IN BRIEF

NEUROSCIENCE

Ultrasound influences behavior

Kubanek, J. et al. *Sci. Adv.* **6**, eaaz4193 (2020)

The ability to modulate the activity of specific brain circuits in awake, behaving animals is essential to elucidate the contributions of different brain regions to behavior in health and disease. Ultrasound, which shows neuromodulatory potential in rodents, is emerging as noninvasive neuromodulation approach that could revolutionize brain function studies.

By showing that brief pulses of low-intensity ultrasound delivered to specific brain regions had strong effects on the behavior of macaque monkeys engaged in a choice task, a study confirms that ultrasound can modulate neuronal activity in the brain of large mammals. This approach might provide new ways to study brain function in humans and to treat brain disorders. *ALB*

https://doi.org/10.1038/s41684-020-0585-2

EXPERIMENTAL MODEL

A fly model of cystic fibrosis

Kim, K. et al. *PNAS* **117**, 10357–10367 (2020)

Cystic fibrosis (CF)—an inherited disease characterized by the accumulation of viscous mucus in the pulmonary and gastrointestinal tract—is caused by a mutation in *CFTR*, a gene encoding a chloride channel expressed in various epithelia. Mouse, pig, ferret, zebrafish and rat models carrying *cftr* mutations have provided valuable insights into CF pathogenesis, but many questions remain unanswered.

By adding *Drosophila* to the list of available models, a *PNAS* study opens new avenues for CF research. The fly model, which was generated by knocking down a *CFTR* ortholog in the adult intestine, recapitulated the gastrointestinal manifestations of CF and could be used for high-throughput drug screens. *ALB*

https://doi.org/10.1038/s41684-020-0586-1

NEURODEGENERATIVE DISEASE

Astrocytes in Alzheimer's

Habib, N. et al. *Nat. Neurosci.* **23**, 701–706 (2020)

Increasing evidence indicates that non-neuronal cells have a major role in the onset and progression of Alzheimer's disease (AD). Single-cell RNA sequencing analyses in mouse and human have identified a microglia type associated with AD, but astrocytes have been less characterized in the disease.

A new study using single-nucleus RNA sequencing to compare cell populations in the hippocampi of 7-month-old wild-type and AD mice (5xFAD) identified a unique astrocyte state in AD mice. The disease-associated astrocytes had an inflammatory and neurotoxic expression profile, with increased expression of *Serpina3n*, which encodes a protein linked to amyloid accumulation. Further investigation is needed to understand the role of these cells and their potential as a therapeutic target for AD. *ALB*

https://doi.org/10.1038/s41684-020-0587-0

NEUROPHYSIOLOGY

Stroke effects

He, F. et al. *Sci. Adv.* **6**, eaba1933 (2020)

Neurovascular coupling—the close spatial and temporal relationship between local neural activity and cerebral blood flow (CBF)—is altered in stroke. However, few studies have measured neural and hemodynamic activities simultaneously to explore how the interaction between CBF and neuronal activity develops over time in stroke models.

Using a new multimodal neural interface enabling the repeated mapping of CBF and electrical activity in the same brain regions of mice for up to 8 weeks after stroke, a study reveals a long-lasting dissociation between CBF and neuronal responses after injury; these findings also inform the limitation of neuroimaging techniques that use hemodynamic parameters as a proxy for neural activity for brain ischemic states. *ALB*

https://doi.org/10.1038/s41684-020-0588-z