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Impact of variable oxygen environments on resistance to acute antibiotherapy by cystic fibrosis related bacteria

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The existence of steep oxygen gradients within the cystic fibrosis (CF) airways mucus is well known, with zones ranging from aerobic to completely anaerobic. Those environments, of heterogeneous availabilities of oxygen, contribute for the proliferation of a phylogenetically diverse ecosystem. This study aimed to inspect whether CF-related bacteria - *Staphylococcus aureus* and *Pseudomonas aeruginosa* and other emerging species *Acinetobacter baumannii*, *Dolosigranulum pigrum*, *Inquilinus limosus*, *Klebsiella pneumoniae* and *Stenotrophomonas maltophilia* – are able to develop *in vitro* biofilms and be tolerant towards ciprofloxacin, an in-use antibiotic in acute CF infections. Single biofilms were formed *in vitro*, under aerobic and anaerobic environments, and further evaluated in terms of biomass and CFU counting. The antibiotic resistance profiles were analysed by constructing time-kill-curves.All species were able to growth under environments with distinct oxygen availability, demonstrating a great biofilm-forming ability highlighted by higher amount of biofilm mass, particularly under aerobic atmospheres.Biofilm time-kill curves showed augmented antibiotic tolerance of the bacteria, which was independent of the oxygen availability, except for *D. pigrum* where total eradication of biofilm-cells was noticed. Data highlighted that CF-related bacteria could persist under atmospheres with restricted oxygen availability, and form biofilms resilient to ciprofloxacin. Therefore, a more detailed knowledge about the effect of CF environments on the ability of the bacteria to proliferate and resist to antibiotics might be crucial for the success of CF infection treatment.