

Parallels between cancers, infection suppression reported

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Tiny parasitoid wasps can play an important role in controlling the populations of other insect species by laying their eggs inside the larvae of these species. A newly hatched wasp gradually eats the host alive and takes over its body.

The host insect is far from defenseless, however. In *Drosophila* (fruit flies), [larvae](#) activate humoral immunity in the fat body and mount a robust cellular response that encapsulates and chokes off the wasp egg.

New research by Dr. Shubha Govind, professor of biology at The City College of New York, and colleagues reveals parallels between how this mechanism fights the wasp [infection](#) and the way blood [cancer](#) develops. "There are fundamental similarities in the processes," she explains. "The response to wasp infection is similar to acute inflammation while the cancer is akin to [chronic inflammation](#) in mammals, where regulation of the response to an infection also goes out of control."

Professor Govind reports that the immune system that counters wasp egg infection is highly restrained. The system works like a thermostat, with certain proteins detecting the infection and triggering the immune reactions. Once the egg has been destroyed the immune reactions come to a halt.

However, when the regulating mechanism goes haywire, cancer can develop. Through sumoylation, the correct balance between positive and negative factors is achieved, Professor Govind and colleagues report.

"There is strong evidence that the fundamental mechanism of regulation uncovered in flies also works in humans," she notes. "Because of the molecular similarities between flies and mammals, it may be possible to use flies to test drugs for potential anti-inflammatory effects in human disease." While such drugs would not cure cancer, they could control inflammation and, perhaps, delay [cancer progression](#).

Other potential applications are in pest control for agriculture. Instead of using insecticides, parasitoids with the ability to suppress the hosts' immune systems could be used to kill insect pests. Also, insecticides could be developed that, at very low concentrations, would weaken the immune systems of host insects and enable parasitoid eggs to succeed, Professor Govind adds.

More information: The findings were published last month in *PLoS Pathogens*.

Provided by City College of New York

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