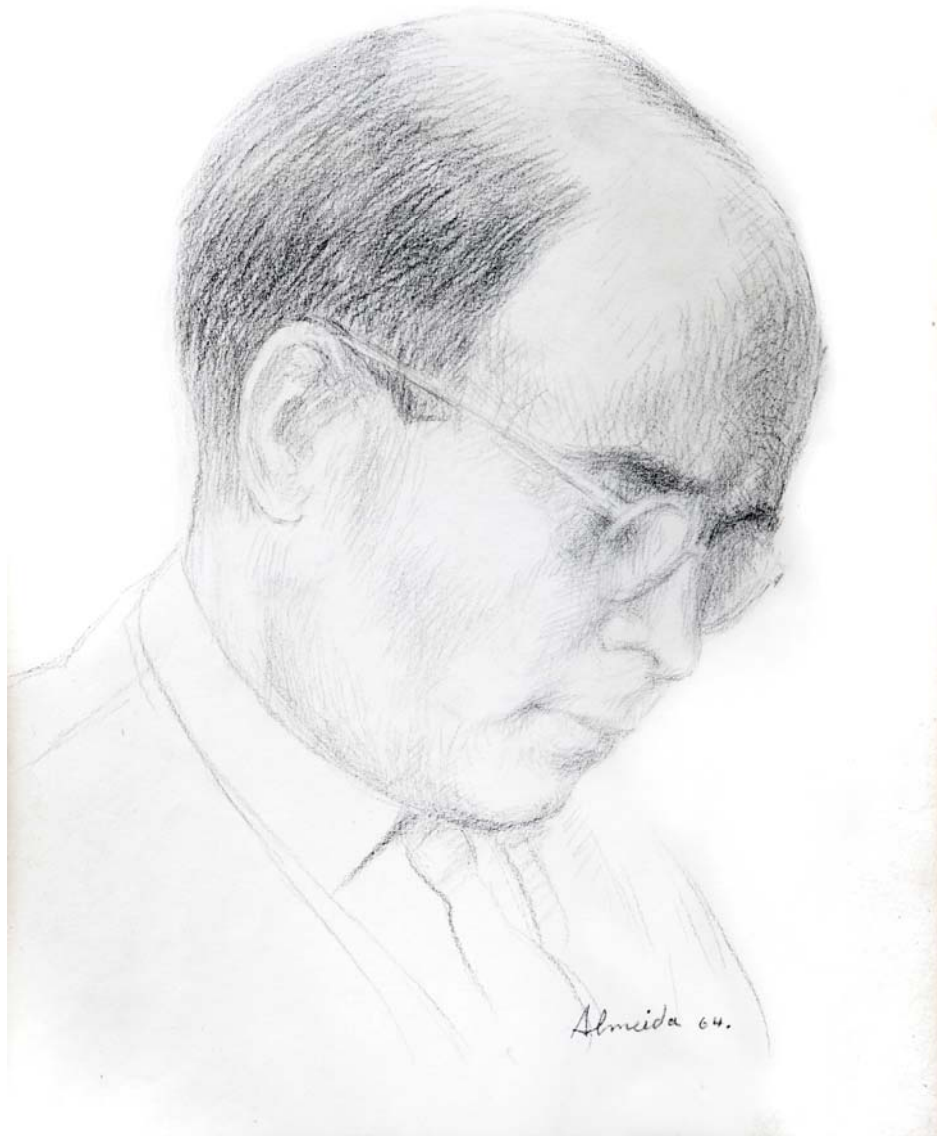


MARK MINDEN, TAK MAK, NORMAN ISCOVE & HANS MESSNER

---

**Ernest McCulloch**  
**1926-2011**



Ernest McCulloch is recognized as a giant in Canadian biomedical science, principally for his pioneering work (with Dr. James Till) on hematopoietic stem cells in the 1960s. The implications of this work have been and continue to be profound, and underpin many significant breakthroughs in our knowledge of normal cellular physiology, pathophysiology, and tumorigenesis.

Ernest Armstrong McCulloch was born in Toronto on April 21, 1926 and died there on January 11, 2011. He attended Upper Canada College in Toronto and received his MD from the University of Toronto (UT) in 1948. After one year conducting research at the Lister Institute in London, UK, he returned to Toronto and undertook further clinical training at the Sunnybrook Hospital, and the Toronto General Hospital. In 1957, he was appointed to the Ontario Cancer Institute (OCI) and initiated a research program that initially focused on the role of viruses in cancer but soon diverged to studies on normal and malignant blood cells. Along with James Till, Dr. McCulloch developed the first functional methodology for enumerating hematopoietic stem cells, and worked out ways to demonstrate and measure their ability both to self-renew and differentiate into every type of blood cell in the body.

Dr. McCulloch went on from there to characterize leukemic cells and develop assays to measure the effects of anti-cancer therapies on their growth, along the way creating conceptual foundations for the notion of stem cell hierarchy in a malignant disease and the necessity of targeting malignant stem cells to achieve cure.

In all, Dr. McCulloch authored over 275 papers, many of which had profound impact on his field. His work established the scientific foundation for bone marrow transplantation, and helped to inaugurate stem cell biology as one of the most exciting and promising areas of biomedical science today.

One of Dr. McCulloch's key attributes was his ability to be an original thinker. He could look at a scientific problem in the wider context of the "big picture", and excelled in making far-flung connections that became obvious to others only after he proved them. Most fittingly, Dr. McCulloch was the recipient of several prestigious awards (shared with James Till), including the Gairdner Foundation International Award, the Thomas W. Eadie Medal, the Albert Lasker Award, and the National Cancer Institute of Canada Diamond Jubilee Award. In addition, Dr. McCulloch served in numerous academic posts at UofT and OCI. While in the School of Graduate Studies at UofT he collaborated with Marshall McLuhan to apply tetrads as a way to think about scientific discoveries. He was also the head or a member of several advisory and leadership committees, including those affiliated with the Royal Society of Canada, the Institute of Medical Science of UofT, and the OCI, as well as several peer-reviewed scientific journals. He was also a member of the Royal Society of London (UK), the Royal Society of Canada, the Order of Ontario, the Canadian Medical Hall of Fame, and an Officer of the Order of Canada. Up until his death, Dr. McCulloch remained a University Professor at UofT and a Senior Scientist Emeritus at OCI.

His other passion was his family. With his life mate Ona had five children James, Robert, Michael, Cecilia, and Paul. He read and re-read to them Dickens and Tolkein, and quoted from memory long passages of Shakespeare, Kipling and Tennyson. With his family he escaped

frequently to their country place at Thunderbeach, Ontario “Mirkwood Forest” and every August to the family cottage in Ahmic Lake in Ontario. There he taught his children to swim, canoe, sail, chop wood, tend a fire and experience nature by long walks along trails surrounded by trilliums and Jack in the pulpits. He was intrigued by the viral infections on his trees and threatened to write a grant in his retirement to study this problem.

Dr. McCulloch was not only a great scientist but also a great teacher. Many high profile scientists around the world revere him as their mentor, and numerous students have said that discussions with Dr. McCulloch inspired them to truly love science and to think above and beyond their immediate projects. Even more relevant in this modern multi-disciplinary world, he urged his students to be cognizant of the need to relate findings in the laboratory to those in the clinic, and to collaborate widely with colleagues to obtain fresh viewpoints.

A generous leader possessing modesty, integrity, passion, courage, innate insight and wisdom, he will be sorely missed by the Canadian scientific community.

*Written by  
Dr. Mark Minden  
Dr. Tak Mak  
Dr. Norman Iscove  
Dr. Hans Messner*

*(Authors titles given as of the time of writing)*