

PS0605/ PE120 Interaction between non-disease causing microorganism and *E. coli* in catheter-associated urinary tract biofilms

Andreia Azevedo (1), *Carina Almeida* (1,2), *Luís de Melo* (1), *Nuno F Azevedo* (1)

(1) *Laboratory For Process, Environment and Energy Engineering (LEPAE), Department of Chemical Engineering, Faculty of Engineering, University of Porto, Rua Dr. Roberto Frias, 4200-465 Porto, Portugal*

(2) *Institute For Biotechnology and Bioengineering (IBB), Centre of Biological Engineering, Universidade Do Minho, Campus De Gualtar, Braga, Portugal*

Most biofilms involved in catheter-associated urinary tract infections (CAUTIs) are polymicrobial, with disease causing (e.g. *E. coli*) and non-disease causing (NDC) microorganisms (*Delftia tsuruhtensis*, *Achromobacter xylosoxidans*, *Burkholderia fungorum*) frequently co-inhabiting the same catheter. Nevertheless, there is a lack of knowledge about the role that NDC microorganisms have on biofilm formation by *E. coli*. This information is essential for a better understanding of CAUTIs etiology. As such, single- and dual-species biofilms were formed in 96-well microtiter plates, using artificial urine medium (AUM). Biofilm quantification was evaluated by crystal violet staining, CFU counts and DAPI counts at 24h, 48h, 96h and 192h. In single-species biofilms, results showed that all species were able to form biofilms (Log 5.84-7.25 CFUs.cm² at 192h). Concerning dual species biofilms, *E. coli* appears to have a negative impact on the ability of the NDC species to form biofilms, but, NDC species do not seem to influence *E. coli* when the two species start forming the biofilm simultaneously and at the same concentration. In fact, the growth rate of *E. coli* (0.4564 h⁻¹) in AUM is higher than the growth rates of NDC microorganisms (0.0458 h⁻¹–0.131 h⁻¹). Additionally, in dual-species biofilms with an *E. coli* pre-formed biofilm, the *E. coli* seems to prevail, even in conditions with a low initial inoculum concentration (102 CFUs.ml⁻¹ vs. 108 CFUs.ml⁻¹ for NDC microorganisms). In conclusion, *E. coli* has a greater ability to form biofilm in conditions mimicking the CAUTIs, which helps explain why *E. coli* is the most prevalent agent in CAUTIs.