

SCIENTIFIC SEMINAR



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CIC bioGUNE*

TO ADAPT OR TO DIE: LESSONS FROM OXYGEN HOMEOSTASIS

Oxygen homeostasis refers to the body's ability to maintain a stable and balanced oxygen level in tissues and organs despite external fluctuations. It is essential for maintaining overall health and ensuring the proper functioning of living organisms as insufficient (hypoxia) or excessively high levels (hyperoxia) of oxygen can have harmful effects.

Hypoxia is indeed a major physiologic challenge during embryonic development, high altitude acclimatization and wound healing. In addition, hypoxia is also associated with a wide range of pathological states, including, but not limited to, ischemic and neurodegenerative diseases, inflammatory and metabolic disorders, and cancer. The research in our group is aimed at dissecting the hypoxia signaling pathway, the molecular mechanisms that govern hypoxia adaptation and restore equilibrium, as a major step towards establishing their implications in health and disease.

Hypoxia signaling is a puzzling and tightly regulated oxygen-sensing pathway. Central to this pathway is the activation of a transcriptional program, primarily mediated by the Hypoxia-Inducible transcription Factor (HIF). HIF is a heterodimer comprising a ubiquitously expressed β subunit (HIF- β) and the O₂-sensitive α subunit (HIF- α). HIF stability is directed through hydroxylation by a class of 2-oxoglutarate-dependent dioxygenases (2-OGDDs), named prolyl-hydroxylases (PHDs). Subsequent work has revealed new 2-OGDDs with substrates other than HIF as well as additional oxygen sensing mechanisms that greatly extend the complexity of hypoxia signaling. This lecture will cover an overview of our research lines related to oxygen as a signaling molecule.

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EXCELENCIA
SEVERO
OCHOA

**Friday
July 7**

**Atrio 800
12.00H**



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