

TABLE 1 Packaged volume fractions of some bacteriophage and eukaryotic viruses

Virus type	Host type	Genome length (Kbp)	Diameter (nm)	ρ_{pack}
Bacteriophage T7	Bacteria	40	55	0.490
Bacteriophage $\phi 29^*$	Bacteria	19.4	47	0.459
Bacteriophage T4	Bacteria	169	92	0.443
Bacteriophage λ^\dagger	Bacteria	48.5	63	0.419
Bacteriophage P22	Bacteria	41.7	63	0.319
Herpes Virus HSV1	Human	152	125	0.159
Human Adenovirus C	Human	36	80	0.143
Smallpox Virus 1 ‡	Human	186	220	0.036
Polyoma Virus SV40	Human	5.3	~50	0.083
Mimivirus §	Amoeba	~800	~400	0.026
Papillomavirus BPV1	Animal	7.9	60	0.070

We have used the outer dimensions of the capsid from Baker et al. (1999) in the calculation of ρ_{pack} since these are more readily available than the dimensions of the empty space inside the capsid. The genome lengths are given, for most viruses, in National Center for Biotechnology Information (2004). The DNA in bacteriophage is seen to be significantly more tightly packed than the other viruses, revealing the geometric origin of the large packing forces associated with bacteriophage.

*Tao et al. (1998). Since the $\phi 29$ capsids are aspherical, we use an average diameter that gives the correct volume.

† Dokland and Murialdo (1993).

‡ World Health Organization (2004). Since the smallpox particles are aspherical, we use an average diameter that gives the correct volume.

§ La Scola et al. (2003); this is the largest virus currently known.

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