UC San Diego
JACOBS SCHOOL OF ENGINEERING

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Preparing the ground for future innovation

So many engineers and computer scientists of all stripes are contributing to the research and technology advances necessary for developing and disseminating COVID-19 vaccines, therapeutics and new methods to study and track the virus. I'm heartened by the technical progress and also adamant that we all must confront the structural and systems-level challenges we face. Technical progress in isolation is not true progress.

Despite it all, we are in the final year of construction of Franklin Antonio Hall, our new building designed to facilitate the kinds of platform-technology pivots critical to today's rapid COVID-19 vaccines.

We designed Franklin Antonio Hall, floor by floor, for strong and rapid responses to emerging challenges we will confront in the coming years. Below is a five-minute video clip in which I share part of the vision behind Franklin Antonio Hall. I am buoyed by our collective efforts and motivated by the knowlege that designing optimal research ecosystems will help to ensure our students and postdocs emerge from academia as the innovation workforce our nation needs.

I look forward to collaborating with many of you on the challenges of 2021. As always, I can be reached at DeanPisano@eng.ucsd.edu.

-Albert P. Pisano, Dean

UC San Diego Jacobs School of Engineering

Franklin Antonio Hall: Spring 2022

Franklin Antonio Hall will serve as a model for how to build innovation ecosystems with physical roots and virtual infrastructure that extend opportunities well beyond the walls of the building. The diverse yet complementary research teams will develop platform technologies that can be pivoted from one application to another to rapidly respond to the needs of the country. Students, innovators and industry partners will all have dedicated spaces in Franklin Antonio Hall. It will grow into an innovation ecosystem with deep technical richness and national and international reach.

Learn more: bit.ly/PisanoFAH

Detecting fever before you feel it

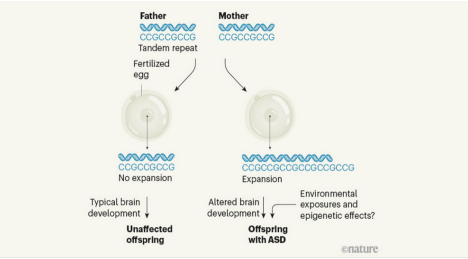
Temperature data collected by wearable devices worn on the finger can be reliably used to detect the onset of fevers, a leading symptom of both COVID-19 and the flu, according to a team of researchers from UC San Diego, UC San Francisco and MIT Lincoln Lab. The researchers studied the data of more than 65,000 people wearing a smart ring that records temperature, heart rate, respiratory rate and levels of activity. "This isn't just a science problem, it's a social problem," said Benjamin Smarr, the paper's corresponding author and a professor in the Department of Bioengineering and the Halicioglu Data Sciences Institute at UC San Diego. "With wearable devices that can measure temperature, we can begin to envision a public COVID early alert system."

Learn more: bit.ly/DetectingFever

Finding worth in wastewater

A wastewater monitoring system is proving to be an invaluable tool in the early detection of SARS-CoV-2 on the UC San Diego campus. While symptoms of COVID-19 generally take four or five days to appear, traces of the virus can be detected much earlier in stool. By monitoring wastewater outflow, viral activity can be discovered near the onset of an infection, including presymptomatic and asymptomatic cases. The Environmental Testing/Wastewater Work Group is led by Rob Knight, professor of Pediatrics, Computer Science and Engineering, and Bioengineering. Knight also directs the Center for Microbiome Innovation at the Jacobs School.

Learn more: bit.ly/COVIDWastewater



Repeat DNA may play role in autism spectrum disorders

Mutations that occur in certain DNA regions, called tandem repeats, may play a significant role in autism spectrum disorders, according to research led by Melissa Gymrek, assistant professor in the UC San Diego Department of Computer Science and Engineering and School of Medicine. "Few researchers really study these repetitive regions because they're generally non-coding--they do not make proteins; their function is unclear; and they can be difficult to analyze," said Gymrek. "However, my lab has found these tandem repeats can influence gene expression, as well as the likelihood of developing certain conditions such as ASD." The study was done in collaboration with geneticists at UCLA.

Learn more: bit.ly/NatureASD2021

Ocean acidification transforming California mussel shells

As the waters off our coasts change due to human influences, biologists and engineers at UC San Diego are finding that the composition of California mussel shells is weakening as it becomes more tolerant of acidic conditions. Scientists have known that over the past 60 years, the shell of the California mussel has changed from mostly the mineral aragonite to the weaker mineral calcite, as it adjusts to the effects of ocean acidification. Biologists partnered with engineering Professor Olivia Graeve, whose lab conducted X-ray diffraction analysis on each mussel shell sample to determine their mineral profiles.

Learn more: bit.ly/MusselShellChanges

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