P3: 86

Soluble ficin disrupt bacterial biofilm

Elena Trizna[1], Baydamshina Diana[1], Holyavka Marina[2], Koroleva Victoria[2], Kayumov Airat[1]

[1]Kazan (Volga Region) Federal University, Russian Federation; [2]Voronezh State University, Russian Federation; trizna91@mail.ru

Many opportunistic bacteria like *Staphylococcus, Micrococcus, Pseudomonas* form biofilms on chronic and acute dermal wounds retarding their healing, causing reinfection and sepsis. Several proteases like trypsin, chymotrypsin were reported to exhibit anti-biofilm properties degrading the backbone of the biofilm matrix and thereby speeding up the wound healing. Our results indicate that ficin, protease from the plant, efficiently degrades the structural components of biofilm matrix formed by *S. aureus, S. epidermidis* and *P. aeruginosa* although with less efficiency. The anti-biofilm effect of ficin was significantly more pronounced compared to trypsin, a protease that is widely used in wound treatment. Significance of the biofilm disruption activity has been also supported by fluorescent microphotographs. Moreover, presence of ficin also led to the increase of the antimicrobial efficiency of ciprofloxacin against biofilm-embedded cells of *S. aureus* and *P.aeruginosa*. While 24h antibiotic treatment did not lead to the increase of red-fluorescent dead cells of neither *S.aureus* nor *P. aeruginosa* embedded into the biofilm matrix, in the presence of ficin the fraction of viable cells decreased significantly. Ficin does not exhibit the cytotoxicity and does not affect the growth of adipose derived stem cells. Similarly, no genotoxic effects were observed in Ames test and SOS-chromotest. Accordingly, soluble ficin appears safe and beneficial for outer wound treatment to prevent the biofilm formation and reduce the reinfection risk.