Biochemist unlocks gene's role in breast-tumor growth

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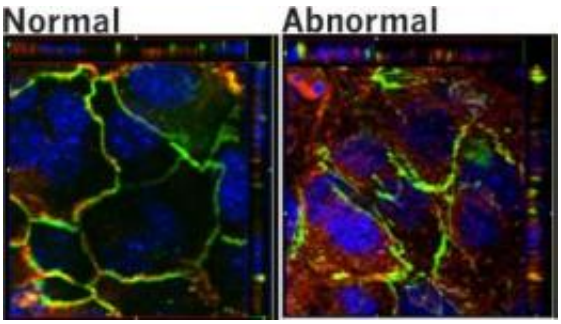

New research led by McGill Biochemist Dr. William Muller helps explain why breastmilk cells lose their structure, causing them to clump up in strange ways (see photos) and sometimes become cancer tumors. With the support of Chen Ling and Dongmei Zuo at McGill's Goodman Cancer Centre, Muller has discovered how one particular gene regulates epithelial cells - cells that normally form in sheets and are polarized to enable the transport of molecules in a single direction. It's this loss of polarity that is thought to play an important role in breast tumor development. Credit: Credit: Chen Ling, Dongmei Zuo, Bin Xue, Senthil Muthuswamy, and William J. Muller, *GENES & DEVELOPMENT* 24:000-000 2010, Cold Spring Harbor Laboratory Press, Cold Spring Harbor, NY, pp. 947-956. Print resolution images are available on request.

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regulates epithelial cells - cells that normally form in sheets and are polarized to enable the transport of molecules in a single direction.

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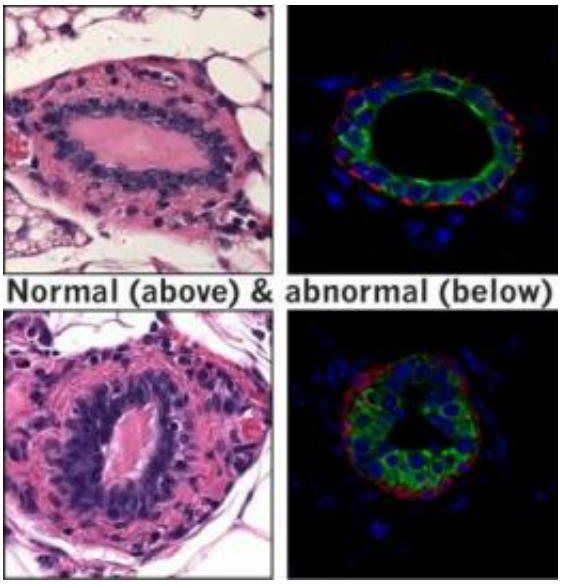

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By using mouse models, Muller discovered that the cells do not form neat structures when the gene malfunctions. "In fact, the first mouse model had a skin defect and was completely incapable of forming sheets of epithelial cells. This gene is frequently lost in breast cancer, significant proof that this gene might play an important role," he said.

The research published today in *Genes and Development* shows that if the gene is reintroduced into a tumour, polarity can be restored. "This is an interesting first step along this particular path," Muller said, pointing out that the gene functions by working with more than 40 various proteins, of which only one, a scaffold protein, has been identified. Proteins, he said, play various roles in our body, from maintaining cell shape and function through to driving chemical reactions, immune responses and growth.

"We have many other steps to take before we can say this path will lead to a treatment or cure."

Provided by McGill University