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### **STM Manipulation of Nanoscale Biomolecules**

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The fascinating advances in single molecule manipulations with the scanning-tunneling-microscope (STM)-tip allow scientists to fabricate artificial atomic scale structures, to study local quantum phenomena or to investigate and control properties of molecules at an atomic limit. The STM manipulation is facilitated by a precise control of tip-molecule interactions, or tunneling electrons, or the electric field between the tip and sample. By combining STM manipulation with imaging and tunneling spectroscopy, powerful experimental schemes can be developed, which opens novel routes to investigate or induce molecular conformation changes with atomic level control. In this talk, various cutting-edge STM manipulation techniques relevant to the biological systems will be introduced and our recent results on manipulation of nanoscale biological molecules including chlorophyll-a,  $\beta$ -carotene and amyloid  $\beta$ /A4 precursor protein on a Au(111) substrate will be presented.