Ahmed M Alafeefy et al., Nat Prod Chem Res 2014, 2:5
http://dx.doi.org/10.4172/2329-6836.S1.005

OMICS Group Conferences
Accelerating Scientific Discovery

2nd International Conference and Exhibition on
Pharmacognosy, Phytochemistry & Natural Products
August 25-27, 2014 DoubleTree by Hilton Beijing, China

Inhibition of human carbonic anhydrase isozymes I, II, IX and XII with a new series of sulfonamides incorporating aroylhydrazone-, [1,2,4]triazolo[3,4 b][1,3,4]thiadiazinyl- or 2-(cyanophenylmethylene)-1,3,4-thiadiazol-3(2H)-yl moieties

Ahmed M Alafeefy[1], **Hatem A Abdel-Aziz**[2,3], **Daniela Vullo**[4], **Abdul-Malek S Al-Tamimi**[1], **Amani S Awaad**[2], **Clemente Capasso**[5] and **Claudiu T Supurand**[4]
[1]Salman bin Abdulaziz University, Saudi Arabia
[2]King Saud University, Saudi Arabia
[3]National Research Center, Egypt
[4]Università degli Studi di Firenze, Italy
[5]Istituto di Biochimica delle Proteine - CNR, Italy

A series of benzene sulfonamides incorporating aroylhydrazone, piperidinyl, sulfone, [1,2,4]triazolo[3,4-b][1,3,4] thiadiazinyl- or 2-(cyanophenyl-methylene)-1,3,4-thiadiazol-3(2H)-yl moieties were investigated as inhibitors of four-carbonic anhydrases (CAs, EC 4.2.1.1), the human (h) isoforms hCA I, II (cytosolic, offtarget enzymes) and hCA IX and XII (transmembrane, tumor-associated isoforms). Low nanomolar activity was observed against hCA II (KIs of 0.56-17.1 nM) with these sulfonamides, whereas the slow cytosolic isoform hCA I was less inhibited by these compounds (KIs of 86.4 nM-32.8 μM). Most of these sulfonamides significantly inhibited CA IX, with KIs in the range of 4.5-47.0 nM, although some of the derivatives incorporating bulkier bicyclic moieties, as well as 2-thienyl fragments, showed a weaker activity against this isoform (KIs in the range 50.1-553 nM). CA XII was also inhibited by all the investigated compounds with KIs in the range 0.85-376 nM. The best inhibitors were those incorporating bulky [1,2,4]triazolo[3,4-b][1,3,4]thiadiazinyl moieties and 1,3,4-thiadiazol-3(2H)-yl groups.

Biography

Ahmed M Alafeefy got his PhD, Pharmaceutical Chemistry, in 2005 from Egypt and left to Saudi Arabia. His current research interest covers the application of modern methods and techniques for the development of drugs to combat cancer and viral diseases. He has been consistently working to locate biochemical rationale which enables the preparation of antitumor drugs focusing on qualitative differences between normal and cancerous cells. The complimentary development of semisynthetic biologically active small molecules as antiviral, anticancer agents is his future aim. Currently, he is the Head of Pharmaceutical Chemistry Department.He has published more than 25 papers in reputed journals.

a.alafeefy@sau.edu.sa