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Thyroid cancer discovery points to new treatments, prevention

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The actions of a mutated protein in cells linked to thyroid cancer have been uncovered by researchers at Queen's University. The discovery paves the way for the future development of drugs to more effectively target, treat and possibly even prevent both inherited and non-inherited thyroid cancers.

"We now know why this gene causes these tumours and can start looking at how best to target the mutant proteins so that the cells expressing them can be killed or stopped from growing," says Lois Mulligan, professor of pathology and molecular medicine with the Division of Cancer Biology and Genetics of the Queen's Cancer Research Institute. She is senior author of a study to be published November 15 in the journal *Cancer Research*.

Taranjit S. Gujral, a Ph D student in Queen's Department of Pathology and Molecular Medicine and lead author on the paper, developed three-dimensional models of the mutated RET protein implicated in a condition causing cancerous thyroid tumours. The model allowed him to predict and compare the protein's molecular actions and to see that the protein was ten times more active than normal in cells associated with Multiple Endocrine Neoplasia 2B (MEN 2B) syndrome, an inherited cancer syndrome. Co-authors on the study include Vinay K. Singh and Zongchao Jia of Queen's Biochemistry Department.

"It's like stepping on the gas in a car and getting way more gas than you bargained for," says Mulligan. "The mutation may cause some new

actions but it chiefly does some actions more efficiently than normal."

MEN 2B is a dominantly inherited condition – the most severe of its kind – and is characterized by the early onset of thyroid tumours, sometimes even affecting infants, and can also cause developmental abnormalities including elongated bones, gastric problems and bumpy lips.

MEN 2B is currently treated with surgery, and other treatments, such as radiation and chemotherapy are not very effective. The study provides valuable tools for specific targeting of the actions of the protein that may aid in the development of anticancer therapies.

Source: Queen's University