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Resistance and tolerance mechanisms play role in cancer as well as infections

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In addition to demonstrating that cancer kills flies in dose dependent manner, just as bacteria and viruses cause infections in dose dependent manner, scientists established a system for disentangling resistance and tolerance mechanisms to cancer in a Drosophila model.

A Stanford University lab whose studies have advanced scientific understanding of resistance and tolerance defense mechanisms to bacterial and viral pathogens has now turned its sights on cancer.

"Just as there are resistance and tolerance mechanisms that target invading microbes, we predicted that there are also resistance and tolerance mechanisms that control a host's response to cancer," David Schneider, Ph.D., who heads the lab, and postdoctoral researcher Adler R. Dillman, Ph.D., wrote in their GSA *Drosophila* Research Conference abstract.

While resistance refers to an organism's ability to rid itself of pathogens, tolerance describes the ability to limit disease severity.

To apply the concepts of resistance and disease tolerance to cancer, Drs. Schneinder and Dillman injected adult *Drosophila melanogaster* flies with varying doses of fly neoplastic cancer cells containing the Ras gene mutation, one of the most common gene mutations in human cancer. The results enabled the scientists to establish the dose response curve of the fly to the mutation.

They screened over 200 different RNA mediated interference (RNAi) lines targeting immune signaling pathways, metabolism and signal transduction. RNAi inhbits gene expression by triggering the destruction of messenger RNA (mRNA). This genetic screen is ongoing.

In addition to demonstrating that cancer kills flies in a dose dependent manner, just as bacteria and viruses cause infections in a dose dependent manner, Drs. Schneider and Dillman established a system for disentangling the resistance and tolerance mechanisms to cancer in the Drosophila model.

More information: Abstract: "Investigating Resistance and Tolerance to Cancer." Adler R. Dillman, David S. Schneider. Microbiology and Immunology, Stanford, Stanford, CA. abstracts.genetics-gsa.org/cgi … il.pl?absno=14531261

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