

SUPPLEMENTARY INFORMATION:

Mechanical disassembly of human picobirnavirus like particles indicates that cargo retention is tuned by the RNA-coat protein interaction

María J. Rodríguez-Espinosa, Javier M. Rodríguez, José R. Castón, Pedro J. de Pablo

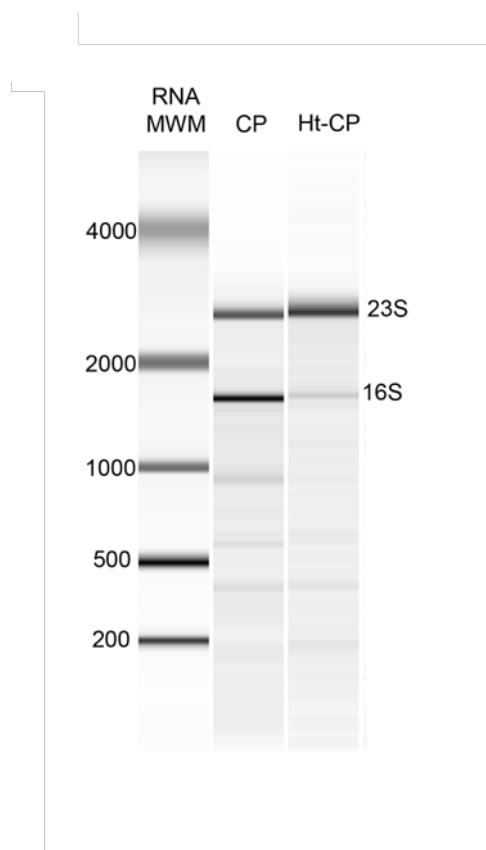
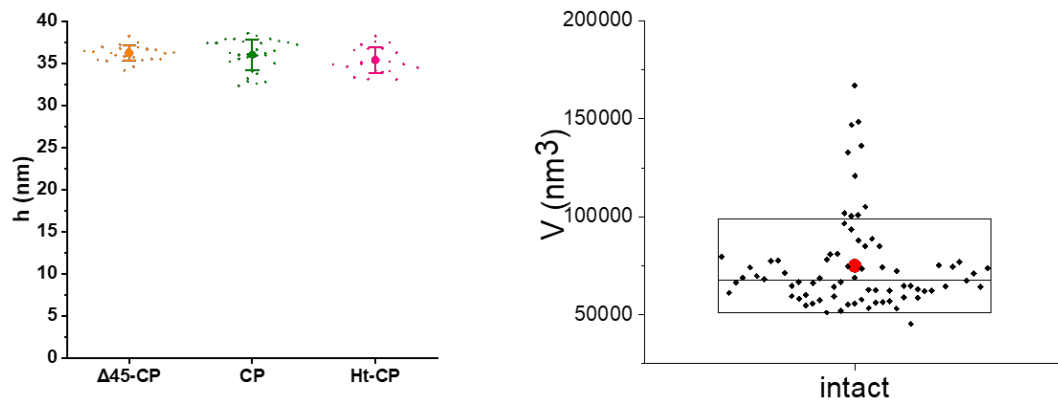


FIGURE S1. Analysis of encapsidated RNAs in hPBV CP and Ht-CP VLPs. Agilent 2100 Bioanalyzer gel image of isolated total RNA from purified CP and Ht-CP particles. The samples were analyzed using an RNA 6000 Nano Chip, a cartridge to make capillary electrophoresis. The position of the bands representing the 26S and 16S rRNA and the size (in bases) of the RNA 6000 Nano Ladder bands are indicated.



	N	h (nm)
$\Delta 45$ -CP	25	36.2 $\pm$ 0.9
CP	32	36.0 $\pm$ 1.8
Ht-CP	22	35.4 $\pm$ 1.5

FIGURE S2. The top-left panel represents the height chart of the three virus species, without showing important differences in the deformation of the particles (bottom table). The top-right panel shows the volume distribution of intact virus particles calculated from AFM images (flooding filter, 25) of 74000 ± 24000 nm³ (mean $\pm$ SD -red dot-, N = 79). This volume is overestimated by the tip-dilation effect, as it is explained in the text.

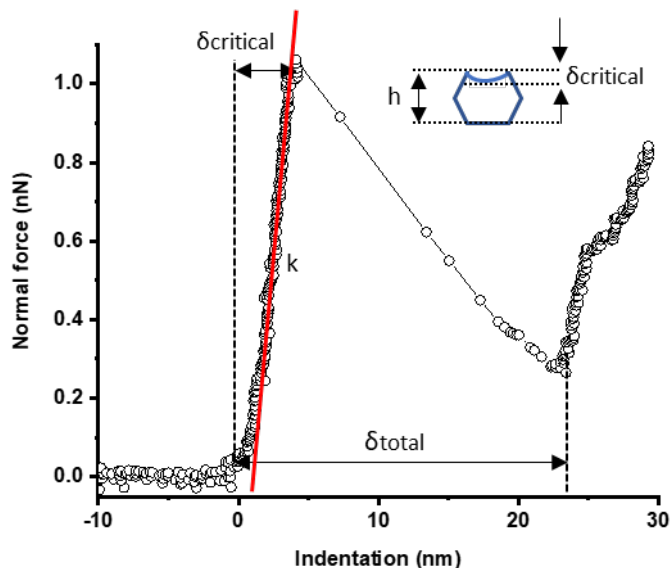


FIGURE S3. AFM indentation or force indentation curve (FIC). Normal force versus indentation curve of a hPBV CP VLP. Spring constant (k), critical indentation (δ_{critical}) and total indentation (δ_{total}) can be calculated from the nanoindentation.

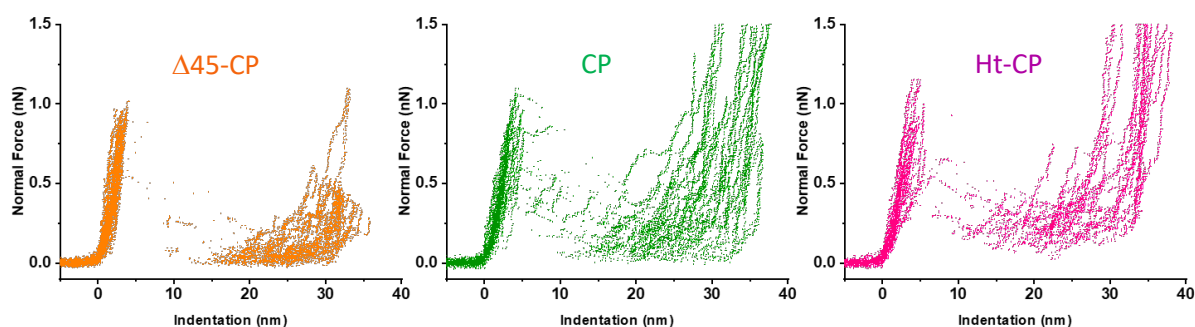
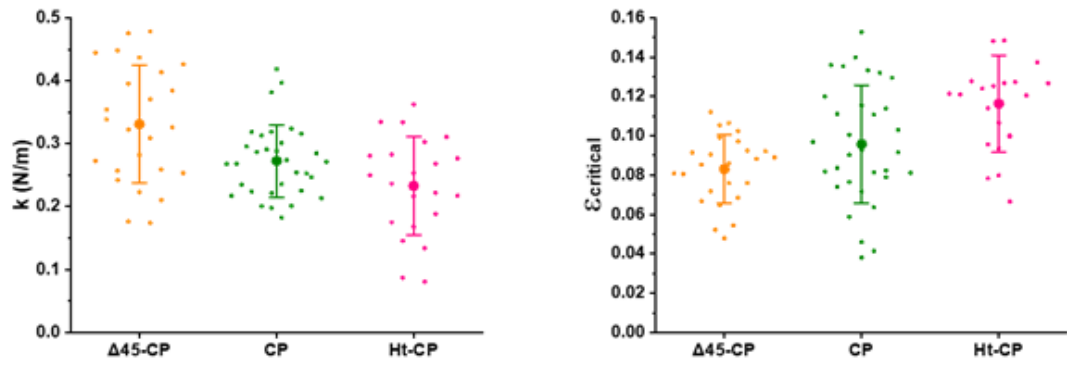


FIGURE S4. Raw data that have been used to build the nanoindentation thermal maps of fig. 3. It is possible to observe that the experimental points of the $\Delta 45$ -CP data FIC (orange) appear to be less dispersed in the linear regime (from 0 to 5 nm) than the CP (green) and Ht-CP (pink) data. This higher density of $\Delta 45$ -CP experimental points appear as red color in figure 4A.



	N	k (N/m)	$\epsilon_{critical}$
$\Delta 45$ -CP	25	0.33 ± 0.09	0.08 ± 0.02
CP	32	0.27 ± 0.06	0.09 ± 0.03
Ht-CP	22	0.23 ± 0.08	0.11 ± 0.02

Fig. S5. The top left panel represents the stiffness/spring constant chart of the three virus species, where Ht-CP particles seems to be a little bit softer than the other two species within the standard deviation. In the right top panel the brittleness chart shows similar values for the three virus classes, with some tendencies within the standard deviation. The bottom panel presents the number of particles measured by specie, and the values of spring constant and brittleness.

Supplementary movies

SM1. $\Delta 45$ -CP VLP, 12 frames, elapsed time 21 min.

SM2. CP VLP, 13 frames, elapsed time 26 min.

SM2. HTCP VLP, 26 frames, elapsed time 55 min.