AFM Spectroscopy for the Study of Lipid Bilayer Stability and Morphology

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Abstract

Atomic Force Microscopy (AFM) enables the visualization of nano-objects, biomolecules, and cells while simultaneously probing their mechanical properties. Force-distance curves derived from indentation experiments provide insights into the elastic and viscoelastic properties of macromolecules and living cells. For example, supported phospholipid bilayers can be used as mimics of cell membranes. And simulate cellular events *in vitro*. Moreover, puncturing the bilayer by AFM tip with a low bilayer radius creates a characteristic peak in the force-distance curve. Location of this break was called a “rupture event” and provides valuable information about the phospholipid membrane, such as its thickness, fluidity, or composition, etc. AFM can also capture protein-membrane interactions and the effects of specific agents on lipid bilayers or cell membranes, demonstrated here on pore-forming peptides with antimicrobial and anticancer potential.

References

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