

surface sensors of abscisic acid. The proteins, G protein-coupled receptors (GPCRs) types 1 and 2 (GTG1 and GTG2), bind abscisic acid, are widely expressed throughout various plant tissues, and are located at the periphery of cells. Their sequences contain motifs that resemble those of GPCR transmembrane domains and of GTP-binding domains of GTPases. These proteins are highly unusual in possessing both the ligand-binding receptor function and the canonical G protein signaling capacity. — PJH

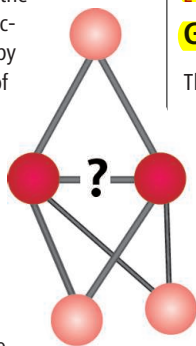
Cell **136**, 136 (2009).

CHEMISTRY

Bonded or Not?

Propellane molecules intrigue chemists for a number of reasons, not least because their carbon frameworks resemble the eponymous macroscopic propellers. The [1.1.1] variety comprises three triangles that share an edge at the center, and a persistent question has been whether this shared edge, or bridge, constitutes a strained bond between the atoms at either end of it, or whether these atoms keep an electron to themselves after sharing three others with the vertices. Most evidence points to a bond of some sort between these bridgehead carbons, and similarly between tin atoms in stannous analogs that have been prepared and structurally characterized. Nied *et al.* have synthesized and obtained the crystal structure of a germanium (Ge) analog by lithium naphthalenide reduction of chloride salts, with the vertices capped by bulky mesityl groups. In the solid state, the bridgehead atoms are roughly 20% farther apart than the length of a typical Ge-Ge single bond. The absence of an electron paramagnetic resonance signal suggests a singlet spin state. Nonetheless, the authors' calculations support a degree of biradical character in the interaction, which is bolstered by observation of facile trimethyltin hydride addition across the bridge. — JSY

Angew. Chem. Int. Ed. **48**, 10.1002/anie.200805289 (2009).



CANCER

Collaborative Damage

The success of cancer as a disease is due in part to a collaborative effort between tumor cells and other populations of nonmalignant cells in the body. These nonmalignant cells, such as stromal fibroblasts and bone marrow-derived cells, have

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been shown to be capable of promoting tumor growth and metastasis. Tumor growth is fueled by the formation of new blood vessels in a process known as angiogenesis, which is stimulated by secreted peptides such as vascular endothelial growth factor A (VEGF-A). Antibodies to VEGF have been demonstrated to be effective anticancer agents in the clinic; however, tumor resistance arises rapidly, followed by patient relapse.

Crawford *et al.* looked at tumor-associated fibroblasts (TAFs) from a murine lymphoma model that was resistant to antibodies to VEGF. They found that these TAFs were able to stimulate the growth of anti-VEGF-sensitive tumors in vivo, suggesting that the tumor somehow regulates the tumorigenic properties of TAFs. Notably, this stimulation occurred even when VEGF was inhibited, implying that TAFs can influence how the tumor responds to being deprived of a major angiogenic factor. The authors found that TAFs from anti-VEGF-resistant tumors were also able to support angiogenesis, which was due to elevated expression of VEGF-A and another growth promoter, platelet-derived growth factor C (PDGF-C), pointing toward another target for the treatment of cancers (such as pancreatic cancer) that are relatively unresponsive to anti-VEGF therapies. — HP*

Cancer Cell **15**, 21 (2009).

ENGINEERING

Get a Grip

The manipulation of cells or other small particles is often accomplished with microgrippers. Examples include devices fabricated with two adjacent strips composed of different materials or kept at different temperatures, so that actuation can be used to grab and release objects. One limitation of this architecture is that the gripper has to be tethered to trigger the actuation. To achieve remote actuation, Leong *et al.* lithographically patterned bimetallic films of chromium (Cr) and copper (Cu) into fingerlike digits on nickel segments bridged with polymer segments, which acted like bones and joints, respectively. Upon heating or exposure to certain compounds, the polymer would soften or delaminate, allowing the Cr/Cu metal bilayers to flex inward. Grippers were remotely moved by a magnet and could also be rotated so that the digits acted like cutters, as demonstrated by the cutting of the connective tissue. In a related study, Randhawa *et al.* placed a polymer between the nickel segments that, on exposure to acetic acid, was etched away, closing the gripper. Subsequent exposure to hydrogen peroxide etched the Cu layer, causing the gripper to open. — MSL

Proc. Natl. Acad. Sci. U.S.A. **106**, 703 (2009);
J. Am. Chem. Soc. **130**, 17238 (2008).

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