new structural classes of HIV-1 reverse transcriptase inhibitors. A new NSERC Strategic grant involving collaborations with A.M. Berghuis at McGill and Crompton Chemical Ltd. in Guelph has been awarded to Gary for discovery of highly specific antifungal agents for plant pathogenic fungi, targeting lysine biosynthesis in fungi. A new NSERC CHRP grant involving collaborations with A.J. Clarke at U. of Guelph and T. Viswanatha at UW and MethylGene Inc. has also been awarded to Gary for strategies to combat bacterial resistance to beta-lactam antibiotics.

Guy Guillemette's research group investigates the structure-function and mechanism of metalloproteins including nitric oxide synthases, calmodulin and aldolases. John Honek's group is involved in the area of mechanistic enzymology of metalloenzymes as well as the structure-function of enzymes involved in methionine biochemistry. He has been appointed to the editorial board of *Letters in Drug Design and Discovery* (Bentham Press) this year and is currently an associate editor of *Biochemistry and Cell Biology* (NRC). Elizabeth Meiering's group is conducting research on the folding, structure, function and dynamics of medically and biologically important proteins. Susan Mikkelsen is interested in biosensors and bioassays. Her group invented the world's first voltammetric sensor for DNA sequence detection, and is now actively developing a new electrochemical antibiotic susceptibility assay for microorganisms; technology available includes screen-printing for disposable sensor design and atomic force microscopy for surface characterization. Michael Palmer's research is focused on the study of novel pore-forming toxins from pathogenic bacteria, and on protein-choles-

terol interactions. Biochemical research in Scott Taylor's group involves the design, synthesis and evaluation of enzyme inhibitors, enzyme mechanisms and the generation of catalytic antibodies (abzymes). The inhibitors are being examined as potential leads for the treatment of diabetes, breast cancer as well as other forms of cancer. Collaborators on enzyme inhibitor projects include Dr. Debasish Ghosh, a crystallographer at the Hauptmann-Woodward Medical Research Institute in Buffalo, Dr. Stephen Bearne at Dalhousie Medical School and Merck-Frosst Canada. His CHIR-funded research on catalytic antibodies involves using abzymes to activate anti-cancer prodrugs. The Chemistry department has completed setting up a new 600 MHz NMR spectrometer and a MicroMass Q-TOF Global ESMS/MALDI mass spectrometer. Radek Laufer completed his Ph.D. degree and is now a senior research scientist with OSI Pharmaceuticals in Long Island NY. Jennifer Steere completed her M.Sc. degree and is now a research scientist at Xerox (Canada). Hanna Wong completed her M.Sc. thesis and is now at the University of Toronto. Justin Wu completed his M.Sc. thesis and is now a research scientist with Brantford Chemicals.

An OGS scholarship was awarded to Heather Montgomery. Pei Hang and Paula Walasek have joined John Honek's lab this year and are involved in studying an rRNA methyltransferase and a metzincin protease respectively. Miriam Heynen (M.Sc. in Biology at UW) has joined the Dmitrienko group as a research associate.

---

## University of Western Ontario

### Department of Biochemistry

*Correspondent: Eric Ball*

Biochemistry at the University of Western Ontario consists of some 60 members and associate members located at the main campus and several research institutes in the city of London,

---

Ontario. The Department was established in 1924, initially focusing on carbohydrate metabolism. Later it became noted for strength in lipids and membranes before a molecular biology section was added. Most recently a focus on physical methods and structural biology has been developed and expansion in the area of human genetics is planned. The Medical Sciences Building on campus, where a major part of the Department is housed, has finally begun renovations forcing many labs to move. A modern, well organized facility is eagerly anticipated, albeit five years down the road.

The Department wished a fond farewell and best of luck to two of our members, **Drs. Marie Fraser** and **George Chaconas**, who have moved west to take up positions at the University of Calgary. We will certainly miss their expertise and fellowship. We were very pleased to welcome **Dr. Fred Dick** as an Assistant professor in connection with our human genetics initiative. **Dr. Dick** did his graduate work at Dartmouth medical school, followed by a postdoctoral stint with **Dr. N. Dyson** working on mutations in pRB

Several faculty have taken sabbatical opportunities. **Dr. Ilona Skerjanc** returned from a short sabbatical spent learning about transgenic approaches to muscle differentiation at the University of Ottawa. **Dr. Chris Grant** is currently on sabbatical pursuing a new interest in medical imaging. **Dr. Gary Shaw** is on a sabbatical sojourn to Australia until the new year.

In the past year both **Drs. Shawn Li** and **Ilona Skerjanc** received a Premier's Research Excellence Award (PREA), the latter in combination with the Foundation for Gene and Cell Therapy. **Dr. Ken Yeung** received a CFI award for New Investigators. **Dr. Gary Shaw** was awarded a Canada Research Chair.

A number of new research initiatives have recently begun in the Department. Thus **Dr. Stan Dunn** has a lead role in setting up the London

Regional Proteomics Centre that will coordinate facilities for both individual analyses and proteomics approaches. **Dr. Rob Hegele** is Director of the London Regional Genomics Centre ([www.lrgc.ca](http://www.lrgc.ca)) that specializes in high throughput genome analysis. The **Dr. Don Rix** Protein Identification Facility is led by **Dr. Gilles Lajoie** and uses mass spectrometry as a major tool ([www.biochem.uwo.ca/wits/bmsl/bmslhome.html](http://www.biochem.uwo.ca/wits/bmsl/bmslhome.html); supported by grants from ORDCE, CFI and Genome Canada). **Dr. Lajoie** is also group leader of the Ontario-wide protein identification facility that has recently received funding from the ORDCE: **Dr. Ken Yeung** is also part of this initiative. **Drs. Gary Shaw** and **Shawn Li** are part of the NMR Structural Proteomics team, while **Drs. Shilton** and **Fraser** are part of the Protein Crystallography for Structural Proteomics application. **Dr. David Litchfield** led a local group of researchers that recently received CFI funding to establish facilities for molecular imaging and dynamics of cell signalling networks.

In undergraduate education, the Department of Biochemistry has played a major role in establishing the new Bachelor of Medical Sciences Program. This program is offered jointly by the Faculty of Medicine and Dentistry and the Faculty of Science. We are offering a 4 year BMSc General degree and BMSc Honors degrees with specialization in six areas, including Biochemistry. A concurrent 5 year honors program in Medical Sciences and Business Administration was just approved by the University Senate. This is a joint program between the Faculty of Medicine and Dentistry and the Ivey School of Business. Departmental chair **Dr. Ted Lo** is the Program Director and **J. Ball** is the Program Counsellor.

---

## York University

### Biology and Chemistry Moving Forward Together

*Correspondent: Logan Donaldson*

I am one of seven new faculty members recruited by the Departments of Biology and Chemistry at York University since January 2000. In this article, I will begin by introducing some of the new faculty members at York University and highlight aspects of our interdisciplinary research and funding activities. Finally, I will summarize some of the very notable achievements of our faculty in the last two years.

In November 2001, I presented a poster on behalf of the York Biotechnology Network at the Ottawa Life Sciences Council BioNorth conference. The York Biotechnology Network is represented by a group of three senior (Drs. **Ronald Pearlman**, **Michael Organ** and **Michael Siu**) and six junior researchers (Drs. **Logan Donaldson**, **Kathi Hudak**, **Philip Johnson**, **Sergey Krylov**, **Sylvie Morin** and **Gary Sweeney**) from the Biology and Chemistry departments. As our interests share a common foundation of molecular biological and biochemical techniques, we have sought to amalgamate our strengths in microscopy, spectroscopy (NMR / MS), high throughput DNA sequencing and combinatorial chemistry into a package that is readily available to on- and off-campus researchers.

The first wave of new recruits began in Summer 2000 with the appointments of Drs. **Sergey Krylov** and **Philip Johnson** to the Department of Chemistry. Dr. Krylov uses a combination of microscopy and capillary electrophoresis called chemical cytometry to interpret biochemical events at a single cell level. Dr. Krylov's research is supported by an NSERC operating grant, a CFI/OIT New Opportunities Award and an Ontario Premier's Research Excellence (PREA) award. Dr. Philip Johnson uses NMR spectroscopy to study the structural biology of RNA

and RNA-protein interactions. His research is funded by an NSERC operating grant. I joined the Department of Biology in Fall 2000. My NSERC funded research explores the biochemistry and structural biology protein-protein interactions involved in signal transduction and gene expression. At the 2002 Canadian Chemical Society meeting, Dr. Johnson and I had the opportunity to describe our research along with a number of junior NMR spectroscopists from Canada at a mini-symposium organized by Dr. Lawrence McIntosh (UBC).

In 2001, Dr. **Kathi Hudak** and Dr. **Gary Sweeney** joined by the Biology Department to support a new Biotechnology initiative. Dr. Hudak is interested in the antiviral properties of a ribonuclease produced by the Pokeweed plant. She is a 2002 NSERC and CFI/OIT recipient. Dr. Sweeney is interested in the molecular and cell biology of insulin resistance and glucose uptake. In addition to a CFI/OIT New Opportunities award, he holds a Canadian Diabetes Foundation Junior Research Fellowship. Following the appointments of Drs. Hudak and Sweeney, Dr. **Patricia Lakin-Thomas** joined to the Biology Department. Dr. Lakin-Thomas is a cell and molecular biologist who studies circadian rhythms in yeast. Her research is currently supported by an NSERC operating and equipment grant.

Since Fall 2002, students enrolled in the third and fourth years of the Honours Biology Program have had the option of selecting a Biotechnology stream of studies. The jewel of this stream is a laboratory course organized by Drs. **Kathi Hudak** and **Gary Sweeney** where students gain hands on experience with yeast two hybrid systems, confocal microscopy, western blot analysis, protein purification, and *in vitro* transcription / translation. Lecture periods concentrate on timely issues related to medical, pharmaceutical and agricultural applications of biotechnology.

Given the growing overlap in the research and academic offerings by the Departments of Biology and Chemistry, we are considering imple-

---

menting a degree program in Biochemistry. As our course offerings continue to evolve, we anticipate the inclusion of bioinformatics, advanced metabolism and structural biology to our combined curriculum.

**Dr. Michael Siu**, the MDS-Sciex Chair in Mass Spectrometry and **Dr. Diethard Bohme**, the Chairman of Chemistry and a recent Tier-1 Canada Research Chair recipient welcome **Dr. Robert Hudgins**, a fellow mass spectrometrists to the Chemistry Department. Dr. Hudgins is a specialist in FT-ICR mass spectroscopy. This technique couples mass spectrometry with a high field magnet to provide unrivaled sensitivity and accuracy. This year, Dr. Siu was a recipient of a 2002 Ontario Cancer Institute Research Grant. As well, Funds from ORDCF and Ontario Genomics Institute support some of his collaborative efforts. Together, the Siu, Bohme and Hudgins laboratories are exploring means to integrate mass spectrometry with structural and biophysical programs at a facility-wide scale.

Many research laboratories on campus benefit from instrumentation housed in the Biomolecular Core Facility. Drawing on support from NSERC, CIHR and the CFI, the Core Facility supports a nucleic acid sequencing service, gel documentation, phosphoimaging, and real time PCR. This facility exists largely through the efforts of **Dr. Ronald Pearlman**. Working in conjunction with the Core Facility is the CFI/OIT funded Biomolecular Expression and Characterization Facility. Hosted by the Donaldson laboratory, this new facility supports fermentation, chromatography, distributed computing and fluorescence spectroscopy. Many research laboratories in the Departments of Biology and Chemistry appreciate the addition of protein-ligand interaction instrumentation (isothermal titration calorimetry and BiaCore) from **Dr. Philip Johnson** and **Dr. Kathi Hudak** in partial fulfillment of their recent CFI/OIT New Opportunities Awards. The cell biologists in the Department of Biology welcome a new confocal microscope obtained through CFI/OIT funding awarded to Dr. Gary Sweeney.

The Department of Biology congratulates **Dr. K. Andrew White**, a molecular virologist, as a 2002 recipient of a Tier-II Canada Research Chair. In addition, Dr. Tara Haas became a CIHR Young Investigator. Five year CIHR operating grants were awarded to **Dr. Ronald Pearlman** and **Dr. Gillian Wu**, our new Dean in the Faculty of Pure and Applied Sciences. National Cancer Institute of Canada operating grants were awarded this year to **Dr. John Heddle** and **Dr. Michael Siu**.

Over the last two years, several researchers in the Department of Biology have received Premier's Research Excellence Awards. Funds from this award (\$100 000 from PREA and a \$50 000 contribution from York University) are designated to support the training of graduate students and postdoctoral fellows. We congratulate **Dr. Imogen Coe**, **Dr. Chun Peng**, **Dr. K. Andrew White**, **Dr. Bridget Stutchbury** and our newest recipient **Dr. John McDermott**. Dr. McDermott's research is an excellent example of the strong relationship between the Departments of Biology and Chemistry. Working with **Dr. Michael Siu** (Chemistry) and **Dr. David Cox** (Biology), he has discovered new phosphorylation sites in the myogenic transcription factor Mef-2 using a combination of tandem affinity tag purification and mass spectrometry.

**Dr. Ronald Pearlman** is the Department's strongest advocate for research in genomics. Currently, his research group is sequencing ESTs from a variety of protists in collaboration with a number of laboratories funded by Genome Atlantic. Dr. Pearlman also lead a proposal with Drs. Donaldson, Siu and Morin which secured a \$1 million gift from the R. Samuel McLaughlin Foundation to establish a Functional Genomics program and recruit a senior level Chair.

The Departments of Biology and Chemistry are moving forward together to further establish York University in molecular biological and biochemical research. We anticipate that this interdepartmental effort will continue to grow in the upcoming years.