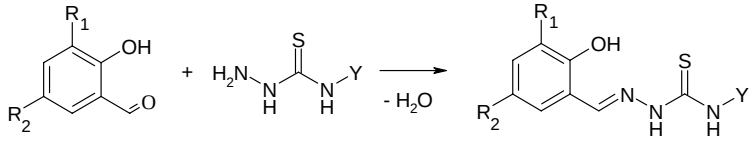
Synthesis, Characterization *in Vitro* Antileukemia, Antibacterial and Antifungal Activity Evalation of Cu(II), Ni(II) and Zn(II) Novel Metal Complexes with Salicylidenthiosemicarbazones

Aurelian Gulea,[a*] Donald Poirier,[b] Jenny Roy[b] and Victor Tapcov[a]
[a]*Coordination Chemistry Department, Moldova State University, Chisinau, 2009, 60 Mateevici Str., Moldova*
[b]*Laboratory of Medicinal Chemistry, CHUQ (CHUL) - Research Center and Université Laval, 2705 Boulevard Laurier, Québec City, G1V 4G2, Canada*
[*]*e-mail: dociu1946@yahoo.com*

The design and study of well-arranged metal-containing Schiff bases with ONS – donor atoms is an interesting field of inorganic and bioinorganic chemistry. *In-situ* one pot template condensation reactions lie at the heart of the coordination chemistry. Transition metal complexes have also received a great attention because of their biological interests, including antiviral, anticarcinogenic, antibacterial and antifungal activities. In a recent study, we have concluded that the *in vitro* HL-60 leukemia cell growth inhibitory activity is unexpected influenced by the nature and geometric structure of copper complexes. Indeed, copper complexes containing tridentate ONS Schiff bases as well as salicylidenthiosemicarbazone have been found effective inhibitors of cell proliferation. We have started a program directed toward the synthesis of different classes of anticancer, antibacterial and antifungal agents designed with complexes of a transition metal and an organic ligand. In continuation of this approach, the present paper describes the synthesis, characterisation and *in vitro* evaluation of inhibitors of HL-60 cell proliferation, antibacterial and antifungal activity using about thirty novel copper nickel and zinc complexes with the salicylidenthiosemicarbazones (H_2L^1 – H_2L^{10}) of general formula (X)N-NH-C(S)-NH(Y) obtained from the condensation reaction of thiosemicarbazide (Y = H) or 4-phenylthiosemicarbazide (Y = C_6H_5) with X = 2-hydroxybenzaldehyde derivatives:



The composition and structure of synthesized complexes were analysed by elemental analysis, X-Ray Diffraction, IR and NMR spectroscopies, magnetochemical, thermoanalytical and molar conductance measurements.

magnetochemical, thermoanalytical and molar conductance measurements. All ligands and metal complexes were tested as inhibitors of human leukemia (HL-60) cell growth. The most potent Cu (II) complexes, have been also tested for their *in vitro* antibacterial activity against: a) Gram-positive - *Staphylococcus aureus (Wood-46, Smith, 209-P), Staphylococcus saprophyticus, Streptococcus (group A), Enterococcus faecalis, Gram-negative - Escherihia coli (O-111), Salmonella typhimurium, Salmonella enteritidis, Klebsiella pneumoniaie, Pseudomonas aeruginosa, Proteus vulgaris and Proteus mirabilis* and b) antifungal activity *against laboratory stems Aspergillus niger, Aspergillus fumigatus, Candida albicans and Penicillium*.