Focus on Faculty #28
Nicole Beauchemin

Dr. Nicole Beauchemin is a McGill University Professor in the Gerald Bronfman Department of Oncology as well as in the Departments of Biochemistry and Medicine, and a member of the Goodman Cancer Research Centre.

I completed my Ph.D. in Biochemistry at the University of Montreal in 1985 and trained as a post-doctoral fellow from 1985-1988 with Dr. Clifford P. Stanners at McGill University. These were the most exciting times in the study of carcinoembryonic antigen (CEA) and its functions and my expertise was key in identifying the gene and the initial functions of CEA. It was therefore fortunate that the Faculty of Medicine through the Department of Biochemistry and the McGill Cancer Centre recognized the importance of this work and offered me a position to work on the role of CEACAM1 (CarcinoEmbryonic Antigen Cell Adhesion Molecule 1) in colorectal cancer and metastasis. I then became a scholar of the "Fonds de la Recherche en Santé du Québec" and a Chercheure Nationale.

My work rapidly gained international recognition in the field of CEACAM1, a close relative to CEA. With continuous funding from CIHR and the Cancer Research Society, among many other discoveries, my research team developed the first mouse models of CEACAM1, allowing *in vivo* studies on its function; these mouse models have now been distributed in over 35 different laboratories worldwide. The major focus of our work was the identification of CEACAM1 as a co-receptor for the insulin, the VEGFR2 and now the EphA2 tyrosine kinase receptors. These functional associations with the receptors defined a role for CEACAM1 in liver lipid metabolism, basal and tumour angiogenesis as well as migration and liver metastasis of colorectal cancer (CRC) cells. These phenotypes occur though a common mechanism that was first delineated in 1997 in

my laboratory. Remarkably for the time, we showed that various tyrosine kinases (receptors and Src-like) were phosphorylating CEACAM1 creating docking sites for the recruitment of Tyr phosphatases, which in turn served to turn off many different signaling pathways downstream of the kinases. Our most recent work focuses on clinically exploiting the biology of CEACAM1 itself as either a checkpoint inhibitor regulating TIM-3-mediated immune tolerance or targeting CEACAM1 partners in CRC liver metastasis. I invite you to glance at a subset of our recent publications (see below).

In addition to the exhilarating work on CEACAM1, I have been collaborating for over a decade with Dr. Philippe Gros on the identification and targeting of CRC and CA-CRC susceptibility gene loci and several gene candidates from carcinogen-induced mouse models.

In addition to my research activities, I have devoted passionate energy in teaching over 5500 clinicians over my 25 years of lecturing Biochemistry to Med1 students and have been committed to the teaching and direction of 30 graduate students/year in the Experimental and Clinical Oncology (EXMD635) course. I have also devoted time on evaluating many of your CIHR grants as a reviewer for three years and then Chair on the Cancer Progression and Therapeutics committee for 9 competitions. More recently, I have been contributing to reviewing internal grants for younger colleagues from the MUHC, JGH and McGill.

As a 16-year breast cancer survivor, I truly believe in sharing my passion for research with the public and have found a niche as moderator of the Goodman Public Forums for a number of years. Down time is spent reading history novels and biographies, cooking up feasts for friends and travelling the world in search of that very special bottle of wine to accompany those new dishes I like to prepare.

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