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EPIGENETIC CONTROL OF EARLY MAMMALIAN DEVELOPMENT

EPIGENETIČKA KONTROLA RANOG RAZVOJA SISAVACA

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Epigenetic state of each cell is crucial in determining its gene expression and consequently its phenotype. Changes in the epigenetic state of the genome are essential for normal development. While gradual changes in epigenetic states occur throughout development there are two crucial moments when massive reprogramming of the genome takes place: transition from somatic cells to primordial germ cells and in zygote, following fertilization, when the germ cell epigenome transits to somatic epigenome state. During those transition a general DNA demethylation takes places, however, there are several components of the genome e.g. imprinted genes that need to be protected. TRIM28 is one of the components of the protective mechanism and its absence during oogenesis leads to post-fertilization failure. Variations in failure phenotype suggest that, in absence of TRIM 28, epigenetic marks are randomly lost, and not replaced, from individual genes resulting in epigenetic chimerism. These results emphasize the importance of maintaining and protecting correct epigenetic state during mammalian development.

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