Abstract Submitted
for the MAR07 Meeting of
The American Physical Society

Evolution of DNA Compaction in X-Ray Compatible Microflow Foil Devices SARAH KOESTER, HEATHER M. EVANS, ROLF DOOTZ, Max Planck Institute for Dynamics and Self-organization, Goettingen, Germany, BERND STRUTH, HASYLAB, Hamburg, Germany, THOMAS PFOHL, Max Planck Institute for Dynamics and Self-organization, Goettingen, Germany — Spatially resolved X-ray microdiffraction in hydrodynamic focusing microdevices provides new opportunities to study time-resolved reactions of complex fluids. A demonstration of this technique as applied to the liquid crystal 8CB was recently reported [1]. Here, we discuss the dynamics of the compaction of DNA by polyimine dendrimers, as studied using microfluidic devices. Due to the laminar flow inside the channels a highly defined, diffusion controlled compaction of DNA occurs. Different snapshots in the time of the reaction are accessible at varying spatial positions along the interaction jet. We use newly developed X-ray compatible microflow foils made from PDMS and Kapton and having dimensions ranging from 30 to 150 micrometers. The real-time evolution of a DNA-dendrimer columnar mesophase with an in-plane square symmetry is reported. These studies are also extended to include a larger library of dendrimers whose size and charge approach those of the biological histone proteins.
[1] Dootz, Evans, Koester, Pfohl, accepted to Small.

Sarah Koester
Max Planck Institute for Dynamics and Self-organization

Date submitted: 20 Nov 2006 Electronic form version 1.4