Objective: To identify the target genes of melatonin in the ovarian tissue of adult pseudopineallectomized rats.

Methods: Thirty-two adult virgin rats (Rattus norvegicus albinus) were divided into two groups: GI - control treated with vehicle, GII - pseudopineallectomized that received melatonin (10mg / night each animal) for 60 consecutive days. After treatment, the animals were anesthetized and the collected ovaries were immediately placed in liquid nitrogen and then frozen at - 80 °C for further cDNA microarray analyzes. To determine the expression of various genes, a GeneChip ® Kit Rat Genome 230 2.0 Affymetrix Array was used, according to the supplier specifications and the experiment was repeated three times for each group. Obtained data were normalized, subjected to GeneChip ® Operating Software program and confirmed by the software analysis of the secondary DNA-Chip Analyzer (dChip). Upregulation and downregulation of genes were considered significant when it was 1.5x higher or lower from the control group. Genes related to ovarian function was further confirmed by immunohistochemistry.

Results: We found an upregulation of adenylate cyclase type 9 and inhibin beta B genes and a downregulation of Element modulator cyclic AMP gene in the ovarian tissue of GII, compared to control group. Regarding the expression of Per2, CYP17 was lower in GI compared to GII.

Conclusion: Our data suggest that melatonin supplementation may decrease the cyclic AMP gene expression in the ovaries of pseudopineallectomized female rats, also altering steroidogenesis and estrogen synthesis.