

Abstract Submitted
for the MAR06 Meeting of
The American Physical Society

Spacer length controlled lamello-columnar to oblique-columnar mesophase transition in liquid crystalline DNA - discotic cationic lipid complexes LEI ZHU, LI CUI, JIANJUN MIAO, Polymer Program, Institute of Material Science and Department of Chemical Engineering, University of Connecticut, Storrs, Connecticut 06269-3136 — A series of asymmetric triphenylene imidazolium salts with different spacer lengths (C5, C8, and C11) were synthesized and their ionic complexes with double-strand DNA were prepared in aqueous solution. The molecular composition of the complexes was determined by FTIR analysis. The liquid crystalline morphology was characterized by polarized light microscopy, X-ray diffraction (XRD), and transmission electron microscope. 2D XRD results indicated an oblique columnar phase for the complex with a short spacer length of C5, while lamello-columnar phases for those with longer spacer lengths (C8 and C11). Thin film circular dichroism results showed the disappearing of any helical conformation in the DNA in all the complexes. Instead, the complexation between single-strand RNA and discotic cationic lipids did not show columnar morphology; therefore, the columnar liquid crystalline morphology in the DNA-discotic cationic lipid complexes was attributed to the DNA double-strand chain rigidity.

Polymer Program, Institute of Material Science and Department of Chemical Engineering, University of Co

Date submitted: 30 Nov 2005

Electronic form version 1.4