

Go With the Flow: Streptococcus canis Affects Endothelial Cell Migration in the Microfluidic Circulation

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Streptococcus canis (*S. canis*) is known as opportunistic pathogen colonizing dogs and cats, but also causes zoonotic diseases such as endocardites and septicaemiae in humans.

In the course of infection, *S. canis* enters the bloodstream and adheres to the endocardium as well as to the vasculature thereby inducing cell damage.

We aim to determine the impact of *S. canis* in particular on endothelial wound healing during cell culture infection. We used our established cell culture technique, which enables live cell imaging of the wound healing process after infection with streptococci. Additionally, differential immunofluorescence staining followed by confocal laser scanning microscopy was performed. Interestingly, incubation of endothelial cells (HUVEC) with *S. canis* causes cell damage and significantly inhibited endothelial gap closure.

With the aim to analyse the effect of *S. canis* infection on endothelial wound healing under physiological flow conditions present in the blood circulation, we combined the CSMA with a microfluidic system, which enables the application of defined shear stress values. Equally to infection under static conditions, circulating *S. canis* significantly inhibited endothelial gap closure at a defined shear stress.

The developed technique in combination with the microfluidic pump system proved to be ideally suited for the analysis of *S. canis* infection in the vascular system simulating systematic disease progression *in vitro*.

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Streptococcus canis, endothelium, cell migration, microfluidic, wound healing

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Professional Status of the Speaker

PhD Student

Junior Scientist Status

Yes, I am a Junior Scientist.

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