Medical Xpress

Attention drug drives memory research

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(PhysOrg.com) -- Scientists at the Queensland Brain Institute have found a way to measure the attention span of a fly, which could lead to further advances in the understanding of attention-deficit hyperactivity disorder (ADHD) and autism in humans.

The researchers combined genetic techniques with brain recordings and found different mutations that either increase or decrease a fly's attention span. Interestingly, all of these mutations produce learning and memory problems.

Using the genetic fruit fly model *Drosophila melanogaster*, lead researcher Associate Professor Bruno van Swinderen found that a fly's level of distractibility is finely tuned to allow "normal" behavioural responses to a constantly changing environment.

"We now have the two ends of an attention spectrum in our model. We have a fly memory mutant that is hard to distract and another fly memory mutant that's too distractible. They both have the same result - they don't learn well but for completely different reasons, not unlike human patients afflicted with autism and ADHD," Dr van Swinderen said.

"You need a certain amount of distractibility to be able to assimilate your world - concentrating too much or too little affects your ability to process and retain information."

Understanding the processes regulating attention and memory in the fly brain will allow researchers to better understand how memory and attention work together to govern behaviour.

Dr van Swinderen fed the fruit flies methylphenidate, which is sold under the brand name Ritalin and used to treat children with ADHD. He found the drug had similar affects on fruit flies as it did on people - namely, it helped the distractible flies to pay attention to visual stimuli.

“It suggests there may be similar pathways in the brains of fruit flies and humans, which means we now have a simple reductionist model, with all the genetic tools that go along with it, to try to understand what exactly this drug is doing,” he said.

“We know that this drug affects different pathways. Now we can really try to ask how does that translate to other brain phenomena, such as how neurons talk to one another. It will help us form the bigger picture.”

That could further unlock clues into how we develop - and retain - memories.

Dr van Swinderen's findings are published in the latest edition of the *Journal of Neuroscience*, out today.

Provided by University of Queensland