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Membrane Disruption Mechanism of Antimicrobial Peptide KIN LOK H. LAM, University of Chicago, TING ANN SIAW TEAM, YUJI ISHITSUKA TEAM, KA YEE C. LEE TEAM — PG-1, a cationic antimicrobial peptide, kills bacteria by forming pores which increase membrane permeability to ions or larger molecules. It has been proposed that PG-1 selectively induces stable membrane pores in bacterial membranes over mammalian membranes. To study the mechanism of action of PG-1, we directly visualize the topological changes induced by PG-1 in model membranes via atomic force microscopy for the first time. PG-1 induces structural transformations in supported lipid bilayers, progressing from bilayer edge instability, to the formation of pores, and finally to a network of wormlike micelles in a zwitterionic dimyristoylphosphatidylcholine model membrane with increasing PG-1 concentrations. The structural transformation can be understood in the framework of the action of 1d detergent, with PG-1 acts as a line active agent. The results elucidate the mechanism by which PG-1 uses to induce leakage in bacterial cells.

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