

**Meeting:** 1004, Bowling Green, Kentucky, SS 4A, Special Session on Knot Theory and Its Applications

1004-92-119      **Mariel Vazquez\*** ([mariel@math.berkeley.edu](mailto:mariel@math.berkeley.edu)), U.C. Berkeley, Mathematics Department, 970 Evans Hall, Berkeley, CA 94720-3840. *Modeling DNA Unknotting by TypeII Topoisomerases*. Preliminary report.

Type II topoisomerases (Topo II) are essential enzymes common to all organisms. Their cellular functions include maintaining the levels of chromosome compaction and ensuring proper segregation at cell division. Topo II performs strand passage on its substrate DNA in a reaction that has been well characterized at the molecular level. When acting on knotted DNA molecules TopoII is known to unknot DNA very efficiently. Here we address the question of whether the knot crossings acted on by topoII are selected at random or not. Our study is based on knot theory and Monte-Carlo computer simulations of DNA unknotting. (Received January 20, 2005)