

KISR Innovation Brief

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A super material applicable to batteries and other energy conversion devices

[An unplanned discovery could lead](#) to future pivotal discoveries in batteries, fuel cells, devices for converting heat to electricity and more. Scientists normally conduct their research by carefully selecting a research problem, devising an appropriate plan to solve it and executing that plan.

Researchers developing air quality sensors to detect COVID-19

[In the not-so-distant-future, Pratim Biswas envisions a time when people can measure their risk of catching COVID-19 in all sorts of environments—like restaurants](#), doctor's offices, and hospitals—by simply wearing a small air quality sensor and connecting it to an application on their phone.

Food systems and the bioeconomy

[Modern food systems must take into consideration the complexities of sustainably producing nutritious food while reducing the use of increasingly scarce and fragile resources to meet the needs of consumers, societies, ecosystems, and economies.](#) The COVID-19 pandemic has sharpened our focus on food—whether it be due to concerns relating to supply chain integrity, the viability of rural communities, or a rediscovery of home-cooking during lock-down.

Transforming 'sewer gas' into clean hydrogen fuel

[The process, detailed recently in the American Chemical Society journal ACS Sustainable Chemical Engineering, turns hydrogen sulfide—more commonly called "sewer gas"—into hydrogen fuel.](#) Hydrogen sulfide is emitted from manure piles and sewer pipes, which is a key byproduct of industrial activities including refining oil and gas, producing paper and mining.

A water-repellent nanomaterial inspired by nature

[A team of researchers at the University of Central Florida](#) has created a new nanomaterial that repels water and can stay dry even when submerged underwater. The discovery could open the doors to the development of more efficient water-repellent surfaces, fuel cells and electronic sensors to detect toxins. The work is documented in the cover story of this month's Advanced Materials journal.

Understanding human-robot interaction critical in design of rehabilitation systems

[Robotic body-weight support \(BWS\) devices can play a key role in helping people with neurological disorders to improve their walking.](#) The team that developed the advanced body-weight support device RYSEN in 2018 has since gained more fundamental insight in BWS, but also concludes that improvement in this field is necessary. They find that recommendations for the optimal therapy settings have to be customized to each device and that developers should be more aware of the interaction between patient and the device.

New ocean temperature data help scientists make their hot predictions

[So many climate models, so little time ... A new way of measuring ocean temperatures helps scientists sort the likely from unlikely scenarios of global warming.](#) We have heard that rising temperatures will lead to rising sea levels, but what many may not realize is that most of the increase in energy in the climate system is occurring in the ocean.