

**TITLE:** CHARACTERIZATION OF BIOFILM FORMATION BY *Staphylococcus pseudintermedius* IN ORTHOPAEDIC MATERIAL

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**ABSTRACT:**

Implant associated infections increase morbidity, cost and may lead to occasional mortality not only in humans but in veterinary medicine as well. Biofilms can make bacteria survive and populate medical devices causing health care-associated infections (HCAIs) that are generally resistant to antimicrobial agents. Surgical site infections (SSI) has been reported associated with implants in dogs caused by *Staphylococcus pseudintermedius*, including methicillin susceptible (MSSP) and resistant (MRSP) strains. When infection occurs after an orthopaedic surgery, it delays healing and often requires additional surgical procedures for implant removal, being a source of significant morbidity, cost, and occasional patient mortality. The *ica* operon is responsible for slime production of biofilm. In the operon, coexpression of *icaA* and *icaD* is required for full slime synthesis. The aim of the study is evaluate the ability of biofilm formation by *Staphylococcus pseudintermedius* in titanium orthopaedic material used in small animal surgery, as well as evaluate genetically the biofilm formation. Sterile titanium nuts were incubated in tryptone soy broth supplemented with 1% glucose of standard suspensions of eight *S. pseudintermedius* isolates, in 24 well plate overnight. The biofilm production was measured by the optical density (OD) after vortexing each nut stained with safranin, in triplicate. The genes associated with biofilm formation (*icaA* and *icaD*) were identified by PCR. Seven isolates were able to form biofilm in titanium nut, six classified as weak biofilm producer and one as moderate biofilm producer. One isolate was classified as no biofilm producer. PCR revealed the presence of the two genes (*icaA* and *icaD*) in all the isolates. In conclusion, *S. pseudintermedius* was able to form biofilm in the orthopaedics material tested. This could represent a serious threat not only to animal subjected to orthopaedic surgeries. Furthermore, because of the close social interaction among dogs and their owners, this could also represent a zoonotic risk. More studies are necessary to test possible way to overcome this threat.

**Keywords:** *Staphylococcus pseudintermedius*, biofilm formation, medical devices, orthopaedic material, MRSP

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