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 Role of nitric oxide in the maintenance of pluripotency and regulation of the hypoxia response in stem cells

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Abstract

Stem cell pluripotency and differentiation are global processes regulated by several pathways that have been studied intensively over recent years. Nitric Oxide (NO) is an important molecule that affects gene expression at the level of transcription and translation and regulates cell survival and proliferation in diverse cell types. In embryonic stem cells NO has a dual role, controlling differentiation and survival, but the molecular mechanisms by which it modulates these functions are not completely defined. NO is a physiological regulator of cell respiration through the inhibition of Cytochrome c Oxidase (CcO). Many researchers have been examining the role that NO plays in other aspects of metabolism such as the cellular bioenergetics state, the hypoxia response and the relationship of these areas to stem cell stemness.

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