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SUPPORTING INFORMATION

Structural Determinants of Mechanical Resistance against Breakage of a Virus-Based Protein Nanoparticle at a Resolution of Single Amino Acids

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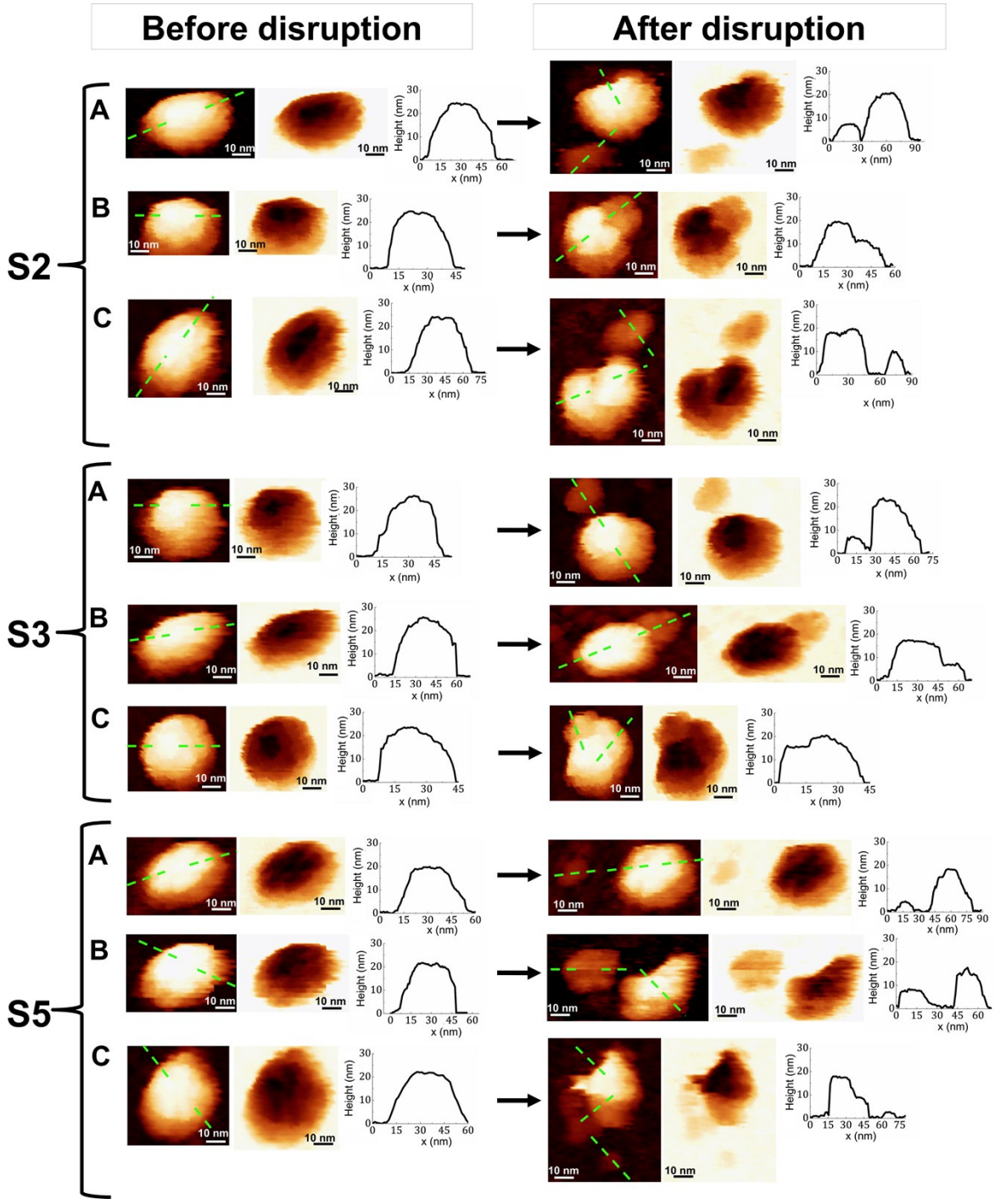

Figure S1. AFM images of individual MVM capsid particles, before (left) and after (right) indentation leading to disruption. Particles are grouped according to the region (S2, S3 or S5) they were indented on. A scale bar (10 nm) is included. The corresponding height profiles following the green dotted line on the particle) are also shown. Some representative cases have been chosen: for each group (indented on S2, S3 or S5) the case labelled A provides an example of those particles for which only a small fragment (smaller than a pentamer of trimers, e.g, a trimer) was removed; the case labelled B provides an example of those particles for which a pentamer of trimers was removed; the case labelled C provides an example of those particles a fragment larger tan a pentamer of trimers, or several fragments, were removed.

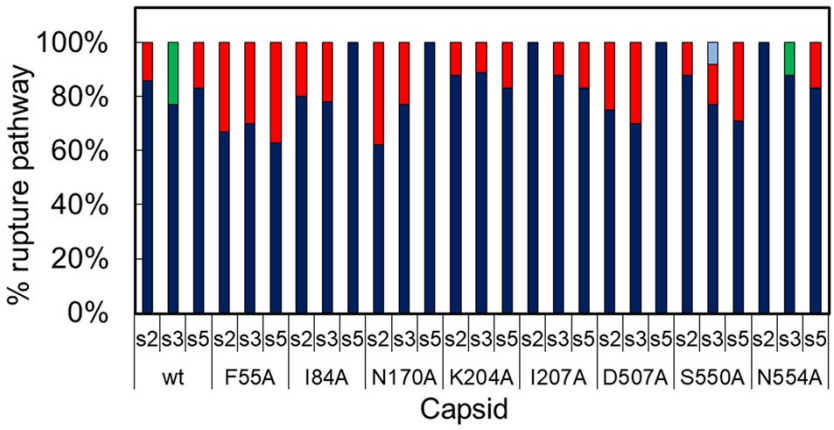

Figure S2. Percent wt or mutant capsids indented on different regions (S2, S3 or S5) that were disrupted in a single nonlinear event (blue), two (red), three (green) or five (light blue) events.

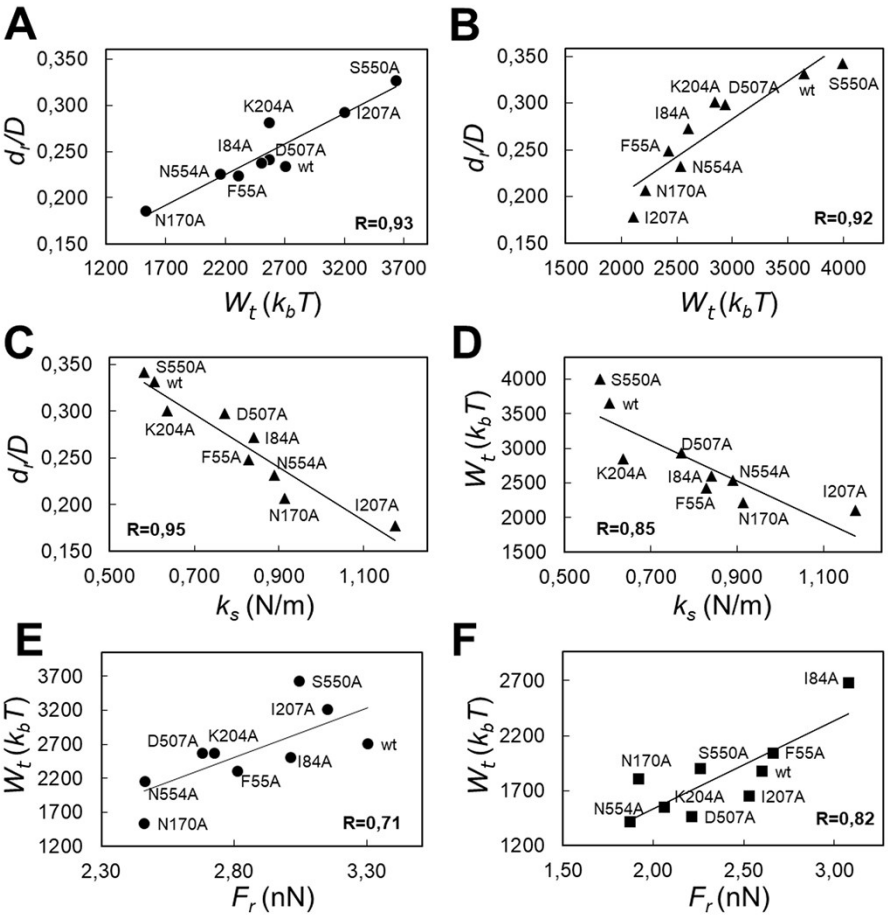

Figure S3. **Correlation analysis for different mechanical parameters related with the deformation and/or disruption of the MVM capsid under load.** (A) d_r/D versus W_t for capsids indented on a S2 region (R=0.93); (B) d_r/D versus W_t for capsids indented on a S3 region (R=0.92); (C) d_r/D versus k_s for capsids indented on a S3 region (R=0.95); (D) W_t versus k_s for capsids indented on a S3 region (R=0.85); (E) W_t versus F_r; for capsids indented on a S2 region (R=0.71); (F) W_t versus F_r for capsids indented on a S5 region (R=0.82).