Abstract Submitted
for the MAR17 Meeting of
The American Physical Society

High-resolution structure, interactions, and dynamics of self-assembled virus-like partilces URI RAVIV, The Hebrew University of Jerusalem, R.ASOR, O. BEN-SHAUL, A. OPPENHEIM, L. C. SCHLICKSUP, L. SELTZER, M.F. JARROLD A. ZLOTNICK, COLLABORATION — Using SAXS, in combination with Monte Carlo simulations, and our unique solution x-ray scattering data analysis program, we resolved at high spatial resolution, the manner by which wtSV40 packages its 5.2kb circular DNA about 20 histone octamers in the virus capsid (Figure 1). This structure, known as a mini-chromosome, is highly dynamic and could not be resolved by microscopy methods (Nucleic Acid Research, 41, 1569, 2013). Using time-resolved solution SAXS, stopped-flow, and flow-through setups the assembly process of VP1, the major caspid protein of the SV40 virus, with RNA or DNA to form virus-like particles (VLPs) was studied in msec temporal resolution. By mixing the nucleotides and the capsid protein, virus-like particles formed within 35 msec, in the case of RNA that formed T=1 particles, and within 15 seconds in the case of DNA that formed T=7 particles, similar to wt SV40. The structural changes leading to the particle formation were followed in detail (J. Am. Chem. Soc. 134, 8823, 2012). More recently, we have extended this work to study the assembly of HBV virus-like particles.

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Date submitted: 12 Nov 2016 Electronic form version 1.4