World Academy of Science, Engineering and Technology
International Journal of Biomedical and Biological Engineering
Vol:10, No:09, 2016

Molecular Design and Synthesis of Heterocycles Based Anticancer Agents

Authors : Amna J. Ghith, Khaled Abu Zid, Khairia Youssef, Nasser Saad

Abstract : Backgrounds: The multikinase and vascular endothelial growth factor (VEGF) receptor inhibitors interrupt the pathway by which angiogenesis becomes established and promulgated, resulting in the inadequate nourishment of metastatic disease. VEGFR-2 has been the principal target of anti-angiogenic therapies. We disclose the new thieno pyrimidines as inhibitors of VEGFR-2 designed by a molecular modeling approach with increased synergistic activity and decreased side effects. Purpose: 2-substituted thieno pyrimidines are designed and synthesized with anticipated anticancer activity based on its in silico molecular docking study that supports the initial pharmacophoric hypothesis with a same binding mode of interaction at the ATP-binding site of VEGFR-2 (PDB 2QU5) with high docking score. Methods: A series of compounds were designed using discovery studio 4.1/CDOCKER with a rational that mimic the pharmacophoric features present in the reported active compounds that targeted VEGFR-2. An in silico ADMET study was also performed to validate the bioavailability of the newly designed compounds. Results: The Compounds to be synthesized showed interaction energy comparable to or within the range of the benzimidazole inhibitor ligand when docked with VEGFR-2. ADMET study showed comparable results most of the compounds showed absorption within (95-99) zone varying according to different substitutions attached to thieno pyrimidine ring system. Conclusions: A series of 2-subsituted thienopyrimidines are to be synthesized with anticipated anticancer activity and according to docking study structure requirement for the design of VEGFR-2 inhibitors which can act as powerful anticancer agents.

Keywords : docking, discovery studio 4.1/CDOCKER, heterocycles based anticancer agents, 2-subsituted thienopyrimidines
Conference Title : ICEDD 2016 : International Conference on Ethnopharmacology and Drug Discovery
Conference Location : London, United Kingdom
Conference Dates : September 29-30, 2016