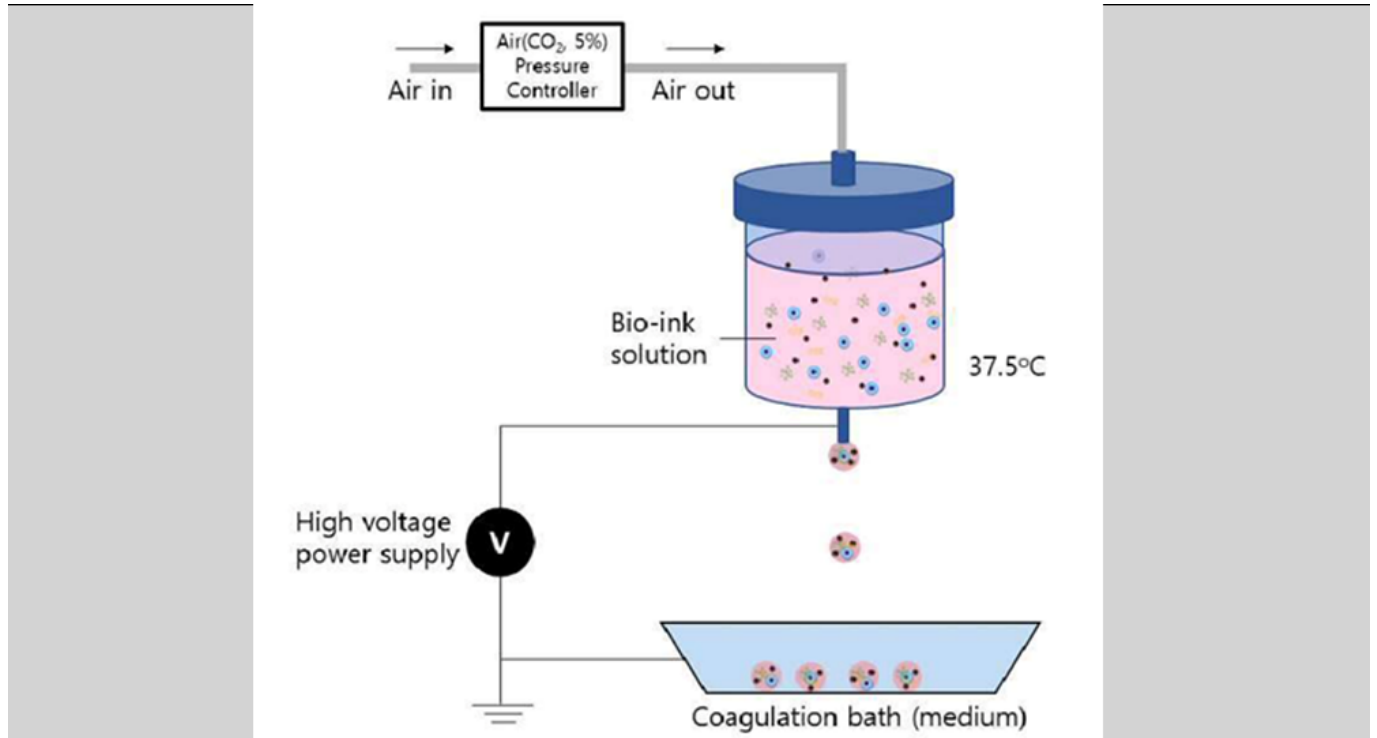


TECH OFFER

Culturing Methods of Homogenized Organoids for Mass Production and Automation



KEY INFORMATION

TECHNOLOGY CATEGORY:

Life Sciences - Industrial Biotech Methods & Processes
Healthcare - Pharmaceuticals & Therapeutics
Manufacturing - Additive Manufacturing

TECHNOLOGY READINESS LEVEL (TRL): **TRL5**

COUNTRY: **SOUTH KOREA**
ID NUMBER: **TO174875**

OVERVIEW

Traditional methods of culturing organoids are labor-intensive, time-consuming, and limited in their ability to produce large quantities of organoids with consistent quality and characteristics. This technology enables the production of homogenized organoids of consistent quality. It utilizes specialized conditions to facilitate mass production and automate the cultivation of organoids derived from various tissues and organs, including the liver, kidney, lung, and brain. The IP addresses a need in the marketplace by providing a more efficient and cost-effective method of producing organoids. This technology reduces the time and cost of producing organoids while improving the reproducibility and scalability of the process. This can accelerate drug discovery and development, improve the accuracy of toxicology testing, enable the development of personalized medicine, and eventually replace the need for animal testing in the long-term vision of drug development.

The technology provider will be producing the desired organoids as the end product with a further aim to enable a platform service for toxicity and efficacy testing when fully commercialized. The identity of the organoids will be validated by expression

of relevant biomarkers. The end users of this technology are likely to be pharmaceutical companies, biotech firms, academic research institutions, and clinical laboratories. Overall, the technology has the potential to transform the way organoids are produced and used in the biomedical field. The technology owner is actively seeking for R&D collaboration to allow integration into existing protocols and testing with institutions, biotech companies and Contract Research Organizations (CROs).

TECHNOLOGY FEATURES & SPECIFICATIONS

- A bioink composition for organoids generation and characterisation
- Method for creating consistent cell droplets, culturing them in suspension, and sorting them by desired characteristics
- Cost-effective, leading to a 10x reduction in price
- Cryopreservation of organoids can be implemented for long-term storage and to ensure stable delivery

POTENTIAL APPLICATIONS

This solution is intended to be a platform technology to be deployed in the biomedical industry, specifically in drug discovery on molecular drugs or gene therapies, toxicology testing, disease modeling, and personalized medicine, as well as CROs providing testing services and biotech firms developing early-stage drugs.

The products that can be marketed based on this technology are organoid assays derived from various human tissues and organs, such as liver, kidney, lung, and brain. These organoids can be used for various applications, including:

- Testing drug toxicity and efficacy
- Investigating disease mechanisms and identifying drug targets
- Developing personalized therapies for patients

MARKET TRENDS & OPPORTUNITIES

The organoids market is projected to grow at a significant rate in the coming years, with an increasing demand for personalized medicine and improved drug discovery and toxicology testing methods. According to a report by MarketsandMarkets, the organoids market is expected to reach USD 1,642 million by 2025, growing at a CAGR of 20.4% from 2020 to 2025.

The drug discovery outsourcing market was valued at USD 4.03 billion in 2020 and is also expected to grow at a compound annual growth rate (CAGR) of 7.8% from 2021 to 2028, according to a report by Grand View Research. The increasing demand for novel and effective drugs, the rising cost of in-house drug development, and the need to expedite drug development timelines are some of the key factors driving the growth of this market.

Pharmaceutical and biotech companies, as well as academic research institutions, are among the key buyers of drug discovery outsourcing services. These companies outsource drug discovery services to Contract Research Organizations (CROs) and Contract Development and Manufacturing Organizations (CDMOs) to reduce costs and accelerate drug development timelines.

UNIQUE VALUE PROPOSITION

The technology represents a significant improvement over the current state-of-the-art in organoid production. Currently, the most common methods for organoid production involve manual culturing, which is prone to variability and can be time-consuming and labor-intensive. Although some automation, such as the use of microfluidics and robotics, has been incorporated

into organoid production, these methods are still limited in terms of organoid yield and quality.

Our technology offers several advantages and differentiates itself from competitors in several ways:

- **Scalability:** One of the key advantages of this technology is its ability to scale up organoid production to an industrial level. The homogenization and suspension of organoids allow for efficient automation and mass production of organoids, reducing the time and cost of production.
- **Standardization:** The technology offers a more standardized and reproducible process for organoid production, reducing variability between batches and improving the accuracy of drug testing and development.
- **Versatility:** The technology can be applied to generate organoids from various organs and tissues, allowing researchers to study multiple disease models in a more comprehensive manner. This versatility allows for a wider range of applications and increases the potential market size.
- **Cost-effectiveness:** The streamlined process and scalability of the technology can lead to significant cost savings compared to other organoid production methods, making it more accessible to researchers and companies.