

SUPPORTING INFORMATION

Real-time monitoring of a 3D blood-brain barrier model maturation and integrity with a sensorized microfluidic device

Maria Cristina Ceccarelli^{1,2}, Marie Celine Lefevre¹, Attilio Marino¹, Francesca Pignatelli¹,
Katarzyna Krukiewicz³, Matteo Battaglini¹; Gianni Ciofani^{1*}*

¹Istituto Italiano di Tecnologia, Smart Bio-Interfaces, Viale Rinaldo Piaggio 34, 56025 Pontedera,
Italy

²Scuola Superiore Sant'Anna, The BioRobotics Institute, Viale Rinaldo Piaggio 34, 56025
Pontedera, Italy

³Silesian University of Technology, Department of Physical Chemistry and Technology of
Polymers, Księża Marcina Strzody 9, 44-100 Gliwice, Poland

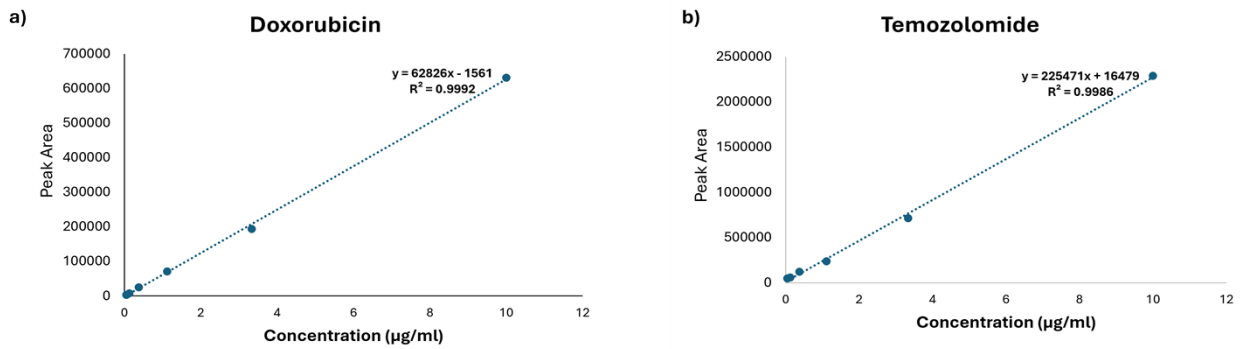


Figure S1. HPLC calibration curves for doxorubicin (a) and temozolomide (b).

| Parameters | Values | Units |
|--------------------|-------------------------------|----------|
| R_{TEER} | 7588.13 ± 688.54 | Ω |
| R_{medium} | 7035.90 ± 943 | Ω |
| $R_{matrix,cells}$ | $3.10 \pm 5.00 \cdot 10^{10}$ | Ω |
| $P_{cells,E}$ | $8.90 \pm 0.61 \cdot 10^{-7}$ | - |
| $n_{cells,E}$ | 0.78 ± 0.01 | - |
| $P_{matrix,cells}$ | $3.30 \pm 1.85 \cdot 10^{-6}$ | - |
| $n_{matrix,cells}$ | 0.94 ± 0.05 | - |
| P_{cells} | $1.80 \pm 0.43 \cdot 10^{-7}$ | - |
| n_{cells} | 0.502 ± 0.004 | - |

Table S1. Parameters extracted by fitting the EIS spectrum with the equivalent circuit considering the model, taking into account endothelial cells in the vascular component and the co-culture of astrocytes and microglia in the hydrogel matrix in the parenchymal compartment.

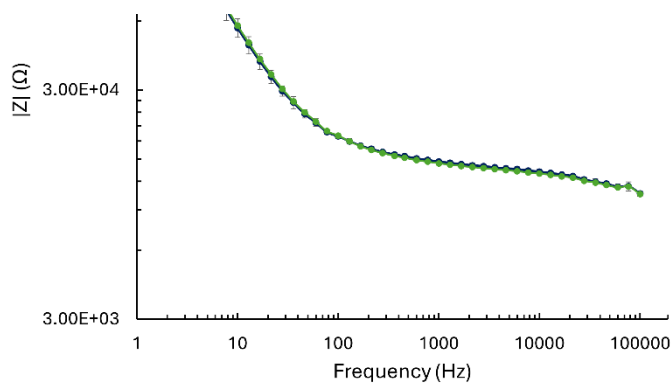


Figure S2. Bode plots of impedance ($|Z|$) versus frequency for the control BBB model before and after the drug crossing experiment.