

Global Gene Expression during the Human Organogenesis: From Tran-scription Profiles to Function Predictions

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Abstarc :

Human embryogenesis includes an integrated set of complex yet coordinated development of different organs and tissues, which is regulated by the spatiotemporal expression of many genes. Deciphering the gene regulation profile is essential for understanding the molecular basis of human embryo development. While molecular and genetic studies in mouse have served as a valuable tool to understand mammalian development, significant differences exist in human and mouse development at morphological and genomic levels. Thus it is important to carry out research directly on human embryonic development. Here we will review some recent studies on gene regulation during human embryogenesis with particular focus on the period of organogenesis, which had not been well studied previously. We will highlight a gene expression database of human embryos from the 4th to the 9th week. The analysis of gene regulation during this period reveals that genes functioning in a given developmental process tend to be coordinately regulated during human embryogenesis. This feature allows us to use this database to identify new genes important for a particular developmental process/pathway and deduce the potential function of a novel gene during organogenesis. Such a gene ex-pression atlas should serve as an important resource for molecular study of human devel-opment and pathogenesis.

Key Word :

Human embryonic development; Gene expression profile; Gene regulation database; Organogenesis; Microarrays; Maternal genes

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