Researchers Develop NANOVESICLE METHOD FOR TUMOR TREATMENT

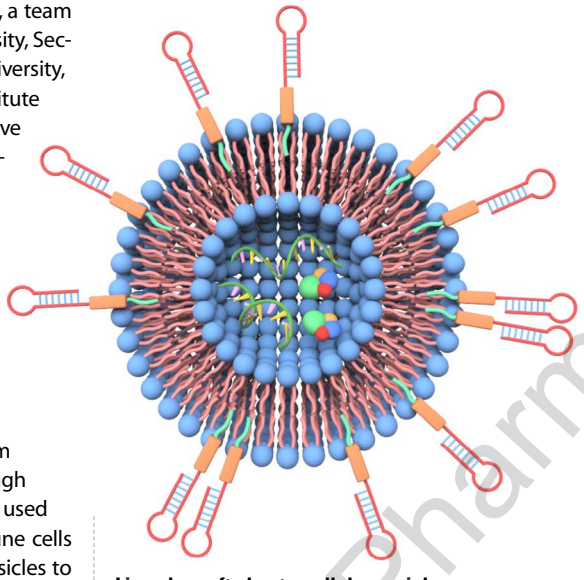
▶ *Trend Watch: Technology boosts cancer care.*

According to a report by Penn State News, a team of scientists working at Penn State University, Second Affiliated Hospital of Southeast University, and Jiangsu Cancer Hospital & Jiangsu Institute of Cancer Research in Nanjing, China, have developed a way to coax the immune system cells to generate nanovesicles that can then be filled with different drug compounds.

Nanovesicles are tiny sacs released by cells that carry chemical messages between cells. These nanovesicles are a natural delivery vehicle and useful in drug delivery for cancer treatment.

Creating enough nanovesicles to inexpensively serve as a drug delivery system may be as simple as putting the cells through a sieve, according to the researchers, who used mouse autologous — their own — immune cells to create large amounts of fillable nanovesicles to deliver drugs to tumors in mice.

The researchers developed a simpler and faster method for attaching ligands. The researchers chemically graft the lipid-tagged ligands onto the cell membrane. They do this before they pass the cells through a sieve, which converts the cell membranes into millions of vesicles bearing ligands that can be filled with an appropriate drug to target the cancer.



Ligands-grafted extracellular vesicles

"Currently, natural nanovesicles can be harvested from cell culture supernatant — the fluid surrounding cultured cells — and they are fillable," says Yuan Wan, postdoctoral fellow in biomedical engineering, Penn State. "However, there are two problems using them for cancer treatment. There aren't enough nanovesicles produced in short timescales and they do not have targeting effect."

The researchers reported their results in a recent issue of Cancer Research.

Precision Health AI Launches First of its Kind "SYSTEM OF INTELLIGENCE" FOR CANCER CARE COMMUNITY

Precision Health AI has launched its Eureka Health Oncology AI platform that leverages EMR data to provide practical artificial intelligence (AI) applications built for real oncology use cases. The new platform is the first of its kind "system of intelligence" for oncology, based on Greylock Partner's The New Moats business model theory, that bridges mass amounts of EMR data available to answer the questions on the minds of pharmaceutical companies and physicians.

The solution, focused on precision medicine applications including enablement of health economics and outcomes research (HEOR) and clinical trials, delivers data-driven insights to the cancer care community to help develop targeted therapies, shape more efficient clinical trials and determine which therapies produce the greatest patient benefits, all while providing oncology experts with a deeper understanding of patient behavior and outcomes.

Precision Health AI's experts use their robust longitudinal oncology dataset to pretrain the Eureka Health Oncology AI platform to address business questions important for pharmaceutical companies, oncologists, CROs, and payers. More than 60 new AI solution modules will use Precision Health AI's proprietary data, which is among the largest available in oncology, as well as data provided by clients to predict a patient's cancer stage, patient-treatment match, adverse event occurrence and treatment impact on survival. Eureka Health Oncology AI platform will augment the work of researchers, oncologists, and insurers to reduce time spent on laborious, manual tasks, and maximize workflow efficiencies throughout the oncology care ecosystem.

DarioHealth Receives U.S. FDA Clearance for iPhone 7, 8 and iPhone X SMART GLUCOSE METER

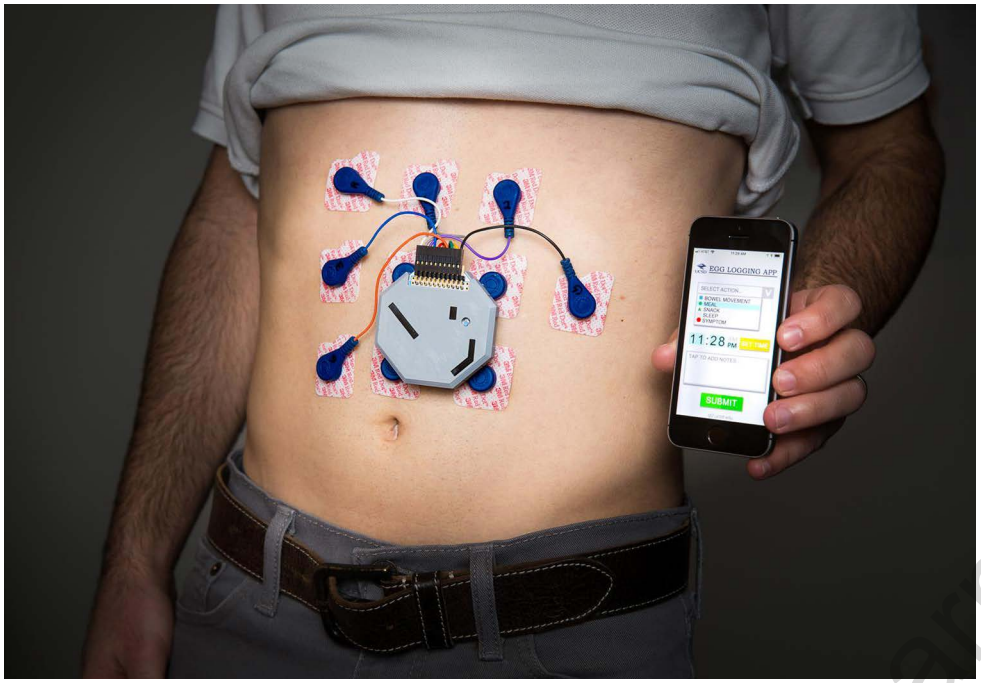
Global digital health company DarioHealth received FDA pre-market notification (510(k)) clearance for its lightning-enabled version of the Dario Blood Glucose Monitoring System that enables the use of the Dario app on iPhone 7, 8 and X smart mobile devices. The launch of Apple's smartphones with only a lightning connector posed a unique challenge to the entire mobile ecosystem. DarioHealth has been marketing the product in the United States exclusively for Apple iOS 6.1 platform and higher since the FDA first granted clearance for the Dario Blood Glucose Monitoring System in December 2015.

Merck KGaA Adopts Medisafe Medication Adherence Tool For CHRONIC CONDITIONS

Germany-based Merck KGaA is collaborating with U.S.-based Medisafe to help its cardiometabolic patients better manage medication intake and adhere to prescribed treatment regimens. Patients will have access to a customized version of Medisafe´s mobile platform that could combine reminders, motivation and support systems, targeted content, coupons, and interventions in their local language.

This will complement Merck KGaA´s current offering of primary care medicines for cardiometabolic conditions, which includes treatments for type 2 diabetes, thyroid disorders, and cardiovascular diseases.

Brazil, Russia, and Mexico are the first three countries where patients receiving the company´s primary care medicines will have access to a customized version of Medisafe.



Scientists Create a Noninvasive Wearable System TO MONITOR STOMACH ACTIVITY

Researchers have developed a wearable system to monitor stomach activity that performs as well as current state-of-the-art methods but can be used outside of a clinical setting. The system also comes with an app that allows patients to log their meals, sleep, and other activities. It essentially functions as an electrocardiogram but for the gastro-intestinal tract.

Applications include monitoring GI activity for patients outside of a clinical setting, which cuts down costs. Monitoring for longer periods of time also increases the likelihood of capturing abnormal events.

The team tested the device, a 3D-printed portable box connected to 10 small wearable electrodes, on 11 children and one adult volunteer. They found that data collected with the wearable system were comparable to data collected in the clinic with state-of-the-art methods, which are invasive, including a catheter inserted through the patient's nose. They also found that the stomach's electrical activity changes not only around meals, but also during sleep, following its own circadian rhythm.

Researchers detail their findings in the March 22 issue of Nature's open access journal Scientific Reports.

"We think our system will spark a new kind of medicine, where a gastroenterologist can quickly see where and when a part of the GI tract is showing abnormal rhythms and as a result make more accurate, faster and personalized diagnoses," says Armen Gharibans, the paper's first author and a bioengineering postdoctoral researcher at the University of California San Diego.

Todd Coleman, the paper's corresponding author and a UC San Diego professor of bioengineering, agrees.

"Until now, it was quite challenging to accurately measure the electrical patterns of stomach activity in a continuous manner, outside of a clinical setting," he says. "From now on, we will be able to observe patterns and analyze them in both healthy and unwell people as they go about their daily lives."

The system is currently paired with a smart phone app that allows patients to log their meals, sleep, and other activities. The long-term goal is to design an app that would allow patients and physicians to see the data collected by the device in real time. GI problems, such as delayed emptying of the stomach, are common in patients with diabetes and Parkinson's disease. This technology could improve the management of these conditions. Healthy people could also benefit from using the device. For example, competitive athletes and their coaches could monitor GI activity to figure out the best time for meals, especially while traveling across different time zones. Pregnant women suffering from heartburn and other GI problems could use it to monitor the stomach's activity before, during and after meals, as would the elderly.

To learn more about this work, visit the team's website at gi2.ucsd.edu.

FDA Launches Mobile App To Increase Access to Information ABOUT DRUGS

The U.S. Food and Drug Administration has created a mobile version of its Drugs@FDA webpage. On the mobile app, the public can search for information about FDA-approved brand and generic prescription and over-the-counter human drugs and biological therapeutic products. The FDA currently operates the Drugs@FDA webpage, which includes information about drug products approved by the agency, including patient information, drug labeling, approval letters, and reviews. The Drugs@FDA Express mobile app is a streamlined version of Drugs@FDA, allowing users to search on their mobile devices for certain product information based on product name, active ingredient or application number. Some information, such as labeling supplements and approval letters, won't be available on the app, but can be found on the webpage.

The app will also feature the most recent product approvals, within seven days, links to the Drugs@FDA glossary and frequently asked questions. It will also provide contact information for the FDA's consumer information office, the Division of Drug Information, druginfo@fda.hhs.gov.

"Consumers are embracing digital health technologies to inform everyday decisions," says FDA Commissioner Scott Gottlieb, M.D. "From fitness trackers to mobile applications tracking insulin administration, these digital tools can empower consumers with a wealth of valuable health information. Advancing mobile apps that inform people about their health and medical choices represents a significant public health opportunity and is a high priority for the FDA."