Murray Llewellyn Barr Biography

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Barr grew up on his father's farm in Canada. He was educated at the University of Western Ontario, and graduated in medicine in 1933. He spent nearly his entire career there-except for his term as a medical officer with the Royal Canadian Air Force during World War II.

Around 1949, when Barr was a professor at the university, he and graduate student Ewart G. Bertran were studying nerve cells, or neurons. Barr noticed that the nuclei of nerve cells in female cats contained a dense mass of chromatin (sex chromatin body) that males did not have.. Discovering the sex chromatin body, now called the Barr body, focused Barr's attention on human and medical genetics. Later studies by Barr and his co-workers found that these sex differences occur in the cells of most mammals.

In 1956, Tjio and Levan showed that there are forty-six chromosomes in human cells, twenty-three pairs. Female cells have a pair of sex chromosomes, known as XX, while male cells have only one sex chromosome in their XY sex configuration. By 1959, researchers identified Down, Turner, and Klinefelter syndromes as disease due to defects in chromosome number. Then, further studies of the Barr body led to the understanding of a process called inactivation. During embryonic development, one of the two X chromosomes is inactivated in each cell. The inactivated X condenses as a Barr body. The embryo cells continue to divide and form a clone of cells that have the same X chromosome active and the other inactive. British geneticist, Mary Lyons, showed that which X chromosome becomes inactive is a random occurrence. Inactivation helped scientists understand the mechanisms of sex-linked inheritance. Barr and his co-workers went on to develop a simple screening test for diseases involving sex chromosome anomalies. Their buccal smear technique using cells from the mouth replaced the practice of making skin biopsies.

Barr's research in human cytogenetics inspired the establishment of the first service facilities for medical cytogenetics. In the 1960's, health centers throughout Canada and elsewhere instituted similar facilities. He also had a major role in the growth of the University of Western Ontario. His later research, writing and teaching was devoted to neuroanatomy. Barr's neuroanatomy notes were published as a textbook, The Human Nervous System: An Anatomical Viewpoint, and is still one of the more popular books on the subject.