

Public Abstract

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Title:Interaction of Transcription Factors in Regulation of Human Chorionic Gonadotropin (HCG) Alpha Subunit gene Promoter Activity

Chorionic Gonadotropin (CG), a glycoprotein hormone, is considered as a primary signal for maternal recognition of pregnancy in higher primates, including humans. CG is a heterodimer, consisting of an alpha subunit (CGA) that is common to other glycoprotein hormone family, and a beta subunit (CGB), which is unique and accounts for biological specificity of each hormone.

The transcriptional control mechanisms responsible for CG subunit expression in human have been extensively studied and several key regulatory elements have been identified for both subunits. Here, i focussed on CGA subunit and on three transcription factors, ETS2 and DLX3, which transactivate the gene, and OCT4, which silences it.

I investigated the mechanism underlying OCT4 - mediated repression of the CGA, concentrating on interaction between OCT4 and ETS2, as well as OCT4 and DLX3. ETS2 and DLX3 on the other hand, synergistically transactivated the CGA promoter activity.

To examine the role of OCT4 further, i determined whether stable expression of OCT4 in differentiated cells could partially reprogram the cells to a less differentiated phenotype. Microarray analysis demonstrated up-regulation of various developmental pluripotency associated genes, suggesting that forced, though relatively low expression of OCT4 in JAr cells was capable of converting them to a less differentiated state, possibly closer to their trophoblast stem cell origin.