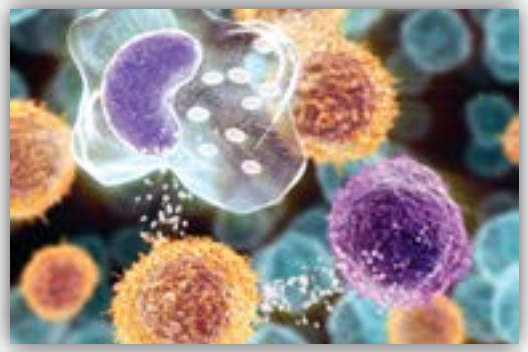
38th Annual congress on

# Microbes Infection

September 28-29, 2017 | London, UK

## Posters



# The use of Bacillus coagulans to reduce Salmonella in broilers

**Shayma Al Qalaf, H Al Khalaifah** and **T Al Suraie**
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Reducing *Salmonella* in poultry products is an important goal to both the industry and the public health authorities to avoid medical problems related to this pathogen. Also, there is a need to minimize the use of antibiotics in poultry feeds for health and safety reasons. Probiotics and prebiotics were claimed to serve as effective alternatives to replace antibiotics in the poultry feed. The current study aims to reduce *Salmonella* in broilers by using commercial probiotics and prebiotics. 1 g/kg of *Bacillus coagulans*, was evaluated for its ability to reduce *Salmonella* in broiler chickens. It was found that this treatment significantly ($P<0.05$) reduced *Salmonella* concentrations in the ceca, as compared with the control. Finally, this study showed the importance of using these treatments control *Salmonella* at the broilers.

## Biography

Shayma alqalaf is associated with University of Kuwait, Kuwait. Shayma alqalaf has published several papers in reputed journals. Shayma alqalaf is committed to highest standards of excellence and it proves through the authorship of many books. Shayma alqalaf research interests include Molecular Biology and Microbiology.

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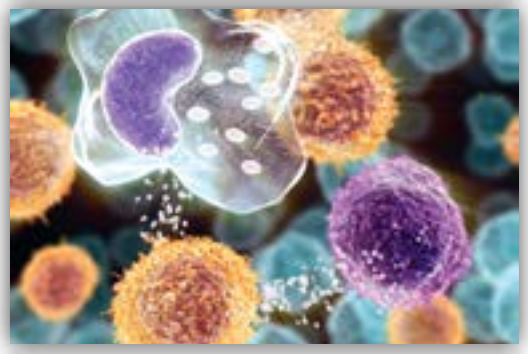
## Accepted Abstracts



# PICOSECOND LASER SURFACE TEXTURING OF STAINLESS STEEL AND TI-6AL-4V AS A METHOD TO REDUCE THE ADHESION OF BACTERIA

**Fatema H Rajab[1], Christopher M Liauw[2], P Benson[2], L Li[1]** and **K A Whitehead[2]**

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Biofilm formation and colonization is initiated by bacterial attachment followed by bacterial adhesion and retention on a surface. The buildup of biofilms may result in related health problems in the medical field and potential biofouling issues in industrial settings leading to increased economic burden. The design and manufacture surfaces that prevent bacterial attachment, retention and biofilm formation through their physical structure and chemical properties provides a potential solution to tackle such issues. Laser surface texturing provides a crucial role for the production of different antifouling surface patterns for use in a diverse range of applications in different medical or industrial fields. In the present work, a 1064 nm Nd:YVO4 Picosecond laser was used to produce a range of textures on 316L stainless steel (SS) and Ti substrates. Surface parameters were determined; topography and roughness using a ZeGage Optical Profiler and wettability using a contact angle analyzer FTA 188. *Escherichia coli (E. coli)* attachment, adhesion and retention assays on the laser textured SS and Ti surfaces were investigated using three different assays (spray with wash, spray and retention). Scanning electron microscopy was used to determine the number of attached/adhered/retained bacteria. Results showed that the *Ra* values and wettabilities of the surfaces all increased when compared to the control following laser treatment. This work demonstrated that on all the surfaces, for all the assays, the number of adhesive bacteria on the laser textured surfaces was reduced compared to the untreated substrate.

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# THE ANTI-HIV CANDIDATE ABX464 DAMPENS INTESTINAL INFLAMMATION BY TRIGGERING IL22 PRODUCTION IN ACTIVATED MACROPHAGES

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The progression of human immunodeficiency virus (HIV) is associated with mucosal damage in the gastrointestinal (GI) tract. This damage enables bacterial translocation from the gut and leads to subsequent inflammation. Dextran sulfate sodium (DSS-treatment) is an established animal model for experimental colitis that was recently shown to recapitulate the link between GI-tract damage and pathogenic features of SIV infection. The current study tested the protective properties of ABX464, a first-in-class anti-HIV drug candidate that has demonstrated anti-viral activity in HIV treatment of naïve patients. ABX464 also induced a long-lasting control of the viral load in HIV infected humanized mice after treatment arrest. ABX464 treatment strongly attenuated DSS-induced colitis in mice and produced a long-term protection against prolonged DSS-exposure after drug cessation. Consistently, ABX464 reduced the colonic production of the inflammatory cytokines IL-6 and TNF as well as that of the chemoattractant MCP-1. However, RNA profiling analysis revealed the capacity of ABX464 to induce the expression of IL-22, a cytokine involved in colitis tissue repair both in DSS-treated mice. A comprehensive analysis of the gene expression profiles by RNAseq demonstrated that the expression of IL22 was preferentially induced by ABX464 in mouse bone marrow derived macrophages only upon stimulation with LPS. Importantly, anti-IL22 antibodies abrogated the protective effect of ABX464 on colitis in DSS-treated mice. Because reduced IL-22 production in the gut mucosa is an established factor of HIV and DSS-induced immunopathogenesis, our data suggest that the anti-inflammatory properties of ABX464 warrant exploration in both HIV and inflammatory ulcerative colitis (UC) disease. In the DSS induced colitis model, ABX464 protects mice from inflammatory response: Prevention of weight loss and colon size; Reduced macrophage recruitment into the intestine; Decreased levels of pro-inflammatory cytokines; Long-lasting effect (like in the HIV humanized mouse model).

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# BIOMATERIALS THAT ENGINEER INFECTION IMMUNITY

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Gene-based nucleic acid vaccines are capable of eliciting protective immunity in humans to persistent pathogens, e.g., HIV, malaria, and tuberculosis, for which conventional protein/peptide vaccines have failed. Recent identification and characterization of genes coding for tumor antigens has stimulated the development of nucleic acid-based cancer vaccines. With increasing life expectancy in high-income countries and newly emerging infections in low-income countries, new technologies are required to address changing vaccine needs. Nucleic acid vaccines have the potential to address these needs, but despite decades of research there is still no commercial product for human use. Nucleic acid vaccines (pDNA, mRNA) have certain advantages over protein antigen vaccines: (a) they lack the MHC haplotype restrictions of peptide/protein antigens and (b) nucleic acid vaccines are not subject to neutralization by the host immune response, thus allowing repeat boosting. Messenger RNA (mRNA) is a promising alternative to plasmid DNA (pDNA) since (a) mRNA does not require nuclear entry for activity, (b) mRNA does not integrate into the host genome, and (c) mRNA does not require cancer derived promoters (e.g., CMV). However, to be commercially competitive as a platform technology, mRNAbased vaccines must match the potency of viral vectors at doses of RNA that are not cost prohibitive. Our work seeks to maximize mRNA vaccine efficacy by (a) enhancing vaccine delivery route, (b) developing an autocatalytic, self-replicating mRNA (SRmRNA) vector, and (c) magnifying dendritic cell (DC) antigen uptake and activation using chemokine therapy. We could carry out this entire immunization study using the classic model antigen, ovalbumin (OVA) (as the protein or its gene). However, the strong CD8+T cell responses elicited against the highly immunogenic OVA peptide may not be indicative of responses to more native epitopes from pathogens or tumor antigens. Consequently, here we will focus on preventing bacterial infections of implanted medical devices. This project has developed a scaffold-based vaccine technology, superior to mucosal or systemic delivery. Implants release mRNA vaccines (or pDNA for comparison) that transfect arriving antigen-presenting cells (specifically dendritic cells - DCs) to produce T- and B-cell memory and antibody expression against the select pathogen, and potentially stimulate direct native killer T-cell responses (ideal for intracellular infecting bacteria).

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# REAL-TIME PCR METHOD FOR DETECTION OF SALMONELLA SPP. IN ENVIRONMENTAL SAMPLES

**Kuppuswamy N Kasturi**[1] and **Tomas Drgon**[2]
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The methods currently used in FDA (Food and Drug Administration) field laboratories and other public health laboratories for detecting *Salmonella* in food/environmental samples require 2 days and have limited sensitivity. We describe the development and validation of a real-time PCR method that detected *Salmonella* and presence of group D in 24 h. Primers and probes specific to the invA gene of *Salmonella*, group D, and Enteritidis serovar were designed and evaluated for the inclusivity and exclusivity using a panel of 329 *Salmonella* isolates consisting 126 serovars from 32-O groups and 22 non-*Salmonella* environmental organisms. The invA-, group D- and Enteritidis-specific sets identified the isolates accurately. The PCR method was100% inclusive for *Salmonella* spp. and had a detection limit of 2 copies of *Salmonella* DNA per reaction. A Single-laboratory validation performed on 1,741 environmental samples demonstrated that the PCR method detected 55% more positives than the Vitek immunodiagnostic assay system method (VIDAS) method that is currently used. The method is more specific and did not report any false-negatives. The receiver operating characteristic (ROC) analysis documented excellent agreement between the results from the culture and PCR methods (area under the curve, 0.90; 95% confidence interval of 0.76 to 1.0) confirming the validity of the PCR method. The validated PCR method will help to strengthen public health efforts through rapid screening of *Salmonella* spp. in environmental samples.

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# MOLECULAR DIAGNOSIS FOR THE RAPID DETECTION OF BOVINE TUBERCULOSIS IN THE STATE OF KUWAIT

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Mycobacterium bovis is the causative agent of bovine tuberculosis (bTB), a zoonotic disease with an overall negative impact on the livestock industry. TB has been reported in Kuwait. Because of the adverse social and economic impact that the disease imposes on livestock and the people of Kuwait, development of surveillance, diagnostic, and control programs are needed to detect new cases and eradicate the disease. Hundred and four dairy cattle tested using the universally accepted comparative intradermal tuberculin test (CITT) was the primary test used during the survey work for assessing the prevalence of bTB in Kuwait's dairy herds. Rapid and highly sensitive molecular diagnostic tools, such as DNA Extraction from blood real-time PCR (polymerase chain reaction) and ELISA (enzyme-linked immunosorbent assay), have been evaluated and compared with traditional, delayed hypersensitivity- and slaughterhouse inspection-based diagnostic schemes. The total number of cases detected between 2012 and 2015 in 10 cattle farms in the state of Kuwait was 104 positive TB cases, which had a mean prevalence of 2.1% per farm. Highest numbers of cases were detected in February 2015, with no seasonal patterns inferred. Spearman correlation coefficients and their corresponding p-values between disease status and both farm size (p=0.43, p-value=0.032) and agricultural area (p=0.49, p-value=0.015) were significant at the 95% confidence level. The overall hierarchal mixed-effect logistic regression analysis was significant (p-value=0.0413). As expected, our results suggested that the prevalence of TB detected cases didn't follow any seasonal patterns, first because, TB is a chronic disease and seasonality can't be quantified within 4 years of surveillance efforts. Second, case detection was highly dependent on the intensification of sample collection at a given season, in which the number of collected samples was substantially high in winter and low in summer seasons.

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