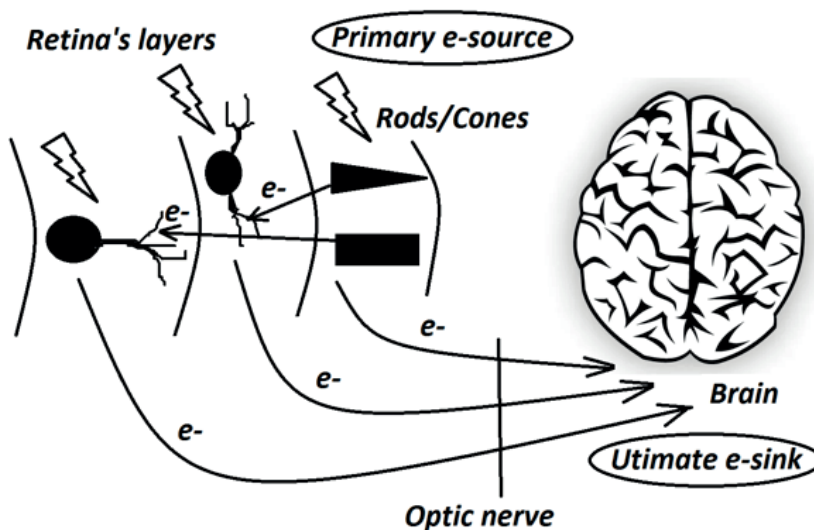
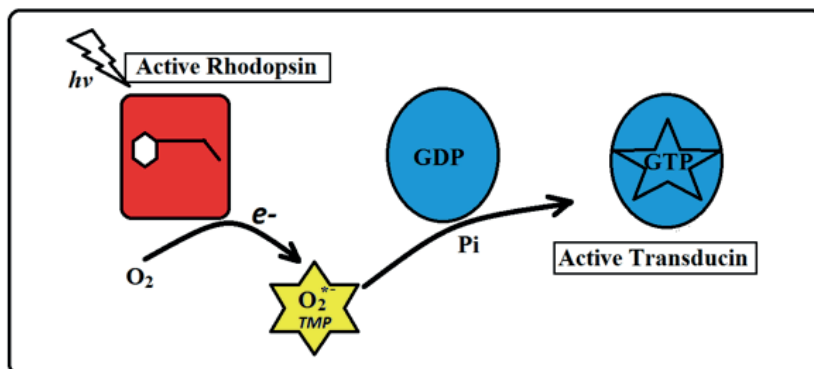


The murburn model of photoreception and signal relay



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BIOMEDICAL REVIEWS

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Scope and Purpose

Biomedical Reviews (ISSN 1314-1929; online) is an official journal of the Bulgarian Society for Cell Biology published by the Medical University Press, Varna, Bulgaria. The Journal is published annually, and includes state-of-the-science (SOS) Reviews, Research Articles and Dance Round (a form of position papers) focused on disease-oriented molecular cell biology presented in concise form.

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Publication of *Biomedical Reviews* is truly a collaborative process. We appreciate the brain-and-heart partnership having with our authors and are committed to further maintaining the excellence of the Journal.

III Editor's foreword

IV Spotlight

VI In Memoriam

Reviews

1 Transcription factor Zbtb20: what expression is telling us of its cellular function?

Dimo S. Stoyanov and Anton B. Tonchev (Bulgaria)

11 Biomarkers of acute kidney injury and their role in clinical patient management

Ecem Büşra Değer, Enver Arslan, Müslim Doğan Değer, and Oktay Kaya (Turkey)

31 On the new prospects in biology inspired by epigenetics

Maria E. Krasteva (Bulgaria)

41 Role of NANOG in glioma malignancy development and potential as therapeutic target

Fergie Runtu and Novi Silvia Hardiany (Indonesia)

49 Phenotypic modulation of smooth muscle cells and matrix metalloproteinases as targets for atherosclerotic plaque stabilization

George N. Chaldakov, Maria D. Zhelyazkova-Savova, Daniela Panayotova, Marco Fiore, and Stanislav Yanev (Bulgaria, Italy)

61 Natural killer cells and immunotherapy based on monoclonal antibodies

Magdalena Pencheva-Demireva, Katerina Kavaldzhieva, Nikola Mladenov, Vladislav Lazarov, Tzvetanka Markova, and Dimitrina Dimitrova-Dikanarova (Bulgaria)

Perspective

67 The murburn precepts for photoreception

Kelath Murali Manoj and Vivian David Jacob (India)

Research Article

75 Brainstem Expression of SLC6A4, HTR2C, NGF, BDNF, TrkA^{NGF}, TrkB^{BDNF} and p75^{NTR} Following Paternal Alcohol Exposure in the Male Mouse

Giampiero Ferraguti, Claudia Codazzo, Carla Petrella, Roberto Coccurello, Mauro Ceccanti, and Marco Fiore (Italy)

91 Interactions between the endogenous cannabinoid system and the peptides of the TYR-MIF-1 family modulate heat stress-induced analgesia

Hristina H. Nocheva, Roman E. Tashev, Adriana I. Bocheva, Dimitrinka Y. Atanasova, Angel D. Dandov, and Nikolai E. Lazarov (Bulgaria)

Dance Round COVID-19

105 New challenges to renin-angiotensin-system in COVID-19 pandemic

Stanislav Yanev and Tsveta Stoyanova (Bulgaria)

113 COVID-19 as an oxygen-deprivation disease

Stanislav Yanev (Bulgaria)

117 Ongoing COVID-19 syndrome and post-COVID-19 syndrome: long-term symptoms and residual changes after SARS-COV-2 infection

Kosta V. Kostov (Bulgaria)

125 From pathogenesis to therapy of COVID-19

Stanislav Yanev and George N. Chaldakov (Bulgaria)

Dance Round

135 In defense of the murburn explanation for aerobic respiration

Kelath Murali Manoj (India)

149 Supplementary Information In defense of murburn explanation for aerobic respiration

Kelath Murali Manoj (India)

Case Report

161 Platelet-rich fibrin treatment of medication-related osteonecrosis of the jaw followed up for two years

Meri Hristamyan and Veselka Hristamyan (Bulgaria)

Continuing Medical Education

165 A sample copy of the textbook *Principles of Cell and Tissue Biology*

George N. Chaldakov (Bulgaria)

193 Instructions to authors

Front cover: From Manoj and Jacob, pp 67-74. **Figure 4. A simplified murburn model for physico-chemical transduction (charge separation leading to a potential generation), followed by signaling cascade and the overall connectivity for relay of signals.** The top panel shows the photoreceptive charge separation leading to superoxide; the middle panel shows how superoxide formation can lead to hyperpolarization (negative charge surplus) and lead to phosphorylation of GDP bound to transducin (or at various loci of rhodopsin). The bottom panel shows that all layers of retina could be photosensitive, although the bottom layer is most efficient in charge separation owing to the stacking of membranes into disks (similar to the thylakoids of chloroplasts). Therefore, a minute and punctuated charge relay (with synapses serving as amplifiers along the path) across the neurons to the brain can result, leading to the transmission of a signal upon stimulation with light. Since the light perception occurs at multiple depths in retina, this can also afford better resolution and depth perception at the retina side itself (and depth perception may not be merely a trained routine of brain image reconstruction).