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A new nano technique tool in medical studies and diagnostic assays: A literature review

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Atomic force microscopy (AFM) is a three-dimensional topographic technique with a high atomic resolution to measure surface roughness. AFM is a kind of scanning probe microscope (SPM) and it's a near field technique which is based on the interaction between a sharp tip and the atoms of the sample surface. There are several methods and many ways to modify its tip to investigate surface properties including friction and adhesion force measurements, viscoelastic properties and determination of Young's modulus and imaging magnetic or electrostatic properties. AFM can analyze any kind of samples like polymers, adsorbed molecules, films or fibers, powders in air, controlled atmosphere or in liquid medium. In the past decade, AFM has been emerged as a powerful tool to obtain nano structural details and biomechanical properties of biological samples including biomolecules and cells. AFM application techniques and in particular its force measurement parts are not still familiar to most of the clinicians. This paper reviews the literature regarding the main principles of AFM and highlights the advantages of using AFM in biology, medicine and especially in dentistry. This literature review was performed through e-resources including Science Direct, PubMed, Blackwell Synergy, Embase Elsevier and Google Scholar for the references published in 1985 to 2010.

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