

Press Release

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UCC researchers investigate why some can resist stress

Why on the rollercoaster of life are some people more resilient to the negative effects of stress than others?

Now University College Cork neuroscientists show that certain receptors in the brain play an important role in determining how we respond to different types of stress. Their research is being published today in the prestigious international journal *Proceedings of the National Academy of Sciences USA*.

It is well known that severe or chronic stressful life events can increase susceptibility to developing psychiatric disorders such as depression. However, many other individuals remain resilient to such negative effects of stress. Thus, scientists are working hard to understand the mechanisms in the brain that determine whether we succumb or resist the negative effects of stress.

Scientists based at the Dept of Anatomy & Neuroscience and the Alimentary Pharmabiotic Centre in University College Cork, Cork, Ireland have identified a novel molecular mechanism that determines how the brain responds to chronic stress. Prof John Cryan and Dr Olivia O'Leary, together with their PhD student Daniela Felice and their colleagues have shown that different subtypes of a given receptor (the GABAB receptor) can confer vulnerability to stress (both in early-life and in adulthood). They found that mice lacking the 1b subtype were resilient to stress, while mice lacking the 1a subtype were more susceptible to stress. They also found different expression of these receptors in the brains of a genetic mouse model of depression. Moreover, the absence of these receptors affected how stress impacts the birth of new brain cells in the hippocampus, a region of the brain involved in cognition and emotion. Notably, increased production of new brain cells in the hippocampus is also thought to contribute to the mechanism of action of antidepressant treatments.

Dr O'Leary says "*although it is early days, these data show that these receptors could be important targets for the development of new drugs in the treatment of depression, where there is still such an unmet medical need*". Indeed, Prof Cryan says that "*understanding the molecular factors that enable the brain to be stress resilient is one of the most exciting areas in neuroscience research currently and these data position the GABAB receptor at the heart of such efforts*", "*we still have some way to go to translate these findings into humans but we are very excited by these data*" Cryan continued. The research was supported by the European Commission [Framework Programme 7 grant DEVANX (Health-2007-A-201714)]. The Alimentary Pharmabiotic Centre is funded by Science Foundation Ireland (SFI) through the Irish Government's National Development Plan. The research was co-authored by researchers at UCC, Stefano Galimberti, H el ene M. Savignac, Javier A. Bravo, Tadhg Crowley and Ted Dinan in collaboration with Lyon (Malika El Yacoubi), Rouen (Jean-Marie Vaugeois) and Basel-based researchers (Martin Gassmann, Bernhard Bettler).

*The research is published in the October 6th early edition of Proceedings of the National Academy of Sciences USA. "GABAB(1) receptor subunit isoforms differentially regulate stress resilience" Authors: Olivia F. O'Leary, Daniela Felice, Stefano Galimberti, H el ene M. Savignac, Javier A. Bravo, Tadhg Crowley, Malika El Yacoubi, Jean-Marie Vaugeois, Martin Gassmann, Bernhard Bettler, Timothy G. Dinan and John F. Cryan.*