Space flies offer clues about microgravity's impact on astronauts

January 31 2014

Fruit flies bred in space are offering scientists a clue as to how astronauts' immune systems may be damaged during prolonged space travel.

A team of researchers from the University of California at Davis and the University of Central Florida has been studying the impact weightlessness has on fruit flies in space. The team's findings are published in this month's journal *PLOS One*.

Fruit flies' innate immune system is similar to that of humans and other mammals and is often used as a model in basic studies. While the negative impact of zero gravity on muscle, bone mass and the immune system has long been documented, exactly how it happens remains a mystery. This study offers a clue into one way the immune system may be affected.

"Our study showed that a biochemical pathway needed to fight fungal infections is seriously compromised in the flies after space flight," said Laurence Von Kalm, a UCF biologist who worked on the study. "More work will be needed to determine if similar effects occur in humans, but this gives us some clues. Getting a better understanding is particularly important, especially as we look to engage in long-term missions such as interplanetary space flights."

The research team, led by UC Davis biologist Deborah Kimbrell, bred flies in space aboard Space Shuttle Discovery in 2006. The flies

developed into adults while on the 12-day mission. The flies were retrieved after the mission and researchers found that they were more apt to get fungal infections. Further analysis revealed that the system the flies use for detecting and defending against fungal infection was deactivated. In contrast, another system used to defend against bacterial infection was not impaired in the space flies.

The team hopes to carry out research with fruit flies on the International Space Station.

More information: www.plosone.org/article/info%3Adoi%2F10.1371%2Fjournal.pone.0086485

Provided by University of Central Florida