

# Gas on your mind

December 11 2006

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Scientists at the University of Leicester are to gain a greater insight into the workings of the human mind...through the study of a snail's brain.

The research may lead to a greater understanding of the development of the nervous system and the processes that control nerve cell regeneration following injury. Researchers received funding of £322,299 from the BBSRC (Biotechnology and Biological Sciences Research Council) for the study.

The research project, led by Dr Volko Straub, a Research Councils UK fellow in the University's Department of Cell Physiology and Pharmacology, may also provide new insights why nitric oxide plays such an important role in many forms of learning.

Dr Straub commented: "The gas nitric oxide has two faces. It can be highly toxic and kill. However, it is also found naturally in the brain where it is used by nerve cells to communicate with each other. So, whilst it can be poisonous, the body also uses it beneficially as an internal signal."

"During brain development, nitric oxide can promote the growth of nerve cells and the formation of connections between nerve cells. Learning also triggers the formation of new connections between nerve cells and in many cases requires nitric oxide."

Despite the recognition of the importance of nitric oxide for the formation of nerve cell connections, scientists know little about the

mechanisms. The Leicester BBSRC-funded project will study directly the relationship between the effects of nitric oxide on the growth of nerve cells and the formation of nerve cell connections.

Dr Straub explained: “Studying these processes in higher animals is complicated by the complexity of their nervous system. Fortunately, evolution has been very conservative. So, we decided to use the nervous system of the common pond snail, which is considerably less complex than the nervous system of higher animals such as mice, as a model system.

“In the snail, individual nerve cells are relatively large and easily identifiable. They are accessible for experimental manipulations. Snail neurons can also be isolated from the nervous system and maintained in cell culture, where they grow and form functional connections. Importantly, the basic processes and factors that control the growth of nerve cells and the formation of functional connections are highly conserved in all animals.”

The results of the project will show what effects nitric oxide has on nerve cell growth and on the formation of functional connections. In a broader context, the results will contribute to a better understanding of the factors that control nerve cell growth and the formation of functional connections.

Source: University of Leicester

Citation: Gas on your mind (2006, December 11) retrieved 7 May 2024 from <https://medicalxpress.com/news/2006-12-gas-mind.html>

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