2126th Conference

Microbiology Conference 2018

Proceedings of
7th Annual Summit on

Microbiology: Education, R&D and Market

September 28-29, 2018 | San Antonio, USA

Keynote Forum

Day 1

Rick Falkenberg, Clin Microbiol 2018, Volume: 7
DOI: 10.4172/2327-5073-C3-038

Rick Falkenberg

Nestle Nutrition Research and Development, USA

Evaluation of the airPHX advance oxidation system in controlling healthcare-associated infections on various surfaces

The effectiveness of reactive oxygen species (ROS) generating airPHX equipment for reducing bacterial populations of *Clostridium difficile*, Methicillin-Resistant *Staphylococcus aureus (mRSA)* and *Pseudomonas aeruginosa* on three (3) common contact surfaces; stainless steel (Austenitic 316), plastic (PVC) and linoleum (floor tile) were studied. Antimicrobial-resistant pathogens pose an ongoing and increasing challenge to hospitals because they cause healthcare–associated infections (HAIs) during clinical treatment of patients.

Biography

Rick Falkenberg has completed his PhD from University California San Diego. Senior Principal Scientist at Nestle Nutrition R&D in Fremont Michigan USA. His expertise is diverse with food microbiology, pasteurization/sterilization process validation, the ability to conduct TDT, Temperature Distribution, Heat Penetration testing, electronic controls, record keeping, and process bio-validation for various products including low moisture foods. He has published several papers in reputed journals and has been serving as an editorial board member of repute. He has seven (7) patents, multiple awards, Fellow of the Royal Society of Health (1992), ΦΤΣ - Phi Tau Sigma, The Honour Society of Food Science and Technology (2017).

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Maria King, Clin Microbiol 2018, Volume: 7
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Maria King
A&M University, USA

Dynamic monitoring and air flow model-based tracking of aerosolized bacteria in meat facilities

Statement of the Problem: *Salmonella* and STEC have been recognized as pathogens of concern in meats due to the prevalence of these microorganisms in the gastrointestinal tract and hide of livestock. Bacterial ingestion due to contaminated food products causes a great economic burden from the hospitalization and death of those who become infected. During the harvesting process, these pathogens may become aerosolized from the carcass by various mechanisms, including worker activity and airflow from heating, ventilation, and cooling (HVAC) systems. Of greatest concern in the meat industry is the possibility of generating bioaerosols containing bacterial pathogens. To identify sources of contamination efficient samplers are needed, however, most collectors are not capable of sampling large air volumes.

Methodology & Theoretical Orientation: Four beef harvesting establishments in Texas were sampled during the spring, summer and fall seasons. At each establishment, two wetted wall cyclone (WWC) bioaerosol collectors were continuously sampling air for one day at the deciding area and in the fabrication room with a flow rate of 100 liters per minute. Two dynamic samplers were moved along the processing line. The samples were analyzed by microbial plating, whole-cell qPCR, and microbiome sequencing. The ventilation systems were modeled using a computational design based on the mechanical blueprints.

Findings: The concentration of airborne *Salmonella* and STEC has elevated during the summer months. The computational airflow models that were created based on the facility's layout and ventilation design validated with the collected bioaerosol concentrations enabled the visualization of the pathogen movement in meat processing facilities and optimization of the air flow for improved sanitation.

Conclusion & Significance: Based on the airflow pattern models and bioaerosol movement the most optimal air intake/exhaust design can be selected that result in the highest sanitation (i.e. the least amount of pathogens) in the air flow.

Biography

Maria King is an expert in the dynamic spatial and temporal collection and characterization of aerosolized bio- and nanoparticles and monitoring their fate in the environment by creating ventilation based airflow pattern models. Her current research is focusing on using the wetted wall cyclone bioaerosol collector systems developed in her laboratory to sample bioaerosols in large air volumes from a variety of environments, including poultry units and meat processing facilities, and track their movement by ventilation based computational air flow modeling. Plating and microbiome analysis resulted in numerous samples that are positive for *Salmonella* and Shiga toxin producing *E. coli*. Displacement ventilation solutions resulted in optimized sanitation in the facilities.

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Day 2

Xhavit Zogaj, Clin Microbiol 2018, Volume: 7
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Xhavit Zogaj
University of Texas at San Antonio, USA

Construction of a live vaccine strain against Tularemia

Francisella tularensis subsp. *tularensis* (Ftt) is a highly virulent bacterium that causes the disease tularemia. Fewer than 10 bacteria are sufficient to cause a fatal infection when the bacteria are inhaled into the lung, therefore Ftt has been classified as a category A biothreat agent. *F. novicida* (Fn) is a closely-related species that is avirulent in healthy humans but causes a fatal disease in mice. We are developing Fn as a live vaccine strain to protect against Ftt infection. We have already shown that Fn with a mutation in *iglD*, the T6SS gene required for phagosome escape and intramacrophage replication (Fn-*iglD*), protects vaccinated animals against pulmonary challenge with Ftt using two different animal models, the Fischer 344 rat, and the cynomolgus macaque. To enhance the efficacy of Fn-*iglD*, we have engineered it to express the LPS O-antigen from Ftt (OAg^{FTT}). The Fn-*iglD* strain expressing OAg^{FTT}, KKF768, induces antibodies against OAg^{FTT} in vaccinated mice and rats. Moreover, KKF768 vaccinated Fischer 344 rats are protected against lethal pulmonary challenge with Ftt, demonstrating that Fn *iglD*/OAg^{FTT} is a good candidate for a tularemia vaccine.

Biography

Xhavit Zogaj is working as an Asst Prof of Research in Biology department of the University of Texas at San Antonio, Texas, USA. His area of specialization is Vaccine development against tularemia and Bacterial Biofilms. His areas of specialization are Vaccine development against tularemia, and Bacterial Biofilms.

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Salina Parveen, Clin Microbiol 2018, Volume: 7
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Salina Parveen
University of Maryland Eastern Shore, USA

Salmonella: An enemy for poultry industry

Statement of the Problem: *Salmonella* infection or salmonellosis is a global public health problem and is one of the major causes of bacterial food-borne illnesses in the United States, causing an estimated 1.2 million illnesses, 23,000 hospitalizations, and 450 deaths per year. Food of animal origin, especially poultry and poultry products, are one of the major vehicles of salmonellosis.

Methodology: *Salmonella* was recovered from chicken carcasses, confirmed and characterized using phenotypic and genotypic methods.

Findings: This bacterium is widely distributed on chicken carcasses and its incidence differs among parts, with rib back and sacral back being the most contaminated. The most common serotypes isolated from chicken during our study were *Salmonella typhimurium* and S. Kentucky. Studies have demonstrated that processing conditions, such as the chilling process, can be a significant source of *Salmonella* contamination between carcasses. Recent reports on the recovery of multidrug-resistant (MDR) and genetically diverse S. *typhimurium* and S. Kentucky from commercially processed chicken carcasses raised serious concern about overall management practices. Studies have also revealed that chilling in chill tanks may play a significant role in promoting the selection of antimicrobial resistant pathogens during poultry processing. Whole genome sequencing of the MDR S. *typhimurium* and *S. Kentucky* strains confirmed that they shared serovar-specific conserved coding sequences, although several genomic regions with significant mismatch were detected. Phenotype microarray and intracellular killing assay results suggest that S. *typhimurium* is capable of utilizing certain carbon compounds at a higher rate, and can survive better and be more invasive than S. Kentucky in macrophages and chicken granulosa cells.

Conclusions and significance: To prevent *Salmonella* infection, it is important to assure that poultry and poultry products are not contaminated with this bacterium. Therefore, active monitoring systems and control strategies must be established from farm to fork.

Biography

Salina Parveen is a Professor in Food Science and Technology Program, at the University of Maryland Eastern Shore, MD, USA. She holds a BS in Botany and an MS in Microbiology from the University of Dhaka, Bangladesh and a PhD in Food Science and Human Nutrition, specializing in Microbiology and Molecular Biology from the University of Florida, FL, USA. She teaches graduate level courses in Microbiology and Toxicology. Her research interests are Food and Environmental Microbiology, Food Safety, and Water Quality. She has an excellent record of grantmanship and received several awards for outstanding academic performance. She has published numerous peer-reviewed journal articles and book chapters, and presented her research findings at various regional, national and international professional meetings. She also serve on several national and international scientific committees and the Editorial Board member of many peer-reviewed journals.

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S M Shamsuddin Khaled

Institution of Engineers, Bangladesh

Microbial fuel cells (MFCs) for future sustainable green technology

As the greatest threats facing the planet as warming, one of the most important is carbon dioxide (CO_2), also sox, nox, PM etc. which we release into the atmosphere by the internal & external conventional combustion of Solid, Liquid &gaseous fossil fuels — such as oil, coal, and natural gas, Nuclear Fuel to generate electricity, power our vehicles, and so. More and more heat is trapped and Earth steadily warms up in response, local environment pollutions. Thus The planet's temperature is rising, Has led to global environmental concerns such as global warming, climate change and depleting energy resources "Global warming is already having significant and costly effects on our communities, our health, and our climate unless we take immediate action of prevent a climate catastrophe. to reduce global warming emissions, these impacts will continue to intensify, grow ever more costly and damaging, and increasingly affect the entire planet. To Meet the goal of ZET, Climate change and sustainable development as contribute The top dominant decarbonized electricity from of energy supply & Hence MFCs mechanism is an attractive & unique renewable technology, which is fully any kind of combustion free thereby making it a green technology. Microbial fuel cell (MFC) is one choice that has received attention as alternative energy in directly generating electricity from organic matters. MFC is a bioreactor that converts chemical energy in the chemical bonds in organic compounds to electrical energy through catalytic reaction of microorganisms under anaerobic condition. Advancement in science and technology has contributed to the development of emerging green technologies that might help to solve some (if not all) of the environmental issues that we are facing. MFCs towards many specialized and value-added applications beyond wider range scope of the laboratory conditions and thus show promising aspects towards a green and sustainable future.

Biography

S M Shamsuddin Khaled is Professionally in Energy and Environment Specialist as he holds numerous Corporate Advisory Positions, Professional Affiliations, consultancy work for companies and has given expert advice also led and delivered more than 50 projects (20GWe+) of Thermal & Renewable Power Generation Industries promote (HELE) such as USC/SC CFPP, CCPP, Solar CSP/PV, Multi fuel Fired (IC Engine based)Tri-generation/Quad-generation energy research, Engineering/Design, O & M, Commissioning, Performance Benchmarking knowledge transfer with Proficiency in Codes & standard(s) Including EHV/HV/MV-GIS/AIS (+35GVA). As a highly sought public speaker, he has delivered more than 200 lectures, speeches, and invited talks in the last few years such as conference scientific committee member, OCM, scientific advisory board member, keynotes Speaker, plenary lectures at international scientific conferences and contributed to numerous scientific research and its utilization in the world. He is part of the Sustainable Industrial Systems research group and specializes in the life cycle impacts of energy technologies including environmental, social and economic aspects Energy sector.

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