**EDITORS’ CHOICE**

**EDITED BY GILBERT CHIN AND JAKE YESTON**

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**PSYCHOLOGY**

**I Think, You Behave**

A trendy consumer good, such as the iPhone on sale today, undoubtedly enjoys a boost in sales due to the desire of some purchasers to fit in. Pronin et al. show that undergraduates, when queried afterward about their support for or opposition to a panel’s recommendations concerning Ivy League institutional procedures, judged their own pattern of votes to be based upon the content of the issues, yet explained the votes of a fictitious other—actually merely the subject’s own choices shuffled—as being influenced by the panel (for more on social conformity, see Hauert et al., this issue, p. 1905). It may seem obvious that we know more about our own beliefs than those of others, and therefore that we regard our own choices as the product of rational deliberation while regarding the choices of others as a response to social pressure. Nevertheless, in a different design but similar scenario—voting on political issues in accordance with or contrary to one’s party affiliation—the issue of asymmetric access to introspective information was addressed by asking each person (the actor) in one half of the subject group to record his or her thoughts during the decision-making period, and by then providing these thoughts, along with the corresponding votes, to a subject (the observer) in the other half of the group. Thus, even when the same information and behavior were being assessed, the value placed upon the information (relative to behavior) was greater for the actor than the observer. — GJC


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**CHEMISTRY**

**Detour to Allylic Amines**

Catalytic olefin and alkyne hydrogenations often proceed through potentially nucleophilic organometallic intermediates, and chemists have recently taken to intercepting such intermediates with a variety of electrophiles. This strategy of carbon-carbon bond formation is appealing from an efficiency standpoint because it eliminates the need to prepare the (often air- and water-sensitive) organometallic nucleophiles stoichiometrically. Barchuk et al. show that an iridium (I) catalyst effectively couples alkyl-substituted alkynes to imine electrophiles during hydrogenation to yield allylic amine products. The reaction proceeds with high selectivity for the E olefin isomer, and also regionselectively places larger alkyl groups closer to nitrogen. This catalyst complements a rhodium analog that proved effective in a range of similar couplings (as summarized recently by Ngai et al.) but led to exclusive hydrogenation of the alkyne in the present system. — JSY


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**EVOLUTION**

**Retrograde Tracing**

Synapses, the essential plug-socket assemblies for animal nervous systems, are intricate molecular structures. Large complexes of proteins in both the pre- and postsynaptic neurons manage the transfer of information, membrane vesicles come and go, and molecular signals light up the wires. How did this chemical connector evolve?

Sakarya et al. have analyzed molecular components of sponges, which represent a primitive branch of the evolutionary tree of animals. Sponges do not have a nervous system or synapses. In animals that do have nervous systems and synapses, the postsynaptic density is composed of probably nearly a thousand proteins. The authors performed a comparative analysis of genomes and cataloged synaptic-like proteins in the sponge *Amphimedon queenslandica*, which lacks neurons, and the cnidian *Nematostella vectensis*, which has a comparatively simple nerve net. Identification of many genes in the sponge similar to the postsynaptic density genes of more complex nervous systems suggests that similar macromolecular structures are assembled even in the sponge. Such structures may have been co-opted during evolution for use in nascent nervous systems. — PJH


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**ASTROPHYSICS**

**Faster than Light**

Faster-than-light motions can be seen as projected visual effects, even if actual movement at or above light speed is prohibited by relativity theory. In astrophysics, such superluminal motion is common in jets of very fast subatomic particles that emanate from massive black holes in the centers of galaxies. These jets reach out far beyond the galaxy itself, and individual blobs of relativistic plasma trapped by magnetic fields can be tracked by radio telescopes. When the jets are pointed toward an observer on Earth, the projected motions of the blobs on the sky make the jet appear to be expanding faster than light. This illusion of superluminal motion normally appears toward the jet’s base near the galaxy’s central black hole, where the accelerations are greatest. However, Cheung et al. have now seen superluminal motion quite far (120 parsecs) from the central engine in the jets emerging from one of the most well-known nearby radio sources, the galaxy M87. From very high resolution radio observations, the authors attribute the phenomenon to a peripheral knot breaking apart and inducing apparent superluminal motion of its components. The same knot had been previously associated with a flaring x-ray source, suggesting a physical connection between the in situ accel-
erated of fast particles and high-energy emission flares that may operate in gamma-ray sources. — JB


CELL BIOLOGY

Caught in Traffic

A number of inherited human disorders are thought to be caused by functional alterations in the primary cilium, a hairlike extension of the cell membrane whose critical role in cellular signaling has been receiving increasing attention. Bardet-Biedl syndrome (BBS) is one such disorder that has been linked to cilia through studies of animal models. BBS affects many different organ systems and its characteristic features include obesity, retinal degeneration, and kidney abnormalities. Because mutations in at least a dozen distinct genes can cause BBS, and many of these genes are functionally undefined, the description of a simple molecular model for disease pathogenesis has been an elusive goal. Important progress toward that goal is reported by Nachury et al., who show that 7 of the 12 known BBS gene products form a stable 450-kD protein complex, dubbed the “BBSome,” that localizes to the ciliary membrane and physically associates with Rab8, a nucleotide exchange factor specific for the Rab8 small guanosine triphosphatase. The authors propose that the BBSome promotes trafficking of specific transmembrane proteins (such as rhodopsin in the case of retinal photoreceptor cells) from the cell to the primary cilium, where they perform critical signaling functions. Conceivably, each organ-specific symptom of BBS could arise through the mistargeting of specific cilium-localized signaling receptors critical to that organ. — PAK


CHEMISTRY

Powerful Twister

A solenoid consists of a conducting metal coil that can surround a metal core in which a magnetic field is induced when electrical current passes through the wire. One option to build a solenoid on the molecular scale would be to use a highly twisted conducting polymer such as polyacetylene to form the coil. Two problems arise, namely, making the polymer chain sufficiently coiled, and preventing the individual fibrils from forming bundles. Goh et al. investigated the synthesis of polyacetylene in nematic solvents doped with a series of substituted binaphthyl derivatives possessing different twisting powers. The best dopant gave a helical pitch to the solvent approxi-

mately one-fourth the size of that induced by the other dopants; for a range of concentrations, this pitch was smaller than the typical radius of a bundle of polyacetylene fibers (about 1 μm). Thus, when this dopant was used, the authors obtained single fibrils rather than bundles, a result they anticipate should lead to exceptional electromagnetic properties. — MSL


<< Plugging Up Connexins

Gap junction hemichannels are membrane-embedded proteins that, when joined at their extracellular faces, enable small molecules (such as ions, peptides, or second messengers) to pass directly between adjacent cells. The permeability of the hemichannel can be modulated by conformational changes, and mutations in connexin26 are associated with human diseases. Oshima et al. have determined the electron crystallographic structure, at a resolution of 10 to 14 Å, of a mutant connexin26 protein related to the one linked to hereditary deafness. The electron density map revealed that the purified hemichannels had apparently reassociated to form a complete channel. Both the mutated connexin used and the conditions for crystallization would have favored a closed conformation, and a prominent density right in the center of the pore was observed. The authors propose that this plug is likely formed from the 20-residue N-terminal tail of connexin. Such a plug would allow the conductance of each hemichannel to be modulated independently; the plugs on both sides would need to be ejected in order to create a fully open channel. — LBR


EDITOR-IN-CHIEF

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