

## IN BRIEF

**EVOLUTION**

## Evolutionary origins for social vocalization in a vertebrate hindbrain–spinal compartment

Bass, A. H., Gilland, E. H. & Baker, R. *Science* **321**, 417–420 (2008)

Like most animals, fish communicate through vocalization. The authors report the discovery of a neural circuit in larval toadfish that consists of motor neurons and pacemaker neurons and that regulates the vocal patterning of the fish's sounds. Comparative analyses revealed that the position of this vocal motor nucleus — at the intersection of the hindbrain and the spinal cord — was similar to that in frogs, birds and primates. These data suggest that the basic neurocircuitry for vocalization evolved from a primitive common ancestor, and that social vocal communication developed early in vertebrate evolution.

**SYNAPTIC PLASTICITY**

## The stress hormone corticosterone conditions AMPAR surface trafficking and synaptic potentiation

Groc, L. *et al. Nature Neurosci.* **11**, 868–870 (2008)

Corticosteroids regulate synaptic plasticity by altering glutamate transmission through AMPARs ( $\alpha$ -amino-3-hydroxy-5-methyl-4-isoxazole propionic acid receptors), but direct effects of these steroids on AMPARs had not been demonstrated. The authors showed that corticosterone rapidly increased GluR2-containing AMPAR membrane diffusion, increasing these receptors' abundance at the synaptic surface. Peak GluR2-containing AMPAR diffusion occurred 150 minutes after corticosterone application; these effects were blocked by mineralocorticoid- and glucocorticoid-receptor antagonists, respectively. Thus, by mobilizing GluR2-containing AMPARs, corticosterone facilitates synaptic potentiation.

**REPAIR**

## Localized regulation of axonal Ran GTPase controls retrograde injury signaling in peripheral nerve

Yudin, D. *et al. Neuron* **59**, 241–252 (2008)

Following a peripheral nerve injury, signalling molecules travel from the injured axon to the nucleus to trigger repair. Importins are essential for this process, but little is known about their regulation. This study demonstrates a role for local regulation of the GTPase Ran in this process. In the uninjured axon, Ran binds importin- $\alpha$  and dynein. Following injury, local translation of a Ran-binding protein causes Ran to dissociate from this complex, allowing importin- $\alpha$  and dynein to form a complex with importin- $\beta$  that can mediate retrograde transport.

**AUDITORY SYSTEM**

## Perceptual organization of sound begins in the auditory periphery

Pressnitzer, D. *et al. Curr. Biol.* **18**, 1124–1128 (2008)

Auditory information can be segregated into 'streams'. Previous studies suggested that the auditory cortex is important for streaming; however, this study demonstrates a role for subcortical neural processing. Guinea pig cochlear nucleus (CN) neurons exhibited auditory streaming properties. Furthermore, a computational model based on guinea pig CN responses to simultaneously presented tones could accurately predict whether human volunteers would perceive one or more auditory streams in the same stimuli.