Joint Event on

International Conference on

CELL AND GENE THERAPY

&

World Congress on

CLINICAL AND MEDICAL MICROBIOLOGY

September 10-11, 2018 | Dublin, Ireland

DAY 1

Keynote Forum

Vipin K Rastogi, Biomed Res 2018, Volume 29 | DOI: 10.4066/biomedicalresearch-C3-006

Vipin K Rastogi

US Army – Edgewood Chemical Biological Center, USA

Biography

Vipin K Rastogi is a Senior Research Biologist with Research and Technology Directorate at US Army - Edgewood Chemical Biological Center, at Aberdeen Proving Grounds, Maryland, USA. He has been conducting R&D for over 23 years in Chemical-Biological Warfare Agents defense area, specifically their detection and decontamination. Before joining APG, he was Assistant Research Professor at Texas A&M University, College Park, Texas. He earned his BSc and MSc in Plant Sciences from Delhi University, India, and earned his PhD from McMaster University, Hamilton, Canada.

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CURRENT CHALLENGES TO BIOTERRORISM RESPONSE

Bioterrorism was reckoned to be a stark reality since mailing of *Bacillus anthracis* spores via USPS, right after 2001. Spores of *B anthracis*, cause anthrax disease in animals and humans, and the infectious dose varies from 1-10 to few thousands. In the event of a large-scale spore release, early detection and delineating the contaminated zones is a significant challenge. Further, rapid and effective cleanup of contaminated sites, including building interiors, is paramount to minimizing the consequence of BW release, and restoration of normalcy. For past 15 years, our lab has been focused on both early detection of bacterial pathogens and ricin toxin, and BW decontamination research. With respect to early BW detection, field detection using molecular approaches is compromised by false-negative and false-positive outcome. Further, use of hand-held assays (lateral flow tickets) must contend with high limit of detection (10,000-50,000). In the event of wide-area release, rapid sampling and sampling efficiency from diverse exterior (porous and non-porous) surfaces is a critical challenge. Some of our recent R&D and that of our collaborators at US EPA has evaluated effectiveness of both, liquid disinfectants and gaseous fumigants, on diverse range of surfaces. For example, peroxide-based approaches will be ineffective on concrete and free-chlorine-based approaches will be ineffective on wood like structures. Some of our recent work on development of a novel approach, DeconGel for BW decontamination will be presented. Based on our recent study, decontamination of vertical contaminated surfaces was found to be only partially effective, when liquid disinfectants were applied.

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Shirley O'Dea, Biomed Res 2018, Volume 29 | DOI: 10.4066/biomedicalresearch-C3-006

Shirley O'Dea
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Biography

Shirley O'Dea has co-founded Avectas Ltd., in 2012 and is the company's CSO. She is charged with overseeing scientific programs. Her basic research provides a strong pipeline of applications for Avectas technology. She has previously served as a Principal Investigator with Johnson and Johnson and has led a large academic group specializing in Lung Biology at National University of Ireland, Maynooth.

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IN VIVO ENGRAFTMENT OF T CELLS TRANSFECTED USING SOLUPORE® IS SUPERIOR COMPARED WITH ELECTROPORATION-BASED SYSTEMS

Solupore is a vector-free intracellular delivery platform that enables development and manufacture of cell therapies. Membrane disruption-based methods, such as Solupore®, that enable intracellular delivery of various cargo types for clinical applications have been proposed as attractive candidates as next-generation delivery modalities because of potential benefits for safety, regulation and production. Electroporation is the most widely used method currently, this includes electroporation-based methods such as nucleofection, however disadvantages include toxicity and proliferation stalling. Solupore® uses reversible permeabilization to achieve rapid intracellular delivery of cargos with varying compositions, properties and sizes. A permeabilizing delivery solution containing a low level of ethanol is used as the permeabilizing agent. The technology achieves intracellular delivery and subsequent reversal of cell permeabilization by precisely controlling the contact of the target cells with this solution. The process is rapid and cargo transfers directly into the cytoplasm by diffusion in an endocytic-independent manner. We have termed the method soluporation. Comparisons of the phenotype and functionality of primary human T cells following soluporation (Solupore®), nucleofection (4D-Nucleofector™) and electroporation (Neon®) are outlined in this work. The extent to which the transfection systems perturb T cells was investigated as well as the effects on cell functionality. The results presented demonstrate that the Solupore® technology does not perturb gene expression or cell surface markers in T cells. Furthermore, cell proliferation and *in vivo* engraftment is superior in soluporated cells compared with nucleofected cells. Thus, the Solupore technology is gentle yet highly reproducible, automated, and scalable and has the potential to enable a broad range of T cell engineering applications.

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Chonghe Jiang, Biomed Res 2018, Volume 29 | DOI: 10.4066/biomedicalresearch-C3-006

EARLY AND RAPID PREDICTION FOR POSTOPERATIVE INFECTIONS FOLLOWING PERCUTANEOUS NEPHROLITHOTOMY IN PATIENTS WITH COMPLEX KIDNEY

Chonghe Jiang
Qingyuan People's Hospital, China

Biography

Chonghe Jiang is the first Research Engineer of Linkoping University, Sweden. Currently, he is working in Qingyuan People's Hospital of Guangzhou Medical University, China as a Professor, Urologist and Director of Kidney Center. He is a major in research work on voiding dysfunctions, and clinical work on urinary tract stone and infections. All his publications are involved in neuron control of lower urinary tract and identifying and clarifying the bladder cooling reflex and applying neuro-modulatory technique in treatment of urinary incontinence by using electrical stimulation are main contributions in this area.

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Purpose: The purpose of the study is to obtain more accurate and rapid predictors for systemic inflammatory response syndrome (SIRS) after percutaneous nephrolithotomy (PCNL) in complex kidney stone patients and provide evidence for early prevention and treatment of postoperative infections.

Methods: A total of 802 complex kidney stone patients undergone PCNL from September 2016 to September 2017 were recruited in the study. Urine tests, urine cultures and stone cultures were performed, the perioperative data were prospectively recorded.

Results: 62 (7.7%) patients developed postoperative SIRS. A multivariate logistic regression analysis revealed that operating time ≥100 min, urine tests with both positive urine leukocyte and positive urine nitrite (UL+UN+), positive urine cultures (UC+) and positive stone cultures (SC+) were independent risk factors of SIRS. The incidence of postoperative SIRS was higher in UL+UN+ (28.7%) and both UC and SC were positive (UC+SC+; 28.8%) patients than that in any other patients ($p<0.05$). Preoperative UL+UN+ can be used to predict UC+SC+ with accuracy of more than 90%. The main pathogens in kidney stones were *Escherichia coli* (43.8%), *Proteus mirabilis* (14.0%), *Staphylococcus* (7.4%), while main pathogens in urine were *Escherichia coli* (53.8%), *Enterococcus* (9.4%) and *Proteus mirabilis* (7.6%). The occurrence of *Escherichia coli* was more frequent in group with SIRS than in group without SIRS ($p<0.05$).

Conclusions: UL+UN+ in preoperative urine tests could be considered as the early and rapid predictor for UC+SC+ and postoperative SIRS. SIRS following PCNL was more related to *Escherichia coli* infections in complex kidney stone patients.

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James Mahony, Biomed Res 2018, Volume 29 | DOI: 10.4066/biomedicalresearch-C3-006

James Mahony
McMaster University, Canada

Biography

James Mahony is currently working as a Professor Emeritus in Pathology and Molecular Medicine at University of Toronto, Canada. He is teaching within the faculty of health sciences includes medical microbiology/infectious diseases and pathology residency training programs, graduate course in clinical virology (MS763) and medical sciences. He completed his fellowship in Microbiology at American Academy of Microbiology as well as in Canadian College of Microbiology. He has decorated his carrier with several publication with local, international, industrial collaboration with Drs Mark Loeb, Jenny Johnstone, Marek Smieja, Peter Timms (Brisbane), Phil Hansbro (Newcastle, Australia), Lee Ann Campbell (Seattle), Theo Moraes (Toronto) and Luminex Molecular Diagnostics, Qiagen, Pro-L. The major focus area of his research is the pathophysiology of acute respiratory infections caused by specific viruses (influenza, RSV) and bacteria (Chlamydia pneumoniae, P aeruginosa and C difficile). One of the major focuses of his laboratory is the development of new antimicrobial agents for both respiratory viruses and bacteria. In addition to the development of novel therapeutics the other focus of his clinical research is in the areas of diagnostics.

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INTRANASAL VACCINATION WITH THE TYPE III SECRETION SYSTEM (T3SS) ANTIGEN BD584 REDUCES BOTH VAGINAL SHEDDING OF *CHLAMYDIA TRACHOMATIS* AND ASSOCIATED UPPER GENITAL TRACT PATHOLOGY

Chlamydia trachomatis infections are the most prevalent sexually transmitted bacterial infections in the world. The WHO has estimated that there are 131 million new cases every year and recently it has been shown that prior Chlamydia infection is associated with increased risk of ovarian cancer. With up to 90% of women and 50% of men having asymptomatic infections many infections go undiagnosed and untreated leading to complications in women including pelvic inflammatory disease (PID), tubal factor infertility and ectopic pregnancy. Public health programs, including screening, partner identification and treatment have failed to curb infection rates indicating the need for an effective vaccine. We have shown previously using a mouse challenge model that vaccination with the BD584 antigen protected mice against *C muridarum* and reduced both bacterial shedding in the vagina and upper genital tract (UGT) pathology. We have now extended these findings to investigate whether BD584 protects against *C trachomatis* infection. C57BL/6 mice were vaccinated intranasally with BD584 and CpG adjuvant (BD584/CpG) then challenged intravaginally with *C trachomatis*. BD584 vaccination elicited serum neutralizing antibody, vaginal antibody and cell-mediated immune responses consistent with a Th1 polarized immune response (INFγ, IL-17 and IgG2a/c:IgG1 antibody ratio). Vaccinated mice had reduced vaginal shedding and reduced UGT pathology (uterine horn dilation and hydrosalpinx) providing evidence that vaccination can protect against late sequelae following resolution of a *C trachomatis* infection. We will also present data on a novel delivery method for the BD584 vaccine involving genetically engineered bacteria. We are currently investigating the efficacy of the BD584 vaccine in a second animal model and if the vaccine is effective in the piglet model then these results would strengthen the rationale for the use of BD584 T3S proteins in a human vaccine and a phase I human trial.