Epilepsy is a chronic neurological disorder characterized by aberrant neural activity. In this special focus issue on epilepsy, we highlight recent research into the pathogenic events and circuit-level changes driving pathological alterations in neuronal excitability. The cover depicts parallels between seismic activity and epileptic seizures. They each start focally but have widespread effects that can be devastating, leaving long-term damage both at the site of initiation and elsewhere. Drawing by Benedicte Ross (pp 331–372)

DA and Glu microdomains (p 386)

Focus on epilepsy

Vernon B. Mountcastle 1918–2015
Solomon H Snyder

GDNF is not required for catecholaminergic neuron survival in vivo

The amygdala accountant: new tricks for an old structure
Clayton P Mosher & Peter H Rudebeck ▶ see also p 461

Neighborly synapses help each other out
J Simon Wiegert & Thomas G Oertner ▶ see also p 402

Attention: feedback focuses a wandering mind
Edward Awh & Edward K Vogel ▶ see also p 470

Tread softly and carry a clock’s tick
Joseph J Paton & Brian Lau ▶ see also p 453

Beyond the hammer and the scalpel: selective circuit control for the epilepsies
Esther Krock-Magnuson & Ivan Soltesz

Animal models in epilepsy research: legacies and new directions
Brian P Grone & Scott C Baraban

Pathway-driven discovery of epilepsy genes
Jeffrey Noebels

Microcircuits and their interactions in epilepsy: is the focus out of focus?
Jeanne T Paz & John R Huguenard

Reprogramming patient-derived cells to study the epilepsies
Jack M Parent & Stewart A Anderson

Molecular mechanisms of epilepsy
Kevin Staley
BRIEF COMMUNICATIONS

373 Manipulating circadian clock neuron firing rate resets molecular circadian rhythms and behavior
J R Jones, M C Tackenberg & D G McMahon

376 Cocaine-evoked negative symptoms require AMPA receptor trafficking in the lateral habenula

ARTICLES

379 A neuroprotective role for microRNA miR-1000 mediated by limiting glutamate excitotoxicity
P Verma, G J Augustine, M-R Ammar, A Tashiro & S M Cohen

386 Dopaminergic and glutamatergic microdomains in a subset of rodent mesoaccumbens axons
S Zhang, J Qi, X Li, H-L Wang, J P Britt, A F Hoffman, A Bonci, C R Lupica & M Morales

393 Sensory inputs control the integration of neurogliaform interneurons into cortical circuits
N V De Marco García, R Priya, S N Tuncdemir, G Fishell & T Karayannis

402 Visualization of NMDA receptor–dependent AMPA receptor synaptic plasticity in vivo
Y Zhang, R H Cudmore, D-T Lin, D J Linden & R L Huganir ▶ see also p 326

408 Optogenetic perturbation of preBötzing complex inhibitory neurons modulates respiratory pattern
D Sherman, J W Worrell, Y Cui & J L Feldman

415 Epigenetic basis of opiate suppression of Bdnf gene expression in the ventral tegmental area

423 Astrocytic adenosine receptor A2A and Gs-coupled signaling regulate memory

435 Social deficits in IRSp53 mutant mice improved by NMDAR and mGluR5 suppression

444 In vivo coincidence detection in mammalian sound localization generates phase delays
T P Franken, M T Roberts, L Wei, N L Golding & P X Joris

453 The striatum multiplexes contextual and kinematic information to constrain motor habits execution
P E Rueda-Orozco & D Robbe ▶ see also p 329

461 Planning activity for internally generated reward goals in monkey amygdala neurons
I Hernádi, F Grabenhorst & W Schultz ▶ see also p 324

470 Closed-loop training of attention with real-time brain imaging
M T deBettencourt, J D Cohen, R F Lee, K A Norman & N B Turk-Browne ▶ see also p 327

NATURE NEUROSCIENCE CLASSIFIED

See back pages.