



WHAT'S NEW

Web-slinging Technology

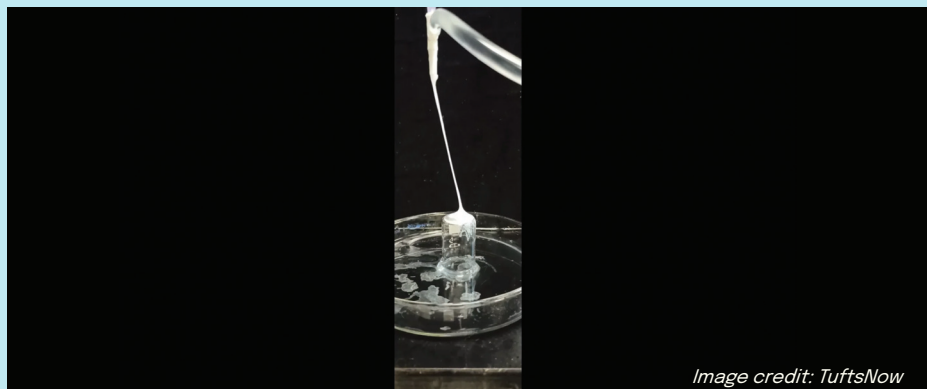


Image credit: TuftsNow

TURNING the imagination into reality of most children's dream to imitate the super-power of Spider-Man, researchers from Tufts University created the web-slinging technology. In this technology, a needle shoots fluid material, which immediately solidifies as a string and adheres to the objects which can be lifted. The fibres used in this technology are modified from silk moth cocoons.

According to researchers, the diameter of the fibres, which lift the object, depends on the bore of the needle from which it is shot, i.e. up to half a millimetre. Additionally, the device is strong enough to pick up objects that are over 80 times their own weight. The innovation is published in the journal *Advanced Functional Materials*.

Source: TuftsNow

The grain-size soft robots for targeted drug delivery

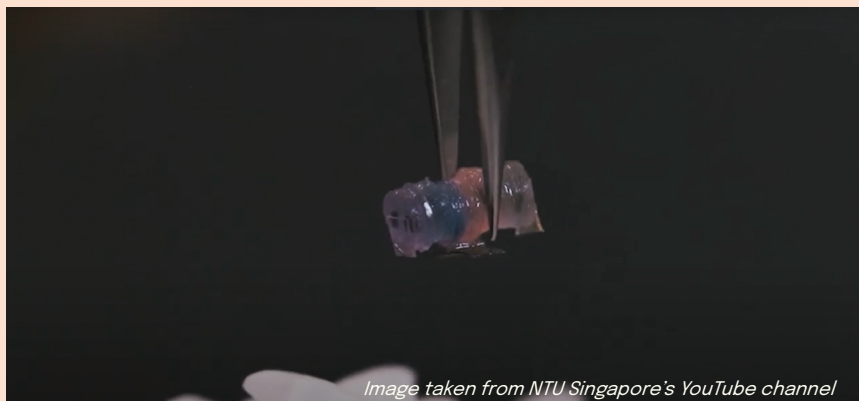


Image taken from NTU Singapore's YouTube channel

IN a recent breakthrough to improve therapies in future, researchers from Nanyang Technological University, Singapore, have developed grain-sized soft robots that can be controlled using magnetic fields. Unlike existing miniature robots that cannot precisely control their orientations, the newly developed soft robot is highly dexterous — quickly rolling and crawling to negotiate obstacles. Its dexterity offers great potential for navigating complex, unstructured environments inside the human body.

According to researchers, these miniature robots can transport up to four drugs and release them in reprogrammable orders and doses. Additionally, the grain-sized robot was created using smart magnetic composite materials (magnetic microparticles and polymer) that are non-toxic to humans. The research was in the scientific journal *Advanced Materials*.

Source: NTU Singapore News Release

A device to capture water directly from air in low humidity

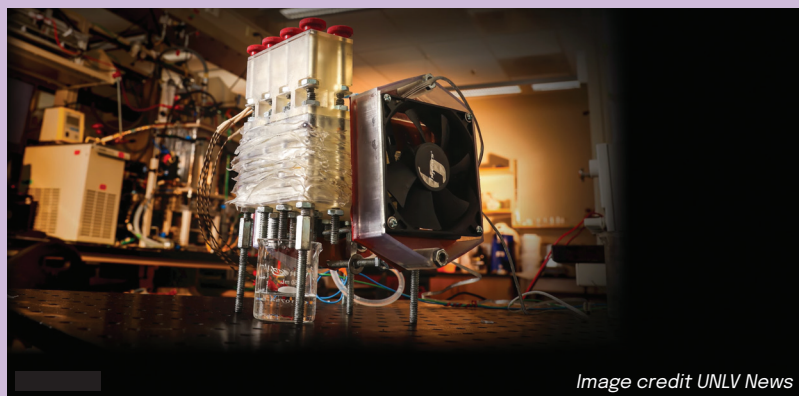


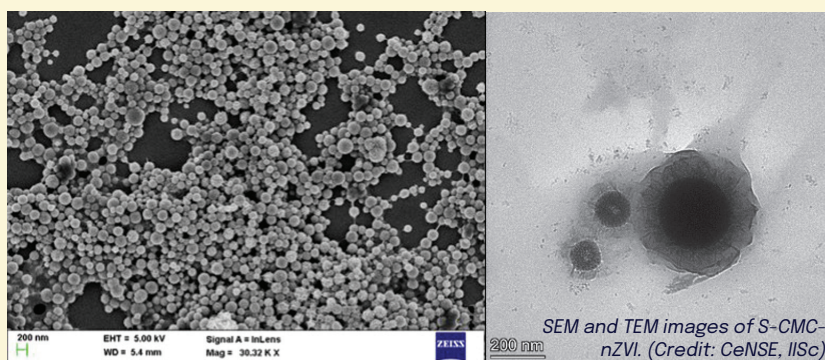
Image credit UNLV News

DRAWING inspiration from nature, researchers from the University of Nevada, Las Vegas, have developed a high-yield atmospheric water-capturing device for arid regions. The device could easily capture water from the air even in low humidity, i.e. up to 10% humidity.

Researchers say it directly captures water in a liquid salt solution, which could easily be processed into drinking water and energy production. The device would be very useful in addressing the issue of water shortage in arid regions due to its ability to capture water in low humidity. Additionally, the device is solar-powered, further making it energy efficient. The research was published in *Proceedings of the National Academy of Sciences (PNAS)*.

Source: University of Nevada, News Release

Researchers at IISc developed a nanomaterial-based solution for removing heavy metal contamination



SEM and TEM images of S-CMC-nZVI. (Credit: CeNSE, IISc)

ADDRESSING the issue of heavy metal contamination in groundwater, researchers from the Indian Institute of Science (IISc) have developed a nanomaterial-based solution that can effectively reduce the presence of heavy metals like chromium in groundwater. These nanoparticles are injected into the subsurface groundwater region. The study is published in the *Journal of Water Process Engineering*.

According to the researchers, most current methods for removing heavy metal contamination rely on pumping out water from the ground, followed by purification using chemical precipitation, adsorption, ion exchange and reverse osmosis at a different location. The IISc team instead proposes an on-site alternative, which involves using iron nanoparticles to remediate the heavy metals.

Source: IISc Press Release