Invasive ovarian cancer accounts for 6% of female cancer deaths in the USA. The long-term effects of ovarian stimulation are unknown. In view of the assumed role of incessant ovulation and increased gonadotropin levels in ovarian cancer pathogenesis, concerns have been raised that ovarian stimulation may increase the risk of ovarian malignancies. New information suggests that the serous type of epithelial ovarian cancer may arise from the fallopian tubes (FT). Oct4 and Sox2 play a critical role in carcinogenesis; their positive ratio of expression gradually increased from benign to malignant ovarian tumors. To understand if repeated cycles of gonadotropin stimulation could modulate intracellular localization and/or content of proteins controlling cell cycle progression in mouse ovaries and FT, ovaries and FT of naturally-ovulating mice and of mice undergoing 2-4 rounds of gonadotropin stimulations were analyzed to detect localization and/or expression levels of Oct-3/4, Sox-2, p53, β-catenin and pAKT. Ovulated oocytes were analyzed to detect meiotic spindles and chromosome alignment. An immunohistochemical double-blind evaluation of protein Sox-2, Oct-3/4, p53 was performed focusing the attention on the epithelium of the ampullary region of the FT. After round 4, ovaries and FT of control and treatment groups showed no differences in Oct-3/4, Sox-2 and β-catenin intracellular localization nor in Oct-3/4, Sox-2, p53, β-catenin and pAKT contents. Results regarding the possible association of ovulation induction medications and invasive ovarian cancer show no increased risk and are reassuring. The effects of four rounds of ovarian stimulation on the normality of metaphase II spindle formation, chromosomal alignment and cytoplasmic organization confirmed Van Blerkom's results about the poor quality and the number of oocytes obtained after ovarian hyperstimulation.