Key protein responsible for controlling communication between brain cells identified

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Scientists are a step closer to understanding how some of the brain's 100 billion nerve cells co-ordinate their communication. The study is published today in the journal *Cell Reports*.

The University of Bristol research team investigated some of the chemical processes that underpin how brain cells co-ordinate their communication. Defects in this communication are associated with disorders such as epilepsy, autism and schizophrenia, and therefore these findings could lead to the development of novel neurological therapies.

Neurons in the brain communicate with each other using chemicals called neurotransmitters. This release of neurotransmitter from neurons is tightly controlled by many different proteins inside the neuron. These proteins interact with each other to ensure that neurotransmitter is only released when necessary. Although the mechanisms that control this release have been extensively studied, the processes that co-ordinate how and when the component proteins interact is not fully understood.

The School of Biochemistry researchers have now discovered that one of these proteins called 'RIM1α' is modified by a small protein named 'SUMO' which attaches to a specific region in RIM1α. This process acts as a 'molecular switch' which is required for normal neurotransmitter release.

Jeremy Henley, Professor of Molecular Neuroscience in the University's Faculty of Medical and Veterinary Sciences and the study's lead author,

said: "These findings are important as they show that SUMO modification plays a vital and previously unsuspected role in normal brain function."

The research builds on the team's earlier work that identified a group of proteins in the brain responsible for protecting nerve cells from damage and could be used in future for therapies for stroke and other brain diseases.

Provided by University of Bristol

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