PARACENTRIN I, A SYNTHETIC ANTIMICROBIAL PEPTIDE FRAGMENT OF A BETA-THYMOSIN FROM THE SEA-URCHIN PARACENTROTUS LIVIDUS, INTERFERES WITH STAPHYLOCOCCAL AND PSEUDOMONAS AERUGINOSA BIOFILM FORMATION

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We demonstrated the presence in the peptide fraction <5kDa from coelomocytes cytosol of the sea-urchin *Paracentrotus lividus* of three small peptides belonging to the sequence segment 9–41 of a beta-thymosin whose molecular mass is 4592 Da (NCBInr acc. no gi|22474470).

In particular, the smallest peptide, called paracentrin 1, is the fragment 9-19 of the beta-thymosin, it has a molecular mass of 1251.7 Da and it presents the chemical-physical characteristics of an antimicrobial peptide.

In this study, the chemically synthesized paracentrin 1 was tested for its antimicrobial and antibiofilm properties against Gram positive and Gram negative reference strains. We found that the paracentrin 1 showed a broad antimicrobial activity against important pathogens such as *S. aureus* and *P. aeruginosa* but it acts at high concentration (12.5 or 6.2 mg/ml) against planktonic forms of these two microorganisms. However, paracentrin 1 shows an interesting additional antimicrobial effect interfering with biofilm formation *in vitro* of the above cited pathogens, at lower concentrations (from 3.1 to 0.75 mg/ml) than MIC evaluated against the planktonic forms. The prevention of biofilm formation – rather than its elimination – is the best strategy to contrast the growth, as a sessile community, of many pathogens. This anti-adhesion property is very interesting because *S. aureus* and *P. aeruginosa* strains are opportunistic pathogens able to form biofilms in open wounds, such as chronic diabetic foot ulcers, or infected wounds in clinical and veterinary medicine. New antimicrobial agents that are effective against staphylococci and *P. aeruginosa* within these wounds are needed. The tested peptide could be a good starting point for novel synthetic derivatives with improved pharmaceutical potential.

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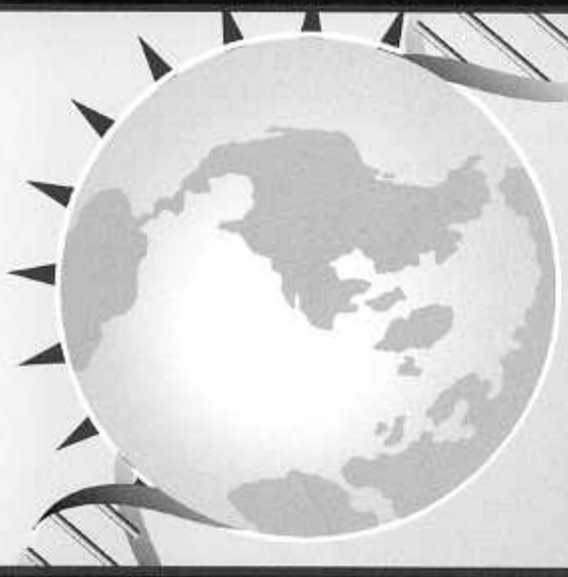

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