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## Biological implications after ovarian stimulation

### OVERVIEW

Ovarian stimulation (OS) is key for ART success. The improved performance of the IVF laboratory, i.e., ICSI, blastocyst culture, embryo biopsy for chromosomal testing and especially oocyte/embryo vitrification, allowed the clinicians to fine-tune OS to fully exploit each patients' ovarian reserve. Hard data support that larger numbers of oocytes retrieved after OS correspond to constantly higher cumulative live birth delivery rate (CLBdR), i.e., the most suitable measure of ART efficacy in a modern IVF clinic. Nonetheless, although the quantity of oocytes retrieved is important, their competence is even more relevant. In this regard, the most comprehensive embryological outcome is the euploid blastocyst rate (EBR) per cohort of metaphase-II (MII) inseminated oocytes. This metric, in fact, accounts for fertilization, blastulation and euploidy rates, therefore outlining both the intrinsic competence of a cohort of oocytes and the putative impact on the IVF laboratory. Evidently, the older a woman, the lower both the blastulation (especially after the age of 40) and the euploidy rates (already after the age 35 due to meiotic mis segregation along oogenesis). Increasing the number of oocytes collected may counteract this inherent reduced competence, therefore several personalized COS strategies have been designed across the years to this end (e.g., various pre-treatment therapies, LH suppression regimens, different types and starting dose of gonadotrophins [Gn], daily or long-active Gn, LH activity, adjuvant therapies, different types of ovulation trigger or unconventional protocols). Across the last decades, some studies claimed that supraphysiological Gn concentrations and estrogen levels may disturb oocyte maturation and the completion of meiosis resulting in poorer embryological outcomes and higher aneuploidies. Finally, OS and P supplementation significantly change the composition of vaginal and endometrial microbiota. The greater instability could affect both endometrial receptivity and placentation.

### LEARNING OBJECTIVES

- Discuss the benefits and paradigms of individualization ovarian stimulation as a treatment option for all patients but in particular low prognosis patients
- Learn how to tailor ovarian stimulation to improve the follicles recruitment
- Understand the possible impact of OS on oocytes and embryo quality
- Determine the possible impact of OS on vaginal and endometrial microbiota of women undergoing IVF treatment

### TARGET AUDIENCE

Fertility specialists, clinicians, physicians and embryologists

### LANGUAGE

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