

# Scientists make brain signal discovery

July 6 2011

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(Medical Xpress) -- A Murdoch University scientist is closer to understanding why early brain development is so critical to mental health and function in the long term.

Dr Sarah Etherington from the School of Veterinary and [Biomedical Sciences](#) studied rodents – which have similar microcircuits in their brains to those found in humans – to discover that there are important changes in the flow of information within a part of the [brain](#) known as the visual cortex, during very early development.

Importantly, some of the most dramatic changes to information flow in the visual cortex, which processes visual information, seemed to occur when the subject first opened its eyes.

“If the flow of information in the visual cortex is changing dramatically when the brain is first exposed to the visual world, it will impact on the other developmental processes in this tissue,” explained Dr Etherington.

“We are particularly interested in researching the development of the visual cortex because several debilitating human medical conditions, such as autism, involve specific deficiencies in the processing of visual information.

“It has been known for decades that normal visual input – the movement, shapes and colours of everyday life – during development is essential for the visual cortex to function normally in maturity, but why this input is so important during this period remains unclear.”

The bulk of Dr Etherington’s studies were carried out in the Medical Research Council Laboratory of Molecular Biology at Cambridge, England where she collaborated closely with Professor Stephen Williams, who has since relocated to the Queensland Brain Institute at the University of Queensland. Professor Williams is an international authority on neuroscience and is Dr Etherington’s mentor.

Together they studied one of the many connections in the visual cortex of rodents and their paper on the research has just been published in the prestigious publication *The Journal of Neuroscience*.

Funding from the McCusker Charitable Foundation will help Dr Etherington, Dr Williams and a research team at Murdoch University study some of the other connections in the mammalian visual cortex. The innovative method they will use records electrical signals from nerve cells in the cortex and so allows Dr Etherington to see how that pattern of information transfer between these cells changes over the early developmental period.

The research will utilise state-of-the-art equipment set up by Dr Etherington and funded by Murdoch University.

“There has not been a lot of research done into how information flow within the visual cortex changes at this early stage of development and so we are now looking forward to mapping these changes,” said Dr Etherington. “We will then be able to test our hypothesis that changes in the flow of information within the [visual cortex](#) are experience-dependent.

“We would hope that this could lead to understanding and ultimately minimising the potentially detrimental impact of early life experiences on lifetime [mental health](#) and function.”

**More information:** [www.jneurosci.org/](http://www.jneurosci.org/)

Provided by Murdoch University

Citation: Scientists make brain signal discovery (2011, July 6) retrieved 24 April 2024 from <https://medicalxpress.com/news/2011-07-scientists-brain-discovery.html>

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