Electronic Supplementary Material (ESI) for Soft Matter
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# Supplementary Information

## A surprising system: Polymeric nanoreactors containing a mimic with dual-enzyme activity

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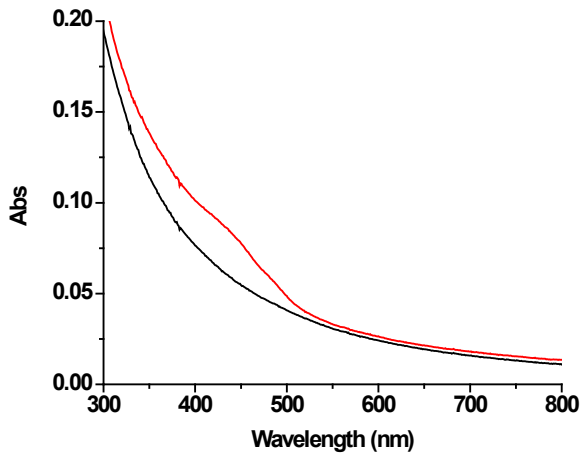


**Fig. S1** UV-VIS spectra. Empty $PMOXA_{12}$-$PDMS_{55}$-$PMOXA_{12}$ polymeric vesicles (black), and $Cu^{II}$ENZm-containing $PMOXA_{12}$-$PDMS_{55}$-$PMOXA_{12}$ vesicles in PBS (red).

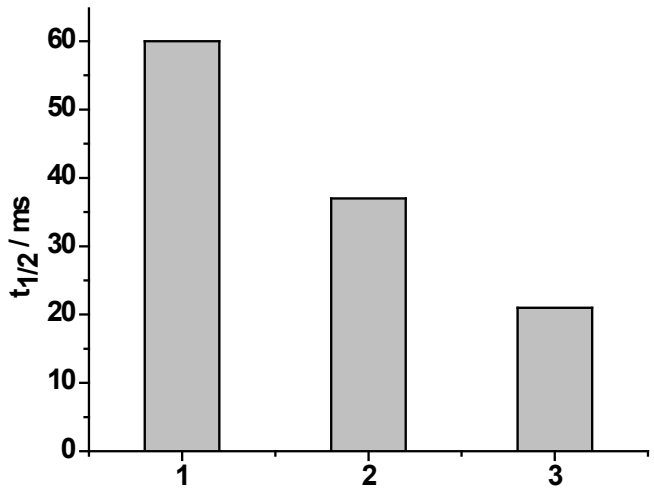


**Fig. S2** Pulse radiolysis assay. Superoxide decay catalyzed by $Cu^{II}$ENZm encapsulated in $PMOXA_{12}$-$PDMS_{55}$-$PMOXA_{12}$ vesicles as function of the $Cu^{II}$ENZm concentration: 1) ca. 1.6 μM, 2) ca. 2.7 μM, 3) ca. 4 μM.

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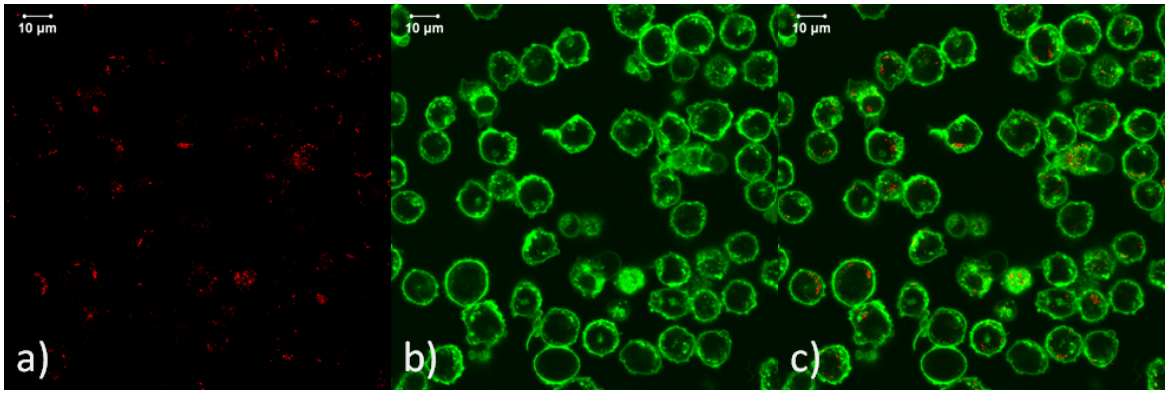


**Fig. S3** Confocal images of THP-1 cells after 48 h incubation with sulforhodamine B and $Cu^{II}$ENZm co-encapsulated inside $PMOXA_{12}$-$PDMS_{55}$-$PMOXA_{12}$ vesicles. a) Internalized $Cu^{II}$ENZm- and sulforhodamine B-containing vesicles, shown in the red channel. b) THP-1 cells membrane stained with Deep Red, shown in the green channel. c) Overlay of the micrographs from the red and green channels.

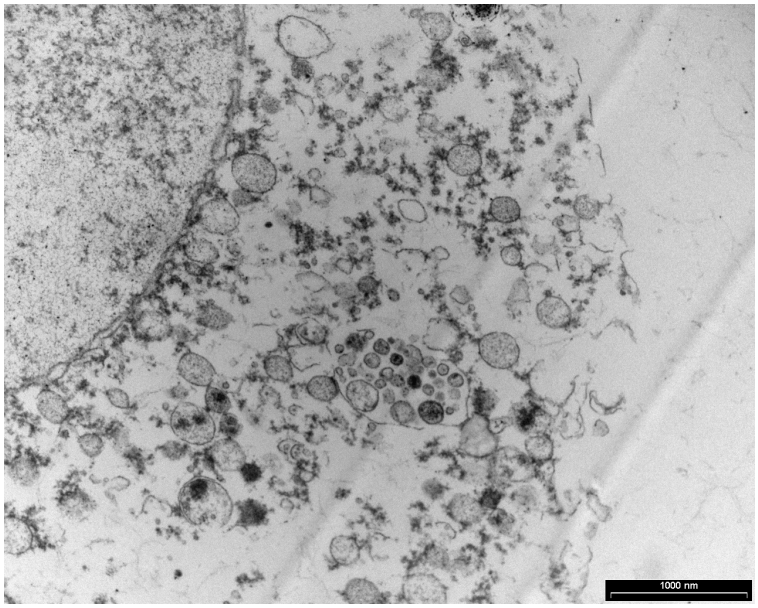


**Fig. S4** TEM images of an intracellular area of THP1 cells incubated with $Cu^{II}$ENZm-containing $PMOXA_{12}$-$PDMS_{55}$-$PMOXA_{12}$ vesicles for 24hrs. Black dots: $Cu^{II}$ENZm containing nanoreactors.

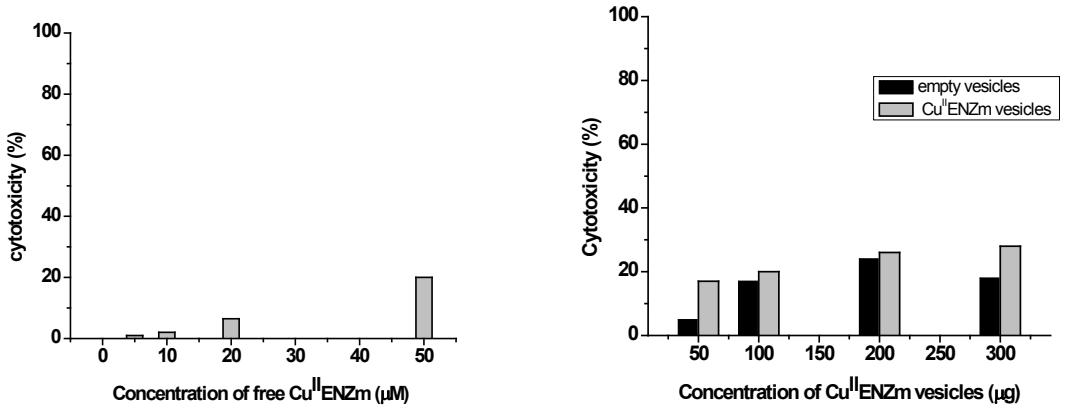


**Fig. S5** LDH assay. The cytotoxicity of different concentration of: a) $Cu^{II}$ENZm, b) $Cu^{II}$ENZm nanoreactors (grey bars) and empty vesicles (black bars), respectively.