56 *Chryseobacterium indologenes* adhesion and biofilm formation onto biomaterials

Joana Rebouta, Pilar Teixeira*, Rosário Oliveira

*IBB – Institute for Biotechnology and Bioengineering, Centre of Biological Engineering, University of Minho, Campus de Gualtar, 4710 – 057 Braga, Portugal. *Corresponding author: pilar@deb.uminho.pt*

Chryseobacterium indologenes is a gram-negative bacillus that has been recognized as human pathogen causing a variety of invasive infections, especially in hospitalized patients with severe underlying diseases. Moreover, C. indologenes has been associated, to infections related with presence of implants and indwelling devices and it is widely distributed in hospital environments. Thus, *C. indologenes* constitute a further threat due to their ability to contaminate and persist in fluid-containing apparatus, probably due to biofilm formation capacity. However, the factors involved in initial adhesion and in biofilm formation by these bacteria have not been elucidated. Therefore, the present study investigated the ability of *C. indologenes* DSM 16777 to adhere to biomaterials and its capacity of biofilm formation. Bacterial adhesion was carried out in 24-well tissue culture plates, where the coupons were placed with the bacterial suspension for 2h at 37°C, 120 rpm. After, the adhered cells were quantified by microscopic observation and enumeration. In order to try to correlate the adhesion ability of *C. indologenes* with surface properties of substrata and cells, hydrophobicity and surface tension components were calculated through contact angle measurements. Biofilms were formed during 24 h. The total attached biomass was quantified by crystal violet and biofilm cell concentration was determined as CFU/ml. The results revealed a higher adhesion extension of *C. indologens* to silicon and acrylic materials than to steel. The adhesion of *C. indologenes* to silicon was promoted due to their hydrophobicity and roughness, forming several microcolonies throughout the coupon. Interestingly, in acrylic material there was a great extension of adhesion, despite being an electron donor. Concerning biofilm formation, it was observed a higher number of cells and that the occurrence of matrix was scarce, in all of the three materials. Biofilm formation was very similar in all materials. However, by scanning microscopy, it was possible to observe a different layout and arrangement. In the case of silicon, the cells displayed microcolony formation with long cell chains. Curiously, the acrylic material presented large clusters but very distant from each other, and few isolated cells. In steel, no clusters were found but many cells isolated were seen in all coupon area. The main conclusion of this work is that *C. indologenes*, in the specific conditions assayed, formed a biofilm composed mainly by cells and that no exopolymeric matrix was detected. This knowledge will allow preventing *C. indologenes* biofilm formation on biomaterials and the associated infections.

Keywords: *Chryseobacterium indologenes*; biofilm; adhesion; biomaterials.