Design, molecular properties and *in vitro* cytotoxic activity of 3,5-dichlorosubstituted salicylaldehyde benzoylhydrazones

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***Abstract*—**Salicylaldehyde benzoyl hydrazone (SBH) belongs to a class of hydrazones of the type R'-CH=N-NH-CO-R which possess a high antiproliferative activity. The common method for the synthesis of SBH is the Schiff base condensation between salicylaldehyde and benzhydrazide. Various derivatives of SBH have been designed in order to discover new more effective antiproliferative compounds. The inserting of halogen atoms in the molecules of different hydrazones strongly influences the biological activity of the compounds.

Novel 3,5-dichlorosubstituted salicylaldehyde benzoyl-hydrazone derivatives were designed by varying the type of the substituents at 4^{th} position of hydrazide moiety. The molecular properties of the compounds, important for drug pharmacokinetics in the human body, were assessed with the Lipinski's rule of five. *In silico* evaluation of the value of logP (partition coefficient) and the remaining parameters of drug similarity, as well as the topological polar surface area and absorption percentage, were used to find the lead candidates with encouraging properties for further elaboration. Some of the investigated 3,5-dichloro substituted hydrazones were further tested for *in vitro* cytotoxicity on a K-562 chronic myeloid leukemia cell line by MTT-test. The bioassay results demonstrated that the compounds exhibit concentration-dependent cytotoxic effects at low micro molar concentrations. The values of IC_{50} are less, but comparable to these of Cisplatin and much lower to these of Melphalan. The results confirm that the compounds are potential candidates for future drug discovery study.

Keywords*—*3,5-dichlorosalicylaldehyde; hydrazones; Lipinski's rule of five; log P; cytotoxicity