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Structural and functional characterization of Cu1 and Nu2 Phyto-Drugs against Multi-Drug resistant bacteria

Abstract:

New drug development against MDR bacteria is a challenging task. So far hundred antibiotic derivatives were destroyed by few dozens mdr genes and few dozens drug efflux genes made the scenario worse making horror of antibiotic void. Plants constantly make ex-metabolites to retard the growth of soil bacteria and thus an ideal source of new antibiotics like alkaloid, saponin, glycoside, flavone, quinone, polyphenol and triterpene. Here, we developed two medicinal plants ethanol extract from Cassia fistula bark and Suregada multiflora root that exceptionally rich in active compounds facilitating easy purification through preparative TLC and UV-shadowing. CU1 from Cassia fistula is a Triterpene-Poly-Bromo-Phenol that inhibits RNA polymerase from E. coli and M. tuberculosis. While NU2 from Suregada multiflora is a poly-Fluro-Phosphate-glycoside that inhibits DNA topoisomerase I of E. coli. We tested the 90% purified phyto-antibiotics in MDR bacteria (E. coli KT-1_mdr, E. coli KC-1_mdr and P. aeruginosa DB-1_mdr) isolated from Ganga River water, rain water, milk, chicken meat and human hair with resistant to ampicillin, amoxicillin, streptomycin, ciprofloxacin, chloramphenicol and erythromycin. The toxicity level of those phyto-drugs was low as tested in mouse 3T3 cells, rats and molly fishes up to 50µg/ml. Although commercial development of those phyto-drugs has not possible yet, we have made MDR-Cure Lotion phyto-extracts in presence of antioxidant and anti-inflammatory principles of 50% ethanol extract of Haldi rhizome and Neem bark to cure human nail infections. The two compounds described here are new and may be an ideal drug combination to cure MDR infections.

Biography

Asit Kumar Chakraborty, MSc and PhF in Biochemistry. (1990) from Calcutta University. Postdoctor at University of California- Berkeley. Visiting scientist at Creighton University School of Medicine and The John Hopkins University School of Medicine. Professor at the department of biochemistry and biotechnology, Vidyasaagar University, West Bengal, India. Research area: DNA topoisomerases in kinetoplastida, proto-Ha-Ras oncogenes, phyto-drugs development against MDR bacteria. Published 89 papers, 18 book chapters and one book.