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Editorial

Oxygen: A New Open Access Journal Focused on the Biology and Chemistry of This Essential Molecule

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Oxygen (ISSN 2673-9801) is a new and exciting open access journal which will embrace research based on this essential molecule. The journal will be a vehicle for the publication of research articles, reviews, short articles, and communications with opinions, all of which will help push the field forward and help those joining this area of endeavor. Special Issues will focus on aspects of oxygen research and will be led by experts in the field. The journal has a broad remit in relation to oxygen-based research. It will cover the roles of reactive oxygen species and antioxidants, the physical properties and reactivity of oxygen and oxygen-based molecules, atmospheric oxygen, dissolved oxygen in the environment, and uses of oxygen, including oxygen therapies.

Oxygen is a molecule essential for aerobic life, and therefore is an excellent focus for this new journal. Although atmospheric oxygen is presently around 21%, it has not always been that way. Early life would have evolved in the absence of oxygen, but its increase in the atmosphere was an essential driver of evolution. During the Carboniferous period, approximately 300 million years ago, the atmospheric oxygen reached 35%, allowing the development of giant insects, for example.

Atmospheric oxygen is a molecule which we as humans cannot live without, but also in many ways, cannot live with. Although the molecule is a terminal electron acceptor in mitochondria, leading to the production of water, there are many biochemical systems which can "leak" electrons which are picked up by oxygen, leading to the generation of oxygen free radicals, in a group of compounds known as the reactive oxygen species. These, if accumulation remains unchecked, can lead to damage to a range of biomolecules, including lipids and DNA. The hydroxyl radical is one of the most reactive molecules seen in biological systems, and is likely to react with the first molecule it interacts with. A range of antioxidant systems, including other molecules and several enzymes, control the buildup of harmful oxygen-based molecules in cells. Many of such antioxidant molecules are supplied in the diet, hence the advice to eat fruit and vegetables given by several governments around the world. However, the generation of oxygen-based reactive molecules is not all bad, with a recognition that they are involved in the control of cellular function, including the regulation of gene expression. The presence of oxygen-based molecules do not of course work in cells in isolation, but partake in a complex interplay with reactive nitrogen species and sulfur-based compounds. This all leads to a complicated control of the redox state of cells and a cell's environment.

Often research is animal, or even human, centric, but *Oxygen* looks to support research on all areas of life. The generation of oxygen through photosynthesis is essential to life on the planet, and therefore plant science should be a significant aspect of the journal. Plants, like animals, use oxygen-based molecules in their defense against pathogens, as well as to control other essential cell functions. It is hoped that the multi-disciplinary approach of *Oxygen* will enable researchers to reach across the divide of kingdoms to bring findings with one organism to help drive and develop research in others. Papers which use such an approach would be particularly welcomed.

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However, the journal *Oxygen* aims to also embrace the chemistry and uses of oxygen, as well as the biochemical aspects. Oxygen is involved in a myriad of reactions, and has many uses, including in medical therapies, especially conditions which lead to hypoxic conditions for cells. The lack of cellular oxygen also has ramifications for tumor growth and how cells respond when oxygen is depleted.

All research is driven to a large extent by the technologies which are developed to allow the generation of new data. The journal *Oxygen* will encourage and embrace any dissemination of the research and development of new technologies, whether they are analytical, or of medical or agricultural benefit. *Oxygen* aims to be a collection of manuscripts on the benefits of oxygen-based technologies, as well as the underpinning experimental data.

Oxygen is a new journal in the MDPI family, the editorial board is excited about the manuscripts which it is hoped will be submitted, and it embraces the opportunity to give this molecule a literary focus. Being a cross-disciplinary open access journal, *Oxygen* guarantees individualized and rigorous peer review by experts across the discipline. The editorial staff of MDPI has a well-established record of scientific publishing, having a high quality which has spanned many years.

Oxygen, like other MDPI journals, will have all publications archived in the Swiss National Library. We aim to publish papers with a high quality to accomplish the goal to be indexed in the important databases such as Scopus, Web of Science, PubMed, and so on.

Oxygen, through the MDPI platform, will have a global reach, and it is hoped that it will become a focus for the dissemination of research in this important area of chemistry and biology. As the Editor-in-Chief of *Oxygen*, I would not only welcome your submissions, which I look forward to eagerly, but I would also be delighted to hear your views on the scope of the journal and how we could increase its impact. I would also very much welcome anyone to come forward with ideas and enthusiasm for Special Issues for *Oxygen*, which will help in its reach and impact. Lastly, I sincerely hope that this journal will encourage young researchers to bring their talents to this field and ensure that it is pushed forward for the future.

Conflicts of Interest: The author declares no conflict of interest.

Short Biography of Author

John T. Hancock having originally been brought up in Cornwall, UK, John moved to the University of Bristol where he graduated with a BSc (Hons) in Biochemistry. He stayed at the University of Bristol where he undertook a PhD investigating the NADPH oxidase of macrophages. He then stayed at Bristol for six years, looking at the wider release of reactive oxygen species by cells. He moved to the University of the West of England, Bristol (UWE) as a lecturer in 1993, joining the science department. He has stayed there ever since, teaching genetics and molecular biology, as well undertaking research in redox biology. He has published over 150 research articles as well as four editions of Cell Signalling, published by Oxford University Press, with a new Cell Signalling book (also OUP: part of the Primers series) to be published summer 2021. John is presently Professor of Cell Signalling at UWE.