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Assisted Reproductive Technology (ART) is defined as all interventions that include the in vitro handling of human and domestic animals oocytes and sperm or of embryos for reproduction. In recent years, the Next-generation genome sequencing (NGS) technological platforms such as mRNA-seq, miRNA-seq, methyl-seq, single-cell RNA-seq (scRNA-seq) were developed to explore and understand the global gene expression and global DNA methylation profiling of oocytes and sperm or of embryos for genetic improvement of reproduction in cattle. In this presentation, we will provide detailed information about these currently utilized NGS and ART technologies, as well as the effective experiment design to successfully conduct in vivo and in vitro experiment on bovine oocytes and embryos, challenges to analyze the large set of generated NGS data from experiment.

Keywords: NGS, ART, single-cell

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