National Institute of Technology Rourkela

Departmental Seminar

Seminar Title	: AFM for life science
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Venue	: Seminar Room (BM)
Date and Time	: 18 Aug 2025 (11:15 AM)
Abstract	: Atomic force microscopy is a type of scanning probe microscopy which uses a sharp tip to scan a sample surface and measures local properties like height, friction, and surface morphology. AFM also have another technique called atomic force spectroscopy used to measure the interaction forces between a sharp tip and a sample surface as a function of distance. In spectroscopy mode it measures the deflection of a cantilever as it approaches and retracts from the surface. AFS generates force distance curves that reveal information about adhesion, stiffness and other properties. This workshop was all about AFM in life sciences. Single molecule atomic force microscopy is a technique used to study the mechanical unfolding and refolding of individual protein molecule, by applying force to a single protein and measuring its response. Proteins of desire are attached to the tip and surface by some linkers. The AFM tip then brought into the contact with the protein and slowly retracted applying a stretch force. The AFM then measures the force required to stretch the protein as a function of the distance the tip is retracted. The force extension curves generated by the AFM are analysed to determine the unfolding forces, distances and the overall energy landscape of the protein.by these techniques the mechanical stability of different protein structures and the pathways by which they unfold can be predicted.