

Synthesis, molecular modeling and in vitro antibacterial activity of new steroid [6, 7 - b] annulated pyrrole derivatives

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Pyrroles are found to be as the fundamental structural motifs in various classes of natural and biologically important molecules such as porphyrins, bile pigments, coenzymes, and alkaloids. This moiety is also present in several synthetic pharmaceuticals as well as electrically conducting polymers. They have shown to possess extensive biological activities and pharmacological properties such as antimicrobial, analgesics, ionotropic, anti-tumor, anti-inflammatory and antiallergic. These have also been employed as P38kinase, prolyl-4-hydroxylase, poly (ADP-ribose) polymerase inhibitors, estrogen receptor β - selective ligands, AT1-selective angiotensin II receptor antagonists and minor groove recognition elements. Several macromolecular antibiotics having pyrrole structure have been isolated from biological sources and their biological activities are thus defined.

Intrigued by the above applications of pyrrole derivatives and in continuation of our work for the development of new antimicrobial agents, we wish to report herein an efficient and novel procedure for the synthesis of 3'-acetoxy, 5 α -cholestano[6,7-b]-2H-pyrroles from steroidal ketoximes using vinyl acetate in the presence of catalytic amount of p-toluene sulphonic acid under reflux conditions.

The newly synthesized compounds were characterized by IR, NMR, MS and analytical data. These compounds were also screened for their in vitro antibacterial activity against different Gram positive and Gram negative strains of bacteria. Molecular modeling studies have been performed to evaluate their binding sites.

Biography

Shamsuzzaman has been a student at Aligarh Muslim University, one of the famous institutions of higher education in India. He obtained his Ph.D. in synthetic organic chemistry in 1983. In 1985 he was awarded Liverhulme Commonwealth/USA Visiting Fellowship to work at Queen's University, Belfast. He is now Associate Professor at the department of chemistry, AMU, Aligarh. His main research subject is to develop new antimicrobial as well as anticancer agents, with particular emphasis on steroid derivatives. He is author of more than fifty publications in international journals. He is a member of various scientific societies.

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