CONSERVATION

The hazards of isolation

Climate change affects animals in many ways, including shrinking and shifting their range. On continents, shifts may facilitate adaptation, but many highly threatened species live in regions where geography limits how far their range can shift. One region facing this challenge is Madagascar, where most species are endemic. Brown and Yoder used a suite of spatial modeling approaches to predict how warming might affect Madagascar's iconic lemur species. They found that 60% of lemur species face range contractions due to climate change. They highlight regions of highest conservation concern and conclude that long-term persistence of lemurs will require maintaining dispersal corridors and reducing habitat loss. — SNV

Curr. Biol. **24**, 2733 (2014).

Climate change threatens lemurs in Madagascar.

understand how cells coordinate these processes during starvation, Rambold *et al.* tracked fluorescently labeled FAs in live mouse cells. Enzymes called lipases freed FAs from lipid droplets, allowing their transfer to highly fused mitochondria located nearby. Autophagy, an intracellular degradation process, replenished FAs to lipid droplets. Such careful coordination allows cells to generate substrates for mitochondrial energy production while preventing free FAs–related toxicity. — MSM

Dev. Cell 10.1016/j.devcel.2015.01.029 (2015).

ORGANIC CHEMISTRY

Ionic liquids can ring in carbon dioxide

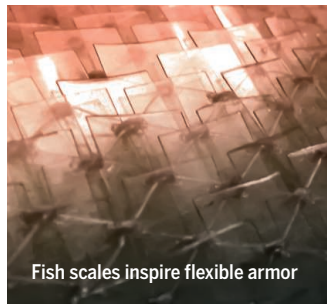
The growing risks of atmospheric carbon dioxide (CO_2) emissions are prompting chemists to explore more productive uses for the gas. Hu *et al.* present a simple means of coaxing carbon dioxide into small, ring-shaped molecules called oxazolidinones, which are of interest in medicinal chemistry research. Specifically, they found that certain ionic liquids can act as both solvent and catalyst to couple CO_2 with propargylic amines. This environmentally benign approach avoids the need to add metals to accelerate the reaction. The solvent showed consistent performance over five cycles of recovery and reuse. — JSY

Angew. Chem. Int. Ed. 10.1002/anie.201411969 (2015).

MATERIALS SCIENCE

Something fishy about synthetic armor

Many fish are covered in rigid scales attached to a flexible dermis layer, an arrangement that is compliant, resistant to penetration, and lightweight—in other words, an efficient coat of armor. Fink *et al.* use this as inspiration for a synthetic protective material based on a stretchable mesh that supports a set of hard



Fish scales inspire flexible armor

plastic tiles. The mesh, made from periodically repeating, sinusoidal polypropylene fibers, provides in-plane elasticity and holds the scales, made from cellulose acetate butyrate, in place as the material is deformed. It also provides a mechanism for scales to rotate and interact with adjacent scales. The mechanical response during in-plane deformation, flexure, and indentation showed many of the advantageous attributes of its biological counterpart. — MSL

ACS Appl. Mater. Interfaces 10.1021/acsami.5b00258 (2015).

EDUCATION

A CURE for promoting undergraduate research

In a perfect world, all undergraduate students would participate in a Course-based Undergraduate Research Experience (CURE). Students participating in CUREs report gains similar to those of students participating in research internships, promoting CUREs as a scalable alternative. What, exactly, do we know about the causal mechanisms underlying the efficacy of CUREs? Using a systems approach, Corwin *et al.* reviewed literature on CUREs and research internships, generated a comprehensive set of outcomes, and connected these outcomes to what students actually do while enrolled in a CURE. These individual outcome models were then combined into an overarching model depicting the relationships among student activities and outcomes. These models are presented with the hope that the CURE community will test and revise them. — MM

CBE Life Sci. Educ. 10.1187/cbe.14-10-0167 (2014).

PHOTOS FROM LEFT: FRANS LANTING/MINT IMAGES/SCIENCE SOURCE; ATASHA FUNK, MARK STOYKOVICH AND FRANCK J. VERNEREY