Figure legends

Fig. 1. (a) Images of the Lucentite particles that had been mixed with *D. radiodurans*. Bar length, 50 μm. (b) Size distributions of the Lucentite particles used as projectiles (black circles) before and (white squares) after collision with the aerogel. The shot particles were found at the track termini.

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Fig. 2. (a) Schematic of the LGG. (b) A bullet ~7 mm in diameter.

Fig. 3. Overview of an aerogel hit by *D. radiodurans*-containing Lucentite particles. Scale bar, 5 mm.

Fig. 4. Overviews (a and d) and views of the track termini (b, c, e, and f) produced by the *D. radiodurans*-containing Lucentite particles. Bar lengths: (a, d), 2 mm; (b, c, e, and f), 500 μm.

Fig. 5. Views of the entrance holes created by *D. radiodurans*-containing Lucentite particles. Bars, 500 μm.

Fig. 6. Fluorescent images of pure Lucentite particles in the aerogel. The aerogel was stained with SYBR Green I. The images were recorded (a) without a filter present, or through a (b) green, (c) (red), or (d) blue filter. Scale bars, 10 μm. The excitation and fluorescence wavelengths of the filters are listed in Table 1.

Fig. 7. Attenuation of Lucentite and SYBR Green I fluorescence visualized through the green filter. The images were taken at 0, 1, and 6 min. (a) A Lucentite particle is identified by the red arrows. (b) SYBR Green I-DNA complexes in a *D. radiodurans* culture are identified by the blue arrows. Scale bars, 10 μm.

Fig. 8. Fluorescent intensity decay for Lucentite particles and SYBR-DNA complexes. The aerogel containing the *D. radiodurans*-containing Lucentite particles was irradiated at 470–480 nm for 300 sec. (a) Open circles, fluorescence arising from Lucentite particles shown

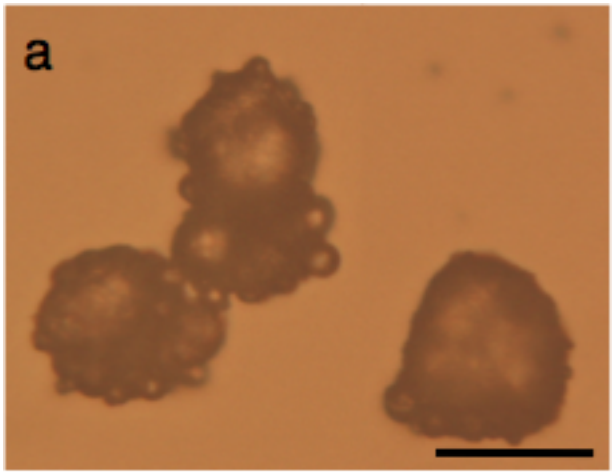
in Fig. 7a. Closed squares, fluorescence arising from SYBR-DNA complexes shown in Fig. 7b; the data is the average of three particles indicated by the blue arrows. (b) The open squares and closed circles indicate the fluorescence intensities of the particles shown in Figs. 9a and b and similar particles found in the same track. Three fast fading particles were averaged (open squares). Three slow fading particles were averaged (closed circles). The error bars indicate standard error of the mean for three particles.

Fig. 9. Fluorescence images of the same field as shown in Fig. 9b taken at different times. The fluorescence intensity of the particle circled in red had decayed by 300 sec (a and b), whereas the fluorescence of the particle circled in blue had not (c and d). Scale bars, 20 μm. The inserts in (a) and (c) are enlargements that include the particles circled in red or blue, respectively. Scale bars, 5 μm.

Fig. 10. Particle images in the same field under different excitation wavelengths. The *D. radiodurans*-containing Lucentite particles in the aerogel were stained with SYBR Green I. The image was recorded under (a) white light. Fluorescent images were recorded through a (b) green, (c) red, or (d) blue filter. The black arrow shows the direction of the particle. The image circled in white was seen under all photographic conditions. The particle circled in red was seen only when a green filter was used. Scale bars, 20 μm. Excitation and fluorescence wavelengths are shown in Table 1.

Figures

Fig. 1



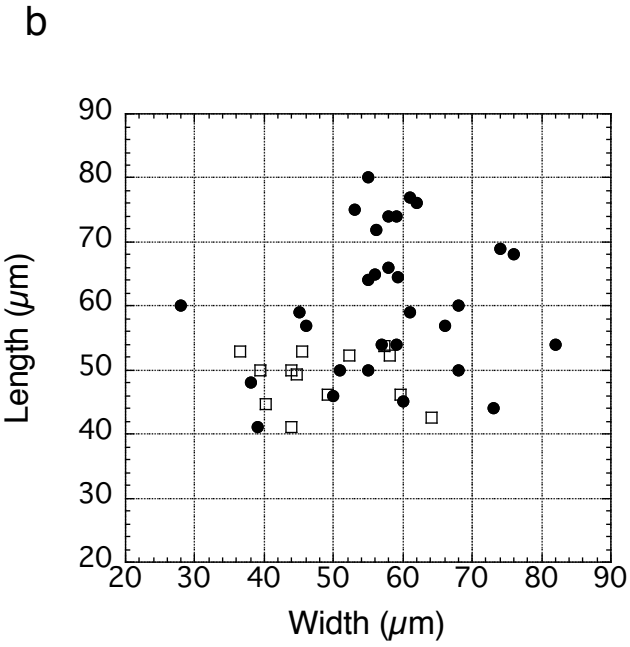
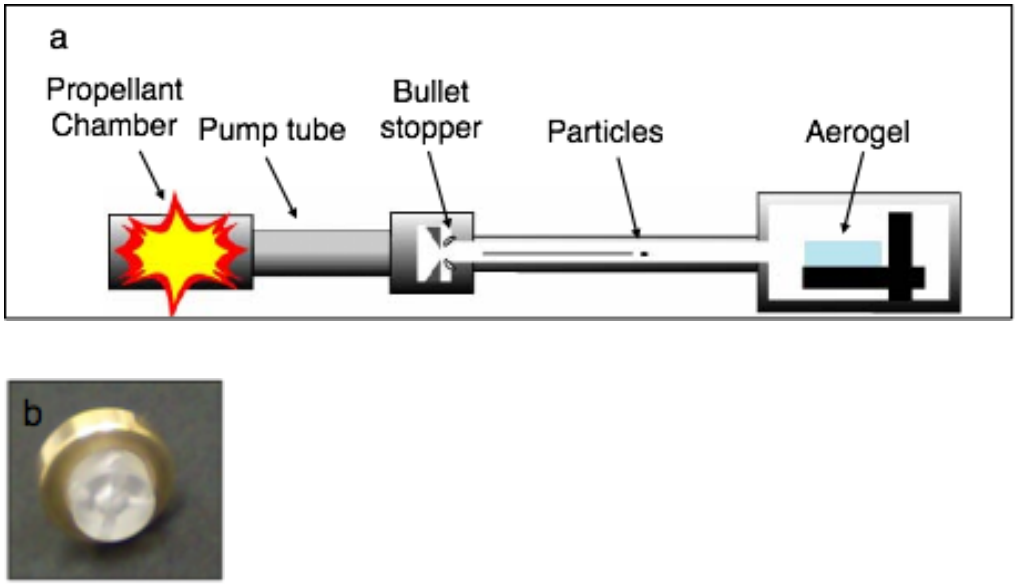


Fig. 2


a
Propellant Chamber
Pump tube
Bullet stopper
Particles
Aerogel

b

Fig. 3