

Flies to Humans - Humans to Flies: A Virtuous Circle of Colorectal Cancer Prevention

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The two Nobel prizes in physiology or medicine of 1995 and 2011 establish *Drosophila* genetics as a significant contributor of genes and signaling pathways relevant to human disease, including innate immunity and cancer. Other than providing clues on mammalian gene homologue function, relatively little attention has been paid on the translational aspect of *Drosophila* genes, microbes and environmental factors that influence homeostasis and disease. This is particularly important for colorectal cancer (CRC) prevention, for which molecular diagnostic tools are non-existent. While clinical studies provide a wealth of information on genes and microbes linked to inflammatory bowel disease (IBD) and CRC, it is unknown if they can serve as biomarkers in terms of CRC prevention. I will discuss the line of research of our team showing that many biomarkers of intestinal inflammation and CRC in humans may be modeled and mechanistically tested in flies. *Vise versa*, genes and processes we find in flies to promote tumorigenesis, such as regenerative inflammation and aging-associated DNA damage, may be tested as biomarkers of CRC risk in humans. Thus, modeling human intestinal inflammation and cancer in flies can provide a means to assess causality of conserved genes and microbes that can colonize the fly intestine. Moreover, successful modeling in flies enables the “treatability” of the pertinent biomarkers via dietary, probiotic and pharmacological interventions and may pave the way for clinical trials of treatments that alleviate intestinal inflammation and the risk for CRC. [Kamilari E, Apidianakis Y, Panagi M (2017) Flies to Humans - Humans to Flies: A Virtuous Circle of Colorectal Cancer Prevention. *Arch Clin Gastroenterol* 3(3): 047-060. DOI: <http://doi.org/10.17352/2455-2283.000038>]

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