

## Varinos Inc.

Commercialized the world's first highly accurate endometrial microbiome testing service by applying next-generation sequencing.

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<https://varinos.com/en>

Founded in 2017  
Founder & CEO: SAKURABA Yoshiyuki, Ph.D.  
No. of employees: 39  
Type of Ownership: Private  
Primary stock exchange: N/A

**September 2022:** Expert in genome technology, Varinos is focusing on developing diagnostic testing services in reproductive medicine and obstetrics and gynecology.

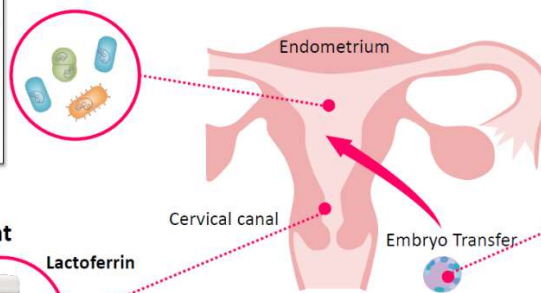


Valuation (VV) interviewed Dr. SAKURABA Yoshiyuki, Founder & CEO.

**VV:** You are currently providing testing services for endometrial microbiome, PGT-A (Preimplantation Genetic Testing for aneuploidy), and POC (Products of Conception) as well as a lactoferrin supplement product.

**Sakuraba:** Varinos is the first company in the world who made the high-grade endometrial microbiome testing service available for clinical use via medical doctors for not only IVF (In Vitro Fertilization) patients but all women who wish to understand their endometrium microbiome.

### ① Endometrial Microbiome Test



### ③ PGT and POC Test



### ② Supplement



Lactoferrin

Via Medical institutions,  
Varinos EC site and EC site  
including Amazon

Recent research studies demonstrate that endometrium contains various bacteria, which is totally contrary to the belief that it is sterile.

We analyze samples of mucus from the endometrium sent us by medical doctors at our laboratory and present results and recommendations in a few weeks. Below is an example report. Detailed bacterial profiling helps identify specific and appropriate treatment. Varinos is able to offer this accurate analysis.

### Test Report Example

Report includes the rate of *Lactobacillus* detected in the specimen, evaluation and detailed bacterial profile. Consultation will be provided if required.

① Customer and test information

② Composition of *Lactobacillus* detected in the specimen

③ Evaluation

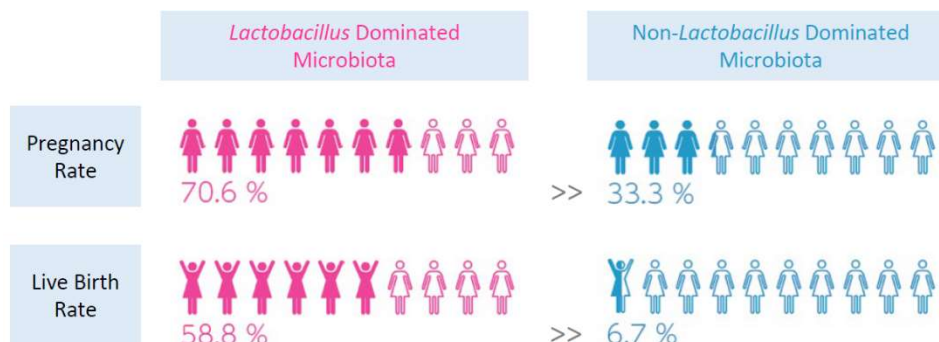
- LDM : *Lactobacillus* ≥ 90%
- NLDM : *Lactobacillus* < 90%

④ Detailed bacterial profile and comments

- Genus and composition
- Possible antibiotics if bacteria related to bacterial vaginosis are identified

We perform 16s rRNA gene sequencing with next-generation sequencing (NGS). 16s rRNA sequencing is used in identification of bacteria and phylogenetic studies. And NGS allows millions of genetic material fragments to be sequenced in a single run. It is high throughput, comprehensive, rapid, and low cost compared to conventional sequencing techniques.

Several research papers have asserted that the uterus should have more than 90% lactobacillus in order for women to become pregnant. The figure below shows the outcome of pregnancy and live birth rate between lactobacillus dominated microbiota and non-lactobacillus dominated microbiota.



I. Moreno et al. AIOG. 2016

It is understood that the lack of sufficient lactobacillus in the uterus has harmful effects on the immune system, artificial insemination, and implantation. Lactoferrin promotes the growth of beneficial bacteria such as lactobacillus. We provide our original lactoferrin supplement product which is patented specifically to improve the endometrial microbiome (Patent No. 6831548).

In addition, we are offering the PGT-A testing service which examines the chromosomes of embryos in order to check for abnormalities and avoid miscarriage. And the POC genomic analysis testing service provides information for the cause of miscarriage.

**VV:** **Your business growth strategy is to maximize your knowhow on genome technology for different medical fields.**

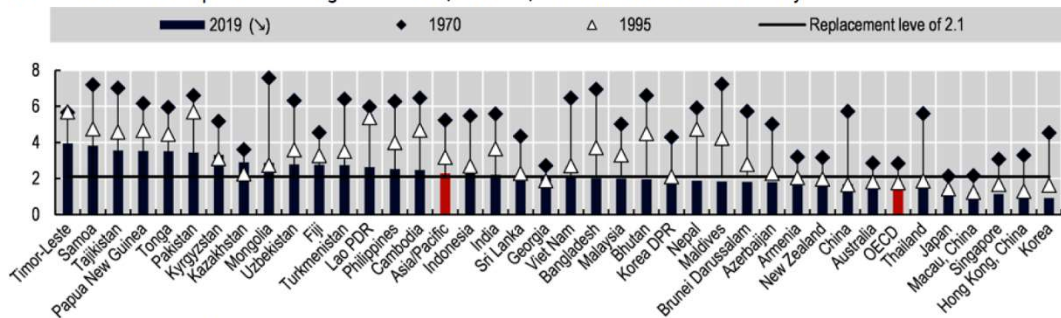
**Sakuraba:** We are expanding our research and development on cancer and neonatal genetic diseases, and in areas where genomic diagnostic testing is required.

With the aim of promoting our business in endometrial microbiome testing service globally, we are exploring the opportunity to set up our labs outside Japan. Proposals for international collaboration are welcome.

**VV Comments after the interview:**

It is common knowledge and concern that the fertility rate has globally declined. The graph below published by OECD<sup>1</sup> shows the change of the number of children per woman aged 15 to 49, in 1970, 1995, and 2019 by country.

Figure 2.4. Despite rapid declines, fertility rates in Asia/Pacific are still higher than in OECD  
Number of children per woman aged 15 to 49, in 1970, 1995 and 2019 or nearest year



Source: World Bank (2021), World Development Indicators; for OECD countries OECD Family Database (2021).

A variety of cultural, social, and economic factors have been discussed and analyzed. Nevertheless, for women who wish to have healthy babies

<sup>1</sup> <https://www.oecd-ilibrary.org/sites/c416afed-en/index.html?itemId=/content/component/c416afed-en>

safely, innovative medical technology such as the diagnostic services Varinos provides brings them significant help and assurance.

According to “Infertility Treatment Market Outlook (2022 -2032)<sup>2</sup>, the global infertility treatment market was valued at 1.5 billion USD in 2021 and is estimated to grow over 3.5 billion USD by the end of 2032. A wide range of advanced reproductive technologies are becoming available. In addition, increasing government support for infertility treatment is another growth factor.

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<sup>2</sup> <https://www.futuremarketinsights.com/reports/infertility-treatment-market>