Electronic Supplementary Material (ESI) for Journal of Materials Chemistry B.

Supporting Information

Inhibitor-Assisted Synthesis of Silica-Core Microbeads with Pepsin-Imprinted Nanoshells

M. Dinc[a], H. Basan[b], T. Diemant[c], J. Behm[c], M. Lindén[d] and B. Mizaikoff*[a]

[a]Institute of Analytical and Bioanalytical Chemistry, Ulm University, 89081 Ulm, Germany

[b]Department of Analytical Chemistry, Faculty of Pharmacy, Gazi University, 06330 Etiler, Ankara, Turkey

[c]Institute of Surface Chemistry and Catalysis, Ulm University, 89069 Ulm, Germany

[d]Institute of Inorganic Chemistry II, Ulm University, 89081 Ulm, Germany

*Email: boris.mizaikoff@uni-ulm.de

Table S1. Surface compositions (in atom%) for various samples determined via XPS

Sample	C(1s) (%)	O(1s) (%)	N(1s) (%)	Si(2p) (%)
M1 (R_{AT}= 0.40)	39.01	40.50	3.34	17.15
M2 (R_{AT}= 0.80)	39.44	37.09	4.65	18.83

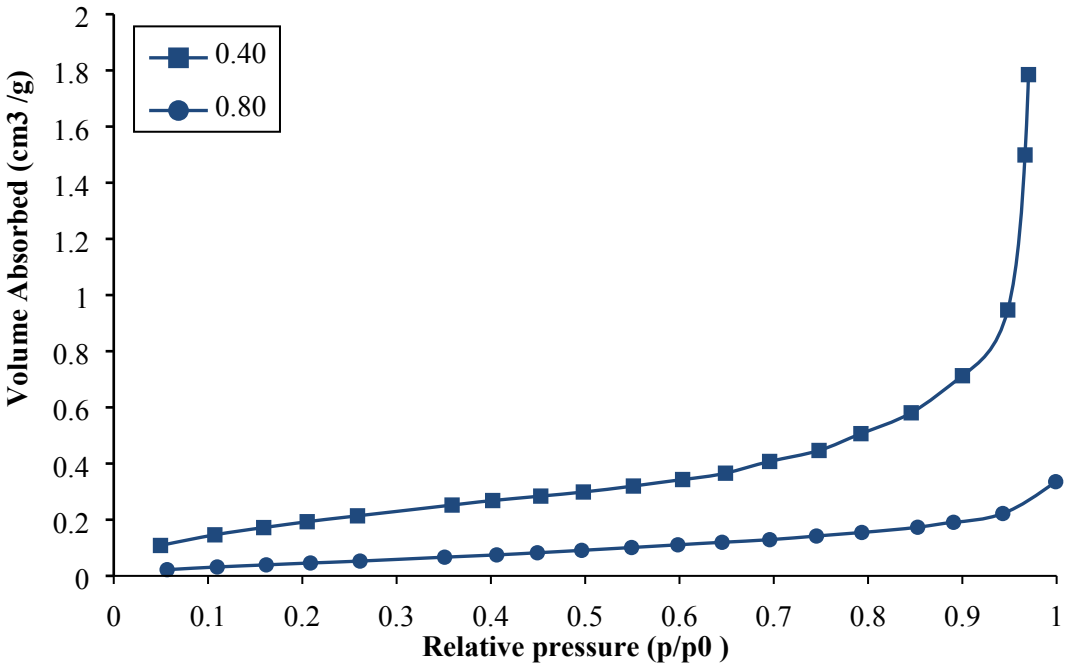

Fig S1. Nitrogen adsorption isotherm of silica samples prepared under R_{AT} = 0.40 and R_{AT} = 0.80.

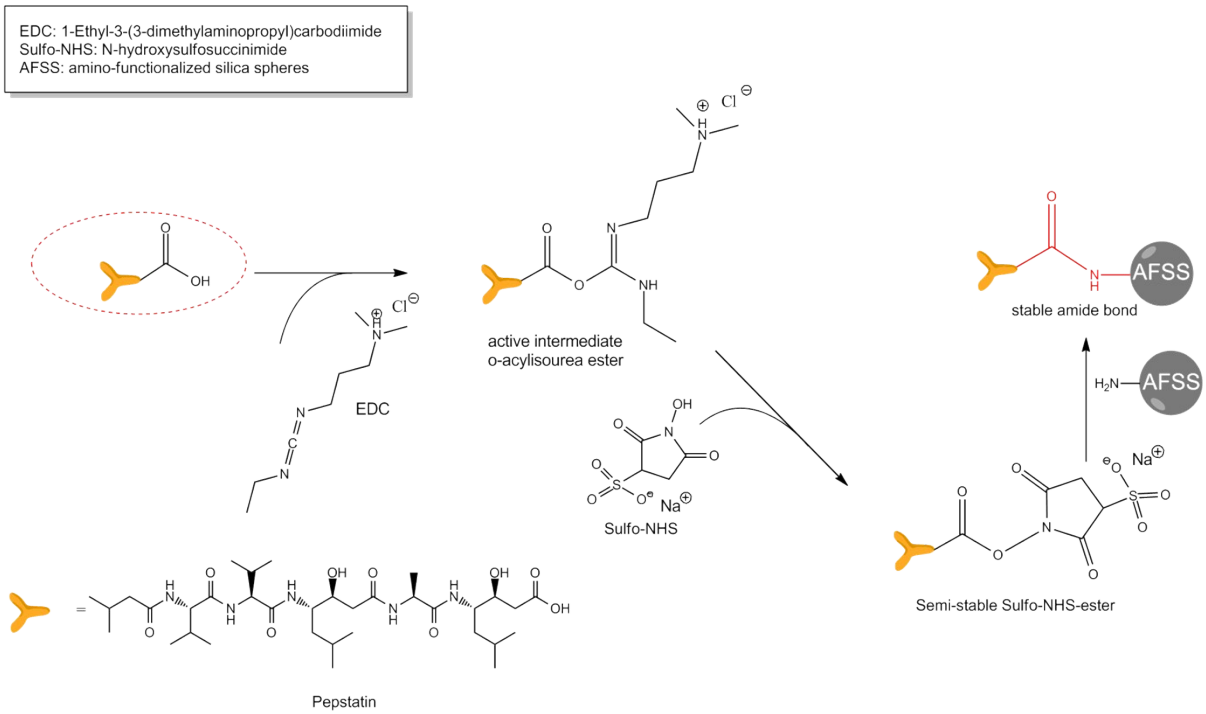

Fig S2. Synthesis scheme for the immobilization of pepstatin.

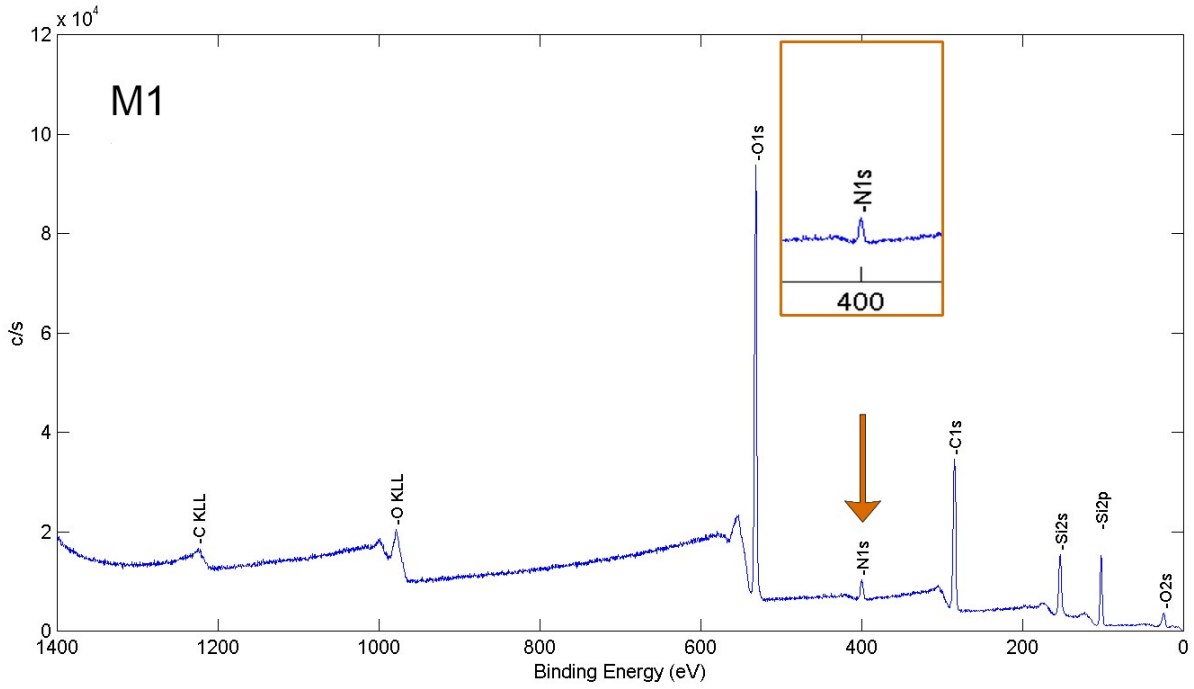

Fig. S3. XPS spectrum of M1.

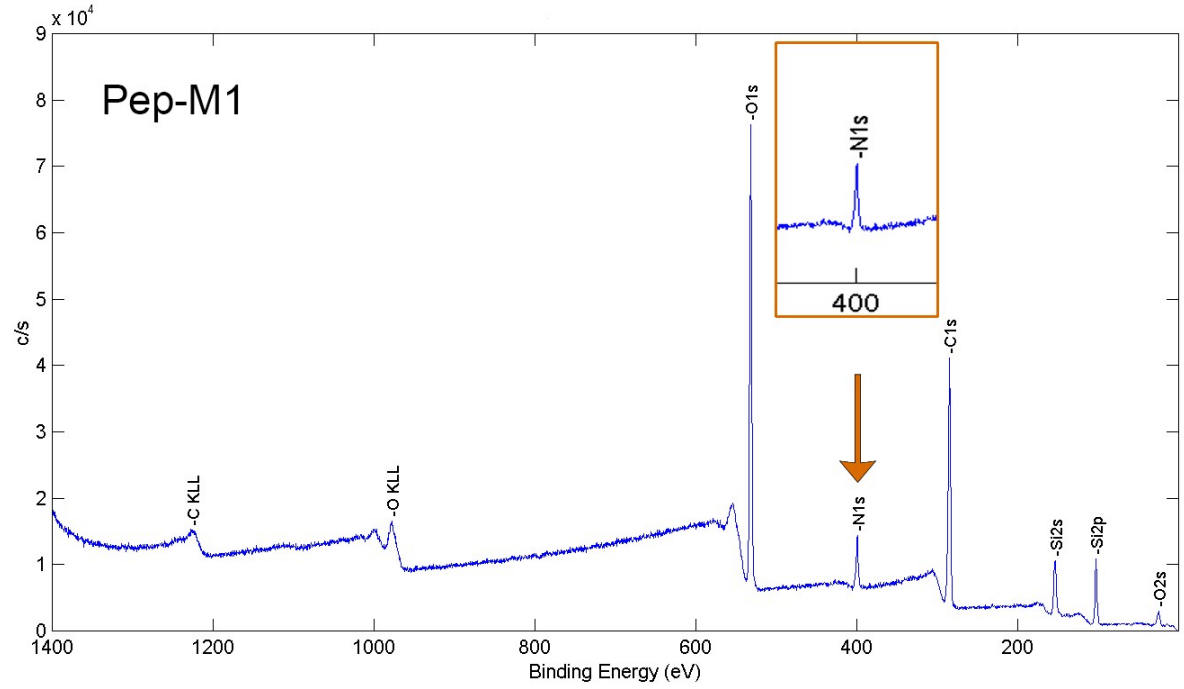

Fig S4. XPS spectrum of Pep-M1.

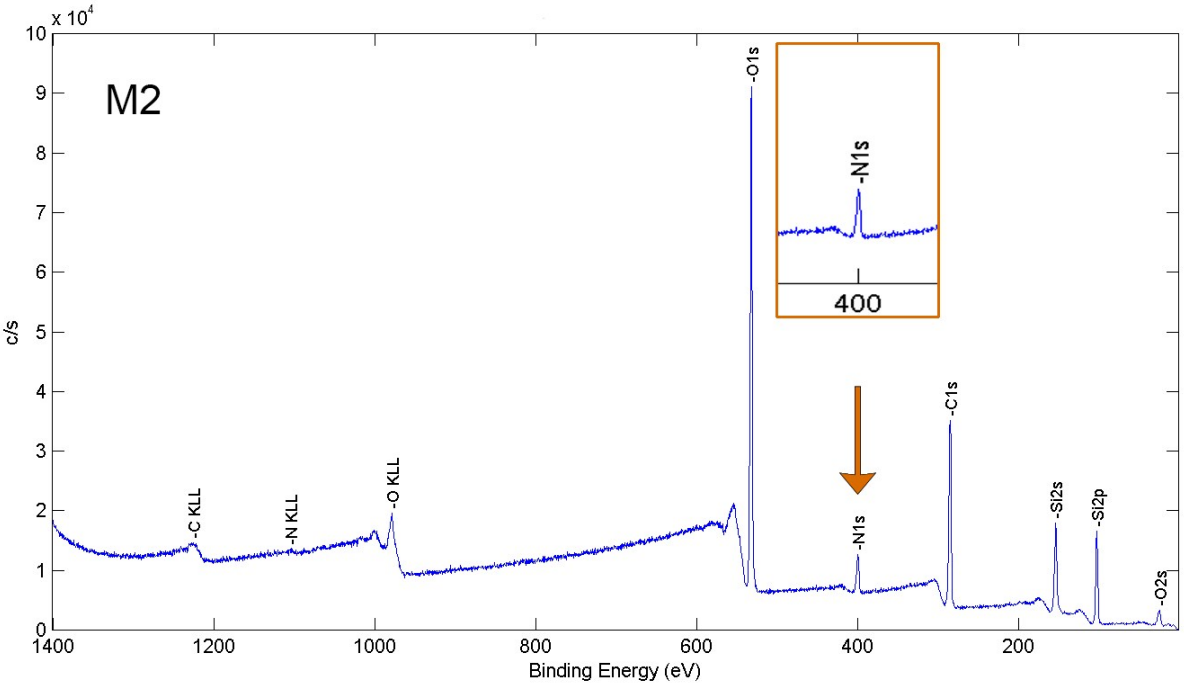

Fig S5. XPS spectrum of M2.

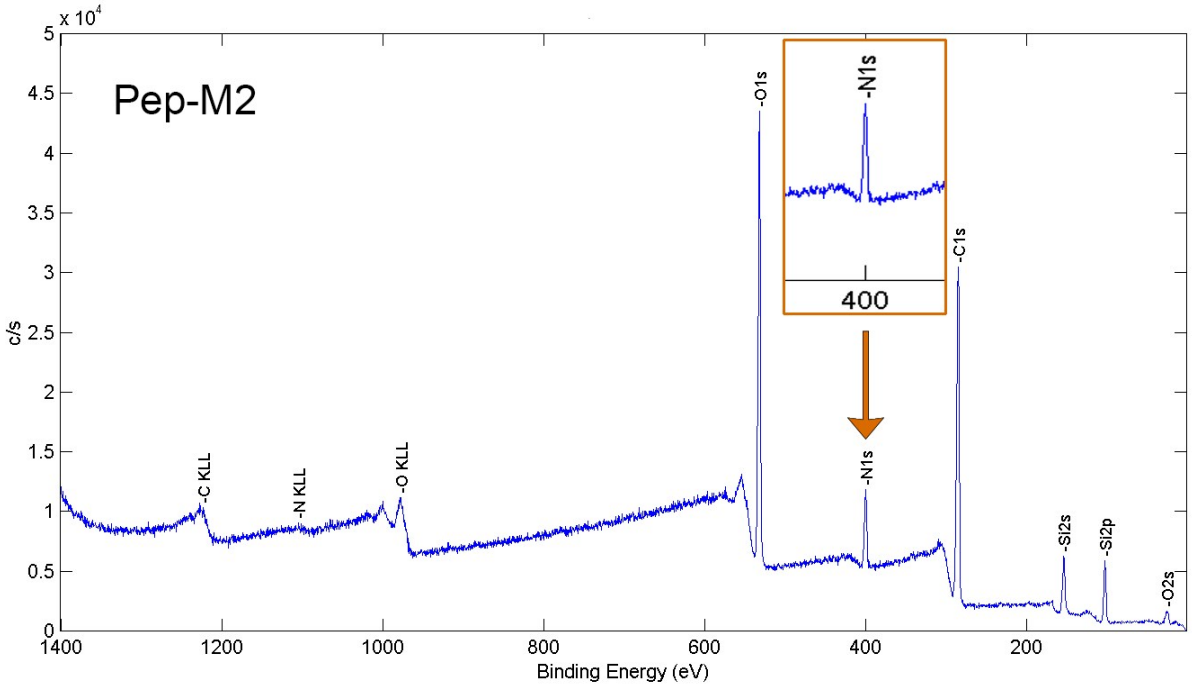

Fig S6. XPS spectrum of Pep-M2.

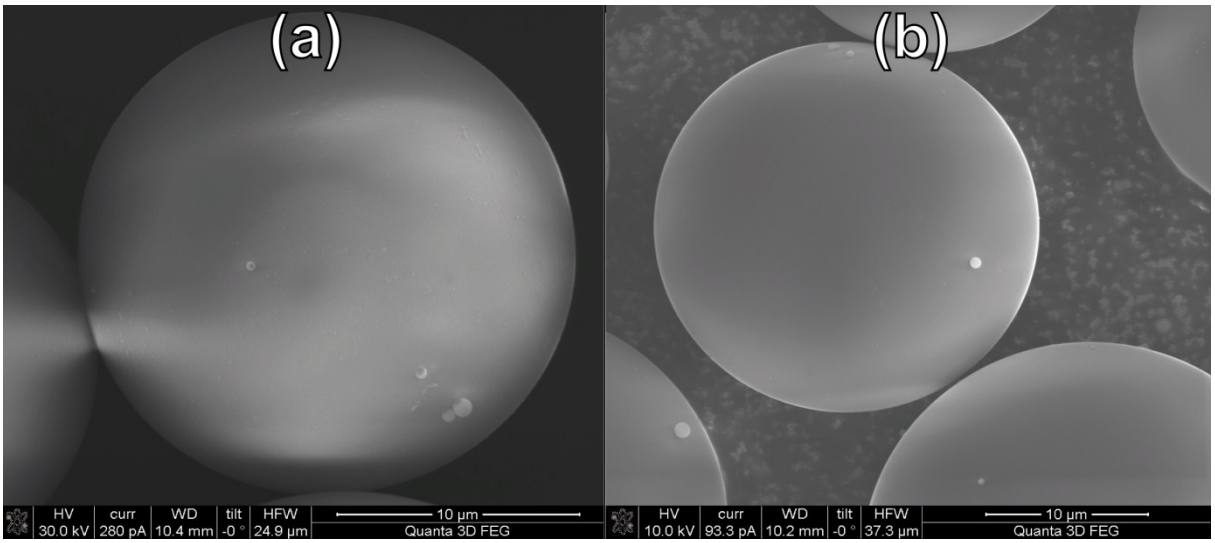

Fig S7. SEM Image of (a) AFSS/M2 and (b) Pep-AFSS/M2.

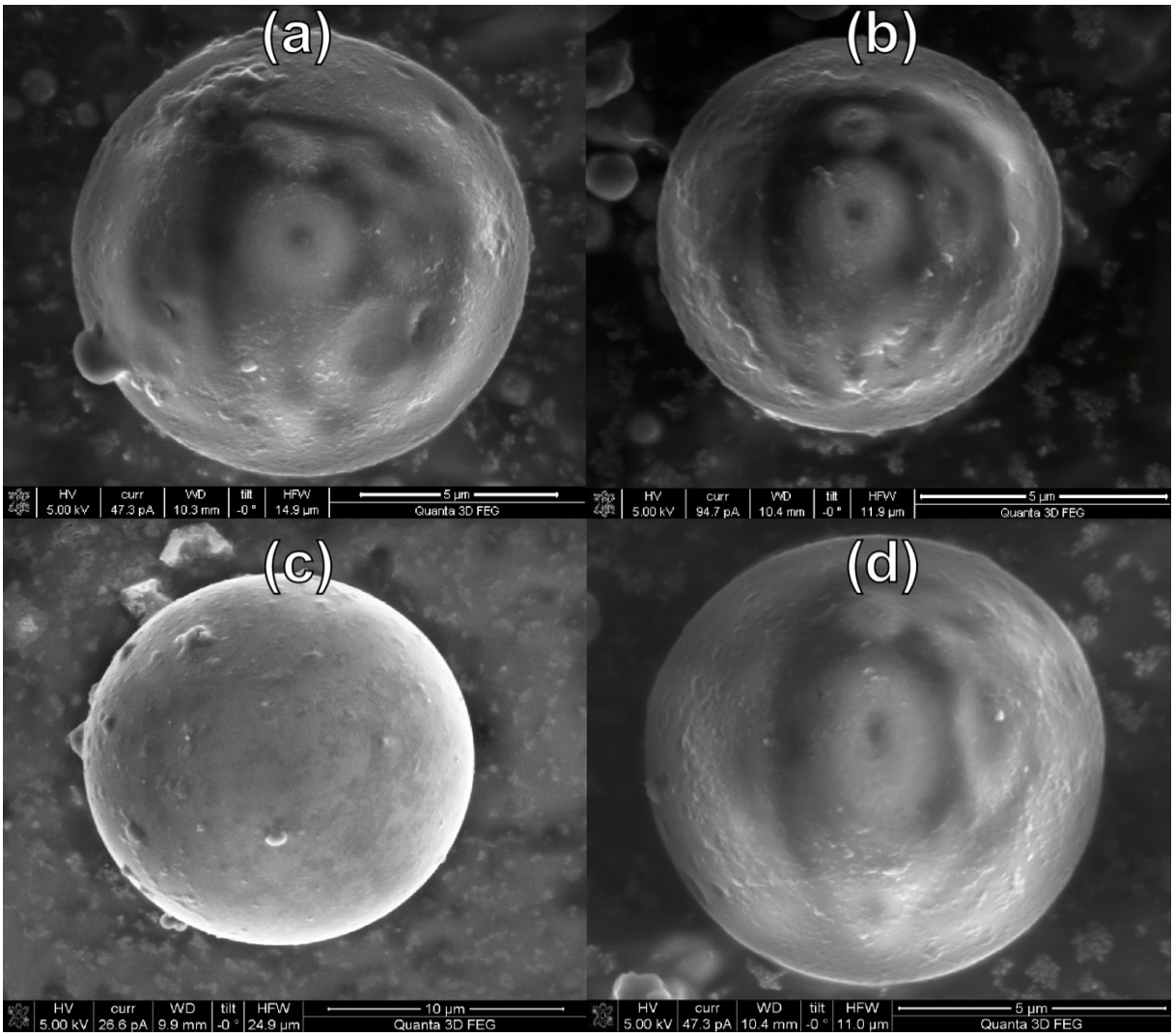

Fig S8. SEM image of (a) Pep-M1/pAPBA-MIP, (b) Pep-M1/pAPBA-NIP, (c) Pep-M2/pAPBA-MIP and (d) Pep-M2/pAPBA-NIP. The SEM images of the microbeads after the grafting of pAPBA films onto the surface are shown. Compared to the images of AFFS and Pep-AFFS, these images confirm the formation of core–shell microbeads. The imprinted beads do not reveal a smooth surface anymore. All samples are rather described by a structured and rough surface. In addition, the rough surface of the imprinted microbeads could indicate that imprinted films have larger surface areas to interact with the pepsin.

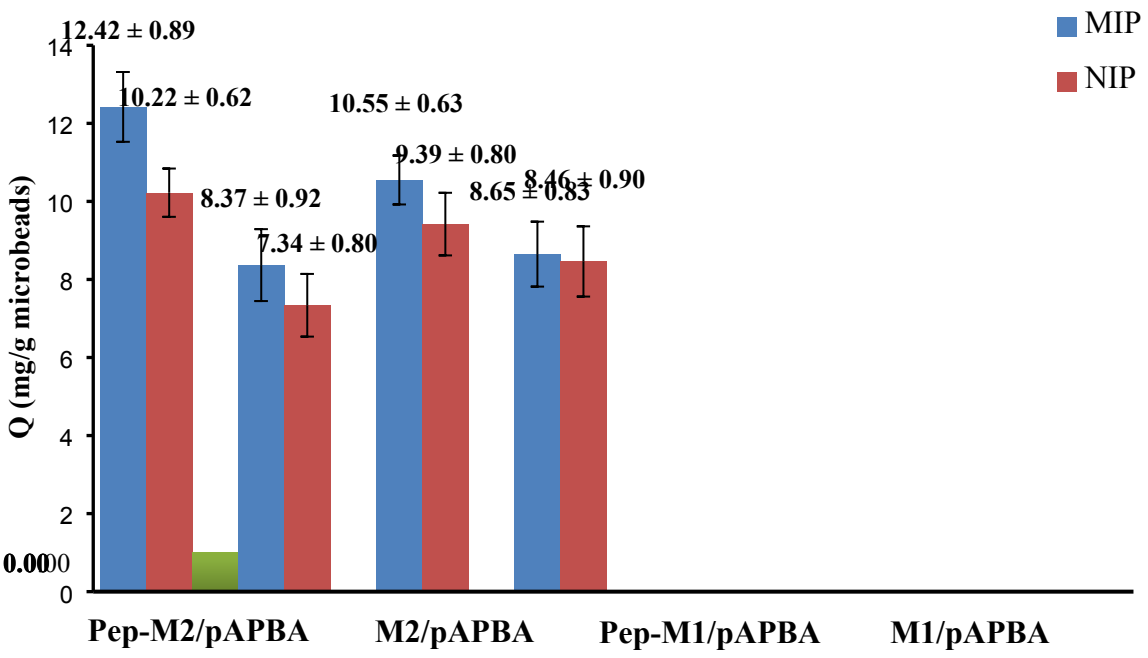

Fig S9. Rebinding profile (n= 4) at MIP and NIP (40 mg). Extraction: at pH 6.0 sodium bicarbonate (0.1 M) containing sodium chloride (0.5 M) for 2 h. Rebinding: at pH 5.0 citrate buffer containing sodium chloride (0.3 M) for 60 min.

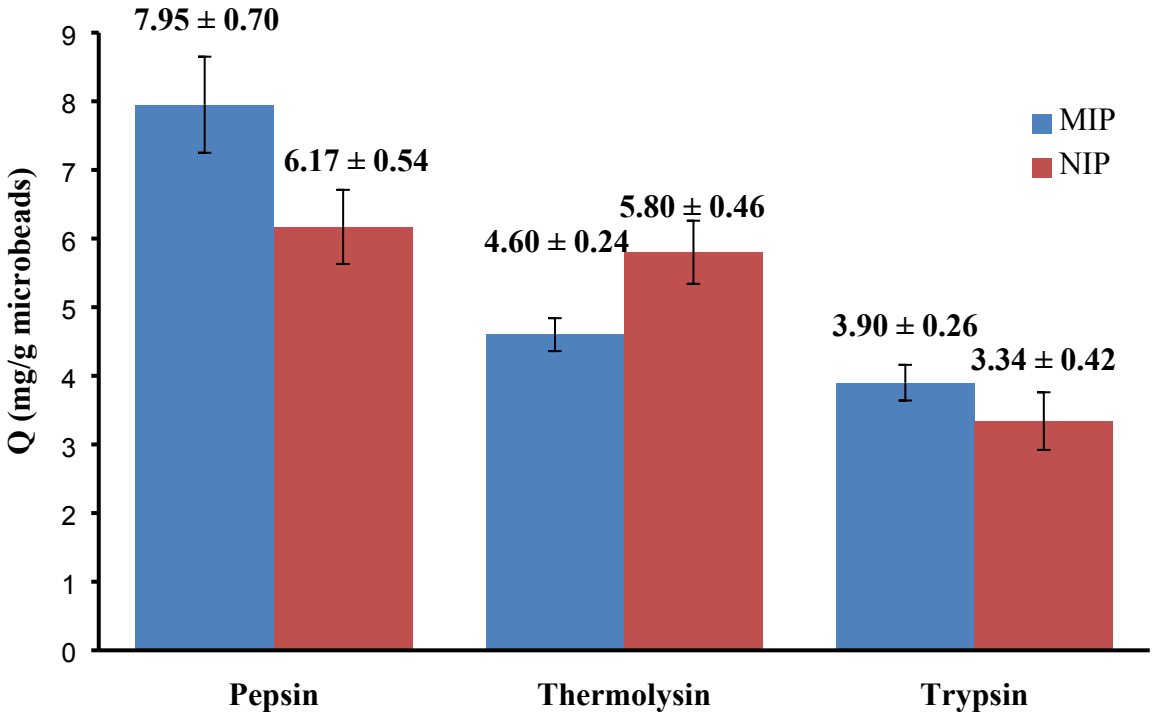

Fig S10. Elution profiles for pepsin, thermolysin, and trypsin (n= 3) on MIP and on NIP (cartridges containing 40 mg MIP or NIP sorbent, respectively). Binding buffer: 0.1 M citrate, 0.5 M sodium chloride, pH 4.5; washing buffer: 0.5 M sodium chloride; elution buffer: 0.1 M sodium bicarbonate, 0.5 M sodium chloride, pH 6.2.