

00921 Moxifloxacin-loaded hybrid organo-inorganic sol-gel coating can prevent prosthetic joint infection in an experimental model

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Background: Prosthetic joint infections occur infrequently, but they represent the most devastating complication. *S. aureus* and coagulase-negative *S. epidermidis* are the most common infecting agents associated with PJI. Nowadays, Gram-negative species, e.g. *Escherichia coli* and others enterobacteria, are gaining relevance. Local antibiotic therapy is a desired featured which would allow locally preventing or treating these infections.

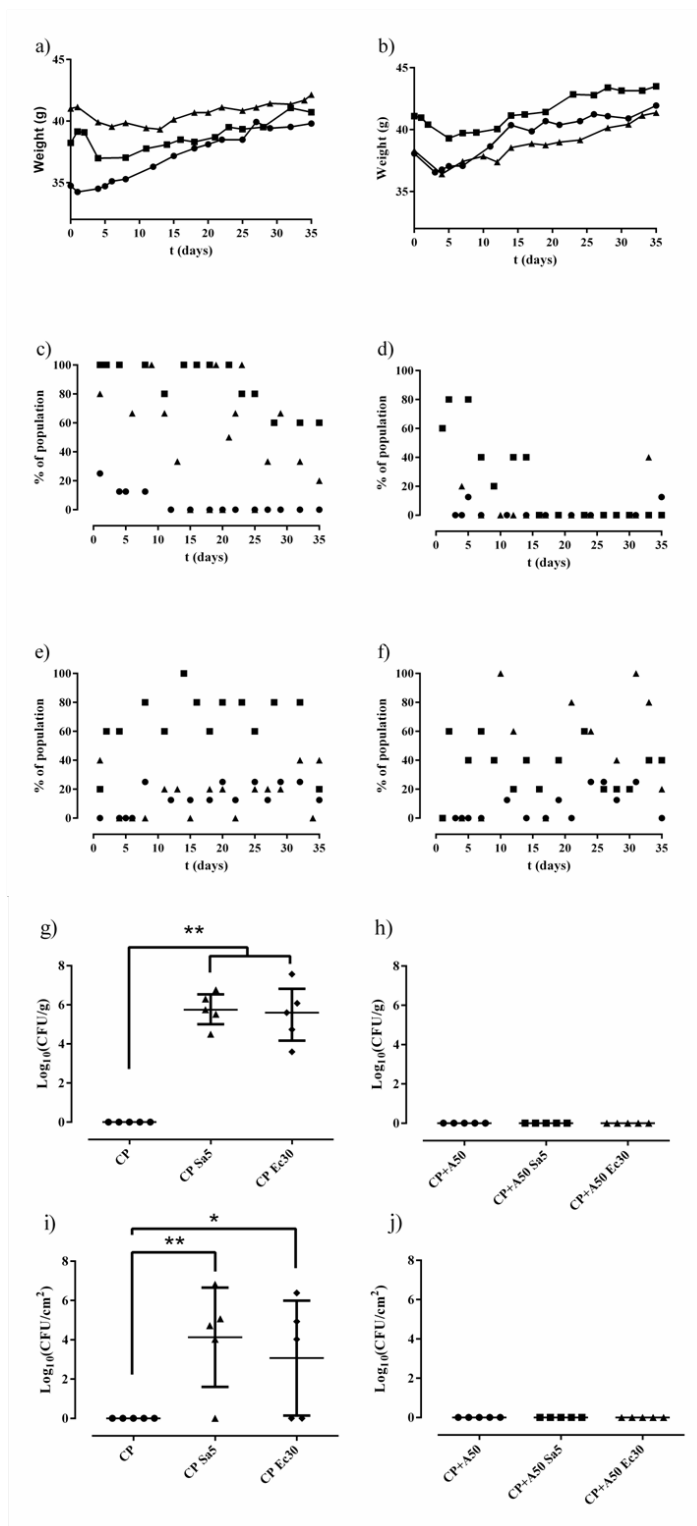
In order to overcome prosthetic joint infection, sol-gel technology allows loading the coating with antibiotics and osteointegrative molecules such us organophosphate compounds. The aim of this work was to evaluate the infective effect of coatings loaded with moxifloxacin using an in vivo murine model of prosthetic joint infection.

Materials/methods: Sol-gel coating was produced using a molar ratio of 1:2 (MAPTS:TMOS) and an organophosphate dispersed in ethanol. The unloaded coating was loaded with 50 mg of moxifloxacin per 20 mL and was used to coat chemical polished Ti6Al4V samples. Chemical polished Ti6Al4V samples without coating were used as control.

The surgical procedure was performed as described previously by Lovati *et al.* (PLoS One. 2013 Jun 20;8(6):e67628) using only one of two femurs of each animal. During five weeks, weight, limping and piloerection of animals were monitored. After five weeks, the animals were sacrificed and the bacterial load was estimated and confirmed in the peri-implant bone tissue and the implant using the methodology described by Esteban *et al.* (*J. Clin. Microbiol.* 2008 vol. 46 no. 2 488-492). Each treatment was performed five times.

The statistical data were analyzed by nonparametric pairwise comparisons using the nonparametric Mann-Whitney test with a level of statistical significance of $p < 0.05$.

Results: The results are shown in the Figure 1.



ABSTRACT A50 in vivo.tif

Figure 1. (a-b) Mean weight, (c-d) limping, (e-f) piloerection, amount of bacteria in bone (g-h) and implant surface (i-j) in different noninfected group (circles), Sa5-infected group (squares) and Ec30-infected group (triangles) with CP (left column) and CP+A50 (right column). *: p-value < 0.05. **: p-value < 0.01.

Conclusions: Moxifloxacin-loaded hybrid organo-inorganic sol-gel coating can prevent the prosthetic joint infections at local level.



