

Circadian clocks during embryonic and fetal development

Seron-Ferre, Maria

Valenzuela, Guillermo J.

Torres-Farfan, Claudia

Circadian rhythmicity is a fundamental characteristic of organisms, which helps ensure that vital functions occur in an appropriate and precise temporal sequence and in accordance with cyclic environmental changes. Living beings are endowed with a system of biological clocks that measure time on a 24-hr basis, termed the circadian timing system. In mammals, the system is organized as a master clock located in the suprachiasmatic nucleus (SCN) of the hypothalamus, commanding peripheral clocks located in almost every tissue of the body. At the cell level, interlocking transcription/translation feedback loops of the genes *Bmal-1*, *Clock*, *Per1-2*, and *Cry1-2*, named clock genes, and their protein products results in circadian oscillation of clock genes and of genes involved in almost every cellular function. During gestation, the conceptus follows a complex and dynamic program by which it is simultaneously fit to develop and live in a circadian environment provided by its mother and to prepar