

Research Project Proposal
Academic year 2016-2017

Project Nº 17
Title: Polymicrobial biofilm growth kinetics. In vitro susceptibility to antimicrobial agents.
Department/ Laboratory Laboratory of Microbial Biofilms. Clínica Universidad de Navarra
Director Dr: Jose Luis del Pozo. Área de Enfermedades Infecciosas y Microbiología Clínica
<p>Summary</p> <p>Biofilm formation is a survival strategy as biofilm microorganisms are more resistant to antimicrobials and environmental stress. Polymicrobial biofilm formation is important in the pathogenesis of biomedical devices related infections. There is a strong medical but also economical motivation for the development of novel anti biofilm strategies due to both the ever growing biofilms resistance to conventional antimicrobials and the high mortality caused by related infections. The proposed project will evaluate the growth kinetics of several polymicrobial biofilms and the activity of antimicrobials against these biofilms.</p> <p>Specific aims:</p> <p>Specific Aim # 1. To assess and compare polymicrobial species (i.e., <i>Candida albicans</i> and coagulase negative staphylococci, <i>C. albicans</i> and <i>Staphylococcus aureus</i>, <i>C. albicans</i> and enterococci, <i>C. albicans</i> and <i>Pseudomonas aeruginosa</i>, <i>P. aeruginosa</i> and enterococci, <i>P. aeruginosa</i> and <i>S. aureus</i>) biofilm growth kinetics on one of the most common biomedical surfaces (i.e., teflon) using a novel quantification methods (i.e., CDC reactor technology)</p> <p>Specific Aim # 2. To evaluate the in vitro activity of antimicrobials against polymicrobial biofilms on a teflon surface.</p> <p>Expected results: We expect to contribute to the body of knowledge about polymicrobial biofilm growth kinetics. We also expect to develop new therapeutic strategies against polymicrobial biofilm-related infections. Potential applications. The most promising antimicrobials will be extensively tested in preclinical studies and if those trials prove satisfactory, exploitation concept will be formulated and partners will be sought for next steps clinical studies to develop a new strategy to treat polymicrobial biofilm related infections.</p>



References

-C. albicans and S. aureus form polymicrobial biofilms: Effects on antimicrobial resistance. Harriott et al., Antimicrob Agents and Chem 2009

-Importance of Candida–bacterial polymicrobial biofilms in disease Harriott et al., TRENDS in Microbiol 2011

-Biofilm infections: Bridging the gap between clinical management and aspects of recalcitrance toward antibiotics. Lebeaux et al., Microbiol and Molec Biology Revs 2014

POSSIBILITY OF PhD

Yes. It would be possible to develop a PhD if the student get fundings.

* (PhD grant required)