IN BRIEF

**IMMUNOLOGY**

**Measuring leukocyte trafficking in NHPs**

Potter, E.L. et al. Sci. Transl. Med. 13, eabb4582 (2021)

Leukocyte trafficking is essential for immunity in homeostatic and inflammatory conditions. However, few methods are available to track leukocyte migration in vivo, limiting our understanding of the regulation of this process.

In a new study, investigators led by Mario Roederer from NIAID developed a method to measure leukocyte migration in macaques. The team used serial intravascular staining (SIVS) with differently labelled antibodies to “barcode” circulating leukocytes according to their location at the time of each infusion. Flow cytometry analysis revealed the time history of cellular position for different leukocyte populations, which was used to calculate trafficking kinetics in lymphoid and nonlymphoid tissues of healthy macaques and in granulomas of *Mycobacterium tuberculosis*–infected macaques.

https://doi.org/10.1038/s41684-021-00730-1

**DIABETES**

**3D imaging of pancreatic islets in mice**

Roostalu, U. et al. Dis.Model Mech. 13, dmm045351 (2020)

Current methods to image pancreatic islets in mice include stereology and optical projection tomography. A study now presents a quantitative light-sheet imaging technique to capture changes in individual pancreatic islets in mouse models of diabetes.

Pancreata from mice with type II diabetes were labeled with antibodies against insulin and cell proliferation marker Ki67 using a modified iDISCO protocol before light-sheet imaging. Image analysis revealed an increase in islet number and volume in diabetic mice compared with control mice, together with an increase in β-cell proliferation.

The platform also enabled the detection of leukocyte infiltration in the pancreas of mice with type I diabetes, by using an antibody against CD45.

https://doi.org/10.1038/s41684-021-00731-0

**NEUROSCIENCE**

**Optogenetics in pigeons**

Rook, N. et al. Commun. Biol. 4, 100 (2021)

Optogenetics has become a powerful tool to study the neural basis of behavior in rodents. The technique has also been established in ferrets and nonhuman primates, but its application in other species remains limited. A study in *Communications Biology* describes for the first time the use of optogenetics in pigeons (*Columbia livia*), which might open new avenues for comparative neuroscience research.

The study shows that adeno-associated viral vector (AAV) serotype 2 pseudotyped with serotype 1 (AAV1) is more efficient than AAV5 and AAV9 in transducing cells in the entopallium of pigeons, and that channelrhodopsin (ChR2) stimulation after AAV1-ChR2 injection in the visual system of the birds resulted in impaired contrast perception.

https://doi.org/10.1038/s41684-021-00732-z

**EXPERIMENTAL MODEL**

**A rabbit model of cystic fibrosis**

Xu, J. et al. JCI Insight. 6, e139813 (2021)

Existing animal models (zebrafish, flies, mice, rats, ferrets, sheep and pigs) of cystic fibrosis (CF) have greatly contributed to our understanding of CF pathophysiology, despite inherent limitations in each.

Now a study in *JCI Insight* describes the generation of a new intermediate-sized model of CF. CF rabbits were generated via CRISPR/Cas9-mediated disruption of the *CFTR* gene and recapitulated key aspects of the pathology, including reduced survival, gastrointestinal disease, abnormalities in intestinal ion transport and in the bioelectric properties of the nasal and tracheal epithelia. Although young CF rabbits did not develop respiratory disease, mucus flakes were observed in the respiratory tracts of 1-year-old CF rabbits, a feature seen in patients with CF.

https://doi.org/10.1038/s41684-021-00733-y