

International Summit on Past and Present Research Systems of Green Chemistry

August 25-27, 2014 Hilton Philadelphia Airport, USA

Green synthesis and antibacterial activity of some novel cyclic and acyclic imides bearing naphthalimide and allylidene moieties

Ramendra K Singh^{1,2} and Garima Kumari¹

¹University of Allahabad, India

²Chapman University, USA

Several new cyclic and acyclic naphthalimide and allylidene derivatives have been synthesized using naphthalic-1,8-anhydride or naphthalic-1,8-anhydride-4-acetamide and cinnamaldehyde following the conventional and microwave (MW) synthetic methods. Basic alumina was used as solid support for MW method. A comparison of both methods clearly showed that the microwave-irradiation method was a much better one since it resulted in better yields and greatly reduced reaction time involving more simplified and cleaner approach avoiding harmful solvents, unlike conventional method where toluene or methanol was used. The molecules were evaluated for their antibacterial activity against a variety of human pathogenic bacterial strains, like *B. subtilis* (NCIM-2156), *S. aureus* (NCIM-2079), *S. epidermis* (NCIM-2493), *P. aeruginosa* (NCIM-2036), *E. coli* (NCIM-2065) and *P. vulgaris* (NCIM 2027) following broth dilution method using ciprofloxacin and vancomycin as reference. All compounds showed MIC values in the range of 0.65 to 80 µg/mL concentration. Structure-activity relationship studies have been performed to assess the effect of various groups on antibacterial activity of these molecules. Compounds having fluorine atom, smaller in size, in place of chlorine (or similar bigger atom/group) showed better activity, which was corroborated by docking process. Docking results on representative molecules with DNA topoisomerases I and II, using the software Discovery Studio 2.5, revealed the possible mode of action of these molecules.

Biography

Ramendra K Singh, an Associate Professor of Chemistry at the University of Allahabad, India, a member of several national committees, has awards/fellowships, like ISCA Young Scientists Award, INSA Visiting Fellowship, UNESCO Fellowship, XVI IUBMB Fellowship, Jawaharlal Nehru Visiting Fellowship, Post-Doc Fellowship, Government of Japan, INSA International Exchange Fellowship and Fulbright-Nehru Senior Research Fellowship to his credit. His research interest lies in computer-aided designing and development of antibacterial and antiviral molecules against human pathogenic bacteria and viruses like HIV, HPV and JEV and developing fluorescent oligonucleotides for use in the field of molecular biology and diagnostics. He has about a dozen anti-HIV and half-a-dozen anti-JEV compounds under patent processing. He is on editorial board of several international journals and referee to more than a dozen journals.

singhrank@rediffmail.com