Protein unfolding

Scientists envision many functions transferred to the molecular machines instead of man-made devices in the future. In order to create molecular machine mechanical stability of the protein complex has to be well understood. Considering small size of the proteins (what is the range of sizes of the tertiary structure of proteins? **1 балл**) atomic force microscope seems to be good tool for studies of the mechanical properties of the proteins, specifically unfolding. The size of the proteins implies that unfolding force will be quite small as well (what is the range of unfolding forces for different proteins? **2 балла**). The standard experiment for measuring protein unfolding is approaching surface with adsorbed proteins with microscope tip, until tip touches the surface, then pull the tip off the surface (please draw schematically force curve as function of tip displacement in experiment described above, consider two cases: molecule/no molecule between tip and the surface. Please describe physical processes happening at each step. **4 балла**). As an experimentalist in this project you have to work with small displacements and small forces, what internal standard you would use to calibrate your system (please list several types of proteins you would use. **2 балла**).

При ответе на английском языке – плюс три балла.