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Applications of atomic force microscopy for the assessment of nanoscale morphological and mechanical properties of bone

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Abstract:

Scanning probe microscopy (SPM) has been in use for 30 years, and the form of SPM known as atomic force microscopy (AFM) has been around for 25 of those years. AFM has been used to produce high resolution images of a variety of samples ranging from DNA to carbon nanotubes. Type I collagen and many collagen-based tissues (including dentin, tendon, cartilage, skin, fascia, vocal cords, and cornea) have been studied with AFM, but comparatively few studies of bone have been undertaken. The purpose of this review is to introduce the general principles of AFM operation, demonstrate what AFM has been used for in bone research, and discuss the new directions that this technique can take the study of bone at the nanoscale.

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