Anaerobiosis and Stemness

Description: Anaerobiosis and Stemness: An evolutionary paradigm provides a context for understanding the many complexities and evolutionary features of stem cells and the clinical implications of anaerobiosis stem cells. Combining theoretical and experimental knowledge, the authors provide a broad understanding of how the absence or low concentration of oxygen can play an influential role in the maintenance and self-renewal of stem cells and stem cell differentiation. This understanding has clinical implications for the fields of regenerative medicine, cancer biology and transplantation, as well as cell engineering and cell therapy. Anaerobiosis and Stemness is an important resource for stem cell and developmental biologists alike, as well as oncologists, cancer biologists, and researchers using stem cells for regeneration.

- Highlights the molecular and evolutionary features of stem cells which make them so important to all biological research
- Explores methods of isolation, characterization, activation, and maintenance of stem cells
- Includes models for clinical application in regenerative medicine, cancer therapy, and transplantation

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Part II: ANAEROBIC-TO-AEROBIC EUKARYOTE EVOLUTION A PARADIGM FOR STEM CELL SELF-RENEWAL, COMMITMENT AND DIFFERENTIATION? 1) Evolution of eukaryotes with respect to the appearance and rise of oxygen in the atmosphere: anaerobiosis, facultative aerobiosis and aerobiosis 2) Evolution of mitochondria in eukaryotes and mitochondria "maturing? from stem cells to committed progenitors and mature cells 3) Evolutionary origins of stemness: relationship between self-renewal and ancestral eukaryote biology conservation of self-renewal principle in parallel with the adaptation to O2 4) Metabolic and genetic features of ancestral eukaryotes vs. metabolism and "master pluripotency genes? of stem cells 5) Some other features concerning the analogy "stem cells primitive eukaryotes": ABC transporters' anaerobiosis/stemness link 6) Harnessing anaerobic nature of stem cells for the use in regenerative medicine 7) Cancer stem cell case and evolutionary paradigm


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