New Discovery in Aging Process
Could lead to extended life spans and improved quality of life

New research from the University of Calgary provides a better understanding of the aging process of cells, which could one-day slow down aging and delay many health problems associated with old-age such as the onset the cancer.

Lead researcher Karl Riabowol, PhD, from UCalgary’s Faculty of Medicine made the discovery in collaboration with J.B. Rattner, PhD, of UCalgary, and Brian Burke, PhD, of the University of Florida. Their study has been published in the November issue of Nature - Cell Biology.

The researchers looked at Hutchinson-Gilford Progeria Syndrome (HGPS), a rare condition in which physical aspects of aging are greatly accelerated. Few children with this premature aging syndrome live past the age of 16 and they die from diseases usually associated with the elderly. The scientists' discovery is the first evidence that the family of tumour suppressors that were previously identified by the Riabowol lab at U of C in 1996, the INhibitors of Growth (INGs), interact with the protein lamin A, mutation of which leads to HGPS.

This provides an important clue as to how HGPS is caused at the molecular level, if further links aging and cancer, and may reveal clues about the processes of normal aging that affect us all.

“As humans age, so do the cells in our bodies. If we can slow down cell aging we may be able to keep people healthy longer, improving the quality of life for the elderly, and possibly even extend the average lifespan in the general population,” says Riabowol.

As part of the natural aging process, cells divide in our body a limited number of times, slowly growing old themselves at which point they become genetically unstable and stop replicating. When this point is reached, usually in old age, many functions are compromised. For example, the frequency of infections and death due to infections increases dramatically in the elderly. This has multiple causes such as the inability to efficiently heal wounds as a consequence of a lack of skin cell division and the inability to mount an effective immune response as a consequence of lack of blood cell division to eliminate pathogens.

Cell aging is increasingly being linked to another common disease that results from genetic instability - cancer. The idea of cancer as primarily a disease of aging hits home with just one statistic: the incidence of cancer is nearly 1,000 times higher for people in their eighties who have accumulated many cells that cannot replicate, compared to people in their twenties.
Riabowol and his colleagues at the UCalgary Aging and Immortalization Laboratory hope this new discovery on aging cells will yield clues to how aging relates to cancer formation, and provide additional clues about how to target and selectively eliminate cancer cells based upon their unstable genetic nature.

Riabowol is a Professor in the Departments of Biochemistry & Molecular Biology / Oncology, A Scientist of the Alberta Heritage Foundation for Medical Research (AHFMR) and a member of the Southern Alberta Cancer Research Institute (SACRI). His research is supported by the Canadian Institutes of Health Research (CIHR), the AHFMR, the Canadian Breast Cancer Foundation (CBCF) and the Alberta Cancer Research Institute (ACRI).

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Full text of the article available at:
http://www.nature.com/ncb/journal/v10/n11/full/ncb1792.html