

Oct-4/Sox-2 协同调控下游基因表达的分子机制

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Oct-4属POU家族蛋白, 是一类在动物早期胚胎发育过程中起重要作用的转录因子, 参与维持细胞的全能性及未分化状态。Oct-4蛋白的主要结构特征为具有POU家族特有的保守结构域(POUS)和POU同源异型结构域(POUHD), 这两个结构域可与DNA上特定区域形成双向结合, 进而对基因转录进行调控。Sox-2是另一种转录因子, 其HMG结构域可结合在DNA的特定序列上, 并可通过与Oct-4的POUs结构域之间的蛋白质-蛋白质相互作用形成POU/HMG/DNA三元复合体以调控下游靶基因的表达。文章就POU家族成员Oct-4和HMG-box家族成员Sox-2在动物早期胚胎发育中调控部分下游基因表达的分子机制进行了概述。

The Molecular Mechanism of Oct-4 and Sox-2 Regulating Downstream Genes Expression Cooperately

As a member of POU transcription factor family, Oct-4 plays an important role in mammalian early embryonic development and takes part in maintenance of cellular totipotency and undifferentiated state. The main structural characteristics of Oct-4 is that it has the POU specific domain, which is a conservative domain of POU family, and POU homodomain. Oct-4 is able to bind to a special DNA section with the two domains by bipartite manner, and then activate or repress expression of downstream genes. Sox-2 is another transcription factor, whose HMG domain could bind to DNA's special sequence and assemble POU/HMG/DNA ternary complex with Oct-4 by protein-protein effect. This paper reviewed the molecular mechanism of Oct-4 and Sox-2 regulating the downstream genes cooperately in the early embryonic development of mammalian.

关键词

Oct-4; Sox-2; POU家族(POU transcription factor family); HMG结构域(HMG domain); 三元复合体(Ternary complex)