
The Incoming President of CSBMCB: Frances J. Sharom



Frances J. Sharom

Frances Sharom was born in Newcastle-upon-Tyne, UK, and lived in several different cities and villages in the north of England over the course of the next 18 years. After completing A levels in Physics, Chemistry and Biology, she emigrated to Canada with her parents and four siblings in 1971. By this time, Frances has already developed a keen interest in chemistry, especially its biological aspects, fuelled in large measure by completion of a Special Level paper in chemistry/biochemistry during her final year of school. Her father took up the position of Chair of the newly formed Department of Computing and Information Science at the University of Guelph.

Frances enrolled in an Honours Chemistry program at the University of Guelph, and graduated with a degree with Distinction in 1975. During the three summers spent at Guelph, she was fortunate to work in the research laboratory of Dr. Allan Colter, then the Chair of the Department, where she carried out kinetic experiments on redox reactions of nicotinamide derivatives with quinones. This experience was extremely positive, and provided an impetus to continue on to graduate research.

During her first year at university Frances met her future husband, who was an M.Sc. student in Environmental Biology, and she and Sharom were married after she completed her B.Sc. degree in 1975. They both moved to the University of Western Ontario to pursue Ph.D. degrees, she in the Department of Biochemistry with Dr. Chris Grant, he at the Agriculture Canada labs on Richmond Street with Dr. Ron Harris. Frances was supported by an MRC Studentship, which actually allowed one to live quite well in those days of low tuition fees! Chris had arrived at Western only 9 months earlier as an Assistant Professor, and Frances was his first graduate student. She greatly appreciated the time and attention that Chris was able to give her in those early years, and fondly remembers the

scientific discussions frequently conducted in his office, and his great sense of humour! Her project involved using spin-labelling to study the biophysical and biochemical behaviour of neutral glycolipids, gangliosides and integral glycoproteins (human erythrocyte glycophorin and Band 3) in reconstituted lipid bilayer systems. The required ESR spectroscopy was actually carried out in the Chemistry department, in the laboratory of Jim Bolton, whose research group she came to know well over the years. These spin label studies were the first of their kind to be carried out on glycosylated membrane components, and led to some unique insights into their behaviour in membranes. Frances defended her thesis in a very pregnant state, and delivered her first child Jeffrey, a week afterwards. She was awarded the Collip Medal at her convocation in June 1978.

Later that summer, Frances and Jeffrey moved to Malaysia to join Sharom, who had returned earlier to a staff scientist position at MARDI (Malaysian Agricultural Research and Development Institute). Despite the offer of a faculty position at the University of Malaya, the difficult political situation in Malaysia made it impossible for Frances to obtain a work permit, and after over a year of frustration, she and Sharom returned to the University of Guelph where they both took up post-doctoral positions. The next year was spent in the laboratory of Alan Mellors, working on the effects of various hydrophobic toxicants on the membrane-bound enzyme 5'-nucleotidase. Frances was chagrined to discover early in that year that her 15 months away from science had made her ineligible for both NSERC and MRC post-doctoral fellowships. No maternity leaves in those days! However, a once-in-a-lifetime opportunity arose during that year; Frances was nominated for, and awarded, an NSERC University Research Fellowship (URF), which provided salary support for a 5-year term as an Assistant Professor. This was the first round of these new fellowships, and things were rushed, to say the least. Frances found out in mid-August 1979 that she was to start as a faculty member in the Department of Chemistry and Biochemistry on Sept 1st!

Things got off to a good start on the research front, with operating funding from both NSERC

and the National Cancer Institute of Canada in place during the first year. Frances was successful in obtaining a regular tenure-track Assistant professor position in the department in 1984, and was promoted to Associate professor with tenure in 1987. On the home front, the arrival of daughter Sofia in February 1983 completed the family picture, and made life considerably more hectic. Sadly, Sharom died in 1991 from a viral infection arising from chemotherapy treatment for a recurring tumour. She and her extended family, both in Canada and Malaysia, still miss his lively spirit and sense of humour. Frances has been a full Professor since 1994, and runs a busy research laboratory, with operating funding from the National Institute of Canada, NSERC and the Cancer Research Society. She has served regularly on Grants Panel G at the National Cancer Institute of Canada since 1993, as well as being a member of external site review teams for both NCIC and MRC, and is currently on the ORDCF Medical Review Panel. From 1991-1994, Frances served a term as Director of the Guelph-Waterloo Centre for Graduate Work in Chemistry and Biochemistry, the jointly run graduate program of the two universities, and the largest of its kind in Canada.

Current research projects in the Sharom laboratory focus in three areas. Frances became interested in the P-glycoprotein multidrug transporter in the late 1980's, after spending a sabbatical leave in the laboratory of Victor Ling at the Ontario Cancer Institute, and starting actively working in this area soon afterwards. Her research group was the first to achieve functional reconstitution of both ATPase activity and drug transport by P-glycoprotein in reconstituted lipid bilayer systems. In 1996, they reported the first fluorescence experiments on purified P-glycoprotein labelled at cysteine residues at the catalytic sites. This spectroscopic approach has proved extremely fruitful, and is continuing to provide many important insights into the interaction of both nucleotides and drug substrates with the transporter, as well as the role of the lipid matrix in these interactions. This work has been generously supported by the National Cancer Institute of Canada. A parallel project, funded by the Cancer Research Society, examines the interaction of P-glycoprotein with linear and cyclic peptides, and is exploring their roles as both substrates for binding and transport by P-glycoprotein, as well as reversers of multidrug resistance. Some of this work is being carried out in collaboration with Balazs Sarkadi's group in Budapest, who have synthesized

some novel non-toxic peptides modulators named reversins. NSERC provides funds for another project on GPI-anchored proteins. Members of the lab are examining the biophysical and biochemical behaviour of GPI-anchored proteins (5'-nucleotidase, Thy-1 and alkaline phosphatase) in reconstituted lipid bilayer systems, and more recently, the association of these proteins with lipid rafts, and their involvement in signal transduction. Frances is also involved in a collaborative project of long-standing with Jim Davis in Physics at Guelph, who is developing magic angle spinning (MAS) NMR techniques for determination of the 3D structure of membrane spanning segments of integral proteins, especially members of the EGF receptor family. Recently, they have started a three-way collaboration with Chris Grant at the University of Western Ontario, with a shared graduate student bridging the gap. Frances is also starting a new project (funded by the NSERC Collaborative Health Program) with Alan Wildeman in Molecular Biology and Genetics at Guelph, on the structure and function of the human papillomavirus E5 protein, and its role in oncogenesis. This protein is believed to mediate its effects through interactions with growth factor receptors, and one of the goals of the project is to develop peptide-based agents to disrupt these interactions.

Faculty at the University of Guelph are highly involved in undergraduate and graduate teaching, and Frances is no exception, typically teaching courses in 3rd year Analytical Biochemistry, 4th year Membrane Biochemistry, and a graduate course in Cell Membranes and Cell Surfaces. In May 1992, Frances was awarded a Special Merit Professorial Teaching Award by the University of Guelph Faculty Association for work on development of new biochemistry laboratories. In June 1993, she was awarded a OCUFA Teaching Award by the Ontario Confederation of University Faculty Associations, and this was followed in October 1993 by a Lieutenant Governor's Award for Teaching Excellence.

Frances is looking forward to serving as your President during the next year, which will undoubtedly prove to be a challenging one! The executive hopes that you will all join in to help us build a strong, vibrant society of biochemists, molecular biologists and cell biologists to carry us forward into the new millennium. In the wake of the impending separation of CSBMCB from CFBS, we will be looking for the membership to strongly support our own annual meeting in May of 2001.