Oxygen signaling: Call for papers

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It has recently been estimated that appreciable concentrations of oxygen in the Earth’s atmosphere and oceans have only been present for the last ~10% of its ~4.5 billion year life (4). There is also increasing evidence for a “bumpy road” to atmospheric oxygenation, starting with “whiffs” of oxygen as early as 3 billion years ago, well before the transition to an atmosphere with oxygen levels comparable to those of the present day, ~500 million years ago (4). Since that time, the abundance of this simple molecule has shaped the evolution of all life on Earth. In turn, the complex interplay between oxygen production by photosynthesis and its consumption by respiration has shaped the development of the Earth’s atmosphere and geology, through fluctuations in redox balance that we are only now beginning to understand in detail (4).

In recent years we have witnessed some major advances in our understanding of the biology of oxygen. These have in part been driven by development of improved methods for assessment of oxygen availability in living tissues, in particular those using optical technology (6). There have also been major advances in our understanding of signaling pathways driven by hypoxia, including those driven by hypoxia inducible factors (HIFs) (5). HIFs appear to be critical in multiple physiological and pathophysiological processes, including wound healing, disease processes in the blood, vasculature, heart, lungs, and kidneys, chronic rejection of organ transplants, and cancer (5). Thus they represent an attractive therapeutic target. But in some cases HIFs appear to provide protection from the harmful effects of hypoxia, whereas in other settings they appear to drive progression of disease (5). So, we still have a long way to go to harness their therapeutic potential. Mitochondria are also taking center stage as critical elements in multiple disease processes, including neurodegenerative (2) and cardiac (1) diseases. Such diverse areas of “oxygen research” have also generated considerable interest in the pages of the journal in recent years (3). The impetus for this call for papers is to build on this interest among the readers and authors of the journal.

In this call, we solicit papers that address the roles of oxygen in integrative processes in physiology and pathophysiology. Submitted manuscripts might address (1) the roles of oxygen-sensing mechanisms and signaling pathways in reproductive, cardiovascular, neural, renal, and/or metabolic physiology; (2) adaptations that allow organisms or specific tissues to survive in hypoxic environments; (3) mechanisms that regulate tissue oxygenation; (4) the roles of hypoxia in disease; or (5) new methods for detecting hypoxia in experimental or clinical settings. However, we also envisage manuscripts from any field of research relevant to the biology of oxygen captured by the broad scope of the journal. To be eligible for inclusion in this Call for Papers entitled “Oxygen Signaling”, manuscripts must be submitted by December 31, 2017.

REFERENCES


