1046-92-326 **Eva M Strawbridge*** (emstrawbridge@math.ucdavis.edu), Department of Mathematics, One Shields Ave., Davis, CA 95616. *The Mechanics and Dynamics of DNA as an Elastic Rod.*

DNA is a sequence of bases strung together into strands, winding around each other. If the strands are pulled apart, the molecule overtwists in one direction, and undertwists in the other, causing it to warp. In DNA this is called supercoiling. We model the progression of supercoiling in the wake of the cellular machinery, motivated by the possibility that it may induce changes in cellular activity or structure. We consider a single molecule as a symmetric, linearly elastic rod. This is a fully dynamic approach. We treat our model in a rigorous form, with a careful consideration of a non-local drag force, when appropriate, and a rigorous treatment of the scaling relationships between the drag model and the equations of motion. We show that when drag is neglected, the planar rod possesses an unstable twist equilibrium. When this equilibrium is perturbed, the rod buckles into an unstable helical shape or experiences a variety of wave motions. Intuition leads us to believe that when drag is included, the twist propagation would subsequently loose all wave-like behavior resulting in the build-up of local twist quickly, in a small domain. (Received August 26, 2008)