

Spectral Investigations of Indole-Containing Organic Compounds for Biomedical Drugs

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The indole-containing organic compounds represent a unique class of substances due to their broad biomedical activity such as antibacterial, antiviral, anti-inflammatory, and anticancer. Our ongoing study presents the design, synthesis, and spectral analysis of novel indole-containing compounds, specifically indolo[2,3-b]quinoxaline and indolo[2,1-b]quinazoline-6,12-dione derivatives, targeted for biomedical applications mentioned above.

The synthesized compounds underwent rigorous photophysical characterization. The absorption spectra were recorded on a Cary 60 (Agilent) UV-Vis spectrophotometer, the fluorescence and phosphorescence spectra were analyzed using a Cary Eclipse (Varian) fluorescent spectrophotometer, which was also used for low-temperature measurements. This extensive experimental dataset was correlated with theoretical calculations performed using Gaussian'16, which modeled the electronic structures and optical properties of the compounds. This combined approach allowed for a deep understanding of the reasons how the chemical structure influences the photophysical behavior, which is critical for designing effective DNA intercalators or photosensitizers [1, 2].

This research expands the class of functional organic compounds with defined photophysical characteristics, establishing a foundation for their development as potential pharmaceuticals, such as DNA intercalators for cancer therapy or novel antimicrobial agents.

[1] Kudrya, V. Y.; Zhang, T.-Y.; Tan, M.-X.; Naumenko, A. P. Spectro-Luminescent characterization of molecular

[2] SHARMA, B. K.; SHAIKH, A. M.; CHACKO, S.; KAMBLE, R. M. Synthesis, Spectral, Electrochemical and Theoretical

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