Supplemental videos. Videos simulate hydrodynamic force acting on VWF. VWF is represented as a string of 50 spheres (cyan except for spheres at the two ends in magenta). Self-association of VWF monomers is modeled as attraction between spheres, which is counteracted by hydrodynamic force acting on the spheres. Although it would move in flow, VWF is re-centered in each frame. Simulations begin with compact VWF and initiation of flow at the indicated rates. Video 1: Shear flow at 1,500 s\(^{-1}\). Video 2: Shear flow at 2,500 s\(^{-1}\). Video 3: Shear flow at 5,000 s\(^{-1}\). Video 4: Shear flow at 8,000 s\(^{-1}\). Video 5: Elongational flow at 100 s\(^{-1}\). Video 6: Elongational flow at 150 s\(^{-1}\). Both shear and elongational flows are measured as velocity/distance and have units of s\(^{-1}\). Low values of elongational flow suffice to extend VWF whereas much higher values of shear flow are required. Simulations are similar to those described in 42,44. Videos are courtesy of Darren Yang and Wesley Wong (Children’s Hospital, Boston, MA). Simulations use a sphere diameter of 80 nm, viscosity of 1 cP, temperature of 300 K, and a Lennard-Jones potential between spheres with a well depth of 2.08 kT. Videos are slowed down by 170-fold. Multiplying the rates by the viscosity gives the stress; i.e. stress in dyn/cm\(^2\) is 1/100 of the rates shown in s\(^{-1}\).