

## Description of Additional Supplementary Files

### **Supplementary Movie Legends**

**Supplementary Movie 1.** Nanoparticle tracking video of Au-polymersomes under laser irradiation (660 nm, 1 W).

**Supplementary Movie 2.** Nanoparticle tracking video of Au-stomatocytes under laser irradiation (660 nm, 1 W)

**Supplementary Movie 3.** Nanoparticle tracking video of Au-stomatocytes without laser irradiation (660 nm, 0 W)

**Supplementary Movie 4.** Motion behavior of Au-stomatocytes under laser irradiation (660 nm, 1.5 W)

**Supplementary Movie 5.** Motion behavior of Au-stomatocytes under laser irradiation from bottom right to the upper left (660 nm, 1.5 W)

**Supplementary Movie 6.** Cryo-electron tomography 3D reconstruction of a typical Au-stomatocyte.  
Playback frame rate: 50 fps.

**Supplementary Movie 7.** Nanoparticle tracking video of DOX-stomatocytes without TP-NIR irradiation

**Supplementary Movie 8.** Motion behavior of DOX-stomatocytes with TP-NIR irradiation