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**Antibiofilm activity of lactoferrin-derived synthetic peptides against *Pseudomonas aeruginosa* PAO1**

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**Abstract**

Many pathogenic bacteria can protect themselves from the effects of antibiotics and the host immune response system by forming biofilms. Biofilms are polymer-entrapped bacterial cells, which adhere to each other and are often attached to a surface. Eradication of bacterial biofilms typically requires much higher concentrations of antibiotics than are normally needed to kill cultured planktonic cells, raising serious clinical concerns. In an attempt to prevent the formation of biofilms or to break up existing biofilms of pathogenic bacteria, herein we have used the standard crystal violet assay as well as the Calgary biofilm device to test several lactoferrin- and lactoferricin-derived antimicrobial peptides for their antibiofilm activity against *Pseudomonas aeruginosa* PAO1. Our results revealed that the short bovine lactoferricin-derived RRWQWR-NH<sub>2</sub> (20-25) hexapeptide has no activity against *P. aeruginosa* PAO1. Moreover, the longer human lactoferricin-derived peptide GRRRRSVQWCA (1-11) and the bovine lactoferrampin (268-284) peptide were also almost devoid of activity. However, several different "mix-and-match" dimeric versions of the two lactoferricin-derived peptides proved quite effective in preventing the formation of biofilms at low concentrations, and in some cases, could even eradicate an existing biofilm. Moreover, the full-length bovine lactoferricinB (17-41) peptide also displayed considerable antimicrobial activity. Some of the longer lactoferricin-derived dimeric peptides acted through a bactericidal mechanism, whereas others seemed to interfere in cell-signalling processes. Taken together, our results indicate that synthetic dimeric peptides comprising short naturally occurring human and bovine lactoferricin constructs could be further developed as antibiofilm agents.

**Keywords:** *Pseudomonas aeruginosa*; antibiofilm peptides; biofilm; conception de peptides; crystal violet assay; lactoferricin; lactoferricine; lactoferrin; lactoferrine; peptide design; peptides « antibiofilm »; test au cristal violet.