

Health matters

Smart skin monitors biological signals on demand

Skin can send certain health-related signals, such as dry skin feeling tighter to indicate the need for moisture. But what if skin could be smarter, capable of monitoring and sharing specific health information, such as the concentration of glucose in sweat or heart rate? That was the question driving a team led by Penn State researchers that recently developed an adhesive sensing device that seamlessly attaches to human skin to detect and monitor the wearer's health.

The details of the smart skin, including how it can be efficiently reprogrammed to detect various signals and even recycled, were published recently. The paper was included in the "Rising Stars" series, which is coordinated by multiple journals to highlight work by early career researchers around the world. The researchers also filed a provisional patent application on the work.

"Despite significant efforts on wearable sensors for health monitoring, there haven't been multifunctional skin-



interfaced electronics with intrinsic adhesion on a single material platform prepared by low-cost, efficient fabrication methods," said co-corresponding author Huanyu "Larry" Cheng, the James L. Henderson, Jr. Memorial Associate Professor of Engineering Science and Mechanics in the Penn State College of Engineering. "This work, however, introduces a skin-attachable, reprogrammable, multifunctional, adhesive device patch fabricated by simple and low-cost laser scribing."

Cheng explained that conventional fabrication

techniques for flexible electronics can be complicated and costly, especially as sensors built on flexible substrates, or foundational layers, are not necessarily flexible themselves. The sensor's rigidity can limit the flexibility of the entire device. Cheng's team previously developed biomarker sensors using laser-induced graphene (LIG), which involves using a laser to pattern 3D networks on a porous, flexible substrate. The interactions between the laser and the materials produce conductive graphene.

"However, the LIG-based sensors and devices on flexible substrates are not intrinsically stretchable and can't conform to interface with human skin for bio-sensing," Cheng said, noting that human skin is changeable in shape, temperature and moisture levels, especially during physical exertion when monitoring heart rate, nerve performance or sweat glucose levels might be necessary. "Although LIG can be transferred to stretchable elastomers, the process can greatly reduce its quality."

As a result, Cheng said, it's more difficult to program a sensor device to

monitor specific biological or electrophysical signals. Even when the device can be appropriately programmed, its sensing performance is often degraded.

"To address these challenges, it is highly desirable to prepare porous 3D LIG directly on the stretchable substrate," said co-author Jia Zhu, who graduated with a doctorate in engineering science and mechanics from Penn State in 2020 and is now an associate professor at the University of Electronic Science and Technology of China.

The researchers achieved this goal by making an adhesive composite with molecules called polyimide powders that add strength and heat resistance and amine-based ethoxylated polyethyleneimine - a type of polymer that can modify conductive materials - dispersed in a silicone elastomer, or rubber. The stretchable composite not only accommodates direct 3D LIG preparation, but also its adhesive nature means it can conform and stick to non-uniform, changeable shapes - like humans.

Snapping photos of food can be good for health

New Curtin University research reveals taking pictures of food isn't just content for our social media feeds, but could be the key to improving people's diets. Published recently, the feeding study saw researchers measure the weight of meals, which were then provided to participants over a day for breakfast, lunch and dinner.

Participants compared different technology-assisted methods to recall what they had eaten over the past 24 hours.

One method asked participants to take photos of their meals using the mobile Food Record app. These photos were then analysed by a research dietitian. The study found the accuracy of the nutritional intake was far higher for the group who had taken photos of what they ate, compared to participants who were asked to remember what they had eaten.

First author and PhD candidate Clare Whitton said this was the largest feeding study to use the mobile Food Record app and the findings could have a big impact on how we capture what the population is eating. "Accurate, reliable



data about what the population is eating is key to supporting people to optimise their health," Ms Whitton said.

"People can struggle to remember what they have eaten, but this study shows dietary assessment can be accurate - particularly when you take the burden away from the person when you ask them to take a photo of what they ate."

While the study saw the food photos analysed by experts, there is work underway to streamline the process.

The team is collaborating with Purdue University in the US to use artificial intelligence to automatically analyse the foods in the photos.

Study lead and mobile Food Record App co-creator Professor Deborah Kerr said this was an exciting development in

getting the bigger picture of what people are eating. "It makes it a lot simpler for people to track what they consume when they only have to take photos for the day," Professor Kerr said.

"This will become even easier as we start to fully automate the analysis of the foods in the photos."

"With advances in AI technology this may be just around the corner."

Professor Kerr said as technology advances, it could provide an avenue to not only better capture what populations are eating, but also offer more accurate dietary advice for individuals looking to eat healthier.

"This research shows the benefit of images; that's the pathway we're going down to get an accurate picture of what people are eating."



Assessing brain cancer mutations during surgery

Brain cancer is difficult to treat when it starts growing, and a prevalent type, known as a glioma, has a poor five-year survival rate. In a new study, Mayo Clinic researchers report on a new surgical platform used during surgery that informs critical decision-making about tumor treatment within minutes. Time is of the utmost importance when dealing with aggressive malignant tumors.

The platform uses mass spectrometry to identify a key gene mutation in brain cancer, known as isocitrate dehydrogenase (IDH) mutations, in real time. Mass spectrometry is a sensitive technique used to analyze substances in tissue samples, including those altered in cancer.

more than 240 small tissue biopsies from patients undergoing brain surgery for suspected glioma at Mayo Clinic between 2021 and 2023, and an additional 137 biopsies from an international collaborator. Neurosurgeons collected biopsy samples from the core of the tumor to identify the mutations, as well as from areas around it, to assess if the tumor had spread.

Each tissue sample was placed on a glass slide steps away from the patients during ongoing surgery. The samples were analysed through the mass spectrometer, which allowed researchers to rapidly assess -- within two minutes -- whether an IDH mutation was present.

The researchers say that, in addition to

enabling real-time diagnosis, the platform allows surgeons to determine a patient's prognosis and perform tumor resection to improve patient outcomes. In the future, the new platform will help surgeons take advantage of the window of opportunity in the operating room to tailor treatment to the molecular features of a tumor, a more personalized approach to medicine.

Researchers hope new therapies developed to target IDH mutations can be delivered in the operating room at the time of surgery.

"The ability to identify this mutation during brain surgery means that we can treat patients locally before they leave the operating room," says the study's senior author, Alfredo Quiñones-

Hinojosa, M.D., dean of research and chair of the Department of Neurosurgery at Mayo Clinic in Florida.

"Therefore, we will be able to bring the fight against cancer to the operating room, before chemotherapy and radiation treatments begin, and before the disease has progressed and invaded further," Dr. Quiñones-Hinojosa is also director of the Brain Tumour Stem Cell Research Laboratory.

In the study, researchers were able to diagnose IDH gene mutations with 100% accuracy. They are conducting more research to find other signatures in tumors where the mutation is absent. In addition, they plan to broaden their discoveries to include other types of brain cancers.



Potatoes, garlic are must foods

V.V.S.Manian
A recent study published in The Journal of Nutrition found that potato consumption moderately reduces the risk of all-cause mortality and cardiovascular disease-specific mortality in adults.

Potatoes are a staple food in many traditional diets and, as a result, are one of the most commonly consumed vegetables globally. Potatoes are a rich source of potassium,

vitamin C, dietary fibers, and many bioactive compounds, all of which are vital nutrients with cardiovascular health benefits.

Garlic proves potent
In a recent study published in the journal Nutrients, a group of researchers in China conducted a systematic review and meta-analysis to investigate the effects of garlic on blood lipid and glucose levels in humans.

Chronic non-communicable diseases, including cardiovascular diseases, chronic respiratory diseases, cancers, and diabetes, cause 41 million deaths annually. Glucose and lipids are crucial for energy, and their dysregulation can lead to atherosclerosis, diabetes, and fatty liver disease.

Dyslipidemia, with high total cholesterol (TC),

low-density lipoprotein cholesterol (LDL-C), triglycerides (TG), and low-density lipoprotein cholesterol (HDL-C), is a major cardiovascular risk factor. Current treatments for metabolic diseases focus on symptom relief and have side effects.

Garlic, rich in compounds like allicin, shows potential for regulating glucose and lipids.

Kotak Mahindra Bank Limited ONLINE E - AUCTION SALE OF ASSET

Registered Office: 27B/C, C-27, G-Block, Bandra Kurla Complex, Bandra (E), Mumbai - 400051
Branch Office: Kotak Mahindra Bank Limited - #185, 2nd Floor, Mount Road, Anna Salai, Chennai 600 006
(Landmark: Mg Car Showroom And Next To Thousand Lights Metro Railway Station)

Online E - Auction Sale Of Asset KOTAK MAHINDRA BANK LIMITED

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Sale Notice For Sale of Immovable Properties

E-auction sale notice for sale of immovable assets under the securitisation and reconstruction of financial assets and enforcement of security interest act, 2002 under rule 8(5) read with proviso to rule 9 (1) of the security interest (enforcement) rule, 2002. Subsequent to the assignment of debt in favour of Kotak Mahindra Bank Limited by "PNB Housing Finance Limited" (hereinafter referred to as "PNBHFL") the authorised officer of PNB Housing Finance Limited (hereinafter referred to as "PNBHFL") has taken the physical possession of below described immovable property (hereinafter called the secured asset) mortgaged/charged to the secured creditor on 18.11.2019. Notice is hereby given to the borrower (s) and guarantor (s) in particular and public in general that the bank has decided to sale the secured asset through e-auction under the provisions of the sarfaesi act, 2002 on "As is where is", "As is what is", and "whatever there is" basis for recovery of Rs. 26,26,913.00 (Rupees Twenty Six Lakh Twenty Five Thousand Nine Hundred Thirteen And Nine Paise Only) outstanding as on 23.05.2019 along with future applicable interest till realization, under The Loan Account No. HOU/CHE/07/1408845; loan availed by Mr. J. Pushpanathan & Mrs. Jayanthi. P as per below details.

Particular	Detail
Date of Auction	27.06.2024
Time of Auction	Between 12:00 pm to 1:00 pm with unlimited extension of 5 Minutes
Reserve Price	Rs. 4,00,000/- (Rupees Four Lakh Only)
Earnest Money Deposit (EMD)	Rs. 40,000/- (Rupees Forty Thousand Only)
Last Date For Submission Of EMD With Kyc	26.06.2024 UP TO 5:00 P.M. (IST)
Description Of The Secured Asset	Schedule Of Property-A: All That Piece And Parcel Of Land Comprised In Survey No. 2182, 2235, 2236, 2237, 2238, 2239, 2240, 2241, 2242, 2243, 2244, 2245, 2246, 2247, 2248, 2249, 2250, 2251, 2252, 2253, 2254, 2255, 2256, 2257, 2258, 2259, 2260, 2261, 2262, 2263, 2264, 2265, 2266, 2267, 2268, 2269, 2270, 2271, 2272, 2273, 2274, 2275, 2276, 2277, 2278, 2279, 2280, 2281, 2282, 2283, 2284, 2285, 2286, 2287, 2288, 2289, 2290, 2291, 2292, 2293, 2294, 2295, 2296, 2297, 2298, 2299, 2300, converted into house site in the name of 'Phoenix City' at No.127, Panruti Village, Siperumpudhur Taluk, Kancheepuram District lying within the registration district of Kancheepuram and the registration sub-district of Walaajabad. Schedule Of Property-B: All that piece and parcel of vacant house site bearing plot no.81, measuring to an extent of 2100 sq.ft., Phoenix City at Panruti Village, Siperumpudhur Taluk, Kancheepuram District comprised in survey no.224/23, 24 d/c no. lp/d/cp/or no. 54 of 2016 dated Plot No.61 bounded on the East by: Vacant land, West by: 30 Feet Road, North by: Plot No.60, South by: Plot No.53 and having a linear measurement of East to West on the northern side - 30', East to West on the southern side - 31', North to South on the eastern side - 18', North to South on the western side - 18' and situated within the registration district of Chennai and sub-registration of Walaajabad and within the limits of Panruti Panchayat Anti Siperumpudhur Panchayat Union. Item No.2: SCHEDULE OF PROPERTY-A: All that piece and parcel of land comprised in survey no.2182, 2235, 2236, 2237, 2238, 2239, 2240, 2241, 2242, 2243, 2244, 2245, 2246, 2247, 2248, 2249, 2250, 2251, 2252, 2253, 2254, 2255, 2256, 2257, 2258, 2259, 2260, 2261, 2262, 2263, 2264, 2265, 2266, 2267, 2268, 2269, 2270, 2271, 2272, 2273, 2274, 2275, 2276, 2277, 2278, 2279, 2280, 2281, 2282, 2283, 2284, 2285, 2286, 2287, 2288, 2289, 2290, 2291, 2292, 2293, 2294, 2295, 2296, 2297, 2298, 2299, 2300, converted into house site in the name of 'Phoenix City' at No.127, Panruti Village, Siperumpudhur Taluk, Kancheepuram District lying within the registration district of Kancheepuram and the registration sub-district of Walaajabad. Schedule Of Property-B: All that piece and parcel of vacant house site bearing plot no.81, measuring to an extent of 2100 sq.ft., Phoenix City at Panruti Village, Siperumpudhur Taluk, Kancheepuram District comprised in survey no.224/23, 24 d/c no. lp/d/cp/or no. 54 of 2016 dated Plot No.61 bounded on the East by: Vacant land, West by: 30 Feet Road, North by: Plot No.60, South by: Plot No.53 and having a linear measurement of East to West on the northern side - 30', East to West on the southern side - 30', North to South on the eastern side - 18', North to South on the western side - 18', totalling in all to an extent of 2100 sq.ft and within the sub-registration district of Walaajabad and in the registration district of Kancheepuram.

Known Encumbrances NIL

The borrowers attention is invited to the provisions of sub section 8 of section 13, of The Act, in respect of the time available, to redeem the secured asset. Borrowers in particular and public in general may please take notice that if in case auction scheduled herein fails for any reason whatsoever then secured creditor may enforce security interest by way of sale through Private Treaty. In case of any clarification/requirement regarding assets under sale, bidder may contact Mr. Syam Namburi (+91 9677288418) & Mr. Velmurugan K (+91 9884718338). Bidder May Also Contact The Bank's Iv No. (+91-9152219751) For Clarifications. For detailed terms and conditions of the sale, please refer to the link <https://www.kotak.com/bank-auctions.html> provided in the bank's website i.e. www.kotak.com and/or on <http://bankauctions.in/>

Place: Chennai, Date: 06.06.2024 Authorized Officer: Kotak Mahindra Bank Limited