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Towards general design rules for membrane active antimicrobials LORI SANDERS, Materials Science and Engineering Dept, University of Illinois, Urbana-Champaign, NATHAN SCHMIDT, Physics Dept, University of Illinois Urbana-Champaign, ABHIJIT MISHRA, VERNITA GORDON, Materials Science and Engineering Dept, University of Illinois, Urbana-Champaign, GERARD WONG, Bionengineering Dept, University of California, Los Angeles — Membrane active antimicrobials are short amphipathic peptides that selectively disrupt and lyse bacterial cell membranes. While it is believed that the combination of peptide hydrophobicity and cationic charge is essential for function, the detailed molecular mechanism of selective membrane permeation remains unclear. We use synchrotron small angle x-ray scattering (SAXS) to investigate the interaction of model bacterial and eukaryotic cell membranes with archetypes from each of the three defensin subfamilies found in mammals. The relationship between membrane composition and peptide induced changes in membrane curvature and topology is examined. By comparing the membrane rearrangement and corresponding phase behavior induced by these different peptides we will discuss the importance of amino acid composition and placement on antimicrobial peptide design.

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