

# How a quirky fruit fly gene could help researchers develop new cancer drugs

June 14 2012

---

(Medical Xpress) -- Loyola researchers are taking advantage of a quirk in the evolution of fruit fly genes to help develop new weapons against cancer.

A newly discovered fruit fly gene is a simplified counterpart of two complex human [genes](#) that play important roles in the development of [cancer](#) and some [birth defects](#). As this fruit fly gene evolved, it split in two. This split has made it easier to study, and the resulting insights could prove useful in developing new [cancer drugs](#).

"[Evolution](#) has given us a gift," said Andrew K. Dingwall, PhD, senior author of a paper that describes how his team identified and analyzed the split gene. Their findings are published in the June issue of the prestigious journal *Development*. Based on the importance of the findings, the paper was recently selected as an "Editor's Choice" in *Science Signaling*, published by the American Association for the Advancement of Science (AAAS).

When normal cells develop, they differentiate into particular types, such as bone cells or muscle cells, and reproduce in an orderly manner. The process is governed by genes and hormones that work in concert. Two of these genes are known as MLL2 and MLL3. [Cancer cells](#), by contrast, undergo uncontrolled division and reproduction.

Since 2010, a growing number of cancers have been linked to mutations in the MLL2 and MLL3 genes. These cancers include non-Hodgkin's

lymphoma, colorectal cancer, kidney cancer, bladder cancer and a brain tumor called medulloblastoma. There also is evidence that MLL2 and MLL3 mutations are involved in breast and prostate cancers.

The MLL2 and MLL3 genes are similar to one another. Each has more than 15,000 building blocks called base pairs -- more than 10 times the number found in a typical gene. Because these genes are so large and complex, they are difficult to study.

In the fruit fly, the counterpart gene to MLL2 and MLL3 split into two genes named TRR and CMI. Each carried information critical for normal gene regulation, and they wound up on different chromosomes. The parsing of the MLL2/MLL3 genetic information into smaller genes in the fruit fly made study of the gene functions much easier; it allowed the researchers unprecedented opportunities to explore the role the [human genes](#) play in the development of cancers.

"This fruit fly gene gives us unique insight into the massive human MLL2 and MLL3 genes that are almost impossible to study because they are so large," Dingwall said.

Dingwall's team studied the function of the fruit fly gene by inducing various mutations and then observing the effects on the flies. This will lead to better understanding of what goes wrong when mutations in MLL2 and MLL3 genes trigger the uncontrolled reproduction of cancer cells in humans. This in turn could help researchers develop drugs that would redirect cancer cells to differentiate into normal cells, Dingwall said.

The study was funded through a grant from the National Science Foundation, with additional support from the National Institutes of Health.

Provided by Loyola University Health System

Citation: How a quirky fruit fly gene could help researchers develop new cancer drugs (2012, June 14) retrieved 24 June 2024 from <https://medicalxpress.com/news/2012-06-quirky-fruit-gene-cancer-drugs.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.