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BOOK OF ABSTRACTS

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P4.11 - FULL SURVIVAL OF GALLERIA MELLONELLA INFECTED WITH *STAPHYLOCOCCUS AUREUS* AFTER TREATMENT WITH NISIN Z

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ABSTRACT

Diabetes mellitus affects nearly 6.4% of the worldwide population, and this number may double by 2030. Up to 25% of diabetic patients may develop diabetic foot ulcers (DFUs). Among DFU patients, 80% will suffer lower-limb amputations due to diabetic foot infections (DFIs), which are generally colonized by polymicrobial biofilms. *Staphylococcus aureus* is the DFIs' predominant pathogen, frequently found together with *Pseudomonas aeruginosa* in chronic and severe infections. Due to their high virulence and antibiotic resistant profile, it is crucial to find alternatives to conventional antibiotics for DFI treatment. Previous studies showed that Nisin Z supplemented with EDTA (0.4%) had higher antibacterial, antibacteriostatic, and antibiofilm efficiency towards *S. aureus* and *P. aeruginosa* DFI isolates. Therefore, we aimed to confirm these data in a *Galleria mellonella* model.

G. mellonella wax moth larvae were reared at 25 °C in the dark, and worms of the final- instar larval stage were selected (10 larvae for each experiment). The larvae were injected with a lethal dose of each bacterium via the hindmost left proleg. After approximately 1 hour, the larvae were injected with Nisin Z (200 µg/ml) in the penultimate right proleg. Then, they were kept in Petri dishes and maintained in the dark at 37 °C for 120 hours. Each larva was scored daily on the *G. mellonella* health index: survival, melanization, mobility, and cocoon formation. Experiments were performed with three independent replicates.

Nisin Z treatment led to 100% survival of the larvae infected with *S. aureus* but had no antibacterial activity against *P. aeruginosa*. Unexpectedly, EDTA supplementation did not increase antipseudomonal activity. Nisin Z was not cytotoxic to the larvae.

Nisin Z may be used as a complement to conventional antibiotic therapy against *S. aureus* in DFI. *G. mellonella* is a valuable model before proceeding to preclinical studies in mammals.

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