According to the Food and Agriculture Organization of the United Nations (FAO, UN), the global population will reach 8 billion by 2025 and 9.6 billion by 2050. Therefore, food production has to increase by 70% in order to feed whole citizens in the world. Agriculture, which is one of the crucial sectors to this solution, exhibits many obstacles such as climate change, limitation of arable lands, reduction of productivity growth, impacts of urbanization and the lack of agricultural labor. To overcome these challenges, the innovative technologies especially digital technologies should be adopted in agriculture and Smart Farming.

The precision agriculture aims to optimize the yield per farming area unit and reduce the investment cost by using precision technologies to manage the amount of water, fertilizers, herbicides, etc. The digital technologies for Smart Farming consists of:

1) Sensing Technology
2) Positioning Technology
3) Software system and application software
4) Communication System
5) Data Analytics Solutions

These technologies support the cycle of Smart Farming i.e. through data collection, interpretation and applications. Fertigation, which is a fertilizer application method by dissolving fertilizers before delivering to the crops via the irrigation system. The precise amounts of water and nutrients to the root zone with precise timings at the right growing stage are the advantages of this technology.

Internet of Things (IoT) and Unmanned Aerial Vehicle (UAV) are also applied to enhance agricultural production and cost effectiveness while reduce loss and waste in agricultural sector. Agribotix, which is the emerging startup leader in agricultural intelligence, uses FarmLens™ analytics software to operate agricultural drone for crop and soil health monitoring, water and chemical usage analytics, and area identification. The high-resolution remotely sensed imagery data is captured in order to develop the reports of crop health and track performance for customers to use in farm management and crop-growing plans in each agricultural cycle. These advanced technologies can increase the sustainability of farming practices agricultural products in both domestic and foreign markets.

Increase Patient Recruitment by Virtual Clinical Trials

29 August 2018 - ABoime Therapeutics, a clinical-stage life sciences company based in Massachusetts, has successfully conducted virtual trials of a 12-week randomized double-blind and placebo-controlled trial of a tropical acne drug through mail, email, phone app, and videoconferencing, where patients can participate from their home. The typical clinical trials are time-consuming, expensive, and less than 5% of eligible patients in participation with drop-out rate as high as 30%. Thus, several leading pharmaceutical firms such as Pfizer, Novartis, and GlaxoSmithKline, are interested in virtual model using digital technologies e.g. smartwatches, mobile apps, and wearable biosensors, to improve patient participation.

Source: Undark Magazine
[https://undark.org/article/clinical-trials-virtual-participation/]

Micromotor Pills for Oral Drug Delivery

5 September 2018 – Researchers from the University of California, San Diego have developed a pill consisting of active Mg-based micromotors encapsulated in sugar-based matrix to overcome problems such as early drug release triggered by body fluids and micromotors trap in esophagus after oral administration. Micromotors, which are self-propelled micro-robots reacting with acid in gastric fluid as a fuel source, are made of Mg/TiO2 core loaded with a fluorescent dye cargo before encapsulated in lactose/maltose excipients. The improvement in cargo release and retention in the stomach of laboratory mice without decreasing their mobility or performance shows a promising approach for oral drug delivery.

Source: EurekAlert!