*Synthesis and bioevaluation of some new isoniazid derivatives*

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The aim of the study was to demonstrate the synthesis of some new compounds with potential anti-tuberculosis activity, containing isoniazid and α,β-unsaturated thiocinnamamide-like thioamides as precursors. The obtained derivatives were evaluated regarding their biological activity (antioxidant and antibacterial), as well as their influence on the eukaryotic cell cycle. The results suggested that the newly obtained derivatives of isoniazid exhibited different biological activities, depending on their structure; thus, the most active compound in terms of anti-oxidant and anti-Mycobacterium tuberculosis effects proved to be the isonicotinic acid N′-(1-amino-1-mercapto-3-phenyl-propen-1-yl)-hydrazide. This compound also increased the expression of NAT1 and NAT2 genes, which are implicated in the metabolism of the isoniazid, demonstrating that it could be rapidly metabolized, and thus well tolerated. The largest spectrum of antibacterial activity (excluding M. tuberculosis) was noticed for the isonicotinic acid N′-[1-amino-1-mercapto-3-(p-chloro-phenyl)-propen-1-yl]-hydrazide, which was also the most cytotoxic, especially at high concentrations, although not significantly affecting the cellular cycle phases. The obtained results showed that the new derivatives could represent potential candidates for the treatment of M. tuberculosis infections, but further research is needed in order to improve their pharmacological properties, by increasing their antimicrobial activity and reducing the risk of side-effects.