Nature Reviews Neurology **11**, 185 (2015); published online X24 March 2015;
doi:10.1038/nrneurol.2015.41;
doi:10.1038/nrneurol.2015.42;
doi:10.1038/nrneurol.2015.43

IN BRIEF

EPILEPSY

KCC2 phosphorylation is critical for limiting the severity of status epilepticus in mice

Neuronal inhibition is critically dependent on K^+/Cl^- transporter (KCC2) activity, which helps maintain low intracellular Cl^- levels. Now, a new mouse study has shown that KCC2 could be a key regulator of the onset and severity of status epilepticus. Phosphorylation of KCC2 at Ser940 enhances KCC2 function *in vivo*, and kainate-induced seizures result in rapid Ser940 dephosphorylation and subsequent loss of neuronal Cl^- homeostasis. Previous genetic studies have reported *KCC2* mutations that decrease Ser940 phosphorylation in humans with idiopathic epilepsy, suggesting that modulation of KCC2 activity might have therapeutic potential.

Original article Silayeva, L. *et al.* KCC2 activity is critical in limiting the onset and severity of status epilepticus. *Proc. Natl Acad. Sci. USA* doi:10.1073/pnas.1415126112

MULTIPLE SCLEROSIS

Hematopoietic mobilization—a potential circulating biomarker for natalizumab response

Increases in circulating hematopoietic stem and progenitor cells (HSPCs) could represent an early biomarker of patients' responsiveness to natalizumab, according to new research. Using flow cytometry, Mattoscio and colleagues evaluated the level of HSPCs in the blood of 45 patients with multiple sclerosis (MS) who were treated with natalizumab, 10 untreated patients and 24 healthy controls. The number of circulating HSPCs recently mobilized from the bone marrow increased during natalizumab treatment, but the magnitude of this increase was variable between individuals, enabling the stratification of 'mobilizer' and 'nonmobilizer' subgroups. In the mobilizer subgroup, natalizumab suppressed disease activity and markedly increased the number of circulating B cells and regulatory T cells, whereas in the nonmobilizer subgroup, disease activity persisted despite natalizumab treatment.

Original article Mattoscio, M. *et al.* Hematopoietic mobilization: potential biomarker of response to natalizumab in multiple sclerosis. *Neurology* doi:10.1212/WNL.0000000000001454

NEUROPATHIC PAIN

Acetyl-L-carnitine can alleviate peripheral neuropathic pain

A meta-analysis of four randomized controlled trials (RCTs), comprising 523 patients, suggests that acetyl-L-carnitine is moderately effective in treatment of peripheral neuropathic pain. Li and colleagues report that acetyl-L-carnitine was more effective than placebo regardless of administration route; acetyl-L-carnitine seemed to be effective particularly in patients with diabetic peripheral neuropathic pain. The number of adverse events did not differ between patients treated with acetyl-L-carnitine, other pain medications or placebo, and acetyl-L-carnitine use was not associated with any severe adverse events. Efficacy of acetyl-L-carnitine in long term (>1 year) treatment of neuropathic pain has not yet been evaluated in RCTs.

Original article Li, S. *et al.* Acetyl-L-carnitine in the treatment of peripheral neuropathic pain: a systematic review and meta-analysis of randomized controlled trials. *PLOS ONE* doi:10.1371/journal.pone.0119479