MedChem & CADD-2013
2nd International Conference on
Medicinal Chemistry & Computer Aided Drug Designing
October 15-17, 2013 Las Vegas, USA

Design, synthesis and antidiabetic, cardiomyopathy studies of cinnamic acid-amino acid hybrid analogs

Subir Samanta

Birla Institute of Technology, India

Abstract

Diabetes mellitus, chronic metabolism disorder is characterized by hypergycemia due to insulin deficiency or insulin resistance. Taking into consideration the high cost of modern treatment we have employed a newer approach of design, synthesis and antidiabetic screening of cinnamic acid and amino acid hybrid compounds. The advent of Biotechnology and Molecular biology has made the role of peptides and amino acids more significant to influence virtually all body functions. Associated complications include Myocardial infarction, cardiomyopathy, retinopathy, neuropathy, and nephropathy.

Cinnamic acid analogs (SSPC0-SSPC21) containing different amino acid were designed, docked into crystal structure of AMPK and PPARs. Among the 22 compounds SSPC5, SSPC8, SSPC11, SSPC14, SSPC15 showed good docking scores using Glide 5.0 Maestro program and subjected to ADME prediction by using software Quickprop version 3.1.

Five best docked compounds were synthesis, characterized and antidiabetic activity carried out using Alloxan induced diabetic mice model by measuring blood glucose levels using glucometer at 0,1,2,4,6,8 and 24 hrs . SSPC5, SSPC8, SSPC11, SSPC14 showed % reduction of blood glucose of 23.02%,37.02%,14.04 and 15.96% as compared to standard glibenclamide with 33.53% reduction. SSPC14 was subjected for the Diabetic cardiomyopathy studies by recording the electrocardiogram using Biopac Student Lab PRO System of both diabetic and control rat , analyzed using Acknowledge 4 and was found to be very efficient at low dose with a prolong duration of action of the heart. (up to 54 hrs). Thus this study indicated that such hybrid antidiabetic drugs will serve as novel future medicines.

Biography

Dr. S. Samanta is a Professor in the Department of Pharmaceutical Sciences, Birla Institute of Technology, Mesra, India with 27 years of teaching and research experience. He is at present guiding 7 PhD students, established the CADD lab for the rational designing and molecular modeling and has been funded by the UCG for UGC-MRP project on antidiabetics. He has 12 international publications to his credit and also received patent for process and product on peptide based antidiabetic compounds.