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Real-Time Interaction between Antimicrobial Peptide and Lipid Membrane Using Atomic Force Microscopy and Confocal Microscopy JIE HU, Department of Physics and Astronomy, University of Texas at Brownsville, VERNITA GORDON, Center for Nonlinear Dynamics, University of Texas at Austin, AHMED TOUHAMI, Department of Physics and Astronomy, University of Texas at Brownsville, DEPARTMENT OF PHYSICS AND ASTRONOMY, UNIVERSITY OF TEXAS AT BROWNSVILLE COLLABORATION, CENTER FOR NONLINEAR DYNAMICS, UNIVERSITY OF TEXAS AT AUSTIN COLLABORATION — Peptidyl-glycylleucine-carboxyamide (PGLa) is a helical cationic amphiphilic antimicrobial peptide known to interact with bacterial membranes. The electrostatic interaction is the major determinant that triggers the affinity of the PGLa towards bacterial membranes. Here, Atomic Force Microscopy (AFM) and Confocal Microscopy (CM) were used to investigate this interaction. Giant Unilamellar Vesicles (GUV) mimicking E. coli membranes were prepared by the natural swelling method that allows the fluorescence dye to be capsulated in the GUVs. After GUVs were incubated with PGLa in medium with low ionic strength, excessive leakage of the internal contents of GUVs was detected. Our results demonstrate that AFM and CM, as well as appropriate sample preparation protocols, are needed to obtain detailed mechanistic insights into antimicrobial function.

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