1037-76-288 **Oscar Gonzalez*** (og@math.utexas.edu), Department of Mathematics, University of Texas, Austin, TX 78712, and **Jun Li**, Program in Computational and Applied Math, University of Texas, Austin, TX 78712. *Modeling the diffusion coefficient of short DNA sequences.* Preliminary report.

Experimental data on the translational diffusion coefficient of short DNA sequences is studied. This data has traditionally been used to support the view that, at lengths up to about 150-basepair, DNA can be modeled as a straight, circular cylinder with an approximate hydrated diameter of 26-angstrom. In this talk, we re-examine this data and view using a recently developed method for computing the diffusion coefficient. In contrast to previous investigations, the method here is based on a direct numerical solution of the Stokes flow equations in the three-dimensional domain exterior to a DNA molecule, and employs a sequence-dependent model of DNA geometry based on crystal structure data. Our results indicate that sequence effects have a measurable impact on the diffusion coefficient, and that previous estimates of the hydrated diameter are likely to be underestimates. (Received February 04, 2008)