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Partitioning of the elastic energy in protein-DNA chimeras ANDREW WANG, CHIAO-YU TSENG, Department of Physics and Astronomy, UCLA, Los Angeles, CA, USA, BILJANA ROLIH, ALEX LEVINE, Department of Chemistry & Biochemistry and The California Nanosystems Institute, UCLA, Los Angeles, CA, USA, GIOVANNI ZOCCHI, Department of Physics and Astronomy, UCLA, Los Angeles, CA, USA — We synthesize Protein-DNA chimeras where a DNA molecular spring mechanically perturbs the conformation of the protein. We measured the elastic energy stored in one such molecule, consisting of the enzyme Guanylate Kinase coupled to a 60 bp DNA spring. From these measurements, the response of the protein in terms of its enzymatic activity, and a mechanical model of the DNA spring we deduce that, in this case, most of the elastic energy of the molecule is stored in the DNA spring. Thus the DNA spring is "softer" than the protein.

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