OP 36

Synthesis and characterization of di-(2-picolyl)amine derivatized sulfonamide ligands towards their biological applications

Yasarathna KWGKP[1], Perera IC[2], Perera NT[1*]

[1]Department of Chemistry, Faculty of Applied Sciences, University of Sri Jayewardenepura, Sri Lanka, [2]Department of Zoology and Environmental Science, University of Colombo, Sri Lanka.

Background: Sulfonamides are an important class of drugs and possess various biological properties. Tertiary sulfonamides with di-(2-picolyl)amine have been proposed as a new way to conjugate biological targets of interest.
Objective: The objective was to synthesize novel di-(2-picolyl)amine derivatized sulfonamide ligands towards the discovery of novel drug leads.
Method: Two novel ligands; N(SO_2imidazole)dpa (L1) and N(SO_2methylimidazole)dpa (L2) were synthesized and characterized by ^{1}HNMR, FT-IR, UV-Vis and fluorescence spectroscopic methods. Single crystal X-ray diffraction was carried out for L1. Biological target prediction was carried out using 'SwissTargetPrediction' and 'SwissADME' servers. Molecular docking studies were carried out using AutoDock Vina wizard in the PyRx 0.9.4 software.
Results: Structural data for L1 confirms that the S-N bond length (1.6385 Å) is within the accepted range of sulfonamide bond length. In ^{1}HNMR spectra, peaks related to the aromatic protons of L1 and L2 were identified in the region of 7.0-8.4 ppm and a singlet peak was observed at 4.50 ppm and 4.65 ppm, respectively for methylene protons. High energy absorption bands in the region of 200-300 nm in UV-Vis spectra indicate intra-ligand л-л* and n-л* transitions. Both ligands display high fluorescence intensities in the visible range. *In silico* analysis of drug-likeness shows that both ligands comply with the Lipinski rule of five. It is predicted that serine-threonine protein kinase is a potential target for L1 with a calculated binding affinity of -6.7 kcal/mol. Furthermore, L1 was predicted to bind with Aromatase and Glucosamine-6-phosphate synthase with binding affinities of -6.6 kcal/mol and -8.2 kcal/mol showing potential to be anti-cancer and anti-microbial drug leads, respectively. GABA-A receptor was a potential target for L2 where it can be analyzed as a sedative and anxiolytic drug lead.
Conclusion: Two new ligands have been synthesized and characterized and their drug-likeness indicate that they can be investigated towards biological applications.

Acknowledgement: Financial assistance by University of Sri Jayewardenepura under the research grant ASP/01/RE/SCI/2018/22.