

New light on bipolar treatment drugs

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Lithium has been established for more than 50 years as one of the most effective treatments for bipolar mood disorder.

However, scientists have never been entirely sure exactly how it operates in the [human brain](#).

Now, new research from Cardiff University scientists suggests a mechanism for how Lithium works, opening the door for potentially more effective treatments.

Laboratory tests on cells have shown that Lithium affects a molecule called PIP3 that is important in controlling brain cell signalling. Lithium suppresses the production of inositol, a simple sugar from which PIP3 is made.

Lithium inhibits inositol monophosphatase (IMPase) an enzyme required for making inositol. Importantly, this research shows that increasing the amount of IMPase causes higher levels of PIP3. This can then be reduced by lithium treatment.

High levels of IMPA2, a gene for a variant of IMPase, has previously been linked to bipolar mood disorder. This new result suggests that Lithium could counteract the changes in IMPA2.

Professor Adrian Harwood of Cardiff School of Biosciences, who led the research, said: "We still cannot say definitively how Lithium can help stabilise bipolar disorder. However, our research does suggest a possible

pathway for its operation. By better understanding Lithium, we can learn about the genetics of bipolar disorder and develop more potent and selective drugs.

"Further, altered PIP3 signalling is linked to other disorders, including epilepsy and [autism](#), so this well established drug could be used to treat other conditions. Research into Lithium could become very important over the next few years."

[Lithium](#) is currently under clinical trial for the treatment of neurogenerative disorder amyotrophic lateral sclerosis (ALS)

The research, funded by the Wellcome Trust, is published in the journal *Disease Models and Mechanisms*.

Source: Cardiff University ([news](#) : [web](#))

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