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Management of High Altitude Pathophysiology

19 July 2018, Pages 257-276

## Electrochemical Immunobiosensors for Point-of-Care Detection of Hypoxia Biomarkers ( Book Chapter)

Karunakaran, C., Santharaman, P., Balamurugan, M., Singh, S.K., Claussen, J.C.

<sup>a</sup>Department of Chemistry, Biomedical Research Lab, VHNSN College (Autonomous), Virudhunagar, India<sup>b</sup>Functional Materials Group, Solid State Physics Lab, Defence Research and Development Organization, Timarpur, India<sup>c</sup>Mechanical Engineering, Iowa State University, Ames, IA, United States

### Abstract

Hypoxia, a state of reduced oxygen pressure below a critical threshold, restricts the function of organs, tissues, and cells. It induces myriad changes in the metabolites, proteins, and enzymes involved in important biological functions resulting in clinical obstacle. With the recent understanding of the molecular pathways regulated by hypoxia and the discovery of novel hypoxia markers, however, the prospect of targeting hypoxia has become more tangible. The measurements of these biologically important hypoxia biomarkers are imperative in human physiology because they provide valuable information regarding people at high altitude. We have fabricated miniaturized electrochemical immunobiosensors to measure various clinically important hypoxia biomarkers, including nitrite and its metabolites, cytochrome c, and superoxide dismutase using specific biorecognition elements, including enzymes and antibodies biofunctionalized nanocomposite modified screen printed electrodes (SPE). Combined with these immunobiosensors, cost-effective LabVIEW-based virtual instrumentation and a microcontroller-based portable electrochemical analyzer to determine hypoxia biomarkers for point-of-care applications have been successfully developed. © 2018 Elsevier Inc. All rights reserved..

### Author keywords

Cytochrome c

Electrochemical analyzer

Hypoxia

Immunobiosensors

LabVIEW

Microcontroller

Superoxide dismutase-1

ISBN: 978-012814000-0;978-012813999-8

Source Type: Book

Original language: English

DOI: 10.1016/B978-0-12-813999-8.00013-6

Document Type: Book Chapter

Publisher: Elsevier

Karunakaran, C.; Department of Chemistry, Biomedical Research Lab, VHNSN College (Autonomous), Virudhunagar, India

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## Chapters in this book

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16 chapters found in Scopus

- High Altitude and Hypoxia
- High Altitude Ailments: Causes and Effects
- Preface
- *Hippophae* sp.: A Boon for High-Altitude Maladies
- *Valeriana* sp.: The Role in Ameliorating High-Altitude Ailments
- *Rhodiola* sp.: The Herbal Remedy for High-Altitude Problems
- *Cordyceps* sp.: The Precious Mushroom for High-Altitude Maladies
- *Ganoderma* sp.: The Royal Mushroom for High-Altitude Ailments
- *Curcuma* sp.: The Nature's Souvenir for High-Altitude Illness
- Characterization Techniques for Herbal Products
- Allopathic Remedies
- Homeopathic Remedies
- Nanoformulations: A Novel Approach Against Hypoxia
- Electrochemical Immunobiosensors for Point-of-Care Detection of Hypoxia Biomarkers
- Performance Enhancement Through Physical Activity at High Altitudes
- Yogic Practices for High-Altitude Ailments

## Cited by 1 document

Jiménez-González, M.L. , Gómez-Guzmán, J.J. , Antaño-López, R.

Thermodynamic study of superoxide dismutase adsorption processes over cysteine-gold electrode

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