

Break Junction Technique for Studying Individual Biological Molecules

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Abstract

Single molecule biophysics is a rapidly growing field that has great implications in the broader area of nanotechnology. The quantum properties of complex biological molecules can also be studied through the use of advanced techniques that examine molecules on an individual scale. Current methods for studying individual molecules often lack the accuracy needed to yield satisfactory data. In our experiments, we attempted to use a Scanning Tunneling Microscope (STM) based break junction method to study the quantum tunneling current through small biomolecules. By probing the currents changes through these molecules on an individual scale under external gating and in a controlled environment, we can learn fundamental physical and chemical properties of these molecules and subsequently apply them to new technologies.

(NOTE: This is an updated version of the attached, previously submitted abstract.)