

MULTICOMPONENT REACTIONS AND SYNTHESIS OF NEW MOLECULAR HYBRIDS: TECHNOLOGICAL AND BIOLOGICAL APPLICATIONS

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Heterocyclic-fatty acid hybrid derivatives represent a new class of compounds that exhibit a wide range of biological activities and hold significant potential in medicinal chemistry. Fatty acids, derived from the oils and fats of various plant and animal sources, are considered some of the most valuable renewable precursors in the synthetic chemical and pharmaceutical industries. Monastrol is the best-known small compound from the dihydropyrimidinones/thiones (DHPMs) heterocycle family, a cell-permeable molecule recognized as an inhibitor of mitotic kinesin Eg5, that is over-expressed in tumor cells and is a very promising target for the development of new drugs for cancer disease. The lipophilic properties of the DHPMs have been demonstrated to be of pivotal importance in the design of new molecules. Meanwhile, heterocyclic compounds are renowned for their inclusion in many commercial drugs due to their unique biological activities.

The combination of fatty acids with heterocyclic compounds has led to significant advancements in creating valuable, biologically relevant molecules for the pharmaceutical industry. Over the past few years, our group has focused on synthesizing several nitrogen-containing lipophilic compounds, which are being studied for various biological and technological activities, including antitumor, antituberculosis, and applications in the agrochemical field.

¹Caroline D'Oca is a PhD in Chemistry, from the Federal University of Rio Grande do Sul (2015) and a professor at the Chemistry Department at the Federal University of Paraná. Has an interest in Organic Synthesis, Medicinal Chemistry, Forensic Chemistry, and Nuclear Magnetic Resonance. Is the coordinator of the Forensic Sciences Center at UFPR, head of the Chemistry Department, and leader of the Research Group on Medicinal and Agrochemical Organic Synthesis (SOMA). Her work involves multicomponent reactions, synthesizing biologically active compounds, and using fatty acids to produce compounds aimed at technological applications. It is affiliated with the Brazilian Society for the Progress of Science (SBPC), the Brazilian Society of Chemistry (SBQ), and the Brazilian Society of Forensic Sciences (SBCF).

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