The mechanism of an amphipathic α-helical peptide’s antiviral activity involves size-dependent virus particle lysis

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The size distribution of vesicles extruded with a polycarbonate track-etched membrane (PETM) with 1-µm pore diameters upon interaction with AH peptide (SI Fig. S1)

With dynamic light scattering, we were able to measure the hydrodynamic diameter, which is the diameter that a sphere would have in order to diffuse at the same rate as the particle being measured. When a distribution of sizes is present, the effective diameter measured is an average diameter that is weighted by the intensity of light scattered by each particle. Here, we sought to test our hypothesis that a greater vesicle size distribution results in insufficient line tension due to reduced vesicle curvature and leads to the diminished influence of the AH peptide during the interaction. We utilized the 1-µm PTEM to make vesicles with an average size of 297.2 ± 3.4 nm and relative variance (polydispersity) of 0.331 ± 0.03 as shown in SI Fig. S2 (red). Note that upon interaction with AH peptides, minimal deviations are observed with the average size changed to 295.2 ± 2.4 nm and relative variance altered to 0.325 ± 0.02 as shown in SI Fig. S2 (blue), confirming our hypothesis.
SI Fig. S1. The average size distribution of larger size vesicles upon interaction with AH peptide. The line represents the Gaussian profile of the average size distribution and the bar represents a histogram of the size distribution.
Infectivity assays used to assess the effect of AH peptide treatment on viruses of two different sizes (50 nm and 360 nm). (SI Fig. S2)

SI Fig. S2. Examples of images used to determine the infectivity of the viral inoculums treated with AH peptide, NH peptide, or media control. Immunofluorescence for HCV focus-forming units (FFU) (top panels) and crystal violet staining of plaque assays for vaccinia virus (bottom panels) were performed as described in materials and methods.
Supporting Reference