ANIMAL BEHAVIOR

Cave chatter

Hyacinthe, C., Attia, J. Rétaux, S. *Nat. Commun.* **10**, 4231 (2019)

Though they are still the same species, the cave- and river-adapted populations of the Mexican tetra, *Astyanax mexicanus* differ in a number of notable morphological, physiological, and behavioral ways. A new study from researchers working in the lab in France as well as in the field in Mexico adds the tetras; communication styles to the list.

The fish are indeed prolific acoustic communicators in the lab and in the wild. They make the same six types of sounds—simple clocs, clicks, and sharp clicks as well as more complex serial clocs, serial clicks, and rumblings—but the morphs vary in how they use those sounds under different social contexts. The cave-dwellers, which have lost their eyesight in their years living without light, seem to chatter to keep tabs on other each in the dark. *EPN*

https://doi.org/10.1038/s41684-019-0433-4

ANIMAL BEHAVIOR

Feeling ticklish?

Ishiyama, S., Kaufmann, L.V., and Brecht, M. *Curr Biol* https://doi.org/10.1016/j.cub.2019.07.085 (2019)

We cannot tickle ourselves, and it's unclear why. Research into this centuries-old question pondered by the likes of Aristotle continues on—with rats. Rats cannot tickle themselves either, but they'll melt into ultrasonic peals of the rat-equivalent of laughter when tickled by a person.

A new study considers the relationships between tickling and sensation. The researchers noted differences in the ultrasonic vocalizations that rats produce when they are grooming vs. simply being touched by a human vs. being tickled. Rats that were then tickled as they groomed 'laughed' less, suggesting that self-touch inhibits the somatosensory cortex, shown previously to be excited during tickling. Chemically inhibiting this inhibition resulted in rats that ended up 'tickling' themselves. A final experiment, in which the rats were trained to request tickling via nose poke, revealed signs of ambivalence—nevertheless, they still asked to be tickled. *EPN*

https://doi.org/10.1038/s41684-019-0436-1

ANIMAL DISEASE MODELS

Unfolding neurodegeneration

Waldherr, S.M. et al. *Nat. Commun.* **10**, 4443 (2019)

The endoplasmic reticulum unfolded protein response (UPR^{ER}) is a conserved, multistep means by which many different organisms maintain protein homeostasis. Such proteostasis naturally declines with age and is increasingly thought to be a contributing factor to neurodegenerative diseases that are marked by abnormal protein accumulations, such as Alzheimer's disease (AD), Parkinson's, and ALS.

Working with transgenic worms that express human tau, a protein associated with AD, researchers in Washington link components of the UPR^{ER} to pathology in a living organism. The team identified two genes directly involved in UPR^{ER} signaling pathways that, when knocked out, lead to increased tau accumulation and disrupted mobility in the worms. Overexpression of the master transcription factor involved, XBP-1, ameliorated the pathological protein burden, as did increasing expression of two genes that in turn have roles in activating XBP-1. *EPN*

https://doi.org/10.1038/s41684-019-0434-3

NEUROSCIENCE

A tale of two worm brains

Hong, R.L. et al *eLife* **8**, e47155 (2019)

100 million years ago, two nematodes diverged from their last common answer. *Caenorhabditis elegans* forged a free-living path, while its relative *Pristionchus pacificus* tends to keep the company of various scarab beetles. The worms look similar but behave differently. A new study compares the brains of the two worms to try and better understand why.

The multi-institution team focused on neurons in the amphid sensilla, a sensory organ. Some features were conserved, such as the number of neurons present and how those neurons were positioned. But at finer detail, differences emerged in morphological structures and the connections between neurons. The authors suggest there are evolutionary constraints on how neurons can be patterned in the brain, leaving dendritic structure and synaptic connectivity to diverge over time and contribute to those behavioral differences. *EPN*

https://doi.org/10.1038/s41684-019-0435-2

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