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2H NMR Studies of Bacterial Membranes Disruption Resulting from the Interaction with Antimicrobial Peptides (G)*

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Antimicrobial Peptides (AMPs) are small chains of between 10 and 50 amino acids with the ability to kill pathogens such as bacteria, fungus, viruses, and even cancer cells. AMPs are one of many mechanisms that living organism have developed to protect themselves from pathogenic microorganisms. Most research in AMPs is focused on understanding the mechanism or mechanisms that AMPs use to kill pathogens. In the case of bacteria, it is widely accepted that AMPs are able to disrupt the bacterial cell membrane more specifically, the lipid bilayer. In order to fully understand how AMPs are able to kill bacteria, it is also important to understand the role of other components of the bacterial cell envelope such as the lipopolysaccharides and the peptidoglycan (PGN) layer. 2H NMR is a technique that can be used to study the fluidity of lipid bilayers assemblies. In particular, 2H NMR can be used to identify order parameter changes resulting from the interaction between lipid vesicles with AMPs. Our group and others have developed methods to grow 2H-membrane-enriched bacteria. In this research, We observe the changes in the 2H NMR spectrum of different bacterial strains (*E .coli* LA8, *E. coli* JM109 and *B. subtillis*) in the presence and absence of different AMPs (MSI-78, CAME and BP100). Additionally, exploring the importance of the PNG layer in the interaction between the MSI-78 and BP100 with the lipids in the bacterial cell membrane of B. subtillis, we discovered that the removal of the PGN layer does not generate changes in the 2H NMR spectrum of B. subtillis. Moreover, the level of disruption observed on the lipid bilayer of B. subtillis caused by MSI-78 and BP100 does not change after the partial removal of the PGN layer.

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