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Title: Preparation of Core-shell Magnetic Polydopamine/Alginate Biocomposite for *Candida rugosa* lipase Immobilization

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1 **Preparation of Core-shell Magnetic Polydopamine/Alginate**

2 **Biocomposite for *Candida rugosa* lipase Immobilization**

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8 **Abstract**

9 A flexible, biocompatible and bioadhesive enzyme immobilizing material, which
10 was synthesized based on the covalent assembly of biomimetic polymer and
11 oxidized polysaccharide on magnetic nanoparticles (NPs), has been developed in
12 this feasibility study. In this work, the bio-inspired polymer, polydopamine (PDA),
13 was used to modify the well-monodispersed Fe₃O₄ NPs (mPDA NPs) with a
14 controllable thickness via a dip-coating process, then the alginate di-aldehyde (ADA)
15 was covalently assembled on the mPDA NPs and employed as a naturally occurring
16 linking agent for *Candida rugosa* lipase (CRL) immobilization. The resulting
17 support material was characterized by means of the transmission electron
18 microscope (TEM), Fourier transform infrared spectra (FT-IR), X-ray diffraction
19 (XRD), thermogravimetry (TG) analyser, and vibrating sample magnetometer
20 (VSM). It was verified that the prepared mPDA NPs possessed distinct core-shell

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