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Guest seminar

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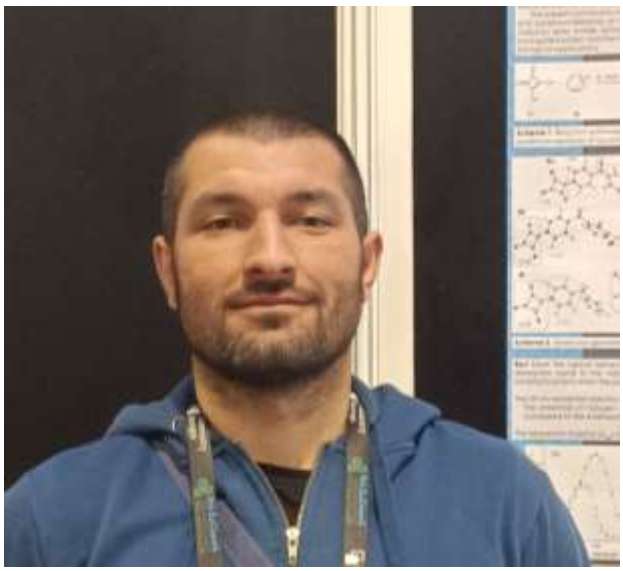
Nitro group containing imidazole and benzimidazole compounds as antiparasitic agents - synthesis, electrochemical and biological studies



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Parasitic diseases are a serious medical problem that affects all continents except Antarctica. It affects countries with tropical and subtropical climates. Widely used in therapy against bacteria and parasites are imidazole and benzimidazolone derivatives. Drugs such as albendazole, metronidazole, tinidazole, etc. have been used in medical practice for years.

One of the mechanisms of antiparasitic activity is based on the ability of the nitro group to undergo bioreduction, passing through a radical anion and becoming toxic in a hypoxic environment. Part of the work is also the study of the possibility of one-electron reduction by electrochemical method. Another mechanism of antiparasitic activity for aerobic parasites is the inhibition of tubulin polymerization. In our studies, we synthesized and studied a number of benzimidazole derivatives. Some of the compounds were tested on decapsulated larvae of Trichinella spiralis, showing very good results.

Short Bio

Nikolay Lumov is a staff researcher and PhD candidate at the Institute of Organic Chemistry with Centre of Phytochemistry, Bulgarian Academy of Sciences. He obtained both his Bachelor's and Master's degrees from the University of Chemical Technology and Metallurgy in Sofia and is currently preparing his doctoral dissertation in the field of Organic Chemistry.

His research is primarily focused on the synthesis, structural characterization, and investigation of benzimidazole derivatives with potential biological activity. In the area of structural analysis, he specializes in infrared (IR) spectroscopy and also conducts studies using ultraviolet-visible (UV-Vis) spectroscopy to evaluate the physicochemical properties of synthesized compounds.

In addition to experimental work, Nikolay applies computational chemistry methods, including Density Functional Theory (DFT) calculations, to study the optimal molecular geometry and electronic structure of the obtained compounds. His interdisciplinary approach combines synthetic organic chemistry, spectroscopic analysis, and theoretical modeling to support the development and understanding of biologically relevant molecules.

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Webinar Host

Krasimira Petrova (Molecular Synthesis Research Group)