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Infectious Diseases, Diagnostic Microbiology & Dermatologists Summit on Skin Infections

October 03-05, 2016 Vancouver, Canada

Posters

Marcia de Souza Carvalho Melhem et al., J Infect Dis Ther 2016, 4:7(Suppl)
http://dx.doi.org/10.4172/2332-0877.C1.018

Quality of water used for hemodialysis: Bacteriological and chemical parameters

Marcia de Souza Carvalho Melhem, Larissa Fadul, Rogerio Antonio de Oliveira, Juliana Possato Takahashi, Gislene Aparecida Palmeira, Silezia Doralice Pessoa, Israel Tadeu de Jesus Zanella, Maria Walderez Szeszs and **Marilena dos Anjos Martins**
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Nowadays the chronic kidney disease is considered a world public health problem. The occurrence of functional kidney failure is a growing issue and the treatment costs are tremendously high. The most applied treatment in chronic kidney disease involves substitute kidney therapy through hemodialysis, peritoneal dialysis and/or kidney transplant. The infections keep being an important cause of morbidity and mortality for patients with chronic kidney disease. The control of microbiological quality of the water for the dialysis services restricts to total coliforms, heterotrophic bacteria and endotoxins according to the Federal Brazilian regulation. The microbiological parameters in other countries are stricter with low established limits for heterotrophic bacteria and endotoxins concentration and some countries also include the *P. aeruginosa* and fungi analysis. This study evaluated the microbiological quality and physicochemical parameters of water supply and water distribution system for dialysis services located in São Paulo State, Brazil. Water samples used in 8 hemodialysis units mostly presented heterotrophic bacteria within the recommended limits; non-compliant samples were found, in the looping and reuse water, and to a lesser degree, those from public supply. We observed yeast opportunistic species of *Candida, Cryptococcus, Trichosporon* and *Rhodotorula*, potential agents that cause invasive infections in samples from distinct points of all hemodialysis units, indicating the risk of human contamination. We recommend the inclusion of some yeast genera as qualitative parameters of quality of water serving hemodialysis systems. The continuous monitoring of this serves as a relevant tool for control of fungal invasive infections in dialyzed patients.

Biography

Marcia de Souza Carvalho Melhem is a Pharmacist and has completed her MSc and PhD from Sao Paulo University in Public Health. She is a Scientific Researcher and Master's/Doctorate Advisor at Secretary of Health of the Government of Sao Paulo State. She has published about 60 papers in reputed journals and has been serving as Reviewer Member.

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Andrei Musaji et al., J Infect Dis Ther 2016, 4:7(Suppl)
http://dx.doi.org/10.4172/2332-0877.C1.018

Call volume and structure in a clinical microbiology laboratory as a tool for assessment of resident's role and competency

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Performing call duties is an integral practical component of a clinical microbiology residency training program. However, data regarding the clinical microbiology resident's call structure and volume is missing from published literature. This observational study was conducted in the setting of ProvLab, Alberta, Canada-a reference clinical microbiology laboratory serving one of the largest provincial tertiary hospital groups, which includes University of Alberta Hospital, Mazankowski Alberta Heart Institute and Stollery Children's Hospital. In this study, we analyzed volume and context of the medical microbiology resident's call during 4 separate call weeks through the period of spring to fall, 2015. Analysis of call volume revealed a total of 395 unique call events during this period. Mean call volume was 99 individual entries per each week of 7 days of call. Blood cultures, virology issues, anaerobic cultures and specimen receiving comprised our major areas of call. Surprisingly, specimen receiving represented a considerable part of the overall call volume, constituting the third most important area in the call structure after blood culture and virology call entries. These findings may serve as a guide for residency training programs when preparing trainees for call duties. Additionally, our data provide estimates of the number of call entries per major area of medical microbiology, thus creating a useful practical tool for competency assessment. Finally, our results allow real time assessment of laboratory utilization, as well as, practical use and distribution of human resources.

Biography

Andrei Musaji has completed his MD in 1999 from State Medical and Pharmaceutical University, Republic of Moldova. He has also obtained his PhD from Universite Catholique de Louvain, Belgium in 2004. After a number of Post-doctoral Fellowships at the University of Manitoba and at the University of Alberta, he joined Medical Microbiology Residency Training at the University of Alberta and is currently in his final year of Clinical Residency Training. His main interests are clinical virology and molecular microbiology.

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Maryam Shahbazi, J Infect Dis Ther 2016, 4:7(Suppl)
http://dx.doi.org/10.4172/2332-0877.C1.018

In silico design of a hexavalent protein, a potential candidate vaccine against *Staphylococcus aureus* biofilm-related infection

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Staphylococcus aureus possessing a pool of virulence factors is responsible for the significant and increasing number of hospital and community-acquired infections worldwide. Developing a potential vaccine to prevent these life-threatening and drug-resistant infections would have many advantageous impacts on global healthiness. In this study, considering the biofilm mode of growth and polymicrobial nature of *S. aureus* and *Candida albicans* co-infections, a multivalent protein vaccine was designed. In the first phase, the prediction of putative antigenic targets of *S. aureus* and *C. albicans* was conducted based on data mining and bioinformatic characterization of their proteins. Various properties of the proteins were evaluated such as subcellular localization, hydrophilicity, repeat containing modules, beta turns, surface accessibility and number of antigenic determinants. Eventually, 6 proteins AlS, ClfA, FtmB, SdrE, Spa and Bap were selected. The second phase included various immunoinformatics analyses on their sequences leading to design of a novel sub-unit hexavalent candidate vaccine. Several potential T cell and B cell epitopes are present in this synthetic construct and it is expected to strongly induce IFN-gamma production. In conclusion, the amino acid sequence introduced here is expected to enhance T cell-mediated and humoral responses against *S. aureus* biofilm-related infections to clear biofilm communities of *S. aureus* and intracellular colonies of pathogen as well as planktonic cells and thus reducing colonization and persistence.

Biography

Maryam Shahbazi has completed her PhD program in Bacteriology from Shiraz University in 2016 with the thesis entitled "Design and Synthesis of a Protein Candidate Vaccine against *S. aureus* Biofilm Related Infections". She is a Researcher and has published 6 articles in peer reviewed journals.

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Danial Khorsandi, J Infect Dis Ther 2016, 4:7(Suppl)
http://dx.doi.org/10.4172/2332-0877.C1.018

Personalized medicine: Regulation of genes in human skin ageing

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As people grow older, the common conditions and developments that happen by aging is skin changes. For example, over period of time the skin becomes drier and thin and other changes will start to occur such as appearing spots, decreasing elasticity, increasing stiffening and appearance of wrinkles on skin. There are many medical procedures which can be helpful to mitigate skin changing process. The most of the commercialized cosmetic products have been created for the majority of customer's population. For instance, the use of many anti-aging creams may or may not prevent or even treat the changes of skin. Therefore, the effect of these products can be different on each human body reaction. The causes of this difference can be related to many parameters such as environment, nutrition and etc. Therefore, the human genome book can be the best source of finding the most accurate solution. The appropriate type of cream for an individual's skin type can be verified and used accordingly. Global gene expression profiling (commonly called genomics) is an approach that can be used in the identification of compounds for inclusion in cosmetic formulations that improve the appearance of aged skin. In this study, the evaluations of all genes and their related antioxidants which lead to skin aging have been studied. The main goal is to match the appropriate medical procedure with the correct type of cream.

Biography

Danial Khorsandi is currently a Researcher at the Harvard-MIT's Division of Health Science and Technology (HST), Brigham and Women's Hospital and Harvard Medical School and has been working on Genomics, Biotechnology and Biomaterials for 4 years. He has worked at the Barcelona Skin Genomics company in Spain and Biomaterial innovation research center in Boston, USA.

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Ali Farrokhi, J Infect Dis Ther 2016, 4:7(Suppl)
http://dx.doi.org/10.4172/2332-0877.C1.018

Application of a Indoleamine 2, 3-dioxygenase (IDO) expressing allogenic dermal fibroblast populated within an acellular skin substitute as a biological wound coverage

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Acute and chronic wounds contribute to increased morbidity and mortality in affected people and impose significant financial burdens on healthcare systems. Despite of advantages of skin grafts, problems such as complications at the donor site, contracture, loss of elasticity, sensory impairment and undesirable cosmetic results including hypo- or hyper-pigmentation resulted in emerge of tissue- engineered alternatives. Among these, acellular dermal matrix (ADM) as an extracellular matrix-based biomaterial has significant mechanical strength with retained biological activity. Further, repopulating dermal fibroblasts into ADM before transplantation may help the graft to restore its function by synthesizing essential extracellular matrix components, growth factors and cytokines, which are important for wound healing. To prepare ready-to-use skin substitute harboring live fibroblasts, it is not feasible to use autologous dermal fibroblasts and using allogeneic fibroblasts can cause immunologic rejection. Although systemic immunosuppressive drugs are widely used for prevention of allorejection, their side effects are of main concern. Here, we hypothesized that application of indoleamine 2, 3-dioxygenase (IDO) expressing allogenic dermal fibroblast populated within an ADM is sufficient to create an immune-privileged area, within the wound, to protect from rejection while providing a rich source of nutrients and growth factors by fibroblasts, in addition to ADM which is serving as wound coverage. To test this hypothesis, adms were prepared using a new detergent–free method, recellularized with IDO-expressing or control fibroblasts, and were transplanted on splinted full thickness murine skin wounds. Investigating the wound healing process in these mice revealed that ADM significantly enhanced the wound healing process within three weeks. Application of IDO-expressing fibroblasts reduced infiltration of CD4+IL-17+TH-17 and CD4+IFN-G+TH-1 immune cells to the grafts. Further, local expression of IDO resulted in decreased allo- response and enhanced immune-tolerance toward allogenic fibroblasts.

The finding of this study shows a correlation between local expression of IDO by fibroblasts and improved wound healing in an experimental model of allogeneic skin substitute grafting. Further studies are on the way to investigate whether application of this pre-made non- rejectable biological skin substitute is a viable option for treatment of chronic wounds.

Biography

In September 2012, I started my PhD in Experimental Medicine Program under supervision of Dr. Aziz Ghahary. I attended the University of Ahwaz, Iran for my BSc. in Genetic and the University of Tehran, Iran for my MSc. in Cellular and Molecular Biology. My current research interest is the studying application of Acellular Dermal Matrix in skin wound healing. Because of my previous experience in the research area of stem cell, also I am interested in stem cell biology.

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October 03-05, 2016 Vancouver, Canada

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Ernesto Rojas Cabrera et al., J Infect Dis Ther 2016, 4:7(Suppl)
http://dx.doi.org/10.4172/2332-0877.C1.018

Combined treatment of mucocutaneous leishmaniasis after therapeutic failure: Case report

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Statement of the Problem: The mucocutaneous leishmaniasis in Bolivia is caused by *L. braziliensis*. The clinical manifestations of disease are lesions in mucosal membranes of oropharynx, larynx and nose. The first election drugs for treatment of this type of leishmaniasis are the pentavalent antimony compounds although with variable efficacy. The absence of effect of antimony compounds promotes the use of other drugs as second election. Nevertheless, in all cases there is the possibility of failure of therapy.

Methodology: A combined treatment of antimony, miltefosine and itraconazole together with zinc as nutritional supplement in one patient with the antecedent of therapeutic failure to different therapies was used.

Findings: It was achieved the remission of disease at end of therapy as result of simultaneous lytic action of drugs used and also to the restoration of immune response of patient by zinc.

Conclusion & Significance: There was no relapse in patient after five years of intervention and he was considered clinically cured.

Biography

Ernesto Rojas Cabrera has expertise in Tropical Medicine. His work is focused mainly on American leishmaniasis.

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Accepted Abstracts

J Infect Dis Ther 2016, 4:7(Suppl)
http://dx.doi.org/10.4172/2332-0877.C1.018

Screening of laboratory workers for latent TB using interferon gamma assay

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Background: Latent tuberculosis infection is asymptomatic and untransmissible disease. According to the World Health Organization (WHO) Global Surveillance and Monitoring Project, in 2014 estimated incidence of TB is 181 per 100 000, with 40% of the population infected with TB in Pakistan and approximately one-third of the population is infected worldwide. Laboratory workers dealing with tan samples or TB patients are always at risk to get TB. In this study, we have investigated prevalence of latent TB in health care providers who are at risk to get TB to the cases of infectious tuberculosis using QuantiFERON assay.

Objective: To screen the lab workers at risk to occupational exposure for latent TB using QuantiFERON Assay.

Methodology: 3 ml of whole blood were collected into 3 specific QFT tubes (NIL, TB, Mitogen) from 60 lab personals including phlebotomists, medical technologist, doctors and faculty members working closely with TB samples or patients. Samples were performed for detection interferon specifically released against TB according to the manufacturer QuantiFERON TB Gold protocol.

Result: Out of 60 samples, 12 samples were found positive, 1 sample showed indeterminate result and 47 were found negative. Out of 12 positive samples 10 were from medical technologists working closely since long time with TB samples or TB patients, and 2 were from phlebotomists collecting samples from patients.

Conclusion: Health care providers usually work with TB infected samples with minimal infection control measures. This study shows the need for effective latent TB infection control measures and emphasizes on the importance to improve over all biosafety precautions during dealing with the TB patients or samples. The study also provides recommendations for routine and regular screening and checkup of the lab workers working with TB to ensure their safety rather safety of all as no one is safe until everyone is safe.

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J Infect Dis Ther 2016, 4:7(Suppl)
http://dx.doi.org/10.4172/2332-0877.C1.018

Validation of the Cepheid GeneXpert for detecting Ebola virus in semen and cervicovaginal fluid

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Background & Aim: After the period of sustained Ebola virus transmission during the 2013-2016 epidemic, sporadic clusters of Ebola virus, linked to the persistence of virus in body fluids of Ebola survivors, were reported in West Africa. The persistence of Ebola virus (EBOV) in body fluids other than blood, including semen, and the documentation of at least one case of sexual transmission led the World Health Organization (WHO) to recommend that men who have survived Ebola virus disease (EVD) refrain from unprotected sexual intercourse for at least 12 months, following recovery or until their semen is confirmed to be EBOV-free. However, there is no fully validated assay for EBOV detection in fluids other than blood. Given the public health implications of viral persistence in the semen of male survivors we have validated the detection of EBOV RNA in semen using the Cepheid Xpert Ebola Assay.

Methods: Whole semen samples were obtained from uninfected donors and spiked with inactivated EBOV virus to generate a series of samples containing 100-100,000 copies/mL of EBOV. Each 100 uL sample was lysed in the 2.5 mL lysis buffer provided in the test kit, incubated for 10 minutes, and then treated with dithiothreitol (DTT) followed by another 10-minute incubation. One positive control (containing both GP and NP targets) and one negative control (human serum) from the SeraCare Control Bundle was tested each day that testing occurred. All samples were tested using the Cepheid Xpert Ebola Assay on the GeneXpert Dx System.

Findings: The Cepheid Xpert Ebola assay had a limit of detection of 1000 copies/mL in semen and 275 copies per mL in blood. Limits of detection increased with longer intervals between collection and testing. However, acceptable results were obtained up to 72 hours after specimen collection. Un-spiked blood and semen donor samples (n=40 and 50, respectively) were all undetected. All positive and negative controls were valid, and there were zero false positives (negative controls with positive results) and zero false negatives (positive controls with negative results) for either instrument.

Interpretation: Similar to its performance characteristics in blood, the Cepheid Xpert Ebola assay on the GeneXpert Dx System is accurate and precise for detecting EBOV in whole semen. Testing of these fluids conducted within 72 hours of specimen collection was acceptable for all samples down to the limit of detection, but specimen-specific extraction controls are necessary. A validated assay for EBOV RNA detection in semen informs the care of male survivors of Ebola, as well as recommendations for public health.

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J Infect Dis Ther 2016, 4:7(Suppl)
http://dx.doi.org/10.4172/2332-0877.C1.018

Direct application of loop mediated isothermal amplification assay for detection of *Mycoplasma bovis* in mastitic milk

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Mycoplasma mastitis is always difficult to control due to lack of rapid and accurate diagnostic tool. The diagnostic methods available are mostly time consuming due to laborious culturing requirement, expensive, non-specific and less sensitive like biochemical tests and conventional PCR assay. A loop mediated isothermal amplification (LAMP) assay was developed for detection of *Mycoplasma bovis* (*M. bovis*) directly from clinical mastitic milk samples. The LAMP assay was developed and validated on clinical samples obtained from *M. bovis* and other mastitis-causing pathogens detected by MALDI-TOF. 3 different sets of primers were used targeting different gene regions of *M. bovis*. The genes selected were UvrC, 16S rRNA and GyrB region. LAMP conditions were optimized for each of these and the efficiency, sensitivity and specificity of these LAMP primers were evaluated and compared. The result of 16S rRNA primers was more sensitive while GyrB primers were more specific. To confirm the specificity of the developed assay, other bacterial strains used were *Mycoplasma agalactiae, Escherichia coli, Staphylococcus aureus, Streptococcus agalactiae, Streptococcus dysgalactiae* and *Streptococcus uberis*. No cross reactivity was observed in all of the primer sets. Results were also compared to conventional PCR assay with primers chosen from the same genes and confirmed by sequencing. For the evaluation of LAMP assay sensitivity, culture-positive milk samples were subjected to the assay. LAMP assay detected *M. bovis* in some of those milk samples which were PCR negative. In the present study we have developed, validated and evaluated LAMP assay for detection of *M. bovis* from mastitis milk samples. The assay is authentic, rapid and sensitive.

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Novel T-cell assays for the discrimination of active and latent tuberculosis infection: The diagnostic value of PPE family

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The diagnosis of active and latent tuberculosis remains a challenge. Although a new approach based on detecting *Mycobacterium tuberculosis*-specific T-cells has been introduced, it cannot distinguish between latent infection and active disease. The aim of this study was to evaluate the diagnostic potential of interleukin-2 (IL-2) as biomarker after specific antigen stimulation with PE35 and PPE68 for the discrimination of active and latent tuberculosis infection (LTBI). The production of IL-2 was measured in the antigen-stimulated whole-blood supernatants following stimulation with recombinant PE35 and PPE68. The discrimination performance (assessed by the area under ROC curve) for IL-2 following stimulation with recombinant PE35 and PPE68 between LTBI and patients with active TB were 0.837 [95% confidence interval (CI) 0.72-0.97] for LTBI diagnosis and 0.75 (95% CI 0.63-0.89) for active TB diagnosis, respectively. Applying the 6.4 pg/mL cut-off for IL-2 induced by PE35 in the present study population resulted in sensitivity of 78%, specificity of 83%, PPV of 83% and NPV of 78% for the discrimination of active TB and LTBI. In addition, a sensitivity of 81%, specificity of 71%, PPV of 68 and 83% of NPV was reported based on the 4.4 pg/mL cut-off for IL-2 induced by PPE68. This study confirms IL-2 induced by PE35 and PPE68 as a sensitive and specific biomarker and highlights IL-2 as new promising adjunct markers for discriminating of LTBI and active TB disease.

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J Infect Dis Ther 2016, 4:7(Suppl)
http://dx.doi.org/10.4172/2332-0877.C1.018

Prevalence of hepatitis C virus genotype 3 at Civil Hospital, Karachi, Pakistan

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Aim: This study was designed to find out the frequency of various HCV genotypes present in patients with liver disorders in Karachi, Pakistan.

Materials & Methods: All patients including, injectable drug users (IDUs), recycled syringe users, those who have undergone invasive procedures for different ailments, visiting hepatitis clinic at Civil Hospital Karachi, Pakistan, who were positive for hepatitis C virus by PCR, were screened for the genotyping of hepatitis C virus. Blood samples were collected from the patients in yellow top vacutainers and allowed to clot, then centrifuged and serum was separated and saved at -400C till further testing. RNA extraction was done with Promega Kit and HCV genotyping was done on m2000 rt Abbott, using HCV genotyping Amplification Kit.

Results: In order to know the prevalence of hepatitis C virus genotype in our community, we determined HCV genotype for 951 patients, who were positive for HCV RNA, by PCR. It was observed that the most prevalent HCV genotype was "3" detected in 713 (75%) patients, followed by 1a in 63 (6.6%) cases. Genotype 3 affecting all age groups was observed. Females were affected by genotype 3 than males.

Conclusions: High prevalence of HCV genotype 3 strain among IDUs due to use of recycled syringes and unsafe blood transfusion is a cause of concern for public health professionals in Pakistan; however timely diagnosis may reduce the chances of serious complications due to comparatively effective therapeutic response to available antiviral treatment. Our observations call for developing effective control of factors contributing to high incidence of disease.

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Oligonucleotides library production for isolation of aptamers to detect *E. coli* O157:H7

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Diarrhea can cause major child mortality in developing countries. E. coli O157:H7 is one of the most important serotypes of enterohemorrhagic *Escherichia coli* (EHEC) that can cause diarrhea. It is transmitted to humans through food, and creates complications such as uremic hemorrhagic colitis. Currently, the standard method for the detection of *E. coli* O157:H7 is culture and detection by serology. Recognition by these methods takes more than 36 hours. Thus, access to a test that could detect E. coli O157:H7 in less time is valuable. The aptamers are the oligonucleotides and short single-stranded DNA or RNA or specific proteins that have the ability to specifically bind to target. In this regard, aptamer is used, capable of binding tightly and specifically to target with complex multimeric structures. In this study, a DNA aptamer that can detect *E. coli* O157:H7 from other similar species was constructed by Cell-SELEX (Systematic Evolution of Ligands by Exponential Enrichment). A library of DNA aptamer was made. Streptavidin coated magnetic beads were used to select specific aptamer. Selected aptamers were amplified by PCR, in each step, then cloned and sequenced. A 117 bp aptamer was selected by six rounds of SELEX method. The aptamer specific binding to *E. coli* O157:H7 was also calculated by flow cytometry. Using the new aptamer specific molecular probes may be quick and easy to diagnose clinically used E. coli O157:H7 bacterial infection. On the other hand, the present method is simple and cost effective for specific bacterial detection.

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J Infect Dis Ther 2016, 4:7(Suppl)
http://dx.doi.org/10.4172/2332-0877.C1.018

A novel approach to antibiotics and antifungals: Testing the effectiveness of *Azadirachta indica* extracts

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Azadirachta indica (neem) extracts have proven themselves to be a promising tool because they are natural and don't cause the harmful side effects of most artificial substances. Preliminary research has shown that certain natural substances can be used without the fear of a new resistant strain developing. Current treatments are plagued by artificial substances that can have harmful side effects to the body and may not be effective for multiple uses. Thus, this project aims to determine the effectiveness of natural substances as antibacterial and antifungal. Early research suggested that the neem oil would be the most effective extract because it would envelop the bacteria and fungi. Cultures of bacteria, specifically *Staphylococcus epidermidis* and *Serratia marcescens*, and cultures of fungi, specifically *Aspergillus niger* and *Saccharomyces cerevisiae,* were cultured and placed in separate plates. Zones of inhibitions were created using neem leaf extract, neem soap, neem oil, a water control and antibacterial soap control disks. The diameters of the zones where growth has stopped were compared using statistical significance tests to see if any of the natural extracts were more effective than the controls. The zones that were significantly different from the controls' zones were compared amongst each other to see if one extract was more effective than the other. This analysis has shown that the natural substances are extremely effective and significantly stronger than antibiotic and antifungal substances and the artificial substances in the soap. The remainder of the plate was then considered to be the pool of potential resistant strands. Thus repetitions were completed with each of the treatments. Since the growth was still inhibited without resistance, it became apparent that the neem extracts could have many practical purposes in treatments of infections. Given that only a few trials were completed, the experiment would have to be completed with more trials to prove the consistent effectiveness.

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A novel small-molecule compound disrupts influenza A virus PB2 cap-binding and inhibits viral replication

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Objectives: The conserved residues 318-483 in the PB2 subunit of influenza A polymerase is an independently folded cap-binding domain (PB2cap) that exhibits a distinct binding mode from other host cap-binding proteins, which suggests that PB2cap might be an ideal drug target. This study aimed to identify a new class of anti-influenza inhibitors that specifically disrupts the interaction between PB2cap and host cap structures.

Methods: An innovative fluorescence polarization assay was established for primary screening, followed by cap-binding inhibitory activity, antiviral efficacy and cytotoxicity evaluations of the selected compounds. The best compound was characterized by multi-cycle virus growth assay, cross-protection test, synergism evaluation, mini-replicon assay, binding affinity analysis, docking simulation and mouse study.

Results: Several PB2 cap-binding inhibitors were discovered. The compound 7-(4-hydroxy-2-oxo-2H-chromen-3-yl)-6H,7H,8H-chromeno[3',4':5,6]pyrano[3,2-c]chromene-6,8-dione, designated PB2-39, was identified as a potent inhibitor of replication of multiple subtypes of influenza A virus, including H1N1, H3N2, H5N1, H7N7, H7N9 and H9N2 *in vitro* and H1N1, H5N1 and H7N9 in vivo. Combinational treatment with the influenza virus release inhibitor zanamivir and PB2-39 exerted a synergistic anti-influenza effect. Mechanistic experiments supported that PB2-39 suppressed viral polymerase activity. Docking and binding affinity analyses demonstrated that PB2-39 interacted with the PB2 cap-binding pocket, suggesting its role as a cap-binding competitor.

Conclusions: Our study provides new insights for the strategic development of novel cap-binding inhibitors of influenza A viruses.

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J Infect Dis Ther 2016, 4:7(Suppl)
http://dx.doi.org/10.4172/2332-0877.C1.018

Public health intervention to address the burden of dermatological complications of diabetes-related foot disorder in community-dwellers living in rural Ecuador

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Diabetes-related foot disorders (DRFD) are among the most feared complications of diabetes mellitus. Foot and ankle ulcerations are the most common causes of non-traumatic amputations in the world. As the majority of these amputations are preventable, efforts should be directed to early detection of individuals at risk, particularly in underserved populations where people are often uninformed of the tremendous risks posed by ulcerative lesions in the feet and ankles. A population-based cohort study to assess the burden of DRFD dermatological sequale was conducted in Atahualpa, a rural Ecuadorian village, by identifying residents aged ≥40 years with diabetes mellitus using ankle brachial index to determine presence of peripheral arterial disease, foot examination to assess skin changes, dry skin, ulcerations, fissures and the Michigan Neuropathy Screening Instrument to estimate peripheral neuropathy. Ulcers of the foot/ankle and amputations (always preceded by ulcers) were noticed in 7% of participants and 60% of individuals without ulcers or amputations were at moderate to high risk of developing active diabetic foot disease. These ulcers had been previously recognized and treated in less than 20% of patients. Public health strategies directed to reduce the incidence of catastrophic consequences such as lower limb amputations, are urgently needed to improve the quality of life of millions of persons with diabetes mellitus living in these underserved populations. As a result, weekly community health workshops have been implemented in Atahualpa to educate the high-risk population about the prevention, recognition and care for dermatological manifestations of DRFD to prevent amputation.

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A systematic review of systemic medications for the treatment of melasma

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Background & Aim: Melasma is a common disorder of pigmentation affecting people with darker skin types, most commonly Fitzpatrick skin types III-IV. Despite the large variety of treatment options available including solar exposure prevention, topical lightening agents, chemical peels, light-based and laser therapies, none have shown effective and sustained results, making melasma a challenging and difficult-to-treat condition. Recently, there has been increasing interest in systemic medications in the treatment of melasma. This systematic review evaluates the current state of evidence of these systemic medications in terms of efficacy and safety/tolerability in the treatment of melasma.

Methods: Multiple databases were systematically searched for randomized clinical trials (RCTs) evaluating the use of systemic medications for the treatment of melasma. A study was excluded if it did not satisfy RCT requirements, did not include melasma patients, did not report melasma specific outcome measures or consisted of fewer than 10 subjects.

Results: Initial search yielded 629 papers evaluating a variety of treatments for melasma.After the application of inclusion and exclusion criteria, a total of 8 studies met eligibility criteria. Systemic medications evaluated include tranexamic acid (TA), *Polypodium leucotomos* extract (PLE), beta-carotenoid, melatonin and procyanidin. These agents have a generally beneficial effect with a minimal number and severity of adverse effects.

Conclusion: Oral medications have been shown to be efficacious, safe and well-tolerated in the treatment of melasma. We recommend that dermatologists introduce systematic medications to their armamentarium for the treatment of melasma.

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J Infect Dis Ther 2016, 4:7(Suppl)
http://dx.doi.org/10.4172/2332-0877.C1.018

System biology approaches in atopic dermatistis

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Atopic dermatitis field is undergoing a translational revolution lately with active development of novel topical and systemic therapeutics. In psoriasis a system biology approach was instrumental in defining biomarkers of disease and therapeutic response as well as predictors of successful response to treatment. We have lately defined a unified atopic dermatitis phenotype using a meta-analysis approach that highlighted key features and biomarkers of atopic dermatitis. This meta-analysis derived transcriptome (MADAD) identified wide lipid abnormalities and for the first time *in vivo*, correlated Th2 immune activation with down-regulation of key epidermal lipids, emphasizing the role of cytokines on the barrier disruption in AD. MADAD is now applied to evaluate changes with different investigational treatments, allowing us to evaluate drug effect at the transcriptomic level not only on the AD phenotype but also the effect on suppressing specific pathways. Since many aspects of atopic dermatitis are constantly evaluated in various mouse models, we also seek to see how well the commonly used mouse models of atopic dermatitis compare with the human MADAD AD phenotype at the transcriptomic level and which mouse model if any captures the hallmark pathways of AD better.

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Evaluating serum levels of hypersensitive C-reactive protein in patients with vitiligo

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CRP is an acute phase protein secreted in the blood stream by the liver in response to inflammatory cytokines such as IL6 and several other systemic inflammation biomarkers. Since inflammatory and immune factors have a key role in the pathogenesis of vitiligo, we aimed to assess the relationship between the serum level of hs-CRP (as a marker for systemic inflammation) and the pathogenesis of vitiligo. In this case-control study, we enrolled patients with vitiligo who had referred to our Dermatology Department. The patients were divided into two groups: Those with type A vitiligo (generalized, n=30) and those with type B vitiligo (segmental, n=30). Moreover, 30 people who had the inclusion criteria and did not have vitiligo were selected among those referring to the clinic as the control group and matched with the other two groups. The serum hs-CRP levels were checked for all the patients in the three groups and compared. The serum level of hs-CRP was 4.76±1.31 mg/l in patients with type A vitiligo, 3.71±1.03 in those with type B vitiligo and 3.01±1.08 in those in the control group. The mean serum hs-CRP level was significantly higher in patients with type A compared with those with type B and the control group ($P<0.001$). However, in patients with type B and the control groups, no significant difference was seen in this regard ($P=0.053$). We found an association between hs-CRP and generalized vitiligo. This association could imply that hs-CRP could intensify the severity of vitiligo.

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J Infect Dis Ther 2016, 4:7(Suppl)
http://dx.doi.org/10.4172/2332-0877.C1.018

Comparing the effects of microsecond pulse duration light system and millisecond pulse duration light system in treatment of facial erythematotelangiectatic rosacea

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Background: Rosacea is a common disease. Persistent centrofacial erythema and telangiectases are common features of erythematotelangiectatic rosacea.

Objective: We aimed to compare the effects of microsecond pulse duration light system and millisecond pulse duration light system in treatment of facial erythematotelangiectatic rosacea. To our knowledge, there was no previous study using intense pulse light (IPL) with microsecond pulse duration for treatment of erythematotelangiectatic rosacea.

Methods: This was a split-face, double-blind, randomized & controlled trial. Each patient received four treatment sessions at one month intervals with microsecond for one side and millisecond pulse duration light system for the other side of his/her face. Duration of erythema, pain scores and patients and dermatologists opinion about improvement of lesions were recorded and the face was photographed.

Results: Ten patients (eight women and two men) with skin phototypes III to V were enrolled; one woman was excluded because of prolonged depigmentation; the data of the nine participants who completed the study were analyzed. Duration of facial erythema using millisecond IPL was significantly longer than microsecond IPL and there was no statistically significant difference in mean improvement grade and pain scores between the two devices. Post-inflammatory hyperpigmentation was detected in one case with skin phototype IV after the second session with millisecond IPL, which resolved five weeks later. No serious adverse events were observed.

Conclusion: Erythematotelangiectatic rosacea is safely and effectively treated with microsecond and millisecond IPL systems. Erythema occurring after using microsecond device may persist shorter than that of millisecond one. Except duration of erythema, no other difference was observed between devices. Further studies are recommended to demonstrate the benefits of IPL with microsecond pulse duration in the treatment of facial telangiectases and other vascular lesions.

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Chestnut honey and sherbet enhance the healing of burn skin wounds in rat model

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Honey has been used throughout the history both as a food and a therapeutic product due to its nutritional value and biological activity (bioactivity) potential. The honeys with high bioactivity are provided to the use of complementary medicine practitioners in developed countries such as USA, UK, Japan, Australia, New Zealand and major EU countries. Wound care in the modern medicine is achieved by using adsorbents, impregnated dressings, foams, hydrogels and hydrocolloids. However, the major problem in wound treatment is the growth of antibiotic-resistant bacteria in the wound area. Meanwhile, honey stands out as the most commonly used agent for wound treatment within the field of traditional and complementary medicine. Both osmotic and high acidity properties of honey, as well as the organic compounds within the nectar sources of honey exert an accelerator effect in the sterilization and healing of the wound. The aim of this study is to examine the healing potential of high bioactivity chestnut honey on the topical burn wounds compared to the control groups in rat model. In this study, rats were induced with burn wounds and divided into 4 groups for treatment, which are saline dressing, honey dressing, Ag sulfadiazine and honey dressing+sherbet. Microscopic analysis of the wound healing was performed through monitoring the skin epithelialization, granulation, neovascularization, inflammation and fibroblast maturation using the immunohistochemical methods. The group treated with honey dressing+sherbet showed the most rapid and effective healing of the burn wound. Based on the findings of this study, the chestnut honey with high bioactivity can be used in clinical trials on burn wounds as a complementary approach to the conventional treatment methods in the future studies.

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J Infect Dis Ther 2016, 4:7(Suppl)
http://dx.doi.org/10.4172/2332-0877.C1.018

Skin alterations: Prolonged use of steroids by dermoscopy

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Objectives: The aims of this study were to investigate if the skin alterations after prolonged use of steroids are highlighted by dermoscopy.

Methods: Patients with variable facial lesions included as (SIFD) after prolonged use of topical steroids more than nine months minimum twice weekly were examined clinically and by Dermoscopy.

Results: All patients showed telangiectasias (100%) and dermoscopy revealed linear, tortuous and polygonal vessels.72% of the patients had dermoscopic features for *Demodex folliculorum*-follicular plugs and *Demodex* tails. All the 29% patients with clinical spinulosus had *Demodex* dermoscopic features.76% of the patients had clinically visible pustules but by dermoscopy the tiny infraclinical pustules could be seen better and earlier. 77% of the patients had visible erythema on the face and by dermoscopy all they had red diffuse areas. The white hairs derived from hypertrichosis were observed at 13% with the naked eye and at 43% by dermoscopy. The atrophy was clinically visible at 12% patients as a severe skin thinning but dermoscopy revealed also atrophic areas at another 2 patients as white structure less areas or patches between vessels. The patients with dermoscopic atrophy were using mometasonefuroat and clobetasol propionate.

Conclusions: The dermoscopic particularity of steroid induced rosacea is the association of white intervascular structure less patches or areas as a sign of the atrophy and also the early detection of hypertrichosis.

Limitations: The small number of the patients may not accurately reflect the percent of dermoscopic findings.

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The *in vitro* effect of methanolic extract to the leaf of *Aloe otallensis* exudates on the *Leishmania ethiopica* and *Leishmania donovani* parasite

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Background & Objectives: Several plant products have been tested and found to possess antileishmanial activity. The present study was undertaken to evaluate antileishmanial activity of methanolic extract of *Aloe otallensis*, which is endemic plant to Ethiopia, on the promastigot stage of *Leishmania aethiopica* and *Leishmania donovani* comparing to standard drugs and also tried to screen its phytochemical constituent.

Methods: Phytochemical screening was done on methanolic extract of the exudates to the leaf of *Aloe otallensis*. The serial dilution of the extract was also evaluated for in vitro antileishmanial activity against *Leishmania aethiopica* and *Leishmania donavani* on the strain of *L. aethiopica* (LDC/134) and *L. donovani* (AM 563), which is found from the black lion hospital parasitology unit and the result was compared to standard drug of Sodium stibogluconate, milfostin and paramomycin.

Result: The extract has an antileishmaniacidal activity with an IC50 of 141 µg per ml on L. ethiopica (LDC/134) and 123 µg per ml on *L. donovani* (AM 563). The experimental data shows that relatively it has better activity than paramomycin and milfostin but less activity than sodium stibogluconate, which is given in Ethiopia as a first line drug. The data analyses was done by pad graph prison version 5 software after it was read by ELISA redder at the wave length of 650 nm. The phytochemical screening of the exudates of *Aloe otallensis* showed the presence of phenol, alkaloid and saponin.

Conclusion: The methanolic extract of exudates of *Aloe otallensis* has a good antileishmanisis activity relatively to paramomycin and milfostin and this activity may be attributed to phenol, alkaloid and saponin present in the plant. But it needs further analysis for the conformation of which constituent present in much concentration and to know which one have highest role.

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