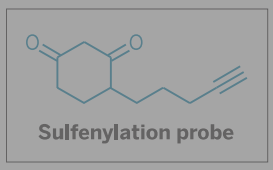
of a fat-cleaving lipase, originating from the yeast *Candida antarctica*, and expressed it in *Escherichia coli* using a new protein-engineering strategy combined with high-throughput enzyme screening (*Angew. Chem. Int. Ed.*, DOI: 10.1002/anie.201106126). The variant selectively hydrolyzes trans and fully saturated fatty acid chains; the cleaved unhealthy fatty acids can be separated from the remaining mono- and diglycerides in the vegetable oil.—SR

TAGGING SULFENIC ACIDS

By tweaking a chemical probe, chemists have learned that a protein modification called sulfenylation influences signaling in the epidermal growth factor receptor (EGFR), a kinase enzyme implicated in multiple cancers (*Nat. Chem. Biol.*, DOI: 10.1038/nchembio.736). Sulfenylation, or formation of sulfenic acid (–SOH) groups, can occur if a cysteine amino acid is exposed to an oxidant such as hydrogen peroxide. Tracking occurrences of the reaction and determining their implications in living cells remain challenging because established probes lack sensitivity or cell permeability. To make their latest probe, Kate S. Carroll of Scripps Florida and coworkers replaced the azide in a previous version with an alkyne. The probe turned out to be sensitive enough to detect differences in sulfenylation rates among various proteins in human cells. The team showed that sulfenylation of a specific active-site cysteine in EGFR, Cys797, enhanced its kinase activity. That cysteine is the target of several covalent drugs under development, but the drugs are designed to latch onto the cysteine in its thiol form. This development raises interesting questions about how to design irreversible inhibitors that target amino acids subject to redox modifications such as sulfenylation, Carroll says.—CD

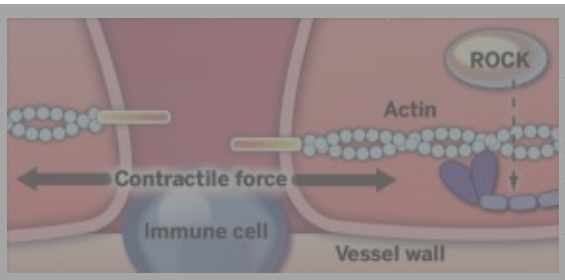


SMART DRUGS GET ZAPPED

A gel that can be injected under the skin releases drugs when stimulated by a weak electric field applied from outside the body (*ACS Nano*, DOI: 10.1021/nn203430m). The new material, designed by Stanford University's Richard N. Zare and colleagues, is based on conductive-polymer nanoparticles loaded with drugs. When exposed to a weak electric field, which can easily be generated by a AA battery, the charge on the polymer changes, causing the material to release the drugs. Zare and his team hold the particles in place by suspending them in a temperature-sensitive material that is liquid at room temperature and turns into a gel at body temperature. Preliminary tests showed that they could control the dosage and timing of the drug release by varying the strength and duration of the applied field. They also injected nanoparticles loaded with a fluorescent dye under the skin of mice and watched the dye spread through the animals' sides after a short electrical pulse. The Stanford group is now studying controlled drug dosages in animals with support from the drug company Sanofi.—JNC

HARDENED ARTERIES HAVE LEAKY TISSUE

Closing the gaps between cells that line patients' arteries could be a new strategy to treat atherosclerosis, a condition that often leads to heart attacks and strokes (*Sci. Transl. Med.*, DOI: 10.1126/scitranslmed.3002761). Increased permeability between arterial cells allows cholesterol and immune cells to accumulate in blood-vessel walls, leading to dangerous plaque formation. Using fluorescent dyes, engineered tissue, and aortas from mice, Cynthia A. Reinhart-King and coworkers at Cornell University showed that hardened arteries—those with stiff tissue scaffolding—cause cells embedded within them to increase their contractile forces and pull apart from one another. To prevent this cell contraction, the researchers focused on rho-associated kinase (ROCK), an enzyme that helps regulate cell forces and movement via structural proteins such as actin. By inhibiting ROCK with the small molecule Y-27632, Reinhart-King's group decreased the average cell-cell gap in hardened synthetic tissue by about 2 μm. Whether ROCK itself is the best target for future therapeutics rather than other molecules further downstream in the ROCK signaling pathway remains to be seen, comments biological engineer Douglas A. Lauffenburger of MIT, but the results of this study are "enticing."—LKW



B. STRAUCH/*SCI. TRANSL. MED.*

Immune cells can sneak between blood-vessel cells that have pulled apart from each other on stiff tissue scaffolding. The enzyme ROCK regulates cell contraction via proteins such as actin.

MAKING ZEOLITES WITHOUT TEMPLATES

A template-free synthesis procedure can be used to prepare zeolites if the earliest stages of the crystallization process are carefully controlled, according to work reported in *Science* (DOI: 10.1126/science.1214798). Zeolites are a class of porous crystalline aluminosilicates that are widely used as catalysts in oil refining and petrochemical synthesis. Expensive organic compounds, such as the ether 18-crown-6, often serve the crucial role of structure-directing agents (templates) in zeolite preparation methods. Efforts to omit these costly compounds have until now met with little success. Svetlana Mintova of Caen University, in France, together with coworkers based in Malaysia and Germany, find that by fine-tuning the reactant ratios, nucleation temperatures and times, and heating procedures (conventional and microwave-driven), they can grow crystals of a zeolite known as EMT from a Na_2O–Al_2O_3–SiO_2–H_2O precursor system without using templates. The team reports that their low-temperature procedure (30 °C) yields ultrasmall and pure EMT zeolite crystals with diameters in the 6- to 15-nm range. And because the crystals are made without templates, the high-temperature treatment typically used to remove the templates is unnecessary, they note.—MJ