Michel G Bergeron “MGB” – a true success

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A TRIBUTE TO MICHEL G BERGERON

Dr Michel G Bergeron founded, more than 40 years ago, the Infectious Diseases Research Center (IDRC) in Quebec City, Quebec, and has been director since then. He has now decided to pass the torch as director, but will remain a researcher at the IDRC. As a way to express their sincere gratitude toward all that Dr Bergeron has achieved throughout the years, some of his closest collaborators have written a tribute to their colleague, mentor and friend.

THE STARTING POINT

In 1963, Michel faced his first important career dilemma. After graduating from the *Académie de Québec*, while studying music (trumpet) at the *Conservatoire de musique du Québec*, in Quebec, he had to choose between his two passions: music and medicine. After discussion with his music professor, Michel decided to attend medical school, but music has always remained very important in his life.

In his early work as a young MD, after tending to a hospital patient who had a heart infection and was successfully treated, Michel had to review the literature on cardiac infections all night to present the case to rounds the next morning. He was so moved by this field that he decided to specialize in infectious diseases, which became his priority over the next 40 years. Dr Bergeron received training in infectious diseases and was stimulated by the passion of two great scientists: Dr Louis Weinstein, physician at the New England Medical Center Hospital (Tufts University, Boston, USA) and Dr Salvador Luria (Nobel Prize, 1969), researcher at the Massachusetts Institute of Technology (MIT) in Boston (Massachusetts, USA).

The passionate and enthusiastic Michel came back to Quebec from Boston and created the Infectious Diseases Research Center (IDRC) at *Université Laval* (Quebec City, Quebec). He collaborated with and was mentored by Dr Léo Gauvreau. Over the years, Michel established critical research projects to tackle infectious diseases on three main fronts: prevention, diagnosis and treatment. Today, the IDRC is one of Canada's biggest research centres in infectious diseases, and is renowned internationally for its excellence. It has 12 fundamental researchers (PhD), 12 clinical researchers (MD), 13 project managers (PhD), 41 research professionals and 55 graduate students (MSc and PhD students), in addition to summer students and research administrative staff, all totaling close to 200 professionals, who come from 23 different countries.

Over the years, this staff, led by Michel, has accumulated \$250 million in research grants and contracts (\$136 million of them were under MGB's name as an investigator), 1700 peer-reviewed scientific and clinical articles, 4000 conference communications, 100 book chapters, 35 patents, 500 graduates (PhD and MSc) and 500 medical residents. The patents resulted in the creation of university spin-offs, and several of them were successful and granted licenses to pharmaceutical industry and gave birth to innovative medical products.

Dr Michel G Bergeron

UN HOMMAGE À MICHEL G. BERGERON

Dr Michel G. Bergeron a fondé, il y a plus de 40 ans, le Centre de recherche en infectiologie (CRI) dans la ville de Québec, et a été directeur depuis. Il a maintenant décidé de passer le flambeau en tant que directeur, mais restera comme chercheur au CRI. Dans le but d'exprimer leur sincère gratitude envers tout ce que le Dr Bergeron a fait au fil des ans, certains de ses plus proches collaborateurs ont écrit un hommage à leur collègue, mentor et ami.

In 2014, we celebrated the 40th anniversary of the IDRC, which coincided with Michel's 70th birthday. And still, he is working with relentless energy.

EFFORTS AND PASSION

Michel's wife, Charlotte Giguère, who has known her husband for more than 50 years, has been there through all of it.

“Michel always exhibited strong inner will and determination, as well as an enormous working capacity. One does not get where he is now without experiencing many sleepless nights struggling to find answers to his questions. Excellence arises from sustained efforts and passion.”

According to Charlotte, Michel owes his professional success partly to his personality, partly to those he encountered throughout his life and partly to decisions he chose carefully.

“His intellectual curiosity is insatiable and his capacity for concentration allows him to carry out several tasks at the same time. He values a caring approach, teaching and research in equal measure. As an excellent teacher, Michel likes to openly share his knowledge. He is also an eager student, always thrilled to learn new things. His colleagues and his students notice his avant-gardism, his sense of innovation, his rigour and also, his Olympian expectations! Advancing science and saving human lives has always been at the heart of his concerns. His love for his alma mater, *Université Laval*, is unconditional.

Michel is noble-hearted and a family man”, says Charlotte. “He always knew how to combine and balance his professional and his family life in spite of his many activities. This loving husband and affectionate father is very proud of his offspring and he remains committed to family values. His three children and six grandchildren are not only part of his life, but they are everything to him. He is very generous, attentive to them, and loves nothing better than to spend his time helping them. A sharp mind in a big heart, these are the attributes that have touched those who have come in contact with him.”

ROLE MODEL

Dr Bergeron has built, from scratch, an impressive research centre providing a creative environment facilitating interaction between

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Photo Marc Robitaille, le Fil, Université Laval

clinicians and fundamental researchers. Right from the start of his infectious diseases practice in Quebec City, he set up a series of training seminars. These weekly Infectious Disease “Sit-Ins” have been running for 40 years and are now broadcast across nine hospitals/medical academic sites and keep the audience up-to-date on important aspects of medicine and research advances. Over the years, MGB elaborated a unique balanced blend between clinicians and fundamental researchers to cover all aspects of infectious diseases (prevention, diagnosis and treatment). In addition, to ensure diffusion of research culture, he was a founding member of several associations: the Canadian Infectious Diseases Society, the Inter-American Society of Chemotherapy, the Canadian Association for HIV Research, and the Canadian Foundation of Infectious Diseases. He is also a champion of international collaboration with many transdisciplinary projects (genome, microbiome, pharmaceutical, biomedical engineering, chemistry, physics and social sciences).

MGB is a real role model, demonstrating that hard work and perseverance accomplish a lot. He takes special interest in undergraduate and graduate students. Earlier in his career, MGB created a “researcher for one day” program for senior high school students to introduce them to all aspects of medical research, inspiring them to embrace a career in research. He created a new next generation of young clinicians/researchers who think of an integrated research-clinics continuum.

A WINNING TEAM

Over the past 15 years, Dr Bergeron made it a tradition to celebrate the research centre's anniversary with a visit from a Nobel Prize winner to motivate his researchers and graduate students. An entire day with a Nobel Prize champion, wow! The IDRC was honoured to receive within its walls: Dr Kary Mullis (Nobel Prize, 1993), Dr Sydney Brenner (Nobel Prize, 2002) and Dr Jules Hoffmann (Nobel Prize, 2011). He has also invited recipients of the Canadian Gairdner Prize, including Dr King Holmes and Dr Peter Piot.

Dr Bergeron really knows how to build a winning team from scratch. He knows how to select people who he can rely on, and build success with them. With his exceptional leadership, he cultivates strength and develops a sense of belonging by delegating responsibilities and powers wisely. Concerned about the well-being of every employee, Dr Bergeron makes individuals flourish professionally. He started the IDRC with his first graduate students (Dr Denis Beauchamp, who became later the executive vice-dean of the *Faculté de médecine* at *Université Laval*, and Dr Sylvie Trottier, who is now the head of the *Département de microbiologie – infectiologie et immunologie* at the *Faculté de médecine, Université Laval*). He recruited Dr Anne-Marie Bourgault, who was until recently scientific director of the *Laboratoire de santé publique du Québec*, Dr Marc Ouellette, who is now the national scientific director of the Institute of Infection and Immunity at the Canadian Institutes of Health Research, Dr Barbara Papadopolou, who is director of the *Axe maladies infectieuses et immunitaires* at the

Centre de recherche du CHU de Québec-Université Laval, and Dr Michel J Tremblay, who became vice-dean of research and graduate studies at the *Faculté de médecine, Université Laval*. You can see right away that Michel is skilled in identifying and fostering champions, even though he has remained very humble throughout the years.

At the IDRC and to his family, Dr Michel G Bergeron is simply MGB, which is now a well-known trademark. For over 40 years, he has gathered and kept approximately 200 hard-working individuals, who believed in him and helped propel the IDRC among the best research centres, nationally and internationally. On top of that, the prestigious Order of Canada and *Ordre national du Québec* were bestowed on him.

HIS RESEARCH

In his early days of research, Michel worked on developing and testing many parameters concerning antibiotics: optimal dose, time of dosage, toxicity and efficacy. Among other things, he proposed a new treatment method for pyelonephritis, worked on the pathogenesis of pneumococcal pneumonia, developed research models to help understand infections and control host immune response, and developed new treatments.

When HIV appeared, Michel attended to the first AIDS patients in Quebec City. He then started working on antiretrovirals, encapsulating them into liposomes to target the site of HIV infection, to improve drug efficacy and reduce toxicity.

Working on the human microbiota has led Michel and his team to discover new bacterial species that he generously named after his beloved university, his mentor and his city (*Clostridium lavalense*, *Ruminococcus gauvreauii* and *Enterococcus quebecensis*, respectively).

As a clinician, he witnessed firsthand the fast rise of bacterial resistance to antibiotics due to the overuse and misuse of these wonder drugs. The old, slow, classic methods used to diagnose and identify bacteria became important concerns for the passionate young clinician and researcher. Michel became convinced of the urgent need to develop rapid molecular diagnostic methods based on bacterial DNA detection and identification.

Not satisfied with the slow culture methods used since the Louis Pasteur era to identify a bacterial infection, Dr Bergeron developed a real-time polymerase chain reaction approach, which accelerated the diagnosis process while greatly reducing hospital expenses. He therefore oversaw the development of the very first two real-time polymerase chain reaction diagnostic assays to be cleared by the Food and Drug Administration. Today, BD diagnostics, installed in Quebec City based on Michel's pioneering work, has several globally marketed rapid diagnostic assays, which serve hospitals, medical laboratories and patients.

Armed with passion and endless energy, Michel didn't stop there. He is now trying to bring rapid diagnostic testing to the patient's bedside and in doctor's offices. Michel's team is now working on an integrated microfluidics system for the amplification and detection of DNA directly from clinical samples, enabling the identification of microbes in less than 1 h. His dream: that each patient receives the right treatment at the right dose and at the right time. With that in mind, he imagines individual medical cards containing, within a microchip, vital information about each individual's genome (susceptibility genes) and microbiome (virulence and resistance genes) that physicians or pharmacists can use to prescribe the optimal personalized treatment and dosage.

In the field of infectious diseases prevention, Michel's powerful imagination has also led him to work on an imperceptible vaginal protection, the Invisible Condom®, which could help women all around the world to gain power over their body by protecting themselves from HIV and other sexually transmitted infections. Dr Bergeron says so himself: the health of too many women depends on the male decision to use a condom. Fortunately, that may be about to change, as the Invisible Condom® is currently in advanced clinical trials.

In summary, MGB's career is devoted to closing the loop from the identification of bedside problems, to bench work finding solutions and developing products to ultimately fill the gap serving bedside needs.

A great success, as is Dr Bergeron's entire career ... and still going. Thank you, Michel.