UC San Diego
JACOBS SCHOOL OF ENGINEERING

MONTHLY NEWS JUNE 2020

A stronger, anti-racist Jacobs School

I am absolutely dedicated to making the Jacobs School of Engineering an anti-racist learning and research community. I recognize that the Jacobs School, like all large organizations in this country, both perpetuates and suffers from institutional and structural racism. I'm also an optimist for the future. Though not sufficient, we have a number of programs in place already that will help us move the needle faster as we learn, listen and grow our way into an anti-racist organization that embraces all forms of diversity.

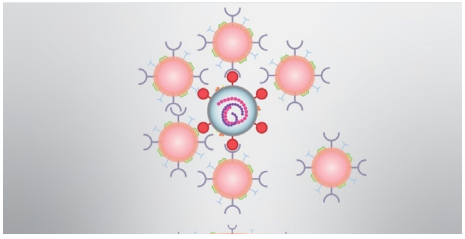
My highest level message to our students, staff, faculty, partners and friends is that I am committed to making real change here at the Jacobs School. This work is too important to rush into without fully engaging our entire community. I am heartened that we are not starting from scratch. I mention some new and existing initiatives and programs below as invitations to engage. It's also critical to recognize and talk about the fact that anti-racist work crucially includes unconscious bias work we must do within ourselves.

I welcome opportunities to engage within and beyond the Jacobs School to build partnerships, initiatives, and opportunities for organizational and individual learning and change. More details on what we are doing and what we plan to do: bit.ly/JacobsAntiRacist

Take care and stay safe. We are all in this together.

~Albert P. Pisano, Dean

UC San Diego Jacobs School of Engineering



Nanosponges could intercept coronavirus infection

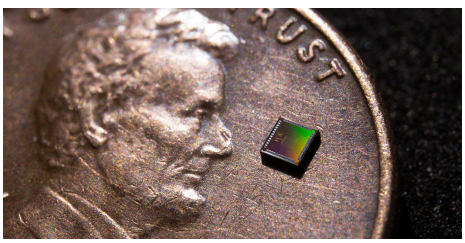
Nanoparticles cloaked in human-cell-membrane fragments can attract and neutralize the SARS-CoV-2 virus in cell culture. This causes the virus to lose its ability to hijack host cells and reproduce. These "nanosponges" were developed by engineers at the Jacobs School of Engineering led by Liangfang Zhang, and tested by researchers at Boston University. The researchers expect these nanosponges will work against any mutated versions of the SARS-CoV-2 virus. The nanosponges may also be able to calm cytokine storms..

Learn more: bit.ly/nanosponges2020

eCOVID platform provides remote patient monitoring

Engineers at UC San Diego developed a remote monitoring platform for patients who have tested positive for COVID-19 but aren't in need of hospitalization. The system is being tested by patients in a clinical trial at UC San Diego Health, and is intended to help health care teams prioritize more critical patients, while also providing data on which symptoms are most indicative of healing or further progression of COVID-19. The technology behind the eCOVID app stems from a similar virtual system developed to monitor and provide personalized care for hypertensive patients.

Learn more: bit.ly/eCOVIDapp



A low-power, low-cost wearable for COVID-19 patients

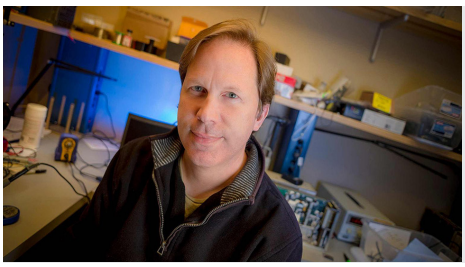
Electrical engineers at the Jacobs School are developing low-cost, low-power wearable sensors that can measure temperature and respiration—key vital signs used to monitor COVID-19. The devices would transmit data wirelessly to a smartphone, and could be used to monitor patients for viral infections that affect temperature and respiration in real time. The research team plans to develop a device and a manufacturing process in just 12 months thanks to a Rapid Response Research grant from the NSF.

Learn more: bit.ly/wearableRAPID2020

Why sweat will power your next wearable

Engineers at the Center for Wearable Sensors at UC San Diego say there's a better way to power the next generation of wearable devices: scavenging energy—especially biofuels—from the wearers themselves. Devices powered this way could be so small that you'll forget they are there. Jacobs School Professors Patrick Mercier and Joseph Wang penned the cover story for *IEEE Spectrum*, writing that the first practical biofuel to power these unobtrusive devices will be a user's own sweat. Certain chemicals found in human sweat can be used as fuel in wearable-size fuel cells. These biofuel cells could offer high power densities in a more practical, wearable form than is possible with any of the existing energy-scavenging approaches. The Center for Wearable Sensors team has already developed prototype wearables that generate power from sweat.

Learn more: bit.ly/SweatWearables

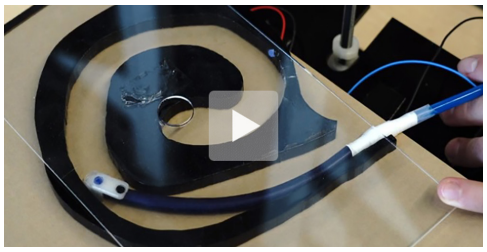


IEEE Test of Time Award for research that changed the auto industry

UC San Diego Computer Science professor Stefan Savage and colleagues won an IEEE Test of Time Award for research and a resulting 2010 paper demonstrating that car computer systems could be hacked. In the decade since the paper was published, it has spawned new automotive security standards and organizations, government programs focused on vehicular cybersecurity, and a pervasive focus on product security by major automakers around the globe. This is Savage's third Test of Time award, which honors research with a broad and lasting impact.

Learn more: https://bit.ly/IEEEtestoftimecars

Magnet-based tracking system for flexible medical robots



Roboticists at the Jacobs School developed an affordable, easy to use system to track the location of flexible surgical robots inside the human body, without requiring exposure to radiation. "Continuum medical robots work really well in highly constrained environments inside the body," said mechanical engineering professor Tania Morimoto. "But it becomes a lot harder to track their location and their shape inside the body." To accomplish this, the researchers embedded a magnet in the tip of a flexible robot, and used magnet localization methods to develop a computer model that predicts the robots location. The whole system, including the robot, magnets and magnet localization setup, costs around $100.

Learn more: https://bit.ly/MorimotoICRA2020