IN BRIEF

CNS CANCER

A xenotransplant model for gliomas

Hoffmann, N. et al. *iScience* **23**, 100813 (2019)

Patient-derived xenografts (PDX) generated by transplantation of human cancer cells into immunodeficient mice are widely used to study human malignancies, but these models are not suitable for exploring the interactions between the immune system and tumor cells. In a new study, Hoffmann and colleagues developed a new xenotransplant model by transplanting human glioblastoma cells into the brain of wild-type mouse embryos in utero. Exploiting the ‘immune-privileged’ developmental time window, human PDX persisted in the postnatal brain of the immune-competent mice and recapitulated important tumor-associated pathological features such as infiltration, vascularization, and tumor microenvironment. This model could be valuable to study tumor interaction with the host immune system and test immune-based therapies. *ALB*

<https://doi.org/10.1038/s41684-020-0494-4>

GENETICS

Transcriptional adaptation in *C. elegans*

Seroby, V. et al. *elife* **9**, e50014 (2020)

Transcriptional adaptation refers to the ability of a mutation in a gene to modulate the expression of related genes. If the regulated genes share functionality with the mutated gene, transcriptional adaptation can lead to functional compensation, which explains the differences that can be observed between certain knockout and knockdown models of the same gene. This phenomenon has been previously described in zebrafish and mice; in a new study, Didier Stainier and his team (Max Planck Institute for Heart and Lung Research) show that transcriptional adaptation can also occur in *C. elegans*, using Actin and Titin genes as examples.

Through a candidate RNA interference screen, the investigators also demonstrated that mRNA decay as well as small RNA biogenesis and transport were critical factors for transcriptional adaptation in *C. elegans*. *ALB*

<https://doi.org/10.1038/s41684-020-0496-2>

EXPERIMENTAL MODEL

CNS regeneration in planarians

Karge, A. et al. *elife* **9**, e47293 (2020)

Planarians are ideal model organisms to study neurogenesis. Their brain undergoes extensive neural differentiation through adulthood and can fully regenerate after injury. An RNAi screen to identify regulators of neurogenesis in *Schmidtea mediterranea* revealed that *tec-1* knockdown could increase the abundance of different types of neurons in the central and peripheral nervous system.

Using BrdU labeling, the investigators showed that *tec-1* inhibition increased the numbers of neurons without modifying the rate of neuronal differentiation, suggesting that *tec-1* negatively regulates neurogenesis by acting on neuron survival; TUNEL staining on head fragments after amputation confirmed that *tec-1* promotes cell death. Future studies are needed to determine whether *tec-1* orthologs have similar functions in vertebrates and could be targeted to promote neural tissue repair. *ALB*

<https://doi.org/10.1038/s41684-020-0495-3>

NEUROSCIENCE

Proteomic profiling in the fly brain

Li, J. et al. *Cell* **180**, 373–386.e15 (2020)

In multicellular organisms, cell–cell interactions drive numerous developmental and physiological processes. Capturing cell-surface proteomes during these processes could provide valuable information, but technical limitations have hampered efforts to characterize the cell surface proteome of a specific cell type in an in situ tissue context.

A new study presents a method for profiling cell-surface proteomes in intact tissues with cell-type and spatiotemporal specificities, which was applied to capture the cell-surface proteomes of developing and mature olfactory projection neurons (PNs) in *Drosophila*. The method detected the changes of PN surface proteins corresponding to the wiring and functional stages of the olfactory circuit. Future investigations of these proteins should increase our understanding of the mechanisms by which neural circuits are assembled. *ALB*

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