Supplementary Information

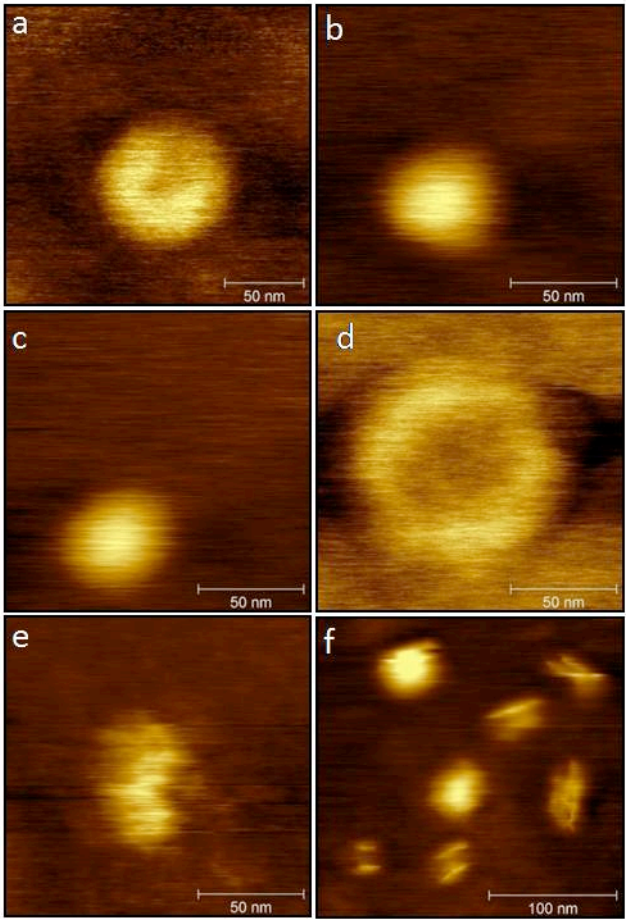

Figure S1 **Reversible mechanical deformation and disintegration of single exosome under varying forces during PM-AFM imaging. a,** Exosome size increases with decreases from a to b with decrease in imaging force applied. Vesicle size then increases from b to c and d with increasing applied force. **e,** Increasing the force to ~5nN, results in disintegration of the exosomes. **f,** Disintegrated fragments can be imaged as parts in this subsequent image. The major fragments of exosomes presumably result from disintegration of vesicular structure constituting the intact exosome structures. All images shown were obtained under forward tip scan direction.

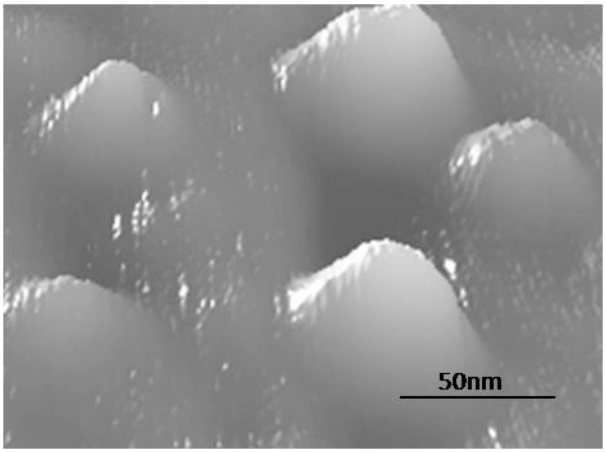

Figure S2 **AFM 3D topographic image of exosomes immobilized over mica surface imaged in buffer.** Individual isolated exosomes with height and lateral dimensions around 4 nm and 120 nm respectively were identified and targeted for force spectroscopy experiments.