† Electronic Supplementary Information (ESI)

A biomimetic hybrid material consisting of $CaCO_3$ mesoporous microspheres and an alternating copolymer for reversed-phase HPLC

*Mai Mochida, Yuta Nagai, Hiroto Kumagai, Hiroaki Imai, Daniel Citterio and Yuki Hiruta**

Department of Applied Chemistry, Keio University

3-14-1 Hiyoshi, Kohoku-ku, Yokohama 223-8522, Japan.

*To whom correspondence should be addressed.

Tel: +81 45 566 1568; Fax: +81 45 566 1568; Email: hiruta@applc.keio.ac.jp

Material characterizations

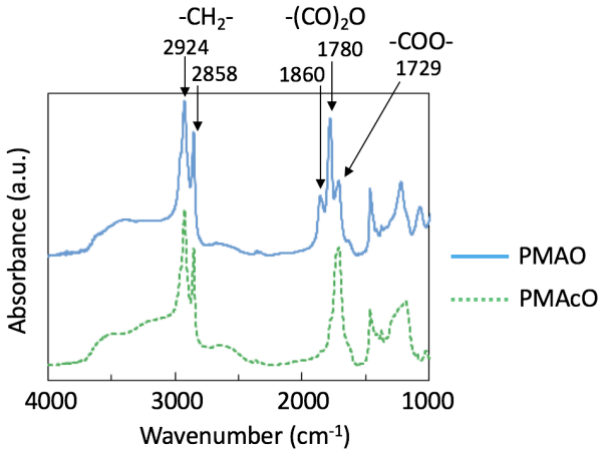

Fig. S1 FT-IR spectra of PMAO and PMAcO.

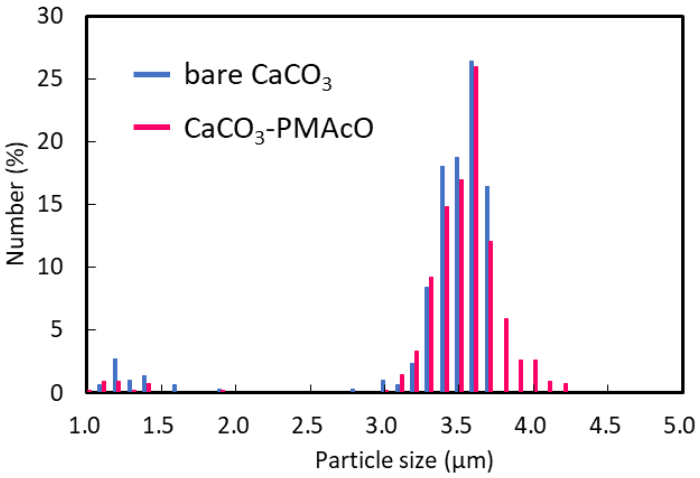

Fig. S2 Particle size distributions of bare $CaCO_3$ and $CaCO_3$-PMAcO (n = 400, measured from the SEM images shown in Fig. 2D and 2H of the main text).

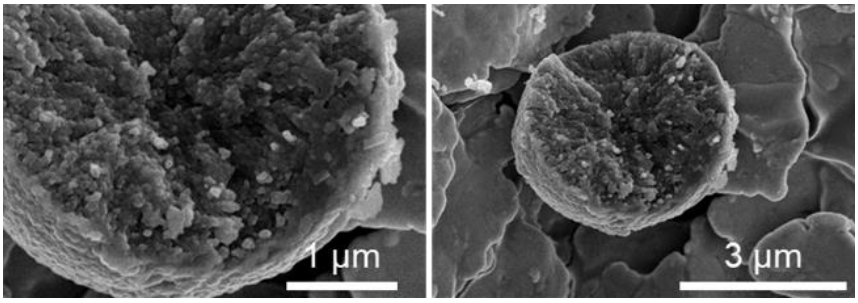

Fig. S3 SEM images of the fracture surface of $CaCO_3$-PMAcO.

Chromatographic results

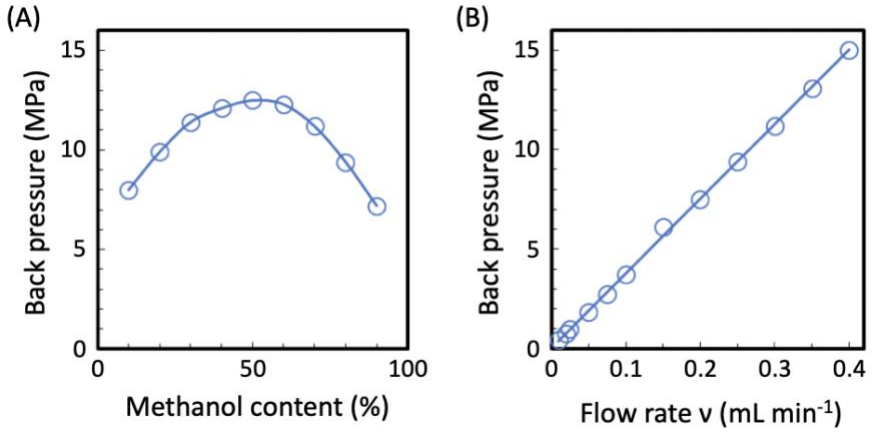

Fig. S4 Back pressures of $CaCO_3$-PMAcO column; (A) depending on mixing ratio of methanol/water mobile phase with flow rate at 0.3 mL/min; (B) depending on flow rate with methanol/water (70/30, v/v) mobile phase.

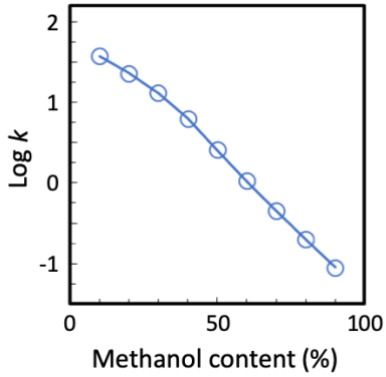

Fig. S5 Retention factors of naphthalene in changing the mixture ratio of mobile phase for $CaCO_3$-PMAcO column. A methanol/water mobile phase was flowed at 0.3 mL/min.

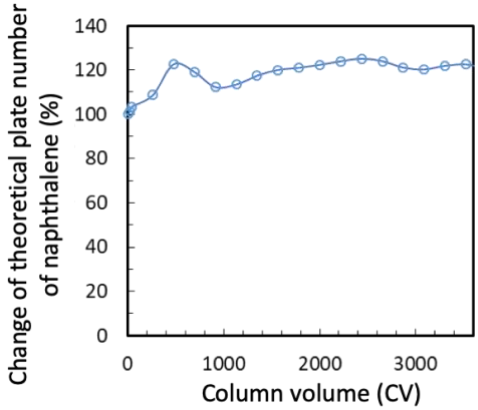

Fig. S6 Relative change of the theoretical plate number of naphthalene upon continuous running of alkaline mobile phase (50/50 (v/v) methanol/pH 10.8 $Na_2B_4O_7$ buffer) in the case of $CaCO_3$-PMAcO column; flow rate of mobile phase 0.3 mL/min; experimental conditions equivalent to those in Fig. 4C of the main text.

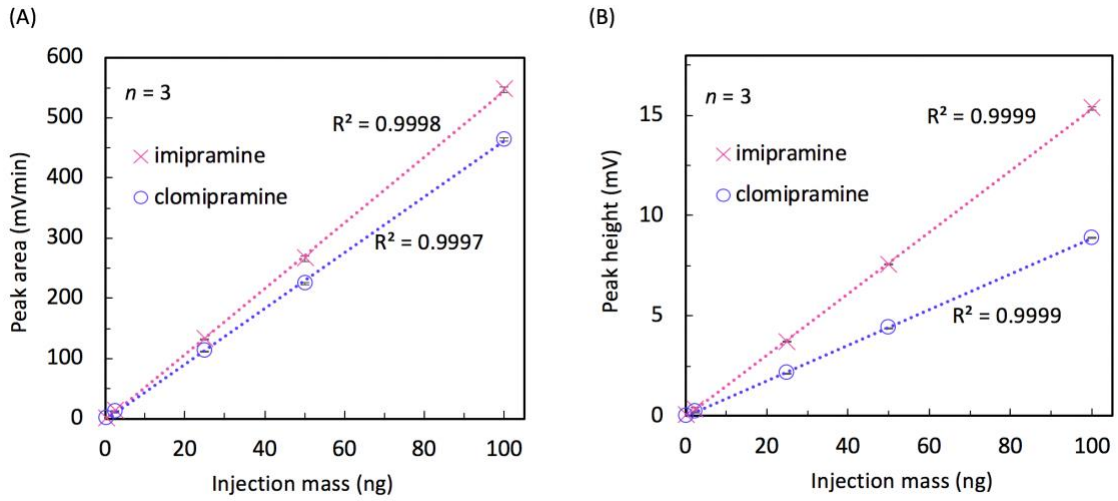

Fig. S7 Calibration curves of two basic antidepressants (clomipramine and imipramine) based on the data in Figure 6B of main article (A) from peak areas, (B) from peak heights.

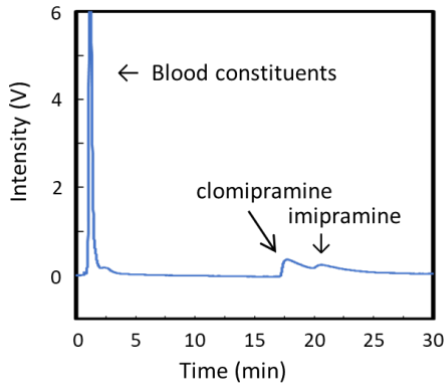

Fig. S8 Chromatogram of the separation of basic antidepressants (clomipramine and imipramine) spiked into porcine whole blood with a ODS column.; a 80/20 (v/v) methanol/water was used as mobile phase at a flow rate of 0.3 mL/min.