The anterior pituitary gland occupies a central position in the hypothalamus-pituitary-glands axes and secretes hormones involved in reproduction, growth and metabolism. The plasma concentrations of pituitary hormones present fluctuations during the 24 h and are markedly altered during the hypothyroidism. The presence of an intra-pituitary circadian oscillator might be related to these oscillations; however, the molecular mechanism and the consequences of the hypothyroidism are still unknown. The purpose of the present study was to investigate the expression of Bmal1, Per2, Dbp, Nrd1d1, Rora and Dio2 during the adult hypothyroidism.

The expression of Bmal1, Per2, Dbp, Nrd1d1, Rora and Dio2 presented a circadian pattern in anterior pituitary of C rats and the peak of Per2, Dbp, Rora and Dio2 expression occurred at ZT 12, while for Bmal1 was ZT 0/24. In the hypothyroid animals, the circadian pattern of Bmal1, Rora and Dio2 was lost and the acrophase of Per2, Dbp and Nrd1d1 was advanced about 2.5 h, 3 h and 45 min, respectively. Tx also reduced Mesor values of Dbp and Nrd1d1.

Our studies reveal that the expression of core clock and clock-controlled genes in anterior pituitary gland are changed during the hypothyroidism and might contribute directly or indirectly to the altered hormonal pattern of secretion observed in this pathological condition. Further studies are in progress to assess this issue.