

Oxygen supply is necessary for today's form of life on Earth. Molecular oxygen is a terminal electron acceptor in mitochondrial respiratory chain and enables the efficient production of ATP by oxidative phosphorylation. The lack of availability of oxygen decreases energy production and can endanger the processes maintaining homeostasis. Therefore the compensatory mechanisms were developed by which cells respond to hypoxia. The master regulator of cellular responses is the hypoxia inducible transcription factor, HIF. In general HIF-1 isoform supports glucose availability and glycolysis; also attenuates energy-consuming processes and thus reduces energy loss. HIF-2 isoform stimulates antioxidant mechanisms to reduce the amount of reactive oxygen species which could cause cellular damage. At the same time, both of isoforms contribute to increasing the supply of oxygen by activating erythropoiesis and angiogenesis in the affected area. HIFs provide these changes either directly, by using their target genes, or by interactions with other transcription factors and signaling pathways.