

Fruit flies drawn to the sweet smell of youth

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Fruit Fly. Credit: UCSD

Aging takes its toll on sex appeal and now an international team of researchers led by Baylor College of Medicine and the University of Michigan find that in fruit flies, at least, it even diminishes the come-hither effect of the chemicals of love – pheromones.

"This is new because we have direct evidence that the pheromones produced at these different ages affect sexual attractiveness differently," said Tsung-Han Kuo, a graduate student in the department of molecular and human genetics and the Huffington Center on Aging at BCM. Kuo is first author of the report that appears online in the *Journal of Experimental Biology*.

Pheromones are chemicals produced by an organism to communicate or attract another. In this case, *Drosophila melanogaster* or [fruit flies](#) produce chemicals called cuticular hydrocarbons. Special mass spectrometry studies that looked in detail at the composition and level of production of these hydrocarbons showed that they differed between the sexes, but more important, they changed with age.

"In fact, cuticular hydrocarbon production may be an indicator of the insect's health and fertility," said Kuo. Reproduction is one of the major activities of the short-lived insects, and they enhance the possibility of passing on their genes through the production of these pheromones. Unfortunately, the alluring effect of the chemicals wanes with age.

"The results were remarkably consistent across different strains of flies," said Dr. Scott Pletcher, now of the University of Michigan, and Kuo's initial mentor at BCM.

Kuo, Pletcher and Dr. Herman A. Dierick, assistant professor of molecular and human genetics at BCM, then determined how the pheromones produced at different ages affected the attractiveness of the fruit flies.

Using a specially designed holding cell, Kuo introduced a male fly into a chamber that contained two females – a young fly and an old fly. Video of the encounter showed that the male was much more attracted to the young fly.

To eliminate physical appearance from the equation, he then conducted the experiment in the dark. The males still courted the young females more vigorously. When the scientists washed the pheromones off the females' bodies, the males could no longer tell a difference between young and old.

"In the last analysis, we took the pheromone from the young and old flies and put it on flies that do not produce pheromones," said Kuo. "The flies were identical in every way but the males still preferred the flies with the 'younger' [pheromone](#)."

"We know that aging is conserved across species," said Pletcher. "We want to examine the exciting possibility that the mechanisms underlying attractiveness are also conserved across species."

More information: jeb.biologists.org/ , DOI:10.1242/jeb.064980

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