

New study reveals responses of genes in females to sex

September 11 2012



Drosophila melanogaster

Sex can trigger remarkable female responses including altered fertility, immunity, libido, eating and sleep patterns—by the activation of diverse sets of genes, according to research from the University of East Anglia.

Publishing today in the journal [Proceedings of the Royal Society B](#), the researchers studied how female *Drosophila melanogaster*—or fruit flies—respond to mating.

They discovered that a single protein found in semen generates a wide range of responses in many genes in females, which become apparent at

different times and in different parts of the female's body following mating.

The findings could in principle be akin to responses in many animals, including humans, where sperm and semen is released inside the female's body during sex.

Lead researcher Prof Tracey Chapman, from UEA's school of Biological Sciences, said: "It's already known that seminal fluid proteins transferred from males during mating cause remarkable effects in females – including altered egg laying, feeding, immunity, [sleep patterns](#), water balance and sexual [receptivity](#).

"We tested here the effects of one enigmatic seminal fluid protein, known as the 'sex peptide', and found it to change the expression of a remarkable array of many genes in females – both across time and in different parts of the body.

"There were significant alterations to genes linked to [egg development](#), early embryogenesis, immunity, nutrient sensing, behavior and, unexpectedly, phototransduction – or the pathways by which they see.

"It showed that the semen protein is a 'master regulator' – which ultimately means that males effectively have a direct and global influence on the behaviour and reproductive system of the female. Such effects may well occur across many species.

"An additional and intriguing twist is that the effects of semen proteins can favour the interests of males whilst generating costs in females, resulting in [sexual conflict](#).

"For example, there can be a tug-of-war, where males employ semen proteins to ensure that females make a large investment in the current

brood – even if that doesn't suit the longer term interests of females."

More information: 'Sex peptide of *Drosophila melanogaster* males is a global regulator of reproductive processes in females' is published online today by the journal *Proceedings of the Royal Society B*.

Provided by University of East Anglia

Citation: New study reveals responses of genes in females to sex (2012, September 11) retrieved 28 April 2024 from <https://phys.org/news/2012-09-reveals-responses-genes-females-sex.html>

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