Session 9 : Mixed species (including bacterial-fungal) biofilms

S-47 : Cf Multispecies Dynamics: Role of Oxygen Milieu and Antibiotic Therapy

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Cystic fibrosis (CF) airway harbours a complex microbiome, wherein atypical species and common pathogens co-exist/interact, shifting disease progression and treatment routes. Also evident is the myriad of factors challenging the CF community dynamics, thus disturbing the sociomicrobiology in the infection site. This work aimed to assess how chemical (antibiotic exposure) and environmental (variable oxygen conditions) stress could disturb CF polymicrobial (dual/three-species) consortia of *Pseudomonas aeruginosa* and CF-unusual species (*Inquilinus limosus* and *Dolosigranulum pigrum*).

Minor changes in biofilms occurred across environments of distinct oxygen availabilities, with dual-species consortia exhibiting similar relative proportions and *P. aeruginosa* and/or *D. pigrum* dominating three-species biofilms. When exposed to antibiotics, dual-species biofilms showed enhanced resistance profiles, evolving to a high level of fluctuations in their microbial compositions/distributions/interactions. Fluctuations convoluted for three-species populations, being dependent on the antibiotic, on its dose, and on oxygen environment.

This work highlights environmental and antibiotic stress (particularly) as key factors driving CF multispecies dynamics, through significant compositional/functional changes. Also, the role of uncommon species in mediating social interactions with pathogens, affecting the whole community and contributing for CF outcome is emphasised.

The authors acknowledge the Portuguese Foundation for Science and Technology (FCT), under the scope of the strategic funding UID/BIO/04469/2013 and COMPETE 2020 (POCI-01-0145-FEDER-006684). This study was also supported by FCT and European Community fund FEDER, through Program COMPETE, and BioTecNorte operation (NORTE-01-0145-FEDER-000004) funded by European Regional Development Fund under the scope of Norte2020 - Programa Operacional Regional do Norte. FTC is also acknowledged for S.Lopes Post-Doc Grant (SFRH/BPD/95616/2013).