clinical antibiotic resistance as cystic fibrosis lung pathogens, and preservative resistance as industrial product contaminants will be outlined. In addition to their intrinsic antibiotic resistance, *Burkholderia* bacteria also have a rapid ability to further adapt to high-level resistance and the mechanisms underlying this will reviewed. In contrast with these problematic features, recent studies have shown that *Burkholderia* are an untapped resource of natural product antibiotics. Rapid screening of *Burkholderia* for novel antibiotics using a genome mining approach will be described. Finally, the dilemmas and bottlenecks of trying to translate a basic academic antibiotic discovery into potential commercial development of these exciting *Burkholderia* antibiotics will be highlighted.

15.45 **Reconciling academic idea with product development and commercialisation**
Dr Martin Kiernan, GAMA Healthcare

Abstract: *Modern medicine continues to develop at a fast pace, meaning that increasingly elderly and immunosuppressed patients can be treated. Healthcare-associated infections caused by organisms that are increasingly difficult and sometimes even impossible to treat with antibiotics currently available is a significant threat to the provision of healthcare. It is vital that clinicians, academics, and industry work collaboratively to produce implementable interventions that can help reverse this trend. Clinicians are seeking solutions to their problems however are frequently presented with solutions to problems they do not have through the failure of industry to talk to clinicians at an early stage in the development of products. Narrow-focused regulation means that many potentially useful solutions to the growing trend of antimicrobial resistance are subject to regulatory constraints, which impede their use. Both of these areas will be discussed during this presentation.*

16.15 Close: Networking Reception in Room C 0.13

If you would like to become a CITER member, please contact: Jane Graves, CITER Administrator, GravesJA@cardiff.ac.uk for an application form.

Cardiff Institute of Tissue Engineering and Repair

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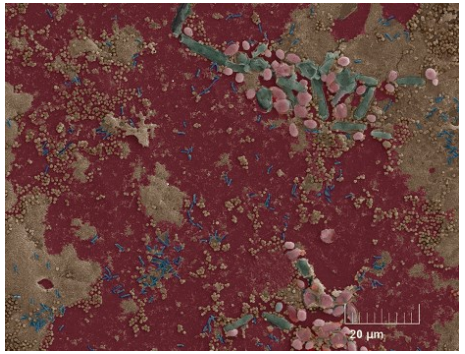

Image:
Acknowledgement: Prof David William, School of Dentistry, Cardiff University

Tackling Antimicrobial Resistance: an academic and industrial perspective

11 May 2016

Location: Phys A Lecture Theatre,
School of Bioscience, Sir Martin Evans Building,
Cardiff University

Workshop: 1.00 -16.15pm Networking:16:15-17:30pm

REFRESHMENTS WILL BE PROVIDED

To register your attendance, please email the CITER Administrator, Jane Graves (GravesJA@cardiff.ac.uk)

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12.30pm **Registration**

Session 1: Chair: Prof Jean-Yves Maillard,
School of Pharmacy and Pharmaceutical Sciences

13.00 **Antimicrobial resistance in Veterinary and Human medicine – are we at breakpoint?**
Professor Mark Fielder, Faculty of Science, Engineering and Computing, Kingston University

Abstract: *Science is facing an uncertain future with regard to treatment of infectious disease. Once treatable diseases are becoming more of a therapeutic challenge and reports indicate we are heading back toward a pre-antibiotic era. What are the drivers that have lead to this point and what can be done to reverse the progression in the apparent favour of the organisms. The use of targeted treatment is suggested to be a logical step but how can this be achieved? Improved rapid diagnostics? Changes in treatment policy? Examining antibiotic use data? Or just making new antibiotics? The art of the possible needs to be identified and exploited and put into action.*

13.45 **Atmospheric Pressure Non Thermal ('Cold') Plasmas – New frontiers in Control of Biofilm Infections**
Professor Brendan Gilmore, School of Pharmacy, Queen's University Belfast

Abstract: *Biofilms, surface adhered microbial communities embedded in a self-produced matrix of extracellular polymers, represents the predominant mode of growth of microorganisms in almost every niche, including chronic infections. The biofilm provides a privileged environment for the survival of pathogens during persistent and chronic infections, acting as a nidus of infection. Atmospheric pressure non-thermal plasmas have proven to be effective in the eradication of a range of pathogenic biofilms, including Pseudomonas aeruginosa and other members of the 'ESKAPE' pathogen group. These observations make this a promising approach for potentially controlling P. aeruginosa and other pathogens associated with chronic or device associated infections in the clinical environment. However, the exact mechanisms of plasma-mediated biofilm destruction (and tolerance to plasma exposure) remain poorly elucidated. Indeed, we report here widespread variation in response to plasma exposure across a range of clinical strains of P. aeruginosa isolated from sputum of cystic fibrosis patients. In this study we have therefore investigated the role of biofilm matrix components in mediating tolerance to plasma-mediated bactericidal activity. Research in our group has also focused on how plasma-derived reactive species interact with bacterial cells and their signalling molecules, whereby plasma exposure has been demonstrated to reduce P. aeruginosa virulence through direct modification of autoinducer molecules involved in quorum sensing (QS).*

In general, considerable variability in tolerance to plasma exposure has been observed across various species of bacteria when grown as biofilms. This presentation focuses on characterisation and elucidation of the mechanisms by which bacterial biofilms tolerate plasma exposure, describes recent research into understanding and overcoming phenotypic resistance for improved biofilm control and discusses the developmental journey from laboratory scale to a prototype portable device for applications in the healthcare environment.

14.30 **Tea/Coffee room C0.13**

Session 2: Chair: Prof Rachel Waddington,
School of Dentistry

15.00 **Multifaceted *Burkholderia* bacteria: understanding resistance and discovering new antibiotics within the same bug!**
Professor Eshwar Mahenthiralingam, School of Biosciences, Cardiff University

Abstract: *Burkholderia* are Gram-negative bacteria that fore the most part live in the natural environment associated with plant roots, soil and water. They are intrinsically resistant to a wide range of antimicrobials including antibiotics and preservatives. Problems associated with their