This Week in The Journal

● Cellular/Molecular

**Targeting of hDAT without PDZ Domain Interactions**

Christian Bjerggaard, Jacob U. Fog, Hanne Hastrup, Kenneth Madsen, Claus J. Loland, Jonathan A. Javitch, and Ulrik Gether

(see pages 7024–7036)

In this week’s *Journal*, the human dopamine transporter (hDAT) presents a curious enigma: its C terminus contains a PDZ domain-binding motif (in the form of a terminal LKV sequence), interacts with the PDZ domain-containing protein PICK1, and is required for targeting to the plasma membrane. The LKV sequence itself, however, seems inconsequential to targeting. PDZ-binding motifs come in two flavors: type 1 and type 2, which presumably bind distinct sets of target proteins; hDAT contains the latter. When Bjerggaard et al. deleted the LKV sequence, the transporter remained stuck in the endoplasmic reticulum. When they replaced it with a type 1 motif, however, hDAT was recruited to the membrane and active. Other disruptions of the PDZ-binding motif did not prevent membrane localization. Additional analysis revealed that although certain C-terminal residues are crucial, hDAT does not require PDZ domain interactions for maturation, but it does form them for an as yet undefined purpose.

▲ Development/Plasticity/Repair

**Auditory Localization in the Owl**

William M. DeBello and Eric I. Knudsen

(see pages 6853–6861)

The barn owl, given a reason, can reorganize its auditory map to match its perception of visual space. This plasticity was thought to center on only one brain area, the inferior colliculus (ICX), the initial site in which the map is formed. Now DeBello and Knudsen identify a second site of plasticity: the superficial layers of the optic tectum (OT), an area that corresponds to the superior colliculus in mammals. They outfitted late-juvenile owls with prismatic glasses. The owls realigned their auditory map to match the horizontally displaced visual map by adjusting the tuning of neurons in the OT. These experience-driven functional changes have been seen only in the ICX of younger owls; these older juveniles revealed an age-related component to plasticity. In adulthood, the ability to make plastic changes decreases. Although the potential for plasticity declines in the ICX beyond 80 d of age, the higher-level OT retained the ability to adjust for 200 d. That’s bad news for the barn mouse.

■ Behavioral/Systems/Cognitive

**Fear, Place Cells, and the Hippocampus**

Marta A. P. Moita, Svetlana Rosis, Yu Zhou, Joseph E. LeDoux, and Hugh T. Blair

(see pages 7015–7023)

Hippocampal space cells encode information about the spatial environment, creating a map that tends to remain stable when the animal reenters the same space. However, even within a single environment, place cells can change their preferred firing locations, presumably to convey contextual details. This week, Moita et al. show that fear conditioning can induce such a remapping process. Rats were chronically implanted with recording electrodes in the dorsal hippocampus. After place cells were recorded in a neutral environment, rats underwent fear conditioning that either paired an auditory stimulus with an electric shock (cue conditioning) or specifically presented unpaired stimuli so that the environment itself predicted the shock (contextual conditioning). After the training, place cells remapped, although the spatial environment itself had not changed. The remapping was more pronounced in rats that received contextual training. The authors suggest that place cells can convey not only the geometric details of an environment but motivational and behavioral cues as well.

♦ Neurobiology of Disease

**Goαolf and Parkinsonism**

Jean-Christophe Corvol, Marie-Paule Muriel, Emmanuel Valjent, Jean Féger, Naïma Hanoun, Jean-Antoine Girault, Etienne C. Hirsch, and Denis Hervé

(see pages 7007–7014)

Parkinson disease (PD) is usually treated with the dopamine precursor L-dopa, but its long-term use is often limited by dyskinesias. What molecular adjustments underlie this exaggerated response to dopamine? Although D1 dopamine receptors become hypersensitized in the putamen, the number of receptors remains constant. Corvol et al. now show that hypersensitivity may arise from upregulation of a protein linking D1R to adenylyl cyclase: the G-protein α subunit Goαolf. The putamen of postmortem tissue from parkinsonian patients had greatly elevated levels of Goαolf, as did rats depleted of dopamine by 6-hydroxydopamine lesions. Interestingly, the ubiquitous Gas was unchanged, but Gy7 was also increased. The plasma membrane-associated elevation in Goαolf coincided with increased cyclase activity. Rats chronically treated with L-dopa or a D1 agonist partially restored Goαolf levels. Thus enhanced signaling through Goαolf may be a potential contributor to the genesis of dyskinesias.