

## CHAPTER 27

### SCREENING OF ENDOMETRIAL MICROBIOMS BEFORE EMBRYO TRANSFER

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#### **What is human microbiome? What is the aim of the the Human Microbiome Project (HMP)?**

The human microbiome is an assembly of archaea, bacteria, fungi and viruses, habituating the human body. The aim of the Human Microbiome Project (HMP) is to find out the distribution of the core microbiome of oral, respiratory, gastrointestinal urogenital tracts and skin and its role in human health and disease (1). Approximately 100 trillion microbes, in association with the cells in the human body, have 150 times more functional microbial DNA than human genes (2). Among all the microorganisms, involved in human microbiome, the most of studies have been conducted on bacteria. A healthy human microbiome provides fundamental biological functions to the host, such as digestion, production of essential compounds and strengthening of the immune system (2). In addition, human microbiome provides a natural barrier that eliminates the growth of pathogenic microorganism (3).

#### **How is human microbiome assed to differentiate the bacterial variety?**

The classical methods, used for centuries, are based on culturing the bacterial samples on the media. Recently, it was reported that up to 80 % of the human microbiome cannot be cultured with these classical methods. Thus, the diversity of bacteria on human body was not determined previously. New genotypic tools that are more reliable and accurate have been used to determine the human microbiome. In these methods, DNA is the target, not the isolates, therefore culturing is not mandatory. The most commonly used molecular methods to identify the bacterial diversity is polymerase chain reaction (PCR) based methods, focusing on 16S ribosomal RNA (rRNA) gene encoding DNA region, followed by microarray and next generation whole genome sequencing (NGS). The most advance and accurate method for metagenomic analyses of human microbiome is whole genome sequencing. Although DNA based methods are specific and reproducible, it is not possible to differentiate the dead and viable cells through the DNA samples. Also

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