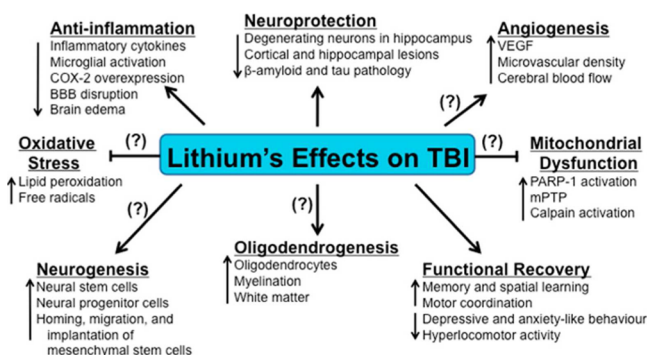


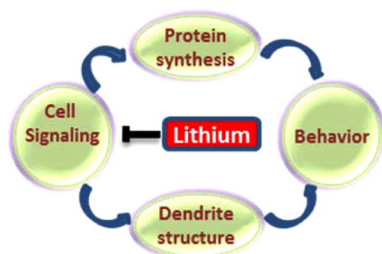
## LITHIUM'S EFFECTS ON TRAUMATIC BRAIN INJURY



Traumatic brain injury (TBI) is defined as brain tissue damage caused by mechanical force. To date, no treatment is available to alleviate TBI. In the current issue, Leeds et al. (DOI: 10.1021/cn500040g) provide convincing evidence that lithium can reverse some of the deleterious effects of TBI.

The authors show that lithium stimulates neurogenesis via multiple signaling pathways. It inhibits glycogen synthase kinase-3, upregulates neurotrophins and growth factors, modulates inflammatory molecules, upregulates neuroprotective factors, and concomitantly downregulates pro-apoptotic factors. Lithium has also shown promise in preclinical models of TBI.

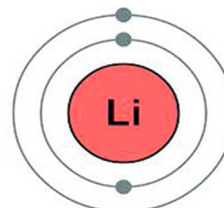
## TARGETING FRAGILE X SYNDROME



Fragile X syndrome (FXS) is a genetic disorder that causes intellectual disability. The underlying reason for this disorder is the expansion of a sequence of CGG trinucleotide repeats in the 5'-untranslated region of the *Fmr1* gene. Now, Liu and Smith (DOI: 10.1021/cn500077p) provide an overview on the recent work indicating the effectiveness of lithium in treating FXS patients.

The development of animal models of FXS, especially the *Fmr1* knockout mouse model and additional models in rats, *Drosophila*, and zebrafish, have advanced our understanding of FXS. The authors of this Review focus on lithium treatment in both mouse and fruit fly models of FXS, which has shown to reverse numerous behavioral, physiological, cellular, and molecular phenotypes. Additionally, a pilot clinical trial confirmed lithium as a possible FXS therapeutic.

## LITHIUM AS A BIPOLAR DISORDER THERAPEUTIC



### BIPOLAR DISORDER

Bipolar disorder is serious mental illness that afflicts between 2 and 5% of the world population. The use of mood stabilizing drugs is vital to the treatment of these patients. Lithium has been shown to be effective in treating approximately one-third of bipolar disorder patients. In the current issue, Rybakowski (DOI: 10.1021/cn5000277) summarizes the current knowledge on neurochemical and neurogenetic correlates of lithium response in the treatment of bipolar patients.

The author delineates the mechanisms underlying lithium responders and those that do not respond favorably to lithium treatment. In particular, the author focuses on a correlation between serum brain-derived neurotrophic factor (BDNF) levels and favorable effects of lithium.

**Special Issue:** Current Hypotheses of Lithium's Mechanism of Action as a Neuropsychiatric Medication

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