Sahar I Mostafa, J Pharma Care Health Sys 2016, 3:2(Suppl)
http://dx.doi.org/10.4172/2376-0419.C1.010

4th African Pharma Congress

June 20-21, 2016 Cape Town, South Africa

Sahar I Mostafa

Mansoura University, Egypt

New transition metal complexes of enantiomeric Δ and ∧-benzimidazol derivatives in presence of dinitrogen or phosphorous aromatic donors: Synthesis, characterization and DNA interaction

In the pharmacological field, it is very important to prove the efficacy of chiral or enantiopure drugs; i.e., single enantiopure drugs have been shown to be better due to its safe and potent effect in comparison to the racemate drugs. Chiral drugs are assumed to be therapeutically active as most of the bio-targets of drugs are chiral in nature. Thus, considerable attention has been paid to chiral molecules design and construct that are versatile in occupying the active site, possess a metal-binding domain and have a bioactive organic functionality (pharmacophore), which pre-orients the molecule as a drug entity and reduces the toxicity parameters. The introduction of chirality enhances the pharmacological behavior of a metal complex by adopting a specific conformation and a target selective binding affinity for DNA (as DNA itself exists in nature only in one chiral form). The design of metal-based pharmaceuticals depends on the donor framework, the metal ion and its oxidation state. The donors can significantly alter the biological properties by modifying reactivity or substitution inertness. Tailored, multifunctional donors introduced into the metal-based medicinal agents facilitate metal ion redistribution, limit the adverse effects of metal ion overload and inhibit selected metalloenzymes. Therefore, chiral metal complexes have a promising future as robust chemotherapeutic agents in medicinal inorganic chemistry. This study is aimed to preparation of new chiral nucleases derived from Δ- and ∧-benzimidazol derivative (H_2bie) complexes of Zn(II), Pd(II), Pt(II) and Ag(I), in absence and presence of 2,2'-bipyridyl, 1,10-phenanthroline and triphenylphosphine frameworks. Their structures are discussed on the bases of spectroscopic (IR, Raman, UV-Vis, NMR (^{1}H, ^{13}C and ^{31}P) and mass), elemental analysis, molar conductivity and thermal degradation measurements. The *in vitro* anticancer activity of free Δ-H_2bie and ∧-H_2bie and their complexes were evaluated against two of the most famous, human breast cancer (MDA-MB231) and human ovarian cancer (OVCAR-8) cell lines. The enantio-selective complex DNA binding by circular dichroism (CD) furnishes direct information on how the DNA helix and enantiomeric complexes interact and thus reveal the influence of each enantiomer of a given complex on the DNA-binding strength. Comparisons of the CD spectra of pair of enantiomers, Δ-H_2bie and ∧-H_2bie complexes in 5 mM phosphate buffer 50 mM NaCl (pH 7.2) have been measured and the results indicate intercalative CT-DNA binding capabilities.

Biography

Sahar I Mostafa is a Professor of Inorganic Chemistry at Chemistry Department, Faculty of Science, Mansoura University, Egypt since 2008, Visiting Professor at Chemistry Department, McGill University, Montreal, Canada since 2009. She has developed several aspects of O,O; N,O; N,S and N,O,S low cytotoxic-organic transition metal complexes. Her current research interest is on the synthesis, characterization, reactivity and applications of O,O; N,O; N,S and N,O,S low or non-cytotoxic organic transition metal complexes in particular for biology, particularly, anticancer, for catalytic oxidation of organic substrates using transition metal complexes at higher oxidation states and catalytic epoxidation of olefins using transition metal complexes immobilized on Modified Solid Supports (MSS) such as zeolite, silica, cellulose and chitosan in heterogeneous catalytic systems. She has written several chapters in books including MSS transition metal complexes. She is the principal author of about 50 publications and co-author of 20 publications. She is a Member in the Editorial Boards and Reviewer in many Inorganic, Bioinorganic and Catalysis journals. Her academic efforts have been recognized nationally by Al-Azhar University Award (2007, 2009, 2011), Who's is Who's in the world (2008) and Lecturer Award from Mansoura University for Excellence in Graduate Teaching (1992).

sihmostafa@gmail.com