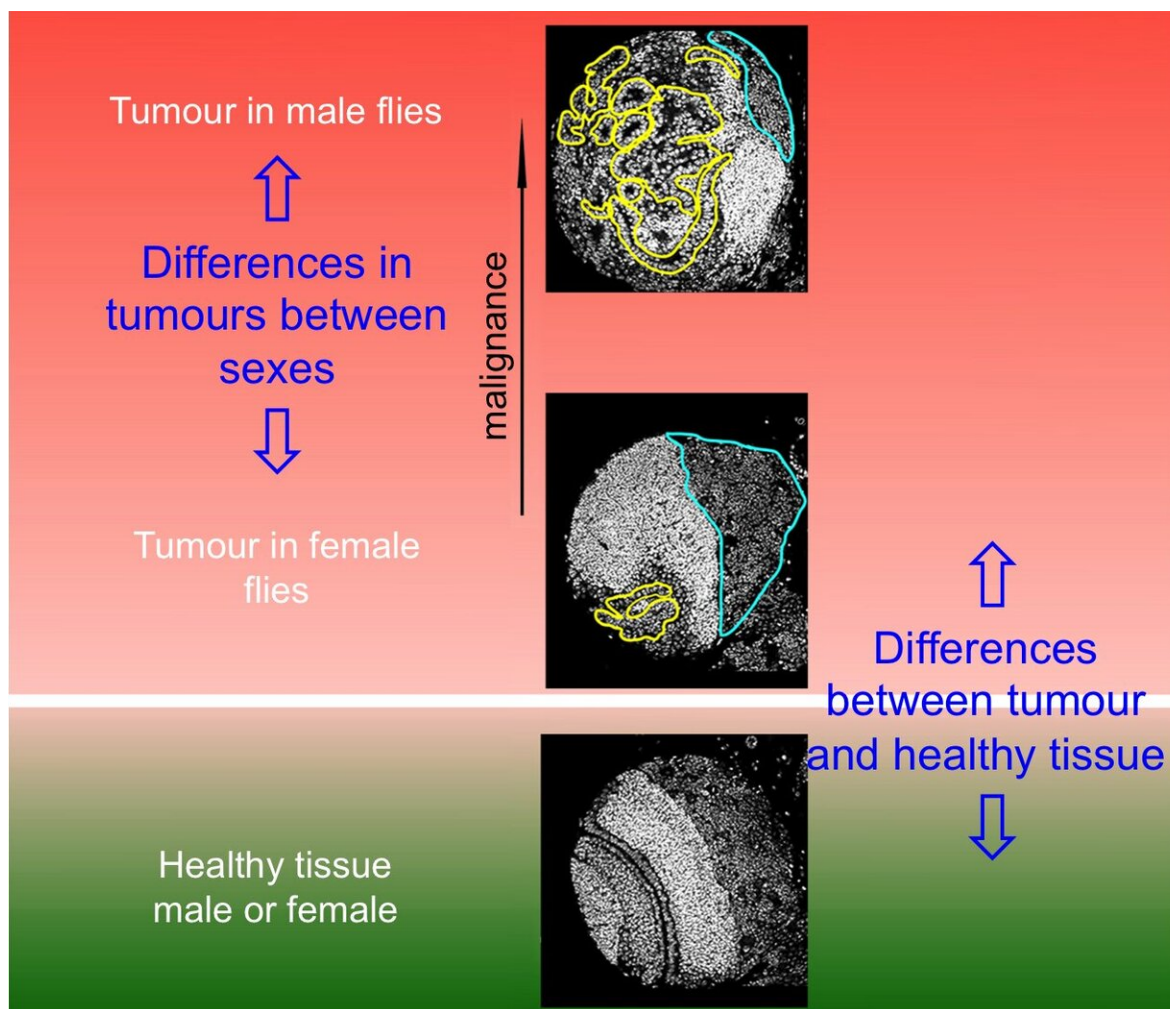


Genes responsible for sex-related differences in cancer aggressiveness found in vinegar flies

August 16 2019



Differences between tumours in male and female vinegar flies. Credit: Cayetano González, IRB Barcelona

An understanding of the molecular basis of differences in the incidence and survival of cancer between men and women may allow the discovery of specific and more effective treatments.

The study, published in *Science Advances*, compares the brain tumors of male and female flies at the [molecular level](#) and identifies proteins responsible for the different degree of aggressiveness.

Cancer does not affect men and women equally, but we know little about the molecular causes underlying this difference. Published in *Science Advances*, a study by the Institute for Research in Biomedicine (IRB Barcelona) involving the [vinegar fly](#), *Drosophila melanogaster*, has identified possible regulators that determine differences in tumors between sexes.

"We have identified possible regulators responsible for tumor differences between male and female flies," says ICREA researcher Cayetano González, head of the Laboratory of Cell Division at IRB Barcelona. "The results also show that these genes could be potential targets to neutralize their degree of malignancy," adds the researcher.

Epidemiological studies have shown that there are notable differences in the degree of incidence and survival of [cancer](#) between men and women, even in tumors not related to reproductive organs. This is the case, for example, in certain types of brain tumor, and also in the case of children in which the influence of risk habits can be ruled out.

González and his team compared the development of experimental tumors induced in the brains of male and female vinegar flies. They observed that the former tumors were more aggressive and identified numerous proteins whose expression was markedly higher in tumor cells

of male flies compared to females.

"Many of the possible regulators of sex-dependent differences in tumors that we have identified in our *Drosophila* model are highly conserved proteins that are also found in humans," says González.

Among the proteins identified in this study, the researchers focused on the so-called Phf7, which is also found in humans. Phf7 is present in tumor cells in males, which show more aggressiveness, and absent in tumor cells in females. They found that by removing this [protein](#) in male flies, the aggressiveness of the tumors was markedly reduced, reaching levels similar to those present in female flies.

"Our results show that the proteins responsible for the differences in tumors between males and females can be regulated to reduce the degree of malignancy that is associated with the sex of the individual affected," explains Cristina Molnar, postdoctoral researcher at IRB Barcelona and first author of the study.

"Understanding the molecular basis responsible for the sex-related differences in the incidence and development of cancer may allow us to find specific treatments for men and women," González adds.

This study was carried out in the vinegar fly *Drosophila melanogaster*, an experimental model that has been used for research purposes for more than a hundred years and that has allowed the discovery of many of the proteins that are of great relevance in human cancer. In recent decades, experimental models of various types of human cancer, such as leukemia, neuroblastoma, glioblastoma and ovarian cancer, among others, have been developed in this animal model.

More information: Cristina Molnar et al. The histone code reader PHD finger protein 7 controls sex-linked disparities in gene expression

and malignancy in *Drosophila*, *Science Advances* (2019). [DOI: 10.1126/sciadv.aaw7965](https://doi.org/10.1126/sciadv.aaw7965)

Provided by Institute for Research in Biomedicine (IRB Barcelona)

Citation: Genes responsible for sex-related differences in cancer aggressiveness found in vinegar flies (2019, August 16) retrieved 13 March 2024 from <https://medicalxpress.com/news/2019-08-genes-responsible-sex-related-differences-cancer.html>

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