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Study opens a new door to understanding cancer

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An in-depth understanding of the mechanisms that trigger cancer cell growth is vital to the development of more targeted treatments for the disease. An article published in the August 3 issue of *Molecular Cell* provides a key to these mechanisms that may prove crucial in the future.

The paper is co-authored by Dr Morag Park, Director of the MUHC Molecular Oncology Group, and Dr Kalle Gehring, Head of the Nuclear Magnetic Resonnance Laboratory of the McGill University Biochemistry Department.

“To understand cancer, it is necessary to first understand how the molecules interact,” explains Dr. Park, who is also a Professor of oncology and biochemistry at McGill University. “In that study we have clarified the structure of some of the proteins involved and their connections, which allows us to understand the consequences of these interactions.” This is, in fact, a feat that merits close attention, because it means that researchers can now “see” elements smaller than a millionth of a millimetre!

In a cell’s interior, the function of the ubiquitin molecule is to “clean house.” It attaches itself to proteins that must disappear and triggers their degradation; in doing so, it allows a number of mechanisms to be minutely controlled. This new study reveals that ubiquitin also promotes interactions between proteins known as Cb-b. In a healthy patient, Cb-b is activated when a growth factor attaches itself to the surface of a cell, its role being to mitigate the cell proliferation and growth mechanisms

induced by the factor. However, in some cancer patients this mitigation mechanism does not appear to function, partly because the ubiquitin does not attach itself correctly to the cell surface and to Cb-b. As a result, the effects of the growth factor become much more pronounced, which results in an unrestrained proliferation of cells – that can become a cancer.

“In the long term, this may serve as a basis for us to find ways to intervene in this chain reaction and discover a treatment” adds Dr. Gehring. “This new information about ubiquitin marks an important advance in our understanding of the mechanisms associated with cancer and contributes to the fight against the disease by directing us towards research avenues for new medications”.

Source: McGill University Health Centre

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