

## **Description of Additional Supplementary Files**

**File name: Supplementary Movie 1**

**Description:** Simulated 3D acoustic streaming mediated by acoustic materials.

**File name: Supplementary Movie 2**

**Description:** Experimental 3D acoustic streaming mediated by acoustic materials.

**File name: Supplementary Movie 3**

**Description:** Simulated dye release process via acoustic materials.

**File name: Supplementary Movie 4**

**Description:** Experimental dye release process via acoustic materials.

**File name: Supplementary Movie 5**

**Description:** A free-moving mouse with an acoustic metamaterial patch device.