

Global Summit on
Steroids

July 13-15, 2015 Baltimore, USA

Peptidomimetic steroid hybrids: Microwave energy in synthesizing steroid-amino acid conjugates via Ugi-4CR

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Among the modern organic chemists, one of the most fascinating challenges is to design new synthetic strategies that could provide structurally diverse and complex molecules with novel physical, chemical and biological properties in order to develop newer and potential steroid based drug molecules. It has been found that macrocyclic skeletons due to their several pre organised structural architectural features are considered to be an especial class of target hosts, as they can combine with conformational flexibility and biological stability. Steroids due to their rigid framework with significant biological properties, numerous therapeutic effects, having ability to penetrate the cell membrane and specific in nature towards hormonal receptors have therefore considered as target host for many hybrid systems. Attachment of many synthetic biomolecule to the naturally occurring saponins demonstrated a promising approach to obtain structurally diverse chemical substances for pharmacological testing. For example sugars attached to the steroid A-ring and D-ring hydroxyl groups, have shown to possess novel amphiphilicity on phospholipid membranes. Similarly, steroid-peptide conjugates have been found to exhibited potent biological activity. They are recognized to be used as artificial proteolytic enzymes, employed in the construction of anion receptors and cationic antibiotics, and as synthetic receptors for oligopeptides. The steroid skeletons are transformed into spiroketal moiety, which results in the reversal of multidrug resistance in hippurin-1, and sub nanomolar anticancer activity in cephalostatins and ritterazine M. Squalamime like novel aminosterols are synthesised, which provide strong antiproliferative properties indicating a promising challenge in cancer chemotherapy. Thus chemical transformations of steroids towards the formation of a chemically stable linkage between a steroid and other building blocks find a remarkable application in designing novel steroid drugs. Synthesis of some triple hybrids of steroids, spiroketals and olipeptides as new biomolecular chimeras, could show potent integrin antagonistic effect. Application of microwave energy in synthesizing steroid-amino acid conjugates- a class of peptidomimetic hybrid molecules will be presented.

Biography

Pritish Chowdhury has completed his PhD from Gauhati University, India and Postdoctoral studies from University of Hanover, Germany as a DAAD Fellow. He is presently Chief Chemist at CSIR-North East Institute of Science & Technology, Jorhat, India, a premier multi-disciplinary Scientific Organization. He has been an awarded Dr BM Das Memorial Science Award, India during 1992 and also received the certificate of the Prestigious Author for Chemical Engineering & Process Technology, 2011 by OMICS Publishing Group. He is life member for various societies such as Indian Chemical Society, Kolkata, Indian Society for Chemists & Biologists and Assam Science Society. He has published more than 42 papers in reputed journals, 1 Book Chapter, 9 Patents including 1 US Patent and serving as an Editorial Board member of World Journal of Organic Chemistry.

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