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Relationship between peptide membrane curvature generation and bactericidal activities NATHAN SCHMIDT, MICHELLE LEE, DAVID KUO, Bioengineering Dept, UCLA, ANDRE OUELLETTE, Pathology & Laboratory Medicine Dept, USC, GERARD WONG, Bioengineering Dept, UCLA — Many amphipathic peptides and amphipathic domains in proteins can restructure biological membranes. Two examples are host defense antimicrobial peptides (AMPs) which disrupt and destabilize the cell membranes of microbes, and apolipoproteins which help stabilize nanoscale lipid aggregates. We use complementary x-ray and bacterial cell assays to elucidate the molecular length scale membrane deformations generated by amphipathic peptides with different structural motifs and relate these deformations to their activities on bacteria. Small angle x-ray scattering is used to study the interactions of model membranes with prototypical AMPs and consensus peptides from the amphipathic domains in apolipoproteins. By characterizing the nanoscale curvature deformations induced by these two distinct classes of membrane restructuring peptides we will discuss the role of amino acid composition on curvature generation. Bactericidal assays are used to access the in vivo activities of different amphipathic peptide motifs in order to understand the relationships between cell viability and membrane curvature generation.

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