

## Smart Multifunctionalized and Responsive Polymersomes as Targeted and Selective Recognition Systems

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**Abstract :** Polymersomes are materials which are considered as artificial counterparts of natural vesicles. The nanotechnology of such smart nanovesicles is very useful to enhance the efficiency of many therapeutic and diagnostic drugs. Those compounds show a higher stability, flexibility, and mechanical strength to the membrane compared to natural liposomes. In addition, they can be designed in detail, the permeability of the membrane can be controlled by different stimuli, and the surface can be functionalized with different biological molecules to facilitate monitoring and target. For this purpose, this study demonstrates the formation of multifunctional and pH sensitive polymersomes and their functionalization with different reactive groups or biomolecules inside and outside of polymersomes' membrane providing by crossing the membrane and docking/undocking processes for biomedical applications. Overall, they are highly versatile and thus present new opportunities for the design of targeted and selective recognition systems, for example, in mimicking cell functions and in synthetic biology.

**Keywords :** multifunctionalized, pH stimulus, controllable release, cellular uptake

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