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Asymmetrical binding of cationic peptides onto an oppositely-charged lipid-bilayer membrane: area expansion and membrane rupture[1]
SATTAR TAHERI-ARAGHI, BAE-YEUN HA, Department of Physics, University of Waterloo, Ontario N2L 3G1, Canada — We study asymmetrical binding of cationic peptides onto a negatively charged lipid-bilayer membrane. The peptide not only interacts electrostatically with anionic lipids, rearranging their spatial distributions, but it can also insert hydrophobically into the membrane, expanding the area of its binding layer (ı.e., the outer layer). We examine how peptide charges and peptide insertion (thus area expansion) are intertwined. Our results illustrate why high valences are required for selective toxicity of antimicrobial peptides, (ı.e., they selectively rupture bacterial membranes while leaving host cells intact).

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Sattar Taheri-Araghi
Department of Physics, University of Waterloo, Ontario N2L 3G1, Canada

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