

NANO-HIGHLIGHT:

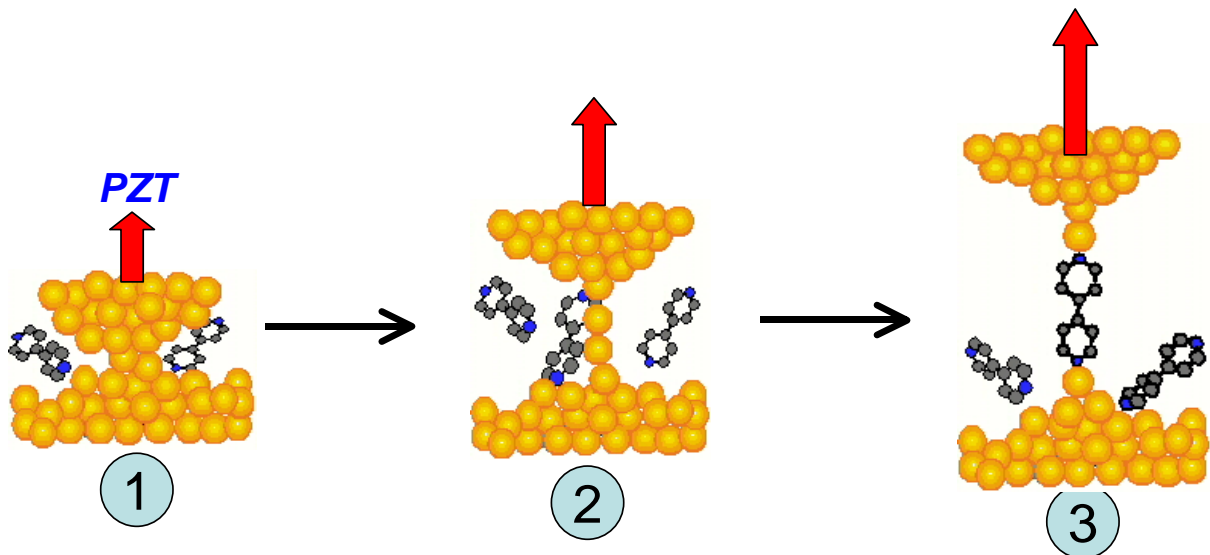
## Rapid Single Molecule Measurements

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NANOSCALE MOLECULAR OPTOELECTRONICS

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It has recently become possible to measure the electronic properties of a single molecule reliably and reproducibly, using a technique in which a metal to molecule to metal sandwich is 'self-assembled'. However, the method is quite time-consuming and subject to complications associated with the very small contacts used. Bingqian Xu and Nongian Tao (*Science* 2003, **301**: p. 1221-1223) have developed a new technique in which nanoscale junctions are constantly broken and remade while electrical data are recorded continuously. When a histogram of the current values recorded at a particular bias is made, peaks are found at the resistance corresponding to the single molecule values determined by the more complicated self-assembly method. This new technique will allow many more molecules to be studied more rapidly. It will also allow measurements to be made in an aqueous environment using standard insulated STM tip methods.



**Figure 1:** Repeated gap formation for single molecule contact: Gap formation is preceded by formation of a single-channel conductor (2) and only the reproducible molecular attachments (3) contribute peaks to the current histogram.