

Dying cells in fruit fly alert neighboring cells to protect themselves

March 26 2014

Cells usually self-destruct when irreparable glitches occur in their DNA. Programmed cell death, or apoptosis, helps insure that cells with damaged DNA do not grow and replicate to produce more mutated cells. Apoptosis thereby helps protect and insure the survival of the organism.

At the GSA *Drosophila* Research Conference, TinTin Su, Ph.D., will report that a dying *Drosophila melanogaster* larvae cell alerts neighboring cells that they are in danger of suffering a similar fate.

Dr. Su and her collaborators at University of Colorado, Boulder used ionizing radiation (IR) to induce DNA damage and [apoptosis](#) in cells of the wing imaginal disc, the immature form of the fly's wings. The neighboring cells responded by activating bantam, a microRNA. As a result, the neighboring cells became more difficult to kill by IR.

The scientists determined that the key to this process was the receptor tyrosine kinase Tie. The dying cell's signal turned on Tie, thereby activating the short microRNA molecule bantam.

Previously the only known role for Tie in fruit flies was in long-range signaling in border cell migration. Although Tie is not required for normal larval development, it becomes necessary for survival after radiation exposure, Dr. Su noted.

The dying cell's signaling its neighbors to protect themselves from apoptosis challenges the long held view that cells in the vicinity of dying,

irradiated cells become more prone to death. The results of the experiments conducted by Dr. Su and her collaborators also complement previous studies that showed that a larval disc cell's death leads to proliferation of [cells](#) in the disc.

If this protective mechanism also operates in mammals, it may affect the results of the sequential use of cytotoxic agents and radiation in cancer therapy, she pointed out.

More information: "Dying cells protect survivors from radiation-induced cell death." TinTin Su, Amber Bilak, Lyle Uyetake. MCD Biology, University of Colorado, Boulder, CO. abstracts.genetics-gsa.org/cgi...il.pl?absno=14531034

Provided by Genetics Society of America

Citation: Dying cells in fruit fly alert neighboring cells to protect themselves (2014, March 26) retrieved 1 May 2024 from <https://phys.org/news/2014-03-dying-cells-fruit-neighboring.html>

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