Discovery in worms points to more targeted cancer treatment

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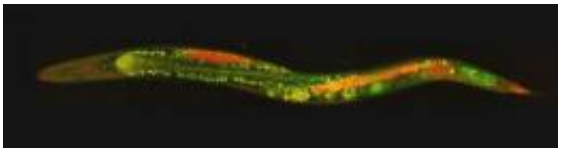

Research on this microscopic worm (*Caenorhabditis elegans*) may offer a drug target for cancer treatment. Credit: Ian Chin-Sang and Tony Papanicolaou

Researchers at Queen's University have found a link between two genes involved in cancer formation in humans, by examining the genes in worms. The groundbreaking discovery provides a foundation for how tumor-forming genes interact, and may offer a drug target for cancer treatment.

"When cancer hijacks a healthy system, it can create tumors by causing cells to divide when they shouldn't," says Ian Chin-Sang, a developmental biologist at Queen's and lead researcher on the study. "Certain genes control the normal movement and growth of cells, and by studying how these genes interact, we can understand what is abnormal when cancer is present."

There is an important gene in humans called PTEN that acts as a tumor suppressor. When the PTEN gene function is lost, it can lead to cancers. For example, 70-80 per cent of all prostate cancers have lost PTEN

function. Another gene family, called Eph receptors, often shows high levels in cancers, but a connection between PTEN and Eph Receptors in cancer formation has never been shown. The Queen's study shows the remarkable relationship between these genes in worms.

When the research team increased Eph receptor levels in worms, the PTEN levels diminished and the worms died prematurely. When they decreased the Eph receptor level in the worm, the PTEN levels went up and the worm lived longer than normal. The team believes the same principals are applicable to humans.

"Obviously humans and worms look very different," states Professor Chin-Sang, "but at a molecular level, they are very similar. In some instances, like the ones we are studying, the cellular mechanisms are so similar that the human genes can replace the worm's gene."

The next step is to take a closer look at the interaction of these two genes in humans. The findings could lead to exciting breakthroughs in cancer treatment.

"There is a drug used in the treatment of breast cancer that some women develop a resistance to," adds Professor Chin-Sang. "Those same women have also lost their PTEN. Perhaps their Eph is overactive, and that has made the PTEN go down. The research on the worm may therefore provide a useful drug target for therapeutic intervention of breast cancer. In fact, this worm is becoming a bit of a scientific celebrity. Studies on this worm have won researchers three Nobel prizes in the last seven years."

The study is published online in the journal *Developmental Cell,* and was recently highlighted in *Science*.

Source: Queen's University (news : web)