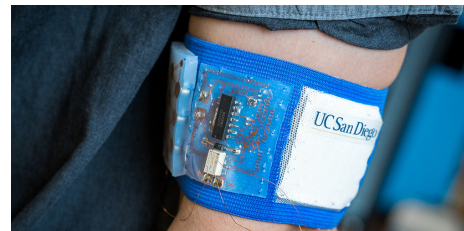


Personalized cooling and heating

Engineers at UC San Diego developed a wearable patch that could provide personalized cooling and heating at home, work, or on the go. The patch is powered by a flexible, stretchable battery pack and can be embedded in clothing. The soft, stretchy patch cools or warms a user's skin to a comfortable temperature and keeps it there as the ambient temperature changes. The leaders of this cross-disciplinary project aim to pave the way for wearable products that help save energy on air conditioning and heating.



Learn more: bit.ly/CoolingHeatingPatch



What makes deep-sea dragonfish teeth transparent?

A team of researchers led by engineers at UC San Diego and marine biologists at Scripps Institution of Oceanography have discovered what's responsible for making the teeth of the deep-sea dragonfish transparent. This unique adaptation, which helps camouflage the dragonfish from their prey, is possible because the teeth are made of nanostructures so small that light passes through without being scattered or reflected. The findings could provide "bioinspiration" for researchers looking to develop transparent ceramics.

Learn more: bit.ly/DragonfishTeeth

Fast food is causing your gut to leak digestive enzymes

Physicians and bioengineers at UC San Diego offer a potential explanation for how eating meals like American-style fast-food breakfasts could contribute to the prevalence of type 2 diabetes. Their study showed that after these high-calorie, fast-food-style meals, people leak digestive enzymes into their blood circulation. The enzymes appear to clip cell receptors for insulin, leading to insulin resistance and an increased risk of type 2 diabetes. Bioengineering professor Geert Schmid-Schonbein was instrumental in developing the models to detect this mechanism. He is a leading expert on the phenomenon of autodigestion, in which digestive enzymes are released out of the gastro-intestinal tract and start digesting cells and tissue.



Learn more: bit.ly/EnzymeLeak



Plant viruses can ward off pests and keep plants healthy

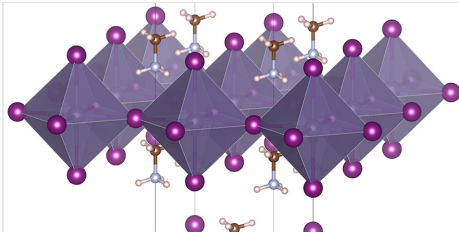
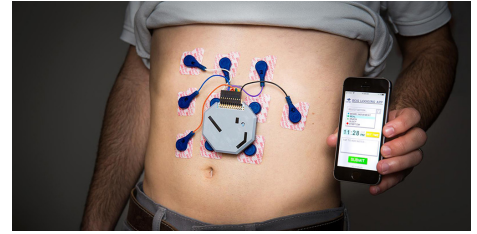
Researchers led by Nicole Steinmetz, a professor of nanoengineering at the Jacobs School, discovered that a biological nanoparticle—a plant virus—is capable of delivering pesticide molecules deeper below the ground, to places that are normally beyond their reach. This work could help farmers better manage difficult pests, like parasitic nematodes that wreak havoc on plant roots deep in the soil, with less pesticide. "This is an emerging field of research in nanotechnology showing that we can use plant viruses as pesticide delivery systems," said Steinmetz. "It's similar to how we're using nanoparticles in medicine to target drugs towards sites of disease and reduce their side effects in patients."

Learn more: bit.ly/PlantVirusStudy

UC San Diego biomedical sciences ranked 9th in world

The 2019 Nature Index ranked UC San Diego ninth among the top 200 institutions in biomedical sciences worldwide, and sixth in the United States. Recent UC San Diego biomedical science advances include: uncovering fundamental cellular mechanisms that contribute to inflammation and tumor development; developing the first personalized cancer vaccine to be tested in humans; and developing a new version of the CRISPR-Cas9 gene editing technique to correct RNA defects underlying certain muscular dystrophies. This is the first Nature Index assessment of biomedical institutions, and it's based on published research in a targeted set of high-quality scientific journals. The Jacobs School's Department of Bioengineering is ranked 5th in the nation for biomedical and bioengineering.

Learn more: bit.ly/biomedranking2019



Data science helps engineers discover new materials for solar cells

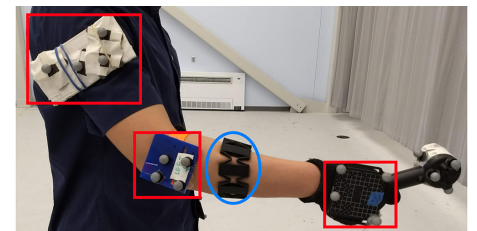
Engineers at the Jacobs School developed a high-throughput computational method to design new materials for next generation solar cells and LEDs. Their approach generated 13 new material candidates for solar cells and 23 new candidates for LEDs. Calculations predicted that these materials, called hybrid halide semiconductors, would be stable and exhibit excellent optoelectronic properties. Seeking alternatives to perovskites, a team of researchers led by Kesong Yang, a nanoengineering professor, used computational tools, data mining and data screening techniques to discover new hybrid halide materials beyond perovskites that are stable and lead-free.

Learn more: bit.ly/NewSolarMaterials

Strong robotics showing at ICRA 2019

Engineers and roboticists from UC San Diego made a strong showing at ICRA 2019, the International Conference on Robotics and Automation. The six UC San Diego projects included improvements to long-distance surgery, human-robot interaction in manufacturing settings, and UAV testing platforms. ICRA is the flagship conference of the IEEE Robotics and Automation Society and a premier international forum for robotics researchers to present their work. Jacobs School engineers are affiliated with the UC San Diego Contextual Robotics Institute.

Learn more: bit.ly/ucsdicra2019



FACTS AND FIGURES: #3 IN THE NATION

**ON JUNE 15, WE'LL GRADUATE
~1,600 UNDERGRADUATE ENGINEERS**

**#3 IN THE NATION FOR BACHELOR'S DEGREES
AWARDED IN ENGINEERING AND COMPUTER SCIENCE**

*ASEE, JUNE 2018



Sign up to receive the Jacobs School monthly newsletter: bit.ly/JacobsSchoolMonthlyNews

Contact newsletter editor, Daniel Kane: dbkane@ucsd.edu

UC San Diego – Jacobs School of Engineering Monthly News for June 2019 - jacobsschool.ucsd.edu