

Discoveries pivotal to science of toxins and illness associated with *E. coli*

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Many Canadian scientists and clinicians were unsung heroes during the early years (1977–1983) of research unfolding around verotoxigenic *E. coli* (VTEC). In an article published today in the *Canadian Journal of Microbiology*, Dr. Cimolai, a clinician and medical microbiologist, documents the history of this area of study, focusing on the key discoveries and major contributions made by Canadians to the science of what many people refer to as 'hamburger disease'. This disease poses an ongoing and significant threat to the general population; examples of its impact are the Walkerton outbreak and recent meat tainting episodes affecting the beef production industry in Alberta, as well as food contamination in Europe.

Dr. Cimola writes "As stories of microbiological and infectious disease discoveries are told, one of the most charming of these in Canadian history is the recognition of VTEC and associated disease." The considerable burden and impact of *E. coli*-associated infections is experienced worldwide. The contributions of our national scientists in this field must be seen as a vital part of medical and microbiological Canadiana.

Cimolai reports on key contributors, including Jack Konowalchuk, Joan Speirs and their collaborators in Ottawa, who defined the *E. coli* verotoxin; Mohamed Karmali, Martin Petric and colleagues at The Hospital for Sick Children in Toronto, who established the association of VTEC and hemolytic-uremic syndrome; Carlton Gyles, University of Guelph Veterinary School, and Peter Fleming, Hermy Lior and their

scientific and medical peers. Many Canadian investigators, but especially those in the veterinary school at the University of Guelph, also contributed to the science of VTEC among animals. The interactions between clinical and veterinary researchers led to a then unprecedented exponential growth in the knowledge base of VTEC. "The Toronto group led by Karmali stood front and centre during the most critical period of scientific progress, but certainly Konowalchuk et al.'s findings were pivotal."

"From a Canadian perspective, many sentinel and key observations emerged early in the general science of this topic, and as a Canadian, one can be proud of how quickly the essence of these contributions was disseminated across Canada and worldwide, " explains Dr. Cimolai. "While perhaps not as impactful as the Banting and Best story, perhaps it may be the next best thing in the realm of microbiology but with a Canadian flavour."

These toxin-producing *E. coli* are disease-causing bacteria and can cause episodes of diarrhea and bloody diarrhea. They can also lead to a complicated medical disorder known as hemolytic uremic syndrome, the most common acute form of serious kidney failure among children. It is also a major disease-causing germ among animals, but especially bovine and porcine; farm animals and their related food products can serve as a source for the bacterium to humans. Water can also be contaminated by these germs. The profound impact of disease from these toxigenic *E. coli* continues to be felt around the globe.

More information: Read the full story in "The Canadian Contribution to the Science of Verotoxigenic Escherichia coli and Associated Illnesses: The Early Years", published today in the *Canadian Journal of Microbiology*. nrcresearchpress.com/doi/abs/10.1139/13-0644#.Um_TyhCzLWg

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