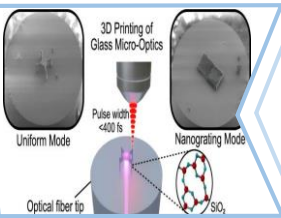


Innovation Brief

April - June 2024

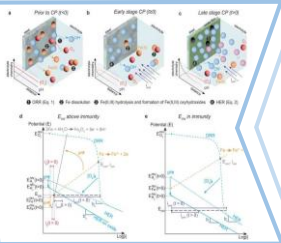
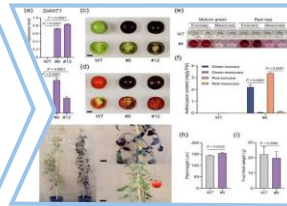


A Thousand Times Smaller than a Grain of Sand – Glass Sensors 3D-Printed on Optical Fiber

In a first for communications, researchers at KTH Royal Institute of Technology in Stockholm 3D printed silica glass micro-optics on the tips of optic fibers – surfaces as small as the cross section of a human hair. The advance could enable faster internet and improved connectivity, as well as innovations like smaller sensors and imaging systems.

Researchers Identify Tomato Exocarp-Specific Promoter for Genetic Enhancements

In a triumph for precision agriculture, researchers at Sun Yat-sen University have pinpointed a tomato exocarp-specific promoter, unlocking the potential for tailored genetic enhancements. This innovation promises to bolster the fruit's visual appeal, fortify it against environmental stressors, and significantly prolong its shelf life.

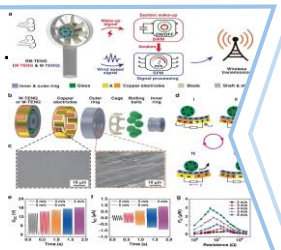


Study Resolves Decades-Long Debate on Cathodic Corrosion Protection

A team of researchers at ETH Zurich published a study in the journal *Communications Materials*, shedding light on the complex processes involved in cathodic corrosion protection (particularly in the case of steel in porous media such as soil or concrete) at the interface between the metal and the porous medium. The consistent understanding gained can help improve corrosion protection technologies and operate critical steel-based infrastructures in a safe, economical and environmentally friendly manner.

'Forever Chemical' Discovery Can Aid Drinking Water Treatment

A UCR team discovered a breakthrough chemical process that allows high levels of salt normally found in wastewater from water treatment plants to act as a catalyst that facilitates the breakup of PFAS compounds by cleaving the stubbornly strong fluorine-to-carbon bonds. The process destroys long-chain PFAS & short-chain PFAS that are more difficult to get rid of by traditional separation technologies. This can help municipal & privately-owned water providers separate PFAS compounds from drinking water supplies.



New Wind Speed Sensor Uses Minimal Power for Advanced Weather Tracking

Researchers from the Beijing Institute of Nanoenergy & Nanosystems have unveiled a pioneering breeze wake-up anemometer that operates autonomously and efficiently in varying wind conditions, marking a substantial advancement in the field of sustainable environmental monitoring. The device can remain in a near-zero power quiescent state until activated by wind speeds exceeding 2 m/s. It generates power from the motion of rolling bearings, which is harnessed to wake the device from its low-power state.

Scientists Learn from Caterpillars How to Create Self-Assembling Capsules for Drug Delivery

NTU Singapore scientists have created nanosized capsules that could be used to deliver drugs and mRNA by harnessing the self-assembling abilities of proteins from the cuticles of Asian corn borer moth caterpillars (*Ostrinia furnacalis*) in a study published in *Nature Nanotechnology*. The scientists identified peptides that could self-assemble to form hollow non-toxic nanocapsules, paving the way for various potential biomedical applications.

