SMALLMACHINES, First Mover of Digital Transformation for Digital Healthcare Solutions

About the Company

Healthcare Guardian for Humans

SMALLMACHINES was founded in 2014 with the belief that pre-diagnosis and prevention, rather than treatment, are key to future medical care. It is committed to developing innovative medical devices for on-site in vitro diagnosis by continuing research based on the convergence of IT, NT, BT and digital technologies.

SMALLMACHINES is creating a world where everyone can enjoy a healthy and happy life under universal healthcare coverage (UHC, WHO 2016) without being discriminated based on age, gender, region, race, poverty, and disability. It aims to achieve this goal by providing personalized medical care that will reduce the time and cost spent on disease treatment and by introducing 4P (personalized, participatory, predictive and preventive) medical care that can detect risks at an early stage and prevent and address them accordingly.

Background

Leading Changes in the Future Healthcare System

People are expected to live longer thanks to advances in medical technology and future healthcare services being developed based on IT and big data to open the era of personalized medicine. In light of these changes, SMALLMACHINES is developing innovative on-site medical devices by considering the inevitable need to shift healthcare to a system centered on prevention and management rather than treatment.

Once these efforts help build digital data for disease prevention and management and reduce the cost of treatment through early diagnosis, more people will be able to enjoy healthcare benefits. At the same time, the reduced cost of treatment, mostly in developed countries, will enable universal healthcare benefits in the forms of aid to developing countries and system transition centered on telemedicine and non-face-to-face care.

If general blood tests can be done anywhere, anytime and at an affordable cost with a miniaturized on-site device rather than patients going to hospitals so that anyone can easily and quickly monitor his/her health conditions with a small amount of blood, it will be possible to innovate future medicine centered on proactive diagnosis and prevention.

About the Product

Whole Body Home Predictive Examination Project

SMALLMACHINES' WHOPE project is a digital healthcare platform that comprehensively analyzes cellular, immune, and chemical test data using only a small amount of blood. It is also linked to a clinical decision support system (CDSS) to enable anyone to manage personal health and predict and prevent diseases regardless of time and place. Its product lines include WHOPE, DELISA, and CELLOP.

WHOPE (general blood testing device) can analyze 17 blood elements and 15 diseases with a very small amount or a "drop" of blood taken from a finger, thereby collecting blood data specific to certain diseases. It is a cloud image analysis system that diagnoses and predicts diseases at an early stage based on the collected data. SMALLMACHINES is the only Korean company that has such a system, alongside only a helpful of companies worldwide.

DELISA is a high-sensitivity immunoassay that uses a diagnostic cartridge incorporating ultra-precise lab-on-a-chip technology developed based on microfluidics. It is optimized for measuring small molecules and low concentration biomarkers that have previously been difficult to measure. DELISA can also detect vitamin D, dementia, and ultra-sensitive cardiovascular biomarkers and can be used in studying various fields of biology, such as protein activity that requires expensive equipment or reagents to study.

CELLOP is an automatic cytometer that measures the number, viability, and size of cells in cultured cells or samples. Whereas other automatic cytometers are only capable of simply counting cells or measuring viability, CELLOP combines state-of-the-art optical technology, FPM (Fourier Ptychographic Microscopy), and artificial intelligence image analysis technology to measure cell size and aggregation.

Competitive Edge and Business Strategy

First Mover of Digical (Digital+Physical) Transformation

SMALLMACHINES has core source technologies for producing high-value-added products in the advanced bio-health industry. Its LOBA technology covers microfluidic chip design and processing technology (Lab-on-a chip), FPM-based large-area high-resolution optical technology (Optics), magnetic bead-based ultra-trace target molecule detection technology (Bio protocol), and AI-based ultra-high-resolution image reinterpretation technology for single-cell analysis (AI).

Based on LOBA, SMALLMACHINES is developing and producing innovative medical devices for in vitro diagnosis. It also has data-centered software capabilities such as disease prediction algorithms capable of identifying correlations of specific diseases with AI and multi-factor analysis.

Based on these capabilities, SMALLMACHINES aims to grow into a total solution platform provider holding data for individually customized medical systems and developing and producing key equipment for the advanced bio and digital healthcare industry.

Future Plans

Emerging as a Global Digital Healthcare Provider

SMALLMACHINES is preparing to expand its business in full scale by introducing systems for mass production of lab-on-a-chip, providing OEM/ODM services for chips, and establishing production systems for key products such as WHOPE, DELISA, and CELLOP, as well as entering overseas markets by obtaining international certifications. Based on these efforts, SMALLMACHINES aims to increase sales to USD 10 million by 2025 by pursuing its digital healthcare business titled 'Healthcare Guardian Project' and successfully completing the IPO. To this end, SMALLMACHINES plans to launch Series B in the first half of 2024 to add infrastructure such as factories and production lines, and to continue recruiting key researchers for the future.

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** The opinions expressed in this article are the author's own and do not reflect the views of KOTRA.*