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In silico optimization of antimicrobial peptide enables combinatorial exploration for peptide design

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Antimicrobial peptides (AMPs) have attracted considerable attention because of their multiple and complex mechanisms of action toward resistant bacteria. However, reports have increasingly highlighted how bacteria can escape AMP administration. Here, the molecular mechanisms involved in Escherichia coli resistance to antibiotics were investigated through comparative transcriptomics. Furthermore, we also describe the use of a genetic algorithm to design synthetic AMPs derived from plant (Pg-AMP1) a glycine-rich peptide previously isolated from guava seeds and sea animals (clavanins). This approach yielded both peptides classes that possess an unusually high proportion of arginines and use tyrosine residues as hydrophobic counterparts. Guavanin 2 emerged as a prototype AMP, among fifteen guavanin analogues screened for their activity against an engineered luminescent strain of Pseudomonas aeruginosa. Similarly, clavanin-MO was also selected. Both peptides were further characterized in terms of structure, activity and biotechnological potential. These novel peptides were unstructured in water and underwent a coil-to helix transition in hydrophobic environments. This conformation was corroborated by NMR analysis in dodecylphosphocholine micelles, which revealed an α-helical structure. Guavanin 2 and clavanin-MO caused a bactericidal effect at low micromolar concentrations to several resistant bacteria, causing membrane disruption, without triggering depolarization but rather hyperpolarization. In summary the present work presents a computational approach to explore natural products for the design of short and potent peptide antibiotics that could be used against resistant bacteria.

Biography

Octávio Luiz Franco has a degree in Biological Sciences from the Federal University of Ceará (1998) and a PhD in Biological Sciences (Molecular Biology) from the University of Brasília (2001). He did his first post-doctorate in 2001 at Embrapa followed by another at the University of Edinburgh (Scotland). He worked as in work missions in countless countries including Australia, Israel, Portugal, Cuba, Holland and others. He completed his first Sabbatical at the University of Wisconsin (USA) and the second at British Columbia University (Canada) in the area of infectious disease control. He is a researcher 1A and a consultant to the National Council for Scientific and Technological Development (CNPq).

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To carry out the quality control tests and release studies on different available brands of levofloxacin

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Levofloxacin is a broad-spectrum, third-generation fluoroquinolone antibiotic and optically active L-isomer of ofloxacin. It is an antibiotic that is active against both Gram-positive and Gram-negative bacteria and is used to treat a number of bacterial infections including acute bacterial sinusitis, pneumonia, H-pylori (in combination with other medication), urinary tract infections, chronic prostatitis, and some types of gastroenteritis. Quality control is the set of measures and procedures to follow in order to ensure that the quality of a product is maintained and improved against a set of benchmarks and that any errors encountered are either eliminated or reduced. Invitro profile also helps us to get an idea of how drug will behave in-vivo. Different brands of Levofloxacin tablets are known to show different Pharmacokinetic parameters and release profiles. A study was planned because of lack of data about Quality Control tests on Levofloxacin tablets available in Oman.The objectives of our study were to carry out dissolution rate studies on all the available brands and to find out the best brand in terms of the Quality Control test parameters and release of the drug from the formulations. Four brands of Levofloxacin 500 mg tablets marketed in Oman were pharmaceutically evaluated via weight variation, hardness, friability, thickness, disintegration, and dissolution studies to assess their Pharmaceutical equivalence. Pharmacopeia demands that all the tablets must meet quality control standards. A linear graph was obtained with a regression coefficient of 0.9988 using the pure drug.

Biography

Prof. (Dr.) Alka Ahuja has been serving as a Chair of Pharmacy Program at National University, Oman. She has published more than 250 articles in journals of repute. She has been bestowed with honours and awards including Global education and leadership award and best publication awards. She is serving on the editorial board and has been a speaker at several international conferences. She has handled several consultancy and funded projects and had been member of the Ethical Board. She established a school of Research in Novel drug delivery systems and her research areas include Pharmacokinetic studies, development of Dosage forms and clinical studies.

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Antibiotic Stewardship program in ambulatory care settings

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Antimicrobial peptides (AMPs) have attracted considerable attention because of their multiple and Antibiotic misuse and overuse is a common problem in ambulatory care settings. This problem will increase the rate of antibiotic resistance in both settings of ambulatory care and hospital setting. The project is a trial to implement ASP (Antibiotic Stewardship Program in an ambulatory care clinic within a network of ambulatory care centers in the emirate of Abu Dhabi UAE. Applying ASP in outpatient is challenging and till now has no standards. In this project antibiotic prescribing and consumption was estimated using DDD/100 patients visits and antibiotic prescription rate also the cost of antibiotics was estimated and all data of 2018 after implementing ASP project were compared to the data of 2017.The implementation of the ASP project in ambulatory care had achieved reduction in both antibiotics prescription rate and DDD/100 patients' visits.

Biography

Dr. Bedeer Sabry is a pharmacist and pharmacologist He is graduated from Faculty of Pharmacy Mansoura University Egypt in 2003, He had been certified as Board Certified Pharmacotherapy specialist BCPS for Board of Pharmacy specialties USA in 2013, In 2014 He was granted MS Master in Clinical Pharmacy from Supreme Council of Universities Cairo University Cairo, Egypt. He has more than 15 years' research experience in Pharmacological studies and pharmacy practice and presented more than 10 lectures about pharmacology and pharmacy practice in conferences and symposiums in Abu Dhabi UAE also he is doing research about antibiotic use and is leading the antibiotic stewardship program in his institution. He is currently working as a clinical pharmacist in SEHA Abu Dhabi and he is a member of PTC screening and evaluation Committee in SEHA UAE. He has been awarded many recognition certificates for best employee and innovation. He attended more than 40 scientific meetings such as conferences, symposia, workshops, and seminars at National and International level. He has worked in several projects in SEHA UAE. Member of editorial panel of EC Pharmacology and Toxicology Journal.

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Medicinal values of Weeds: A descriptive analysis

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Ayurveda is an oldest Indian medicinal system and it was based on uses of plants as medicines. Due to high demand and quick relief is a major reason of development of chemical based medicines, but its having many side effects. Medicinal plants as medicine is accepted worldwide and is always a hot topic of research. In the present study we are trying to explore and explain impotence of weeds. Weeds are naturally grown plants in cultivated felids without any care and are not at all useful. A chemical analysis of these weeds proves that there are many chemical compounds present, are may be useful for treatment of many diseases. Small plants like few species of Parthenium, Amaranthus, Argemone, Tridax, Chrysopogon, hysterophorus, Cynodon, spinosus, Mimosa and Oxalis easily found in our garden and roadside, are having many medicinal value. In the present situation when whole world is suffering with pandemic, natural remedies are the best way to treat many chronic diseases. Weeds was not at all a point of attraction for researchers but Insilico studies can explore the binding affinities of phytochemical of weeds with few important human receptors, and on the basis of this we can conclude that they can have some importance as medicines. Through this article we want to show some specific features of weeds and it may possible that in future we will treat is as important plants and we can remove the tag of unwanted plant.

Biography

Dr. Anamika Singh has completed his PhD at the age of 29 years from Indian Institute of Information Technology, IIITA, India. Sh ahse nine year teaching and research experience. She has published more than 10 papers in reputed journals and more then 20 book cjhapters. She has also authored a book.She is reveiwer of few journals and also she is guiding Ph.D. Her area pof specialization is moleciular biology, drug designing and bioinformatics.

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Aloe Vera gel formulation for wound dressing: Comparison of different polymers using factorial 2^3 design

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Human skin is known to be the most fragile and sensitive part of the body, it covers entire body, and has various functions in regulating the body temperature and providing a shield against microorganisms such as bacteria1.

Different topical preparations containing antibacterial for treatment wound infection are available in market. Antibiotics are highly effective in wound healing, however their side effects such as irritation and skin allergy reaction are troublesome to the body and if absorbed it will cause systemic side effect. These drawbacks could be avoided if the therapy was switched from synthetic to a natural active ingredient like the plant Aloe Vera.

A promising, but still an underrated group of potential antibacterial agents that can be integrated into wound dressings are known as natural products, especially plant like Aloe vera which help to switch from chemical to natural product treatment2, 3. Leaves of this plant are green resembles with cactus leaves filled with a clear gel like fluid, which is viscous in nature.It can be used alternative for minor sunburn and cosmetics2,4,5. It has been demonstrated that Aloe vera has UV protective, anti-inflammatory, and wound healing properties

Biography

Nida'a M. A. Wadi :Register pharmacist for more than 30 years. She is Assistant lecturer at (NUST, National University of Science and Technology (formally named Oman medical College). She has practiced as lecturer in Medical college and Sr. lecturer Pharmacy College for several years. She has many contributions as speaker, poster presenter as well as published some articles. She teaches in the graduate pharmacy program different pharmacy subjects and she is chairperson of training program for national and international training coordinator with West Virginia pharmacy college, USA & JSS India . Her interest of research on antibiotic delivery system and formulation and evaluation of local delivery system.

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First report on the antibiotic resistance profiles and virulence genes of Staphylococcus pseudintermedius colonizing shelter dogs and dog owners in Nigeria

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The increase in antibiotic-resistant staphylococci among pets and its transfer to humans threaten veterinary medicine and public health. This study was designed to determine the antibiotic resistance patterns and the prevalence of virulence genes among S. pseudintermedius obtained from dogs and dog owners in Abakaliki, Nigeria. Exactly 112 swab samples (perineum, nares, and mouth) were obtained from shelter dogs while nasal swabs of 97 dog owners and 150 non-dog owners were collected. Swab samples were processed and isolates were identified using standard microbiological procedures. MIC was determined by broth micro-dilution using the sensititre system. Isolates were screened for sec, siet, exi, and lukD genes by PCR. A total of 99 S. pseudintermedius isolates [86 (76.8 %) from dogs and 13 (13.4 %) from dog owners] were obtained, out of which 52 (52.5 %) were identified as methicillin-resistant S. pseudintermedius (MRSP) strains as they harboured mecA genes. No S. pseudintermedius isolate was recovered from non-dog owners. Isolates were highly resistant to penicillin (100 %) and ampicillin (94.2 %). Equal resistance frequency (51.2 %) was each observed for fluoroquinolones, clindamycin, trimethoprim/sulfamethoxazole, and erythromycin. Isolates also exhibited resistance to gentamycin (46.5 %), chloramphenicol (23.1 %), tetracycline (19.8 %), and tigecycline (8.1 %). Isolates harboured sec (73.7 %), exi (2 %), siet (62.6 %), and lukD (55.6 %) virulence genes. S. pseudintermedius isolates, including MRSP strains which harboured mecA genes in this study were multi-drug resistant and notably more resistant than those reported in literature.

Biography

Moses Ikechukwu Benjamin completed his in in the Department of Pharmaceutical Microbiology and Biotechnology, Faculty of Pharmaceutical Sciences, Nnamdi Azikiwe University, Awka, Nigeria on the 25th of November, 2019. Presently, he is a Lecturer in the Department of Applied Microbiology, Faculty of Sciences, Ebonyi State University, Nigeria. He has published more than 35 research articles in reputable peer-reviewed journals.

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