IN BRIEF

NEUROSCIENCE

Large-scale electrophysiology with polymer-based electrodes

Chung, J. E. et al. *Neuron* **101**, 21–31 (2019).

Large-scale single-unit recordings are typically acquired with silicon-based electrode arrays, but these inflexible devices can cause damage at the implant site. Chung et al. achieve larger-scale recordings with polymer-based electrode arrays. These electrodes are more flexible than silicon-based electrodes. However, single-unit recordings have not been practical so far. The researchers developed 32- and 64-channel devices with single-unit recording capabilities. These devices can be wired together in a modular fashion, thus allowing the recording of up to 1,024 channels from multiple brain regions. In different sets of experiments with rats, the researchers demonstrated concurrent recording from 375 units, data collection for 160 or more days, and continued recording from the same neurons over 10 days. The recordings were even stable while animals performed a learned spatial behavior task. *NV*

https://doi.org/10.1038/s41592-019-0315-0

EPIGENETICS

Detecting changes in methylation landscape

Sina, A. A. L. et al. *Nat. Commun.* **9**, 4915 (2018).

Cancer genomes often have distinct methylation patterns, and these methylation patterns can be used as generic cancer markers. However, the effects of this methylation on the physicochemical properties of DNA have not been fully explored. Sina et al. found that the distribution of genome methylation has a strong effect on DNA solvation properties, which in turn change the way DNA adsorbs onto a gold surface. The team leveraged this finding and developed an electrochemical assay for cancer discrimination. In addition to the change in DNA solvation, they also noted the difference in DNA–gold affinity between normal and cancerous genomes. They thus simplified the electrochemical assay into a gold-particle-based colorimetric assay that does not require complicated sample preparation and can be completed within ten minutes using a plasma-derived cell-free DNA sample. *LT*

https://doi.org/10.1038/s41592-019-0316-z

GENOMICS

Pan-African genome

Sherman, R. M. et al. *Nat. Genet.* **51**, 30–35 (2019).

The current human reference genome is not representative of the diversity of human populations and thus is of limited use for studies of admixed populations. The 1000 Genomes Project has shown that 86% of variants in populations across five continents are present in only one continental group; African populations in particular have the highest number of variants. Sherman et al. deeply sequenced 910 individuals from the Consortium on Asthma among African-Ancestry Populations in the Americas to create an African pan-genome, which added 296.6 Mb of novel sequence—about 10% of the human genome. They found that 120 Mb are shared with Korean or Chinese populations, which suggests that these sequences were lost more recently. This pan-genome demonstrates that a single human reference is not sufficient for population genetic studies and supports the need for multiple references representing distinct human populations. The authors hope that over time such references will lead to a pan-genome that represents all human DNA. *NR*

https://doi.org/10.1038/s41592-019-0317-y

MICROSCOPY

Magnetic sample orientation

Berndt, F. et al. *Nat. Commun.* **9**, 5025 (2018).

A major challenge in microscopy is orienting a sample so as to obtain optimal images. This is especially true for light sheet fluorescence microscopy of developing organisms, which may be relatively large, irregular, or opaque. Berndt et al. developed a versatile, non-contact approach for positioning samples that harnesses the power of magnets. In their approach, a magnetic bead is either embedded in an agarose sphere containing the organism of interest or directly embedded into the developing organism. The user can then control the precise position and orientation of the organism by applying magnetic fields, and thereby gain access to the desired regions for imaging. The researchers showed that the approach is applicable to a range of organisms from brine shrimp to mouse embryos and used it to image developing zebrafish embryos. *RS*

https://doi.org/10.1038/s41592-019-0318-x