



Singapore Journal of
Scientific Research

ISSN: 2010-006x

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Mice Can Synthesize Their Own Morphine, Research Shows

Traces of morphine in urine samples have been considered a clear proof of drug use or the consumption of food containing poppy in the past. Now a study by a team of scientists from the Institute of Environmental Research at TU Dortmund and the Donald Danforth Plant Science Center in St Louis, Missouri, point to another possible explanation: they managed for the first time to prove that mice -- and probably humans and other mammals as well -- produce their own morphine in their bodies.

For these experiments the scientists injected the mice with labeled tetrahydropapaveroline over a period of five days. This chemical is the substance which the poppy plant converts into morphine in a complex process involving several steps. These steps, 17 altogether, were exactly what the scientists found in the mice.

"The animals have to possess an elaborate enzyme system which enables them to produce morphine autonomously," explains Prof. Michael Spiteller from the Dortmund Institute of Environmental Research. Apart from one little difference in the early stages, the conversion process is the same in the animal and the poppy plant. According to Spiteller,

evolution has obviously found two ways to synthesize morphine.

The purpose of the body's own morphine production is still unclear. Morphine might help the nerve cells to communicate with each other. But it is also possible that animals, and possibly humans too, use the production of morphine, for instance, under shock or in case of severe injuries as the body's own painkiller.

Further investigations in cooperation with the university hospital in Cologne are to establish clarity.

The research was recently published in the Proceedings of the National Academy of Sciences.