Supplementary Information

Solid-to-fluid DNA transition inside HSV-1 capsid close to the temperature of infection

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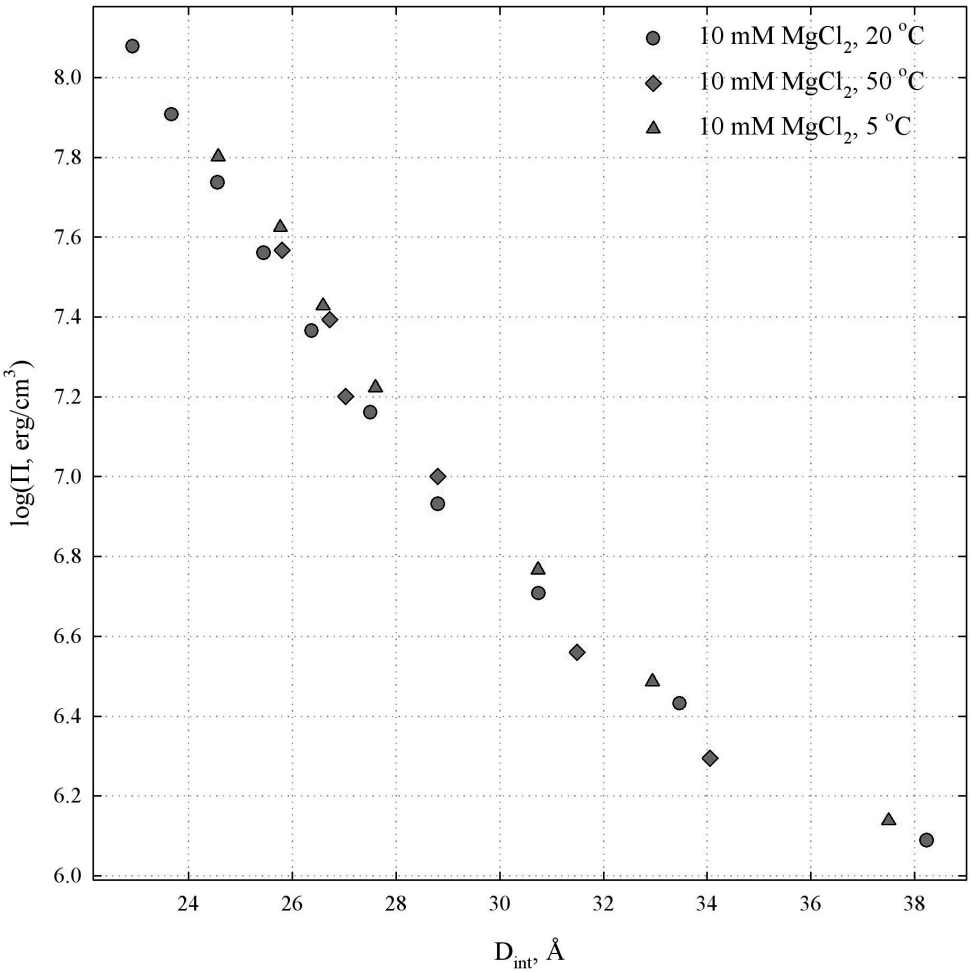

Supplementary Figure 1: Comparison of intermolecular force curves (log_{10} of PEG osmotic pressure, P, versus interhelical DNA-DNA spacing, D_{int}) measured for helices in 10 mM $MgCl_2$ Tris-buffer at 5, 20 and 50°C.

The osmotic stress technique for measuring forces is described in ref.[1] (see below). Force measurements were carried out at the Laboratory of Physical and Structural Biology, Program in Physical Biology, National Institutes of Health. Ni-filtered Cu-Ka radiation from an UltraBright microfocus x-ray source from Oxford Instruments equipped with polycapillary focusing x-ray optics was used for the small angle x-ray scattering (SAXS) experiments. The primary beam was also collimated by a set of slits. After equilibration, samples were sealed with ~ 100 ml equilibrating salt-PEG solution in a sample cell and mounted into a temperature-controlled holder. The flight path between the sample and detector, ~ 16 cm, was helium filled. Typical exposure times were ~ 30 min. Further details are described elsewhere[2].

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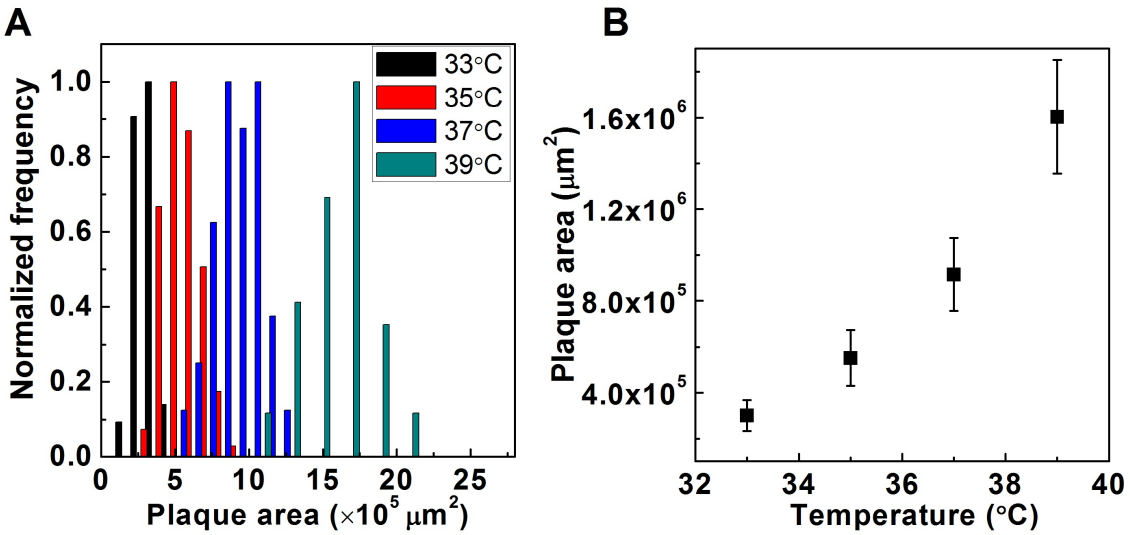

Supplementary Figure 2: **(A)** Distributions of plaque area formed on a layer of Vero cells at incubation temperatures from 33˚C to 39˚C. Plaques were measured after 75 h for all samples. The plaque area is associated with the rate of infection spread of HSV-1 at each temperature. **(B)** The averaged plaque area is plotted as a function of incubation temperature. At least 300 plaques were analyzed for each sample. Error bars show the standard deviation.

References:

1. Parsegian, V.A., Rand, R.P., Fuller, N.L. & Rau, D.C. Osmotic-Stress for the Direct Measurement of Intermolecular Forces. *Methods in Enzymology* **127**, 400-416 (1986).
2. DeRouchey, J., Hoover, B. & Rau, D.C. A comparison of DNA compaction by arginine and lysine peptides: a physical basis for arginine rich protamines. *Biochemistry* **52**, 3000-9 (2013).

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