

New Era of Precision Embryo Implantation Reverses 9 Miscarriages Destiny in 24h Taiwan's Original Reproductive Technology Leads Its International Medical Status Leap Forward Again

GGA Corp. (4160), in collaboration with Quark Biosciences, has launched the world's first clinical routine service of using microRNA (miRNA) biomarkers in reproductive medicine - MIRA™ - miRNA-based Endometrial Receptivity Analysis.

Today (March 3) at Shin Kong Hospital, they jointly announced a successful clinical case, creating an extremely rare medical miracle of assisting a woman with nine recurrent miscarriages to get pregnant in one go!

MIRA™, a new product developed and patented by Quark Biosciences in response to market demand, has been rapidly commercialized in collaboration with GGA to help push the limits of clinical application in the field of reproductive medicine in countries, such as Japan, Malaysia and Indonesia, where infertility treatment technology is booming. At the same time, the technique was also published in *Fertility and Sterility*, which is the most influential and indicative original research journal of the American Society for Reproductive Medicine (ASRM). This achievement can be considered the pride of Taiwan in the field of reproductive medicine.

In Taiwan, over 30% of pregnant women are of advanced maternal age, and the infertility rate is as high as 15%. Studies also found that nearly one-third of the women with recurrent implantation failure had displaced window of implantation, which may increase the incidence of subsequent miscarriage if the endometrium has not reached full maturity. About 40,000 people in Taiwan seek infertility treatment each year, and the declining birthrate has severely affected the country's economic development as well as national defense security.

In 2020, the number of newborns fell to a record low of 165,000. This year, the number of births in Taiwan hit an all-time low in January, with less than 10,000 newborns in a single month. If the 40,000 patients seeking infertility treatment can have one or two children with the help of precision medicine, the number of births will grow by 40,000 to 80,000 each year, which will be beneficial to Taiwan's economy and national security. Taiwan's international medical services are highly competitive, and rank the second in the world with an average implantation rate of 36.7% for IVF treatment. Now, with the government's four-year international medical

services multiplication plan, the continuous introduction of forward-looking reproductive medicine technology is expected to enhance Taiwan's unique medical service niche again. This undoubtedly adds value to the policy of re-opening access to Taiwan for medical care starting from March 1.

Year 2020 was the period of explosion for the application and commercialization of RNA technology, from clinical testing, therapy, drug manufacturing to vaccine development, all of which are of great interest. Among all, the most widely known application would undoubtedly be the Covid-19 viral RNA detection and mRNA vaccine development. GGA is also entering a new era of RNA technology with miRNAs in the field of reproductive medicine, and is planning to engage in the broader cancer market. The main function of RNA is to control and participate in gene expressions, and therefore promises more clinical application potentials.

MIRA™, the contributor behind this innovation in reproductive medicine, is the world's first original reproductive test to successfully commercialize the endometrial receptivity analysis technique by using miRNA biomarkers. The test developer, Quark Biosciences, is a company with a long history investing in clinical research. Quark Biosciences applies its own NextAmp™ bifunctional gene assay system, which uses machine learning and big data analysis to perform microRNA performance profile analysis, already has several international patent applications and papers filed. Quark Biosciences further collaborates with GGA to promote the service as a clinical routine test and expands it to major medical cities in Asia.

MIRA™ is useful for women whose endometrium have been damaged or who have a thin lining that may lead to difficulties in pregnancy. It can help the physician find the most suitable window for personalized embryo transfer with less amount of sample required under the least invasive process. MIRA™ not only increases the pregnancy rate but also reduces the miscarriage rate at the same time.

According to the WHO survey, there are currently 48 million couples and 186 million people worldwide suffered from infertility problems and in urgent needs of help from reproductive medicine. In 2018, the artificial reproduction market in Japan exceeded 450,000 treatment cycles, and is still increasing. In response to the problem of declining fertility, Japan also released a new fertility policy this year, doubling the subsidy from 150,000 yen to 300,000 yen for a single infertility treatment, and reproductive medicine has become a major goal of development for all countries. The average cost of artificial reproductive treatment in Taiwan is \$150,000 to \$200,000 NTD per cycle. GGA worked with the fertility team of Shin Kong Hospital to help Ms.

Huang, who had multiple recurrent miscarriages, to implant her embryo with a simple shift in transfer time of only 24 hours and she was able to have a successful pregnancy. Ms. Huang said that in the past five years, excluding the regular medical appointments and medications, the total cost of infertility treatment alone could add up to \$1 million NTD, which was a great financial pressure. According to GGA CEO Chris Tsai, the use of personalized reproductive technology for precise embryo implantation can be described as "reversing the fate of nine miscarriages in 24 hours" and saving \$1 million NTD in costs without additional burden. If the embryo implantation rate can be effectively increased in clinical services, it will help to improve the fertility rate and create more than one million dollars of value for infertility patients.

The Taiwan government is promoting six core strategic industries that are expected to establish Taiwan as a global benchmark country for precision health. It is expected that by 2025, the global precision health market size will reach \$584.7 billion USD. GGA and Quark Biosciences have joined hands to introduce the world's unique emerging technologies as well as provide Taiwan's top technologies to more people in need. GGA continues to dedicate to its 40% of neonatal and 90% of fertility center market coverage in Taiwan, while adding innovative energy to Taiwan's international medical services.

For more Information please contact GGA Corp.