IN BRIEF

EXPERIMENTAL MODEL

A *Drosophila* model of TBI

Saikumar, J. et al. *PNAS* https://doi.org/10.1073/pnas.2003909117 (2020)

Traumatic brain injury (TBI) triggers a chronic and progressive neurodegeneration that increases the risk of neurodegenerative diseases such as Alzheimer's disease. Rodent models have been widely used to understand TBI pathology and identify potential neuroprotective agents, but drugs developed in animal models have all failed in human trials.

A study describes a new model of TBI in *Drosophil*a, in which traumatic injury was inflicted to the fly head using a piezoelectric actuator. This closed head model of TBI recapitulates features characteristic of mammalian TBI, including brain degeneration. By allowing large-scale genetic and pharmacological screens, this model offers new perspectives to understand TBI pathology and identify efficient neuroprotective drugs. *ALB*

https://doi.org/10.1038/s41684-020-0604-3

CANCER

Telomeres and cancer

Lex, K. et al. *PNAS* **117**, 15066–15074 (2020)

Cancer incidence increases with age as telomeres get shorter. However little is known about how telomere shortening may lead to cancer.

Using zebrafish chimeras in which blastula cells from donor embryos capable of giving rise to melanoma were transplanted into wild-type embryos or telomerase-deficient embryos ($tert^{-/-}$) with shorter telomeres, a new study demonstrates that telomere shortening promotes cancer in a noncell autonomous manner. The results also indicate that $tert^{-/-}$ cells increase tumor incidence and progression in zebrafish by creating a systemic senescent and inflammatory environment. Additional investigation in animal models will be needed to confirm that telomere shortening promotes cancer in aging and identify the molecular mechanisms underlying this process. *ALB*

https://doi.org/10.1038/s41684-020-0606-1

GENE EDITING

Restoring hearing in mice

Yeh, W-H. et al. *Sci. Transl. Med.* **12**, eaay9101 (2020)

Genetic defects are a major cause of hearing loss (HL) in newborns. No curative treatments are available for genetic HL, but gene therapy-based strategies that replace an absent gene product or silence a pathological allele have shown promising results in mouse models.

A study describes a new base-editing approach aimed at correcting a point mutation in *Tmc1* that causes deafness in Baringo mice. Adeno-associated virus (AAV) delivery of a cytosine base editor and guide RNA into the inner ears of Baringo mice at postnatal day 1 successfully corrected the *Tmc1* mutation and partially rescued auditory function, thereby demonstrating the potential of base editing as a treatment for HL caused by recessive loss-of-function point mutations. *ALB*

https://doi.org/10.1038/s41684-020-0605-2

GENETIC ENGINEERING

Tracking microglia

McKinsey, G.L. et al. *eLife* **9**, e54590 (2020)

Microglia—the resident macrophages of the central nervous system (CNS)—regulate a wide variety of processes including CNS response to injury. In the context of injury, circulatory monocytes can invade the CNS, differentiate into macrophages and contribute to the CNS response. The lack of genetic tools to specifically target these cell populations makes it challenging to distinguish their relative contributions.

A study describes the development of a new mouse model for the genetic targeting of microglia. Using flow cytometry, immunohistochemistry and ribosomal profiling, the investigators show that *P2ry12-CreER* recombines microglia more specifically than other microglial recombinase lines, such as *Cx3cr1-CreER*. *P2ry12-CreER* mice will be a useful tool to understand the specific role of microglia in development and disease. *ALB*

https://doi.org/10.1038/s41684-020-0607-0