

## **Description of Additional Supplementary Files**

**File name: Supplementary Movie 1**

**Description:** Representative 3D images stack from a single GO<sub>x</sub>-aZIF nanocomposite.

**File name: Supplementary Movie 2**

**Description:** Zoomed images of cross section of a single GO<sub>x</sub>-aZIF nanocomposite showing pore evolution.

**File name: Supplementary Movie 3**

**Description:** Kinetic fluorescence intensity of DCFH-DA cell-staining images in MCF-7 during 4 hour incubation with GO<sub>x</sub>-aZIF nanocomposite.

**File name: Supplementary Movie 4**

**Description:** Kinetic fluorescence intensity showing DCFH-DA cell-staining images in MCF-7 during 4 hour incubation with GO<sub>x</sub>-ZIF-8 composite.

**File name: Supplementary Movie 5**

**Description:** Kinetic fluorescence intensity of DCFH-DA cell-staining images in non-cancer cells (L02) and cancer cells (HepG2) during incubation with GO<sub>x</sub>-aZIF for 4 hours.