SUPPORTING INFORMATION

Lipid-bilayer Coated Nanosized Bimodal Mesoporous Carbon Spheres for Controlled Release Applications

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SAXS measurement

Figure S1: Small-angle X-ray scattering of dried MCS particles.
Chemical structures of the used phospholipid (DOPC, Avanti Polar Lipids) and lipid (DOTAP, Avanti Polar Lipids)

(a)

(b)

Figure S2: Chemical structures of 1,2-dioleoyl-sn-glycero-3-phosphocholine (upper, DOPC) and 1,2-dioleoyl-3-trimethylammonium-propane (b, DOTAP).

UV-Vis spectroscopy

Figure S3: UV-Vis spectrum of SLB@MCS dispersion before (black) and after (red) the release experiment.
The black line represents SLB@MCS loaded with calcein. The peak shows the absorption of the loaded calcein. After the release (red line), no peak is visible, indicating complete release of the fluorescent dye out of the porous carbon particles.

The absolute amount of calcein released from the sample SLB@MCS was quantified by fluorescence spectroscopy. A calcein calibration curve was recorded with fluorescence spectroscopy (Figure S4).

![Calcein calibration curve](image)

**Figure S4.** Calcein calibration curve.

**Calculation of calcein in SLB@MCS**

After reaching the plateau at the end of the release experiment, 257826 counts per second were detected. This intensity leads to a calcein concentration of 10.08 μg mL⁻¹ by using the linear regression of the calibration curve. The cuvette has a volume of 3 mL, which corresponds to an original amount of 30.23 μg calcein. For the release experiment, only 200 μL of the original 800 μL sample dispersion were used. Thus the original amount of calcein in 1 mg MCS is calculated to be 120.9 μg. For loading the particles, 500 μL calcein stock solution (1 mM) was used
corresponding to a total amount of 311 μg calcein. In total, $120.9/311$ (38.9%) of the initial calcein amount of the stock solution was adsorbed by the MCS particles.