

# Similar brain chemicals influence aggression in fruit flies and humans

April 23 2007

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Serotonin is a major signaling chemical in the brain, and it has long been thought to be involved in aggressive behavior in a wide variety of animals as well as in humans. Another brain chemical signal, neuropeptide Y (known as neuropeptide F in invertebrates), is also known to affect an array of behaviors in many species, including territoriality in mice.

A new study by Drs. Herman Dierick and Ralph Greenspan of The Neurosciences Institute in San Diego shows that these two chemicals also regulate aggression in the fruit fly, *Drosophila melanogaster*.

In a series of studies that used drug treatments and genetic engineering we have produced flies that make increased or decreased amounts of serotonin, or whose nerve cells that use serotonin or neuropeptide F are silent or inactive. Our investigations showed that the more serotonin a fly makes, the more aggressive it will be towards other flies. Conversely, presence of neuropeptide F has an opposite modulatory effect on the flies' behavior, reducing aggression. Serotonin and neuropeptide F are part of separate circuits in the brain, circuits which also differ to some extent between males and females. Male flies are much more aggressive.

Both of these chemical modulators affect aggression in mammals, and finding these effects in flies suggests that the molecular and neural roots for this complex social behavior are of ancient evolutionary origin.

Drs. Dierick and Greenspan are Fellows at The Neurosciences Institute,

an independent, nonprofit, privately supported, scientific research organization dedicated to studying the workings of the brain at the most fundamental level. Under the leadership of Nobel Laureate, Gerald M. Edelman, M.D., Ph.D., the Institute is dedicated to a research environment that encourages creativity and innovation in a collaborative atmosphere with true freedom of scientific inquiry, in the expectation that such an environment provides the best chance for making vital advances for the benefit of mankind.

Source: The Neurosciences Institute

Citation: Similar brain chemicals influence aggression in fruit flies and humans (2007, April 23) retrieved 17 April 2024 from

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