

Scientists discover cancer-causing role of gene proteins

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Dr. Tak Mak and scientists at The Campbell Family Institute for Breast Cancer Research at Princess Margaret Hospital have discovered the role of two "cousins" in the genetic family tree of cancer development.

The findings, published online today in the journal *Genes and Development*, plant the seed for a critical new branch of scientific inquiry, says Dr. Mak, principal investigator. Dr. Mak, Director of The Campbell Family Institute is also a Professor, University of Toronto, in the Departments of Medical Biophysics and Immunology.

The cousins are proteins related to the gene p53 family – the patriarch known for two decades to be the master gatekeeper that controls all cancer development. When gene p53 is defective, it loses its ability to regulate healthy cells and suppress cancer.

"Until now, we thought these cousins (TAp73 protein isoforms) were not involved in cancer. Our results prove that they are. This is fundamental to understanding every human cancer and furthering the science."

In the lab, Dr. Mak and his team challenged traditional thinking about the role of these proteins. "Before, scientists studied only whether these proteins were present or absent. We decided to study how they interact with each other and discovered that they actually have a split personality. When we turn one 'on' or 'off', the other changes behavior and becomes part of the cancer-causing process. The key is understanding the ratio of the interaction."

"The next step is to understand how the ratio affects cell division that leads to human cancer," says Dr. Mak, whose work was supported by the Canadian Institutes for Health Research.

Source: University of Toronto

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