SUPPLEMENTRAY INFORMATION

Selective isolation of *E. coli* associated with urinary tract infection using anti-fimbrial modified magnetic reduced graphene oxide nanoheaters

Fatima Halouane,[1,2#] Roxana Jijie,[1#] Dalila Meziane,[2] Li Chengnan,[1] Santosh K. Singh,[3] Julie Bouckaert,[4] Jean Jurazek,[5] Sreekumar Kurungot,[3,6] Alexandre Barras,[1] Musen Li,[7]Rabah Boukherroub[1] and Sabine Szunerits[1*]

[1]*Univ. Lille, CNRS, Centrale Lille, ISEN, Univ. Valenciennes, UMR 8520 - IEMN, F-59000 Lille, France*

[2]*Département de Chimie, Faculté des Sciences, Université Mouloud Mammeri, B.P N_17 RP, 15000 Tizi Ouzou, Algeria*

[7]*Key Laboratory for Liquid-Solid Structural Evolution and Processing of Materials (Ministry of Education), Shandong University, Jinan 250061, China*

[3]*Physical and Materials Chemistry Division, CSIR-National Chemical Laboratory, Dr. Homi Bhabha Road, Pune 411008, India*

[4]*Unité de Glycobiologie Structurale et Fonctionnelle (UGSF), UMR 8576 du CNRS et Université Lille, 50 Av. de Halley, 59658 Villeneuve d'Ascq, France*

[5]*Laboratoire Groupe de Physique des Matériaux (GPM); UMR6634 CNRS-Université de Rouen-INSA de Rouen; Avenue de l'Université BP12; F-76801 Saint Etienne du Rouvray cedex*

[6]*Academy of Scientific and Innovative Research, Anusandhan Bhawan, 2 RafiMarg, New Delhi 110 001, India*

[#]equal contribution

[*]To whom correspondence should be send to: sabine.szunerits@univ-lille1.fr

Fabrication of chitosan modified magnetic particles (MP_{CS})

$FeCl_2 \times 4H_2O$ (0.34 g, 1.7 mmol) and $FeCl_3 \times 6H_2O$ (0.95 g, 3.5 mmol) were dissolved in deareated water (20 mL) and subsequently added to a nitrogen-protected three-necked flask under sonication. The resulting mixture was heated at 50°C for 30 min. Then concentrated ammonium hydroxide (2 mL) was added dropwise and kept at 50°C for 30 min. The system was finally cooled to room temperature and the solid product was isolated *via* a non-uniform magnetic field generated by a Nd–Fe–B permanent magnet. The resulting Fe_3O_4 particles (MP) were washed six times with Milli-Q water to remove unreacted chemicals and then stored in water.

A water dispersion of bare MP (10 mg mL^{-1}, 1 mL) was mixed with chitosan (20 mg) and sonicated for 1 h at room temperature. The formed magnetic particles (MP_{CS}) were isolated by means of magnet and purified through six consecutive wash/precipitation cycles with water to ensure complete removal of unreacted chitosan. The precipitate was dried in an oven at 50°C.

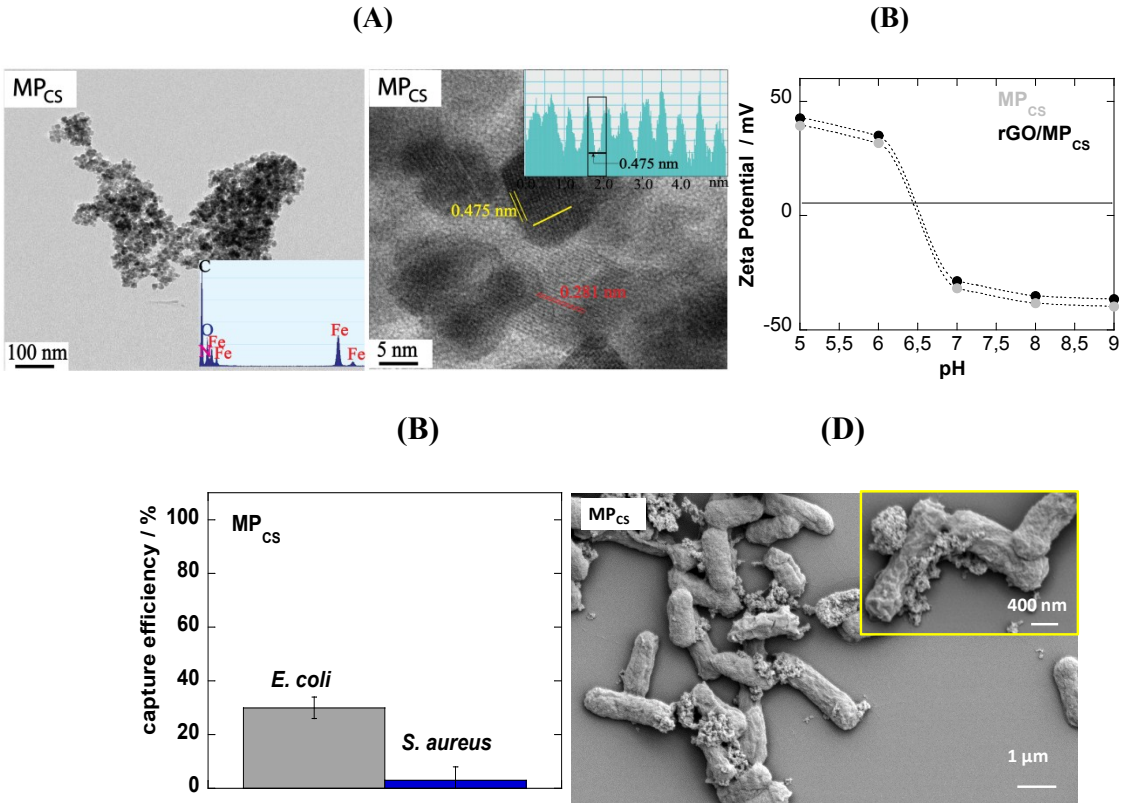

Figure S1: (A) Transmission electron microscopy images and HRTEM analysis of chitosan modified particles (Inset: EDAX analysis displaying the different elements present in the sample), (B) Zeta potential of MP_{CS} and rGO/MP_{CS}as a function of solution pH; (C) Removal efficiency of rGO/MP_{CS} (500 µg mL^{-1}) for *E. coli* and *S. aureus* (1×10^9 cfu mL^{-1}); (D) SEM images of MP_{CS} nanoparticles mediated bacteria isolation.