Abstract Submitted
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Contact nanomechanical measurements with the AFM NICHOLAS GEISSE, Asylum Research — The atomic force microscope (AFM) has found broad use in the biological sciences largely due to its ability to make measurements on unfixed and unstained samples under liquid. In addition to imaging at multiple spatial scales ranging from micro- to nanometer, AFMs are commonly used as nanomechanical probes. This is pertinent for cell biology, as it has been demonstrated that the geometrical and mechanical properties of the extracellular microenvironment are important in such processes as cancer, cardiovascular disease, muscular dystrophy, and even the control of cell life and death. Indeed, the ability to control and quantify these external geometrical and mechanical parameters arises as a key issue in the field. Because AFM can quantitatively measure the mechanical properties of various biological samples, novel insights to cell function and to cell-substrate interactions are now possible. As the application of AFM to these types of problems is widened, it is important to understand the performance envelope of the technique and its associated data analyses. This talk will discuss the important issues that must be considered when mechanical models are applied to real-world data. Examples of the effect of different model assumptions on our understanding of the measured material properties will be shown. Furthermore, specific examples of the importance of mechanical stimuli and the micromechanical environment to the structure and function of biological materials will be presented.

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