

Antimicrobial Amyloid Peptides in Infectious Diseases: Dissecting mechanisms of cell toxicity at high-resolution

Initiative: zukunft.niedersachsen (nur ausgewählte Ausschreibungen)

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Laufzeit:

This proposal touches on the impact of amyloids on a pressing public health concern: the rapid appearance of multi-drug resistant bacteria, coupled with a thirty-year discovery void of new antibiotics. Amyloids are proteins that can form fibers with unique and strong structures, which have been studied for many years, mainly in the context of neurodegenerative diseases and systemic amyloidosis. A potential physiological link between amyloid production in humans and resistance to microbial threats was recently suggested following the discovery that certain human disease-associated amyloids possess antimicrobial properties, and that some antimicrobial peptides (AMPs), secreted by different organisms, assemble into amyloid-like fibrils. In return, microbes also produce virulent amyloids to attack their host and make infections more aggressive. Using cutting-edge and complementary approaches in both the Zweckstetter and Landau laboratories, the properties and mechanisms of microbial and antimicrobial amyloids will be studied at the molecular and atomic levels. This would advance the design of antivirulence drugs, as well as robust antimicrobials for coating of medical devices, food packages, water pipes and other surfaces susceptible to aggressive and resistant pathogens. Moreover, the findings would clarify the molecular basis of the amyloid-antimicrobial link, and can illuminate a physiological role in neuroimmunity for human pathological amyloids.

Projektbeteiligte

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