Electronic Supplementary Material (ESI) for Dalton Transactions.

Supporting Information

Enzyme and voltage stimuli-responsive controlled release system based on β-cyclodextrin-capped mesoporous silica nanoparticles

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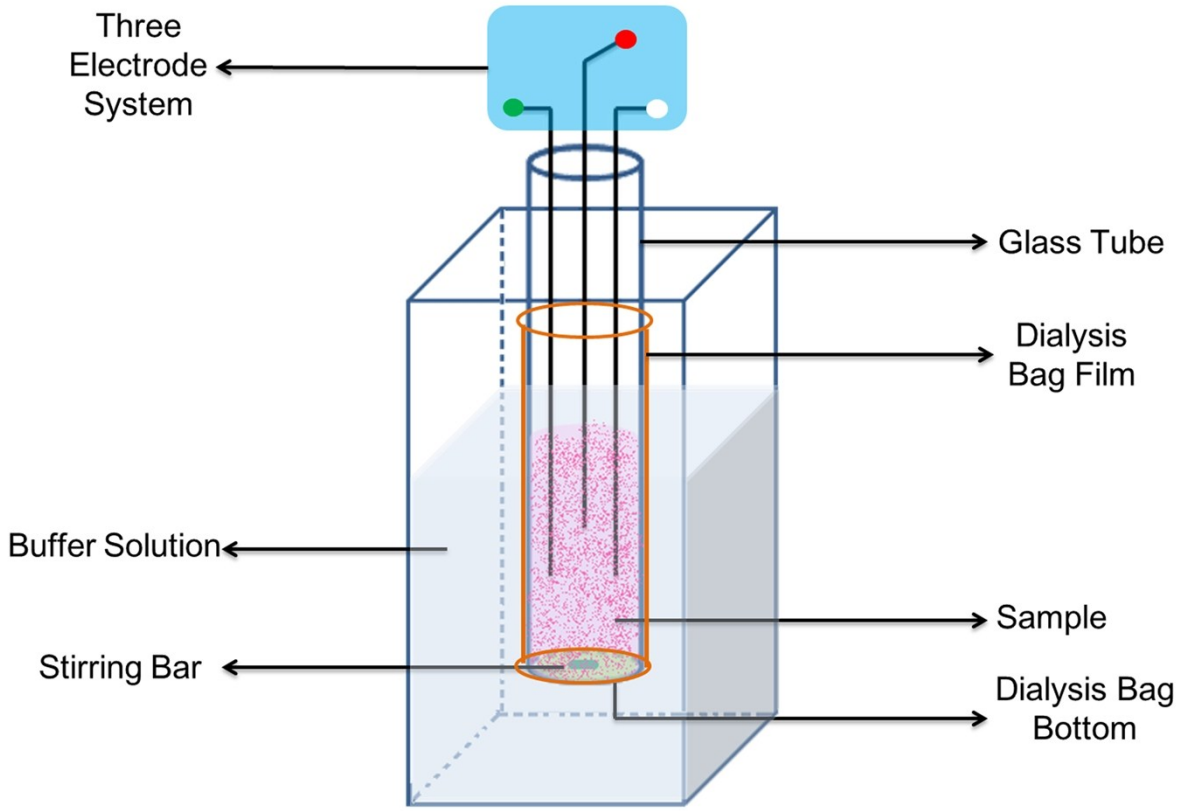

Figure S1. The schematic diagram of instrument for the release upon different voltage. The electrochemical stimulation was carried out on a three-electrode system: using saturated Ag/AgCl as the reference electrode; using two pieces of Pt piece as working electrode and the counter electrode respectively. Before the test, the surface of the working electrode was polished with 0.05 mm alumina and cleaned with ultrasonic wave in the water. The +0.5 V or +1.5 V voltage was applied with 0.2 mol/L KCl as the supporting electrolyte.

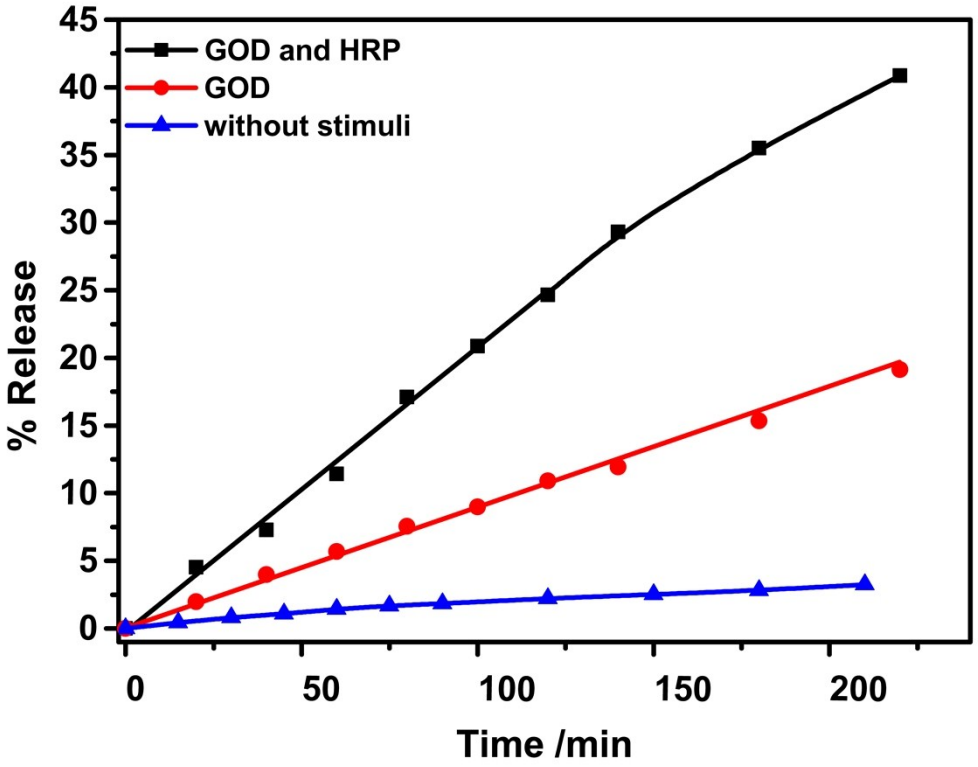

Figure S2. The controlled release with the addition of GOD with glucose comparing to that of GOD with glucose and HRP. GOD can oxidize glucose to produce hydrogen peroxide, a typical oxidant. The oxidant hydrogen peroxide still oxidizes a certain amount of Fc to Fc^+. When adding the HRP as the enzymic catalyst in the system, the generation of hydrogen peroxide is immediately reduced by HRP. The HRP becomes the oxidation state of HRP. The oxidation state of HRP continues oxidizing Fc to Fc^+. Then the oxidation state of HRP becomes the HRP with the ability of reduction. Hence, the Fc becomes Fc^+ in cycles. The β-CD dissociates rapidly from FMC^+-MSNs and the controlled release works.