38th Annual congress on

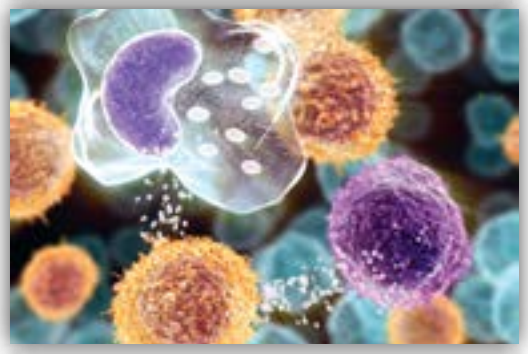
Microbes Infection

September 28-29, 2017 | London, UK

Scientific Tracks & Abstracts

Day 1



Major Sessions:

Thursday, September 28, 2017 | Day 1

Medical Microbiology | Virology | Medical Immunology | Bacteriology and Bacteriocins | Molecular Microbiology | Microbial Infections and Emerging complications| Mycology

Session Chair
Sanjib Bhakta
University of London | UK

Session Introduction

Title: **Prevention and control of microbial induced corrosion in fuel storage tanks**
Khalil Mataqi and B Mathew, Kuwait Institute for Scientific Research, Kuwait

Title: **Investigating the prevalence of rotavirus and its early detection in calves of Kuwait dairy farms using molecular techniques**
Mohammad Alotaibi, Kuwait Institute for Scientific Research, Kuwait

Title: **Fungi in and around trichomes of sawtooth oak leaves**
Ki Woo Kim, Kyungpook National University, Korea

Title: **Molecular characterization of methicillin resistance gene among Staphylococcus aureus isolated from poultry farms in Kaduna, Nigeria.**
Josiah Ademola Onaolapo, Ahmadu Bello University, Nigeria

Title: **Pseudomonas exoenzyme y-mediated evasion of host innate immune responses**
Un-Hwan Ha, Korea University, Republic of Korea

Young Reseach Forum :

Title: **Title: Antiviral activity and possible mechanisms of action of Aristolochia bracteolate against influenza A virus**
Mona Timan Idriss, Sudan International University, Sudan

Prevention and control of microbial induced corrosion in fuel storage tanks

Khalil Mataqi and **B Mathew**
Kuwait Institute for Scientific Research, Kuwait

Microbial induced corrosion can lead to several deteriorating outcomes in the oil industry. The growth of microorganisms (bacteria) in fuel storage tanks results in costly maintenance measures as well as alteration in oil product specifications which leads to issues such as corrosion of steel and fiberglass reinforced plastic tanks, tank linings, elastomeric seals and hoses, low points in the piping, leak detectors, turbine pump components, filters and valves, etc. The aim of this work is to evaluate and monitor the several approaches that aid in the prevention and reduction of microbial corrosion in fuel storage tanks in Kuwait. Predator 8000, Acticide CMG, Kathon FP 1.5 Biocide and Predator 6000 are the most effective biocides among the eight tested, in terms of agar well diffusion technique.

Biography

Khalil Mataqi has completed his M.Sc in Microbiology at Kuwait University during 1988-1992. He finished his M.Phil at University of Sheffield, U.K during 1996-1998 on topic "Effects of Environmental changes on the carbon – Flux in two isogenic mutants of Escherichia *coli*". He did his PhD on topic Bio desulphurization of Organic Sulphur Compounds during 1999 – 2002. Khalil Participated in many projects like: Corrosion–pipe corrosion, Bio surfactant, Biodesulphurisation, Bio-remediation, Seawater injection for oil production, etc. Principal Investigator in: PP023 "Seawater Injection Project- North Kuwait. Principal Investigator in: PP024C: "Monitoring and Assessment of Parameter Effecting Minageesh Water Injection Plant- West Kuwait. Principal Investigator in PP017C: "The Microbiological Aspect of Oil Field Injection System Field Trials for Sea Water in North Kuwait. Assessment and Control of Biomass Growth in Fuel Storage Tank at the KNPC Phase I: Quantification and Identification of Microbial Activities in the Products Storage Tanks. Identification and Bio typing of Bacteria Isolated from Petroleum Installation in Kuwait. Evaluation Of The Effectiveness Of Biocides In Controlling The Microorganisms Causing Problems In Oil Products Tanks"-2014. He received distinguished scientist award in KISR during the period 2012-2013.

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Notes:

Investigating the prevalence of rotavirus and its early detection in calves of Kuwait dairy farms using molecular techniques

Mohammad Alotaibi and **Sami Al Amad**
Kuwait Institute for Scientific Research, Kuwait

Statement of the Problem: Rotavirus is one of the main pathogens causing morbidity and mortality in neonatal dairy calves worldwide, and is responsible for 30-44% loss in cattle. It is the most common etiologic agent of diarrhoea in neonatal dairy calves and children, the dominant type being group A. Another impact of the disease is the massive financial loss in the livestock industry. In Kuwait, viral diseases are the major cause of high mortality and morbidity rates in young dairy calves. The proposed study is intended to assess the prevalence of rotavirus in dairy calves by applying molecular diagnostic techniques.

Methodology: This project is designed to compare molecular with immunological diagnostic methods for the early detection of rotavirus in calves in Kuwait. Evaluation of detection methods for viral particles and ribonucleic acid (RNA) was performed using latex agglutination (LTA) and reverse transcriptase-polymerase chain reaction (RT-PCR).

Findings: A total number of 270 fecal and 10 water samples were collected from farms Sulaibiah and Kabd. The fecal samples in triplicate from calves under one year of age based on age and gender. The foecal samples were suspended in phosphate buffer saline (PBS) and tested with Latex Agglutination and 14% of samples showed presence of rotavirus, while RT-PCR showed 30% of rotavirus. These findings indicate that the RT-PCR assay is more specific and sensitive and can be effectively used for the early detection of rotavirus in foecal calf samples.

Recommendations: The following are the recommendations for early detection of rotavirus in calves: 1. isolation of infected calves to prevent spread of rotavirus between herds. 2. application of rotavirus vaccine to minimize the chances of claves for infection, and 3. application of appropriate diagnostic method by farmers and livestock companies to investigate the presence of rotavirus instantly and take the required actions immediately.

Biography

Dr. Mohammad Alotaibi, graduated from University of Leicester in the UK, is an expert in pathogenic food-borne viruses who is a researcher in Kuwait Institute for Scientific Research (http://www.kisr.edu.kw). He is also an expert in inactivation of pathogenic microbes including viruses and bacteria using solar irradiation of water especially in places under natural crises where water sanitation infrastructure is destroyed. He has published many original scientific papers in international journals. Dr. Alotaibi has ongoing research projects including the research that will be presented in the conference for the early detection of rotavirus in calves in Kuwait and its impact for the morbidity and mortality of this virus.

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Notes:

Fungi in and around trichomes of Sawtooth Oak leaves

Ki Woo Kim
Kyungpook National University, Korea

Brown spots occurred on naturally infected leaves of Quercus acutissima (sawtooth oak) in Suwon, Korea. Field emission scanning electron microscopy revealed that hyphal branching and spore chains were evident on the adaxial leaf surface. Trichomes were usually colonized by septate hyphae. Hyphae coiled the trichomes and appeared to inhibit the unfolding of trichome branches. Plant cell wall modifications and epidermal shrinkage of trichomes were apparent around hyphae. Hyphal growth appeared to disrupt the non-glandular trichomes on the abaxial leaf surface. Transmission electron microscopy revealed that fungal hyphae were present in the naturally infected trichomes of the oak species. Concentric bodies were often found in the hyphal cytoplasm. These results suggest that the foliar trichomes of sawtooth oak would be fungal infection sites as well as the protective surface structures against a variety of external stresses to the plant.

Biography

Ki Woo Kim has completed his PhD from Seoul National University, Korea. He is currently an associate professor at Kyungpook National University, Korea. He has over 100 publications that have been cited over 2,600 times, and his publication H-index is 25 and has been serving as an editorial board member of reputed journals.

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Notes:

Molecular characterization of methicillin resistance gene among Staphylococcus aureus isolated from poultry farms in Kaduna, Nigeria

Josiah Ademola Onaolapo[1], S K Parom[3], J C Igwe[2], R O Bolaji[1] and G O Adeshina[1]

[1]Ahmadu Bello University, Nigeria
[2]Kaduna State University, Nigeria
[3]Gombe State University, Nigeria

Statement of Problem: Zoonotic transfer of resistance genes has been reported as one of the major causes of increased community associated methicillin resistance S. *aureus* (CAMRSA), which has contributed to high hospital visit, mortality and morbidity in clinic.

Aim: This study evaluates the occurrence of S. *aureus* encoding MecA gene in poultry birds from Kaduna metropolis.

Methodology: sample collection was carried out using standard epidemiological procedure, S. aureus isolation, identification and biochemical test were carried out using standard microbiological methods, antibiotic susceptibility testing was carried out using disc diffusion agar while molecular analysis was carried out using PCR techniques.

Results: A total of 600 poultry samples from 300 layers and 300 broilers were randomly collected from 4 poultry farms for evaluation. Using Microgen biochemical kit 27.3% of the samples collected yielded S. aureus. Using disc diffusion method 37.2 % (61) of the S. *aureus* were resistant to oxacillin. The resistance profile of the oxacillin resistant isolates showed that the isolates were highly resistant to tetracycline (88.5%), ciprofloxacin (80.3%), mildly resistant to cotrimoxazole (32.8%), vancomycin (31.1%) and susceptible to amoxiclav (93.4%), cefoxitin and gentamicin (97.7% respectively). High percentage of the isolates 34.4% (21) harbored the *MecA* gene that amplified at 162 base pair while none of the isolates harbor MecA gene with 500bp.

Conclusion: This study reports the presence of MDR S. *aureus* encoding *MecA* gene among S. *aureus* isolates evaluated from poultry farm in Kaduna metropolis, hence this calls for concern as poultry products serves as means to fast dissemination of livestock and community associated methicillin resistant S. *aureus* as high percentage of poultry farmers, abattoirs and meat vendors carries out their activity without veterinary nor government control.

Biography

J A Onaolapo is a Professor of Pharmaceutical Microbiology at the Department of Pharmaceutics and Pharmaceutical Microbiology, Faculty of Pharmaceutical Sciences, Ahmadu Bello University, Zaria Nigeria. He rose from the post of an Assistant Lecturer in 1979 to the rank of a Professor in 1996. He had BSc in Pharmacy with Hon. Second Class Upper division, ABU, Zaria in the year 1977; MSc in Pharmaceutics, ABU, Zaria, 1982 and a PhD in Pharm. Microbiology, Aston University, Birmingham, UK in 1986. His area of focus has been bacterial drug resistance. He has published over 200 scientific articles both in local and international journals. He has supervised over 30 PhD students in the field of Pharmaceutics and Pharmaceutical Microbiology, over 50 MSc and 100 undergraduate students. He has also carried out researches on finding antibacterial drugs from natural products.

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Notes:

Pseudomonas exoenzyme y-mediated evasion of host innate immune responses

Un-Hwan Ha
Korea University, Republic of Korea

Pseudomonas aeruginosa is recognized as a leading cause of respiratory infections in cystic fibrosis or in immunocompromised patients. P. *aeruginosa* possesses a number of virulence factors released through diverse secretion systems, and type III secreted effectors have obtained much attention for their ability to manipulate host cell function and viability during infections. However, little is known about the impact of exoenzyme Y (ExoY), which is directly translocated into the cytoplasm of infected host cells, on the modulation of host innate immune responses. In this study, we analyzed effects of ExoY in the activation of inflammasome, which results in IL-1 production and pyroptotic cell death. Inflammasome-mediated production of IL-1 and formation of pyroptotic cell death were clearly reduced in response to ExoY. These suppressive effects were mediated by the adenylate cyclase activity of ExoY, which plays a role in delaying the activation of NF- B and caspase-1, a key component of inflammasome-mediated responses. Moreover, the reduction in cytotoxicity was in part associated with ExoY-involved suppression of bacterial motility, which probably causes the reduction of bacterial contact with cells. Together, these results demonstrate that ExoY can influence both host and bacterium itself to reduce inflammasome-related responses by delaying the activation of inflammatory pathways and suppressing bacterial motility.

Biography

Un-Hwan Ha has completed his PhD in the field of microbiology and Immunology from the University of Florida in 2002 and has continued postdoctoral studies in the field of innate immunity and cellular microbiology from House Ear Institute and University of Rochester Medical Center. In 2008, he got an Assistant Professor position at the Department of Biotechnology and Bioinformatics, Korea University and has served as Professor since 2015. He has published about 20 research articles contributed as a corresponding author in reputed journals since 2008. His main research area is host-microbe interactions by aiming to understand both bacterial pathogenesis and host innate immune responses.

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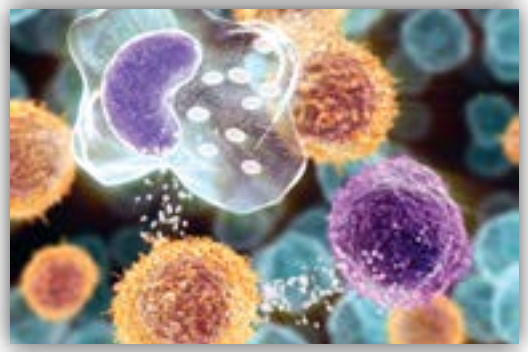
Young Reserach Forum



Antiviral activity and possible mechanisms of action of *Aristolochia bracteolate* against influenza A virus

Mona Timan Idriss[1], Malik SulimanMohamed[2], Sarawut Khongwichit[3], Natthida Tongluan[3], Duncan R Smith[3], N H Abdurahman[4] and **Alamin Ibrahim Elnima[2]**

[1]Sudan International University, Sudan
[2] Khartoum university, Sudan
[3]Mahidol University, Bangkok, Thailand
[4]Universiti Malaysia Pahang, Malaysia

We investigated the anti-influenza virus activity of *Aristolochia bracteolate* and possible mechanism(s) of action in vitro. We found that *Aristolochia bracteolate* has anti-influenza-virus activity, and both pre-incubation of virus prior to infection and post-exposure of infected cells with *Aristolochia bracteolate* extract significantly inhibited virus yields. Influenza-virus-induced hemagglutination of chicken red blood cells was inhibited by *Aristolochia bracteolate* extract treatment, suggesting that *Aristolochia bracteolate* can inhibit influenza A virus infection by interacting with the viral hemagglutinin. Furthermore, *Aristolochia bracteolate* extract significantly affect nuclear transport of viral nucleoprotein (NP). To best of our knowledge, this study revealed for the first time that *Aristolochia bracteolate* extract can inhibit both viral attachment and replication and offers new insights into its underlying mechanisms of antiviral action. The whole plant of *Aristolochia bracteolate* collected from Sudan and Extracted with 70% methanol. The crude extract was screened for its cytotoxicity against MDCK cell line by Presto- Blue assay and WST-1 assay. Antiviral properties of the plant extract were determined by cytopathic effect inhibition assay and virus yield reduction assay (plaque assay). Time of addition assay, and nuclear export mechanism were also performed.

Biography

Mona Timan Idriss is a Lecturer of Microbiology in the Department of Pharmaceutical Microbiology, Faculty of Pharmacy, Sudan International University, in Sudan. She is currently pursuing PhD studies in Molecular Virology (development of novel antiviral drugs from Sudanese plants and possible mechanism of action). She also worked as a Visiting Scientist in the department of Bimolecular Sciences, University of Mahidol, Thailand. She participated in many projects with members of the Molecular virology laboratory in University of Nagasaki, Japan using molecular biology techniques. Most recently, she has written two papers in virology research. She is selected as an Editorial Board Member for Immunotherapy Research Journal and SciFed Journal of Mycology.

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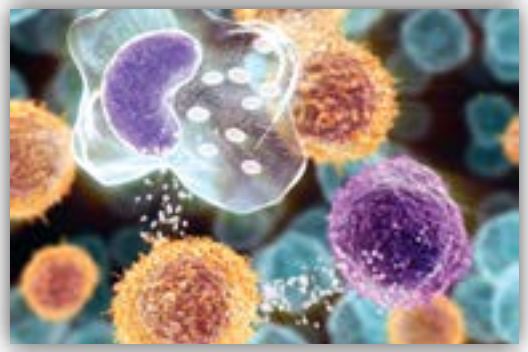
Scientific Tracks & Abstracts

Day 2



Major Sessions:

Diagnostics Microbiology | Industrial Microbiology & Food Microbiology | Immunology

Session Chair
Liaqat Ali Chaudhry
King Salman Military Hospital | Saudi Arabia

Session Introduction

Title: **The secret weapon that allows Staphylococcus aureus to hijack your cell cycle**

Nadejda Berkova, INRA, France

Title: **Understanding immunity to invasive Salmonella diseases to design new preventive measures**

Pietro Mastroeni, University of Cambridge, UK

Title: **Mechanism that enhances the action of rifampicin on multi-resistant mycobacteria tuberculosis when it is administered in combination with an iodine-containing anti-infection drug**

Gulnara A Yuldasheva, The Scientific Center for Anti-infective Drugs, Republic of Kazakhstan

Title: **A 35-year-old immuno-competent male with open pulmonary tuberculosis associated with extra-ordinary extensive extra-pulmonary tuberculosis.**

Liaqat Ali Chaudhry, King Salman Military Hospital, Saudi Arabia

Title: **Probiotics for the use in the development of cattle production in Kuwait**

Tahani Al- Surrayai, Kuwait Institute for Scientific Research, Kuwait

The secret weapon that allows Staphylococcus aureus to hijack your cell cycle

Nadejda Berkova
INRA, France

Statement of the Problem: Bacterial cyclomodulins are a growing family of microbial virulence factors that not only alter host cell cycle progression, but that also interfere with host cell activity, thus favoring the hijacking of host cell protective functions for their own benefit. *Staphylococcus aureus* (*S. aureus*), a highly versatile Gram-positive pathogen can cause life-threatening infections. The implication of *S. aureus* in the alteration of the eukaryotic cell cycle and the biological significance of such an alteration has not been fully investigated.

Aim: The purpose of the study is to explore the mechanism and to identify staphylococcal compounds that caused host cell cycle arrest and to evaluate the benefit provided by cyclomodulins to bacteria.

Methodology & Theoretical Orientation: Flow Cytometry analysis, size exclusion chromatography, mass spectroscopy analysis, Western blotting and immunofluorescence methods were used to identify staphylococcal cyclomodulins and characterize the mechanism.

Findings: We demonstrated that *S. aureus*-induced G2/M transition delay was associated with the accumulation of inactive cyclin-dependent kinase Cdk1, a key inducer of mitosis entry, and with the accumulation of unphosphorylated histone H3. Phenol-soluble modulin a (PSMa) peptides were found responsible for this effect. The use of *S. aureus* mutants confirmed the findings. We showed that the G2 phase was preferential for bacterial proliferation and found that PSMa-induced G2/M transition delay correlated with a decrease in the defensins genes expression. We demonstrated that additionally to secreted staphylococcal cyclomodulins the membrane-anchored lipoprotein-like proteins exert cyclomodulin activity.

Conclusion & Significance: Our findings demonstrate that an alteration of the eukaryotic cell cycle enhances an infective efficiency of bacterial pathogens, suggesting that such an alteration may be used by *S. aureus* for propagation within the host. Moreover, the correlation of PSMa-induced G2/M transition delay with a decrease in the defensins genes expression suggests a reduction of antibacterial functions of infected cells.

Biography

Nadejda Berkova has her expertise in host-pathogen interaction. Her research interest focuses on the molecular understanding of immunological pathways and analysis of gene expression in the context of immune deregulation of the organism. She investigates the mechanistic strategies of pathogens to subvert the host defense for their own benefit. Her team identified several staphylococcal cyclomodulins, the family of bacterial effectors that induce eukaryotic cell cycle alterations, and demonstrated the involvement of these bacterial compounds in the alteration of the host immune response. These findings are important for the development of new anti-infective and anti-inflammatory strategies.

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Understanding immunity to invasive Salmonella diseases to design new preventive measures

Pietro Mastroeni
University of Cambridge UK

Bacterial diseases are a grave threat for humankind causing approximately six million deaths per year. Invasive non-typhoidal *Salmonella* (iNTS) are a leading cause of lethal sepsis in young children and immune-compromised individuals, especially in developing countries with an estimated 3.8M illnesses and 680,000 deaths. Antimicrobial resistance is on the increase and no vaccines are currently licensed. iNTS disease has a pathogenesis that is both extracellular and intracellular, with systemic spread in multiple body tissues. iNTS are vulnerable to antibodies and complement that lyse the bacteria and/or target them to phagocytes, increasing the antimicrobial functions of host cells. Development and optimisation of preventive measures against iNTS, including vaccines, requires a clearer understanding of the correlates and mechanism of action of the protective immune response. Using multidisciplinary approaches that include novel gene-targeted animals and human *in vitro* systems, our work has identified phagocyte receptors, intracellular killing mechanisms and bacterial antigens that are involved in phagocyte- and antibody-mediated killing of iNTS. Using recombinant chimeric immunoglobulins, we have determined the relative potency of different IgG subclasses in human preclinical models, thus generating essential information on the requirements of the protective response. This work lays a foundation for the development of vaccines and antibodies in the prevention and therapy of septicaemic iNTS in immune-deficient individuals.

Biography

Dr.Mastroeni is a scientist with a medical background. His research is focused on the interplay between bacterial pathogenesis and the immune system as the foundation for vaccine development. His work has established many key requirements and mechanisms of protective immunity to bacterial infections and has identified and characterized bacterial virulence and/or immune-evasion genes as targets for live attenuated vaccine candidates. His group has pioneered innovative multidisciplinary approaches, which combine immunology, microscopy, molecularly tagged microbial subpopulations and mathematical modeling, to study bacterial infection dynamics in vivo. This has allowed to unravel the impact of immunity, vaccination and antibiotics on pathogen behaviour at the single cell level and to gather a global understanding of infection biology.

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Notes:

Mechanism that enhances the action of rifampicin on multi-resistant mycobacteria tuberculosis when it is administered in combination with an iodine-containing anti-infection drug

Gulnara A Yuldasheva, Bakhytzhan F Kerimzhanova, Marina B Lankina, Marat E Kulmanov and **Aleksandr I Ilin**
The Scientific Center for Anti-infective Drugs, Republic of Kazakhstan

A new iodine-containing anti-infection drug (AID) has been created possessing a broad spectrum of antimicrobial and antiviral effects at the Scientific Center for Anti-infectious Drugs (Republic Kazakhstan). Unlike other iodine-containing drugs, AID is used for oral administration. AID promotes an increase in the permeability of the cell membrane and bacterial wall and has membraneolytic capacity. *In vivo* and *in vitro* experiments AID was found to possess an anti-tuberculosis effect. In clinical isolates of mycobacteria isolated in clinical trials from patients suffering from multidrug-resistant pulmonary tuberculosis, *in vitro* as well as *in vivo* sensitivity of *Mycobacterium tuberculosis* to rifampicin, isoniazid, streptomycin, ethambutol was found restored and enhanced where AID acted together with antibiotics. The active center of AID is a complex of magnesium ion with lithium halide, molecular iodine and triiodide. Therefore, it can form a complex with rifampicin (Fig.1). When interacting with mycobacterium DNA, the nucleotides displace the peptides and form a complex with the molecular iodine and the lithium halide. In paper, the crystal structure core of DNA-dependent RNA polymerase (RNAP) complex with rifampicin was determined; it is shown that rifampicin inhibits the β-loop of RNAP at a distance of about 12.1 Å from the active center of RNAP. Distinguished are amino acid residues of RNAP, which form hydrogen bonds with rifampicin. In paper, it is shown that the resistance to rifampicin is caused by mutations in the DNA of *Mycobacterium tuberculosis* that lead to the replacement of amino acid residues in the RNAP β-loop region that interacts with rifampicin and, as a consequence, to the weakening of binding energy of amino acid residues with rifampicin. Using the molecular modeling method, we have shown that an increase in the action of rifampicin and the restoration of Mycobacterium tuberculosis's sensitivity to it when administered together with AID are due to the following two reasons: (1) the AID active center binds both the bacterial DNA and the active center of RNAP, (2) when amino acid residues of RNAP are inhibited by the rifampicin complex with the AID active center, the inhibitory energy is enhanced.

Biography

Gulnara A Yuldasheva received her Ph.D from Central Asian Department of National Academy of Sciences. She is now a Leading Research in Scientific Center for Anti-Infective Drug, Kazakhstan, Almaty. She is membership American Chemical Society She works to use quantum-chemical methods. She has an interest in a mechanism the inhibition of DNA HIV replication, mechanisms of anti-cancer action of complex iodine with lithium halogenides and bioorganic ligands and influence on mechanisms biochemical reaction. of iodine complex compounds. Her current research is focused to find of new compounds having anti-infection and anticancer activity.

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Notes:

A 35-year-old immuno-competent male with open pulmonary tuberculosis associated with extra-ordinary extensive extra-pulmonary tuberculosis

Liaqat Ali Chaudhry[1], **Ebtesam Ba Eissa**[1] and **Sidra Chaudhry**[2]
[1]King Salman Military Hospital, Saudi Arabia
[2]Shifa College of Medicine, Pakistan

Multifocal tuberculosis is characterized by the presence of large multifocal tuberculosis areas in the same or different adjacent or distant organs. Primary lesions are usually in the lungs in majority of the patients. Difficulty in confirming multifocal tuberculosis and consideration of other diseases may lead to a delay in diagnosis and thus in initiating treatment. Bone and joint involvement in tuberculosis is uncommon. While osteoarticular tuberculosis most commonly occurs in the vertebral column, less frequently affected sites are hip, knee, and sacroiliac joints. The following is a fascinating case of open pulmonary tuberculosis associated with extensive extra-pulmonary multifocal tuberculosis.

Biography

Liaqat Ali Chaudhry completed MBBS from King Edward Medical College university Lahore1981. He completed his post-graduation in Diploma in Tuberculosis & Chest Diseases -Punjab University Lahore-Pakistan, MCPS from College of Physicians and Surgeons Pakistan and MRCP, FRCP from The Royal College of Physicians Dublin-Ireland. He worked as house physician, Registrar, Assistant professor at King Edward Medical College Lahore, 1982-1987. Later he joined MOH of Saudi Arabia worked as Specialist Physicians chest specialist on Feb-1988, Consultant Pulmonologist and Chief of Tuberculosis Center, Dept. of Internal Medicine & Chest diseases Dammam medical complex and Honorary Associate & Professor Dammam Medical University, Eastern Province K. Saudi Arabia – 2011 and Chairman Internal Medicine & Consultant Invasive.

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Notes:

Probiotics for the use in the development of cattle production in Kuwait

Tahani Al-Surrayai
Kuwait Institute for Scientific Research, Kuwait

Dairy farms in Kuwait are facing extremely arid conditions that induce animal stress and tend to reduce energy reserves that weaken the immune system making the animal more susceptible to disease and increase animal mortality. To combat these diseases, farmers administer antibiotics to the cattle which are also used by humans. Overuse can lead to the bacteria developing resistance to these antibiotics. In addition, when dairy products from these antibiotic-ingested cattle are consumed by humans, the antibiotic residue enters their system causing them to develop resistance to those antibiotics. The main objectives of this research project were to isolate and evaluate probiotic lactic acid bacteria (LAB) during four seasons for utilization as an alternative to antibiotics in cattle production to control enteric pathogens, enhance productivity and improve food safety. The evaluation was covered by determination of antagonistic activity of LAB using in vitro tests and determining their tolerance to acidic pH, resistance to bile salts, resistance to antibiotics bacteriocin production, and aggregation and co-aggregations. The preliminary isolation process resulted in the isolation of 263 presumptive Lactobacilli, and among them, 80 were confirmed to belong to the lactic acid bacteria group by means of molecular tools (16S rRNA-Polymerase Chain Reactions (PCR)-sequencing). Ten representative strains were chosen and screened for their probiotic potential. During this study, active LAB strains were isolated such as *L. fermentum*, *L. rhamnousus* and *L. reuteri*. These strains can potentially inhibit the growth of some common pathogen (*S. enterica* and *E. coil*) and tolerate the acidic condition in the ruminant's digestive system, tolerate bile salt and have the ability to adhere to hydrocarbons. As a final result, a pool of 4 strains seemed to have the relevant probiotic potential to be further tested as agents able to reduce bacterial infections.

Biography

joined the Biotechnology Dept. at KISR in 1995 as a Research Assistant. During the past 22 years, she developed excellent technical skills and has actively participated in several important research projects in the area of Environmental Biotechnology. Her role in the many projects resulted successfully in the isolation, characterization and optimization of a large number of new microbial strains from the local environment. These strains have been used as an integral part of the developed sulfur amendment for enhancing soil fertility. Additionally, she leads a task in a study that focused on the screening and evaluation of PAHs degrading microorganisms for the local environment. Besides her depth of knowledge and skills in biochemistry and microbiology, she is involved in the development of probiotic bacteria for use in livestock and poultry. Accordingly, she has been leading two successful projects in probiotics fields for livestock.

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