IN BRIEF

IMMUNOLOGY

Immunity of the sexes

Metcalf, C.J.E. & Graham, A.L. *Nat. Commun.* **9**, 4391 (2018)

There are trade-offs to the responsiveness of one's immune system. Detect and react quickly to nip illness in the bud, but risk overreactions and autoimmune complications to benign situations. Save the bug-fighting energy until it's really needed, but risk the establishment of a pathogen that the body could've fought off earlier. Females of various species, including humans, tend towards the former strategy; males, the latter. A new mathematical framework from researchers at Princeton attempts to explain the immune discrepancies between the sexes.

Authors Metcalf and Graham define variables that drive sensitivity to pathogens versus the magnitude of immune response, and then evaluate those against life history. Reproduction seems to be a big driver—because females are more limited in their reproductive capacity than males, infections pose a greater risk to their reproductive success, thus pushing the offspring-bearing sex towards more precautionary sensitivity. *EPN*

https://doi.org/10.1038/s41684-018-0208-3

NEUROSCIENCE

PRIME-DE is primed with primate data

Milham M.P. et al. *Neuron* **100**, 61–74 (2018)

Nonhuman primates are increasingly used in neuroscience research, but there are ethical and logistical concerns to working with these animals. Researchers in need of translationally relevant brain data but who lack the resources to conduct their own imaging of man's closest kin have a new resource to tap: the PRIMatE Data Exchange, or PRIME-DE. Twenty two international research centers that work with nonhuman primates recently compiled 25 neuroimaging data collections into the openly available, shared database. Currently, magnetic resonance imaging data is available for over 200 animals in the standardized Brain Imaging Data Structure (BIDS) format, with additional data contributions to be added over time. With registration, users can access the data at http://fcon_1000.projects.nitrc.org/indi/indiPRIME.html. *EPN*

https://doi.org/10.1038/s41684-018-0209-2

BONE DEVELOPMENT

Oh deer, new bone genes

Ker, D.F.E. et al. *Stem Cell Res. Ther.* **9**, 292 (2018)

Deer are unique among mammals: they can rapidly regenerate lost tissues. The tissues in question are their antlers, the bony extensions that grow (and re-grow) from their skulls. What are the genetic underpinnings of such abilities? Recently, researchers at Stanford endeavored to find out.

Deer aren't exactly common to the lab though, and there are logistical challenges to working with such large animals. So the researchers took an in vitro approach, creating a cell culture model of farrow deer antler cells that they could more easily manipulate. With their in vitro model established, they compared RNA-seq data from the deer to human mesenchymal stem cell cultures. The deer have a number of novel and uniquely expressed genes, potentially new candidates for understanding bone growth and regeneration in mammals. *EPN*

https://doi.org/10.1038/s41684-018-0210-9

MICROBIOME

These bacteria are needed for walking

Schretter, C.E., et al. *Nature* **563**, 402–406 (2018)

The microbiome could be behind it all, at least in fruit flies. Disrupting the fly gut microbiome can have profound impacts on locomotion, suggests a new study from researchers at the California Institute of Technology.

Female fruit flies with a conventional, un-tampered-with gut microbiome walk in a characteristic way. But eliminate those microbes and locomotion change—axenic flies, raised to be free of any microbes, walk faster and with fewer pauses than their conventional counterparts. By selectively adding different bacteria and molecules to germ-free flies, the researchers tested which component of the microbiome was influencing locomotion. They observed links to one commensal bacterium in particular, *Lactobacillus brevis*, and a specific enzyme it produces that modulates sugar metabolism in the flies. *EPN*

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