**Oxy-chemiluminescence: New Mechanistic and Kinetic Intricacies and Application Perspectives**

Galina F. Fedorova, Valerii A. Menshov, Vladimir V. Naumov, Aleksei V. Trofimov\*, Yurii B. Tsaplev, Timur L. Veprintsev, Olga I. Yablonskaya

*Emanuel Institute of Biochemical Physics, Russian Academy of Sciences, Moscow 119334, Russia*

The experimental material considered herein refers to the recent advances in the elucidation of oxidation processes followed by the excited-state generation with the subsequent light emission (chemiluminescence) and consists of the two parts. The first part is devoted to the new facets of the luminol oxidation, while the second part is dedicated to the chemiluminescence processes, which may be considered as chemical models of oxidative interactions leading to a weak light emission emerged from living cells and to exploring the possibilities of using them as tools for evaluating the activity of oxygen-metabolism modulators, most prominently, natural bioantioxidants, in particular, of biomedical value. Methodologically, the major attention is paid to analyzing the shapes of the time profiles of the light emission derived from a model chemiluminescence systems, in particular, in the presence of lipid samples of vegetable and animal origin rich in bioantioxidants.