

Supplementary information for videos 1-4.

Video 1:

- **Description:** This video corresponds to Fig. 1a, and shows the annotated experimental set-up during an US/PA volumetric acquisition. The acquisition process last for 21s and comprised 12 different angles with a nominal angular sampling period of $\Delta\alpha = 4^\circ$. For each angle, the imaged volume was scanned with a translation range $L = 30$ mm. The video frame rate is 30 images per second.
- **Size:** 50.6 Mo
- **Player information:** any mp4 player

Video 2:

- **Description:** This animated gif corresponds to Fig. 3, and shows the 3D photoacoustic, ultrasound and superimposed volumetric images of Ph1. PA image (left) is presented with linear scale while US image (center) is shown in dB with a threshold below -40dB. Rotating maximum amplitude projection images around the z axis are displayed with an angular step of 10° between the projections and at a frame rate of 5 images per second.
- **Size:** 1.2 Mo

Video 3:

- **Description:** This animated gif corresponds to Fig. 4 and shows the 3D photoacoustic, ultrasound and superimposed volume image of Ph2. PA image (left) is presented with linear scale and voxel values were thresholded at 40% of their maximum before normalization. This thresholding was used because of a few bright spots that were hiding the rest of the optical absorbers. US image (center) is presented in dB with a threshold below -40dB. Rotating maximum amplitude projection images around the z axis are displayed with an angular step of 10° between the projections and at a frame rate of 5 images per second.
- **Size:** 8.8 Mo

Video 4:

- **Description:** This animated gif corresponds to Fig. 5, and shows the 3D photoacoustic, ultrasound and superimposed volume image of Ph3. PA image (left) is presented with linear scale while US image (center) is presented in dB with a threshold below -40dB. Rotating maximum amplitude projection images around the z axis are displayed with an angular step of 10° between the projections and at a frame rate of 5 images per second.
- **Size:** 5.2 Mo