

Supplementary Information

Oxygen and Drug-carrying Periodic Mesoporous Organosilicas for Enhanced Cell Viability under Normoxic and Hypoxic Conditions

Ravi Kumar ^{1,2}, Nermin Seda Kehr ^{1,2*}

Dr. Ravi Kumar, Dr. Nermin Seda Kehr

¹ Physikalisches Institute, Westfälische Wilhelms-Universität Münster, Wilhelm-Klemm-Straße 10, 48149 Münster, Germany

² Center for Soft Nanoscience (SON), Westfälische Wilhelms-Universität Münster, Busso-Peus-Strasse 10, Münster 48149, Germany; ravikapoorsaini@gmail.com

* Correspondence: seda@uni.muenster.de

Loaded efficiency (E%) of rutin into PMO-PFC particles:

$E\% = (\text{amount of rutin added} - \text{amount of free rutin}) / (\text{amount of rutin added}) \times 100$.

From calibration curve (Figure S1 A), $Y = 0.01294x - 0.00276$

Absorbance of supernatant after loading of rutin into PMO-PFC (Figure S1 B), $Y = 0.7976$

Free rutin in supernatant in 1ml, $x = 61.85 \sim 62 \mu\text{g}$,

Amount of rutin added initially (80 mg) per 100 mg PMO-PFC, means 0.8 mg (800 μg) per 1 mg PMO-PFC

Therefore $E\% = (800 - 62) / (800) \times 100 = 92.25\% \sim 92\%$

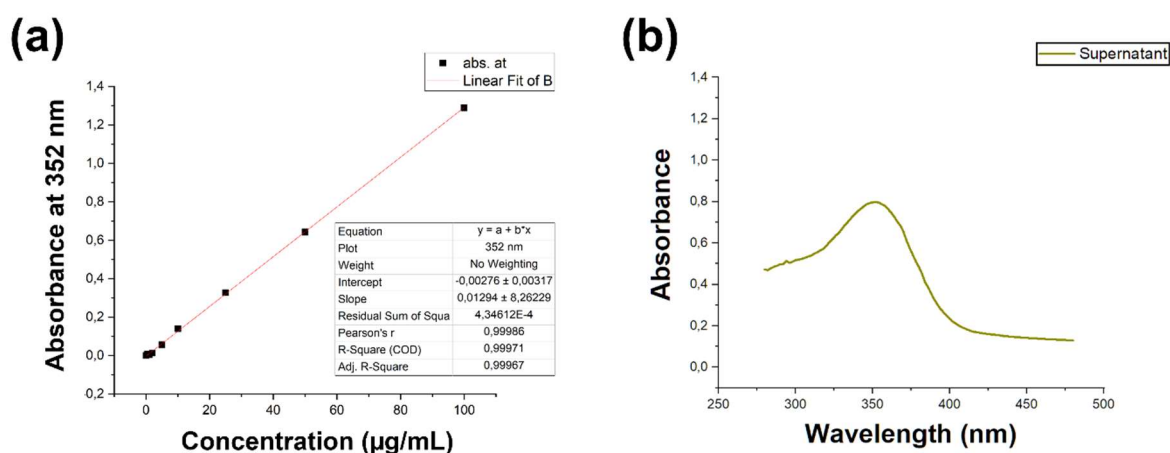


Figure S1. Calibration curve of rutin in water at wavelength of 352 nm (a). The absorbance spectra of supernatant after rutin coating of PMO-PFCs (b).

Similar way after PDL coating, the absorbance of supernatant was measured ($Y = 0,8659$) and rutin concentration was measured $67 \mu\text{g/ml}$. therefore $E \% = (738-67/800) \times 100 = 83\%$.

Table S1. Structural parameters of PMOF.

BET surface area ($\text{m}^2 \text{g}^{-1}$)	Pore volume ($\text{cm}^3 \text{g}^{-1}$)	Pore size (nm)
449.695	0.269	2.39

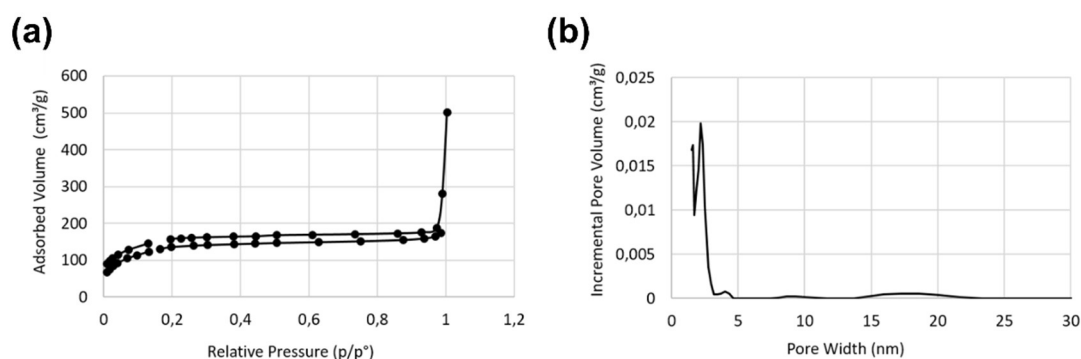


Figure S2. N₂ adsorption-desorption isotherm (a) and pore diameter (b) for PMO-PFC.

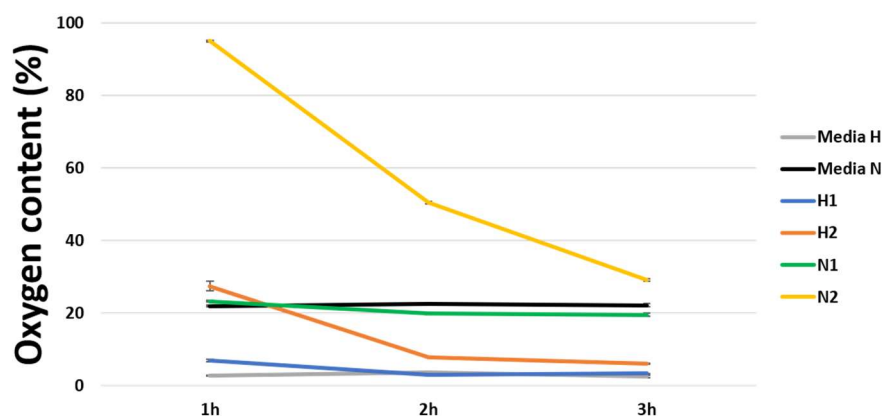


Figure S3. Oxygen content of media containing PMO-PFC particles and particle-free media under normoxic and hypoxic condition. N1, H1 are the measurement value under normoxic and hypoxic condition of media with PMO-PFC, respectively. N2, H2 are the measurement value under normoxic and hypoxic condition respectively, when PMO-PFC flushed with 100% O₂. Number of experiments are 3.

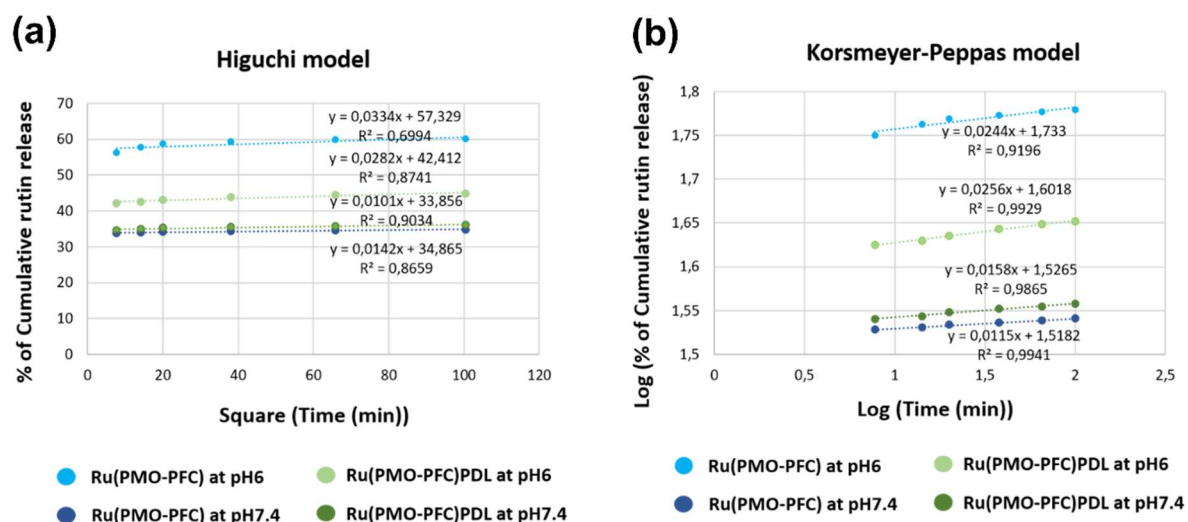


Figure S4. Rutin release profile from Ru(PMO-PFC) and Ru(PMO-PFC)PDL at pH 7.4 and pH 6.0 was fitted with Higuchi (a) and Korsmeyer-Peppas (b) models.

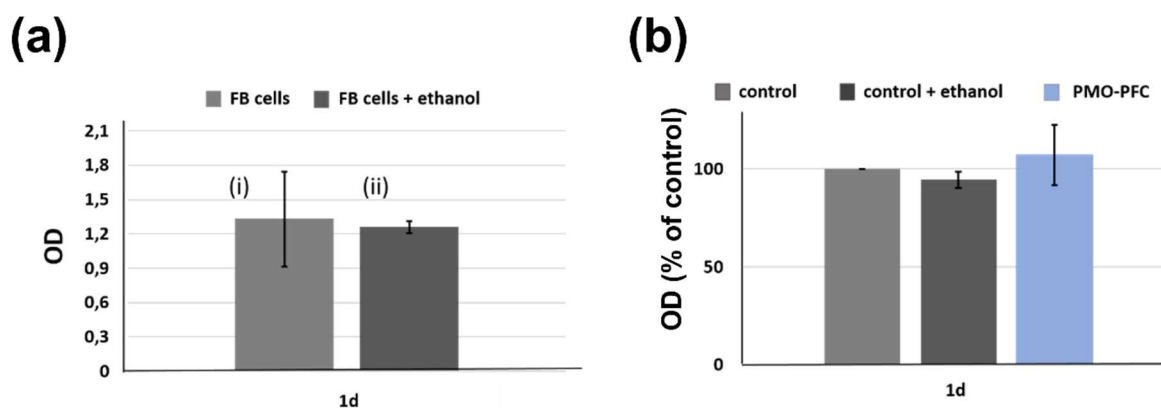


Figure S5. (a) OD of the FB (i) on a culture plate and (ii) on a culture plate treated with the same amount of ethanol used for the preparation of particles on cell culture plate. (b) OD (% of control) of the FB on a culture plate, on a on a culture plate treated with the same amount of ethanol used for the preparation of particles on cell culture plate, and on a PMO-PFC coated culture plate. ANOVA test showed no significant differences between the tested groups. Number of repeated experiments (N) = 3.