CSM Murray Award for Career Achievement Recipient:

Dr. William Mohn, University of British Columbia, Vancouver, BC

Bill Mohn is a Professor in the Department of Microbiology & Immunology in the Life Sciences Institute at the University of British Columbia. Bill has a B.A. from Colgate University (84) and a Ph.D. from Michigan State (90). He was a Research Associate at the National Research Council of Canada, Ottawa (90-92). He was a visiting scientist at both Agriculture Canada, Ottawa (92-93), and the National Centre for Biotechnology, Spain (02-03). He was an Adjunct Professor at Royal Military College (98-06). Bill has conducted ground-breaking research on dehalorespiration, bacterial catabolism of a variety of aromatic compounds and steroids, soil ecology and the human microbiome. He has over 120 peer-reviewed publications. *Pseudomonas mohnii* was named in recognition of pioneering contributions. Bill's research has applications in forest management, conversion of biomass to commodity chemicals and fuels as well as the prevention and treatment of disease. Bill was a Section Editor for the *Canadian Journal of Microbiology* served on the Editorial Boards of both *Applied & Environmental Microbiology* and *Microbial Ecology* and served as an ad hoc reviewer for over 40 other journals. He has served on grant review panels for the Natural Sciences and Engineering Council of Canada and the US Department of Energy and has been an ad hoc reviewer for over 20 other granting agencies. He has served on scientific advisory boards for major research initiatives in Canada and the USA. Bill co-chaired organization of the Canadian Society of Microbiologists Annual Meeting in 2012. He was elected to the Board of Directors of the International Society for Microbial Ecology (09-14). In 2015, Bill co-founded Microbiome Insights Inc. Bill has developed and taught undergraduate courses in microbial metabolism, ecology and physiology. He has trained 18 postdoctoral fellows, 33 graduate students and 48 undergraduate researchers, and he hosted visiting scientists from Europe, Korea, Argentina and the USA.

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Microbial ecology, from enzymes to ecosystems

William MOHN, University of British Columbia

In virtually every environment, microbial communities perform critical metabolic functions. Over the years, my colleagues and I have studied a broad range of microbial metabolism and its role in a variety of environments – natural, engineered and animal host environments. We elucidated a complex pathway for cholesterol catabolism in *Rhodococcus jostii*. We identified an orthologous cholesterol pathway in *Mycobacterium tuberculosis*, which plays an important role in pathogenesis. Subsequently, we elucidated a homologous pathway in *R. jostii* for cholate catabolism. We analyzed over 8000 bacterial, archaeal and fungal genomes for these pathways. The cholesterol pathway is part of the core genome of both free-living and pathogenic mycolic acid bacteria, while the cholate pathway is part of the core genome of *Rhodococcus*. By contrast, a pathway for testosterone and sometimes cholate catabolism appears to have horizontally transferred to diverse proteobacterial taxa. Most recently, we analyzed 599 metagenomes from diverse environments to map the occurrence of steroid catabolism pathways and better understand their ecological significance. In an independent line of investigation, we examined the effect of forest harvesting on metagenomes of soil communities in ecozones across North America. The overall effect of harvesting on community composition was very small relative to major differences between soil horizons and among geographically distinct ecozones. However, in some ecozones, harvesting substantially diminished the genetic potential for biomass decomposition while increasing the potential for nitrogen cycling. Stable isotope probing identified populations involved in hemicellulose and cellulose decomposition. Known cellulolytic organisms were found in the organic soil layer, while novel cellulolytic organisms were identified in the mineral soil layer. In some ecozones, cellulolytic and hemicellulolytic taxa were substantially impacted by harvesting. Overall, these investigations have advanced our understanding of microbial catabolism and its ecological relevance.