

***In vitro* antimicrobial activity of *Pseudomonas aeruginosa* by-products against single and mixed biofilms: the role of Gram- bacteria in the biofilm consortium**

Maria Olívia Pereira, Idalina Machado and Susana Lopes, IBB-CEB, University of Minho, Portugal

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Since bacteria are permanently acquiring resistance to chemicals, the development of novel strategies for biofilm control is needed. Certain microorganisms represent an important source of novel bioactive compounds with marked antibacterial activity, as the secondary metabolites. This work aimed to investigate the antimicrobial effect of *Paeruginosa* by-products on planktonic and sessile growth of several pathogenic bacteria.

Supernatants from *Paeruginosa* planktonic cultures (isolated: PaI and from collection: Pa) were recovered, filtered and tested on their own and on *S.aureus*, *S.epidermidis*, *E.coli* lawns. Their antimicrobial action was also assessed in single *Staphylococcus* biofilm formation and in polymicrobial biofilms formed by *Staphylococcus* species together with Gram- bacteria. Supernatants were applied as biofilm growth media complement or as biofilm disruption agents. Both supernatants inhibited only Gram+ species lawns, being the more remarkable inhibition halos obtained with PaI supernatant. Concerning biofilms, PaI and Pa metabolites can be considered anti-staphylococcal biofilms agents since their single and mixed biofilm growth was significantly disturbed by both supernatants, regardless their mode of application. However, when Staphylococcal species are entrapped in polymicrobial biofilms with *E.coli* and *Paeruginosa*, supernatants did not exhibit noticeable anti-biofilm activity, mainly when applied against established biofilms. In general, all mixed biofilms accumulated more mass and had more metabolic activity when submitted to the supernatants aggression.

It is concluded that *Paeruginosa* supernatants as potential as anti-biofilm agents but only against staphylococcal biofilms since they failed in disturb other biofilm consortia that encompassed Gram- bacteria. This trait makes them quite ineffective chemical countermeasures against real biofilms.

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