WELCOME LETTER

Dear Colleagues and Friends,

We are thrilled to welcome you to the 54rd Annual Meeting of the Brazilian Society of Biochemistry and Molecular Biology (SBBq), at the Majestic Hotel Convention Center in Águas de Lindóia, SP, May 17 to 20, 2025.

SBBq´s annual meeting is one of Brazil's most esteemed scientific events, having been held continuously for over four decades. It is a vital forum for scientific exchange, promoting the advancement of knowledge in Biochemistry, Molecular Biology, and related fields. It also fosters discussions on scientific education and training, as well as consensus positions in the field, contributing towards public policies.

This year, the organizing committee has created an engaging interdisciplinary program that features 8 plenary lectures and 18 symposia led by world-class scientists. These sessions will highlight the latest advancements and current challenges across various research topics in Biochemistry and Molecular Biology. We are also pleased to include policy thinkers who will assess the landscape of science and technology in our country.

We eagerly anticipate your presence in Águas de Lindóia!

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08101 - Sessão de Cartazes I

K.29 - Structure of cinnamaldehyde-derived thiadiazoles and an alternative synthetic route

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INTRODUCTION: Thiosemicarbazones (TSC) are compounds of interest in research related to drug development for cancer treatment. among the most promising TSC, triapine stands out, showing excellent results in in vitro anticancer activity experiments.Researchers have suggested that triapine may be inhibited during in vivo treatment due to the cyclooxidation, forming its corresponding thiadiazole (TD). OBJECTIVES: This Work aims to synthesize, characterize and study the biological activities of some new thiadiazole compounds derived from cinnamaldehyde. MATERIALS AND METHODS: Our research group demonstrated that nitric oxide reacts with TSC in the presence of oxygen through an oxidative cyclization process, forming TD. This could be the reason for the inhibition of the anticancer activity of TSC. Derivative compounds were prepared by substitution of aryl/alkyl group at the N – position of the TSC. The characterization of the products of the reaction between TSC with NO was verified through studies of 1H-13C NMR, FTIR and UV-Vis, elemental analysis, and mass spectrometry of the compounds. In addition, single crystals of two of the compounds were obtained, allowing for X-ray diffraction. The compounds were subjected to biological tests against the MRC-5 (non-tumor lung cells), MDA-MB-231 (breast cancer cells) and A549 (lung cancer cells) lines. DISCUSSION AND RESULTS: The 1H NMR spectrum revealed the absence of the peak at 11.0-12.0 ppm corresponding to the proton of the azomethine carbon (C5) and the presence of the peak at 7.9-8.0 ppm relative to the proton of the hydrazine nitrogen (N2), indicating the oxidative ring closure of the thiosemicarbazone. The infrared spectra showed all the expected vibrations for the components, such as the absorption band, which is assigned to the (C–N) bond of the TD ring. Furthermore, the mass data and elemental analysis showed the expected values for all the synthesized compounds. With the X-ray result, it is possible to confirm that the cyclooxidation of the TSCs into their respective TDs effectively occurred. According to biologics tests, it is observed that thiosemicarbazones showed antitumor activity compared to thiadiazoles that were inactive up to a concentration until 100 µM . CONCLUSION: The compounds were subjected to biological tests against the MRC-5, MDA-MB-231 and A549 . In general, it is observed that TSCs showed greater antitumor activity potential compared to TDs.

Keywords: Thiosemicarbazone, Tiadiazol, Nitric Oxide
Supported by: Capes

08323 - Sessão de Cartazes II

K.30 - The NCX Inhibitor KB-R7943 Induces Necroptosis in Chronic Myeloid Leukemia Cells and Enhances Imatinib Cytotoxicity

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INTRODUCTION: Chronic myeloid leukemia (CML) is a myeloproliferative hematological neoplasm associated with the expression of the oncoprotein BCR-ABL, which has a tyrosine-kinase activity related to disease progression. Inhibitors of tyrosine kinase (TKIs) were developed, improving the treatment of CML. However, resistance to TKI treatment have been described. OBJECTIVES: To evaluate drug combinations to sensitize leukemia cells to the chemotherapeutic drugs in order to improve the therapeutic response. MATERIALS AND METHODS: K562 CML cells (1×10^5 /mL) were cultured in RPMI-1640 medium supplemented with 10% FBS. Cell viability was evaluated by MTT test and the type of cell death investigated by annexin V-FITC/PI staining by flow cytometry. K562 cells were incubated for 24 and 48 hours with TKI imatinib or the BCL-2 inhibitor venetoclax in combination with the proteasome inhibitor bortezomib or the sodium/calcium exchanger (NCX) inhibitor KB-R7943. Based on concentration-response curves, non-cytotoxic concentration of imatinib and KB-R7943 were selected for further investigation. DISCUSSION AND RESULTS: KB-R7943 significantly increased the sensitivity of CML cells to the cytotoxicity of imatinib at clinically relevant concentrations. Such effect was inhibited by the pan-caspase inhibitor Boc-A-FMK and by necrostatin-1, suggesting that caspase-dependent apoptosis and necroptosis contribute to the cell death. Bortezomib did not enhanced the effect of imatinib under the experimental conditions. CONCLUSION: These findings suggest that the combined therapy with imatinib and KB-R7943 has promising therapeutic potential in the treatment of CML. Further studies are required to fully elucidate the signaling pathways and metabolic alterations underlying the synergistic interaction between imatinib and KB-R7943.

Keywords: calcium, leukemia, tyrosine kinase inhibitor