

Electronic Supplementary Material (ESI) for Biomaterials Science.

Supporting information for

# Specific adsorption of a $\beta$ -lactam antibiotic *in vivo* by an anion-exchange resin for protection of intestinal microbiota

Shunyi Li<sup>a,\*</sup>, Kyosuke Yakabe<sup>b,c,\*</sup>, Khadijah Zai<sup>d</sup>, Yiwei Liu<sup>e</sup>, Akihiro Kishimura<sup>a,e,f,g</sup>, Koji Hase<sup>b,h</sup>, Yun-Gi Kim<sup>†c</sup>, Takeshi Mori<sup>‡a,e,f</sup>, Yoshiki Katayama<sup>‡a,e,f,g,i,j</sup>

<sup>a</sup> Graduate School of Systems Life Sciences, Kyushu University, Fukuoka, 819-0395, Japan.

<sup>b</sup> Division of Biochemistry, Faculty of Pharmacy, Keio University, Tokyo 105-8512, Japan.

<sup>c</sup> Research Center for Drug Discovery, Faculty of Pharmacy and Graduate School of Pharmaceutical Sciences, Keio University, Tokyo 105-8512, Japan.

<sup>d</sup> Department of Pharmaceutics, Faculty of Pharmacy, Gadjah Mada University, Yogyakarta 55281, Indonesia.

<sup>e</sup> Department of Applied Chemistry, Faculty of Engineering, Kyushu University, Fukuoka, 819-0395, Japan.

<sup>f</sup> Center for Future Chemistry, Kyushu University, 819-0395, Japan.

<sup>g</sup> International Research Center for Molecular Systems, Kyushu University, Fukuoka, 819-0395, Japan.

<sup>h</sup> Division of Mucosal Barrierology, International Research and Development Center for Mucosal Vaccines, The Institute of Medical Science the University of Tokyo, Tokyo 108-8639, Japan

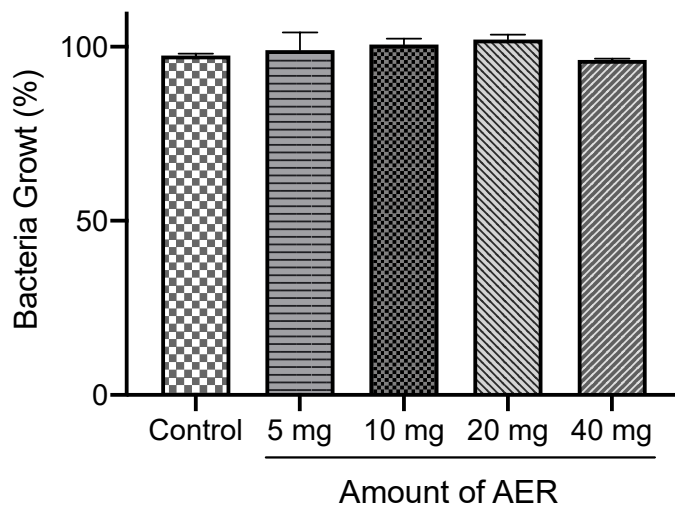
<sup>i</sup> Centre for Advanced Medicine Innovation, Kyushu University, Fukuoka, 812-8582, Japan.

<sup>j</sup> Department of Biomedical Engineering, Chung Yuan Christian University, Chung Li, 32023 ROC, Taiwan.

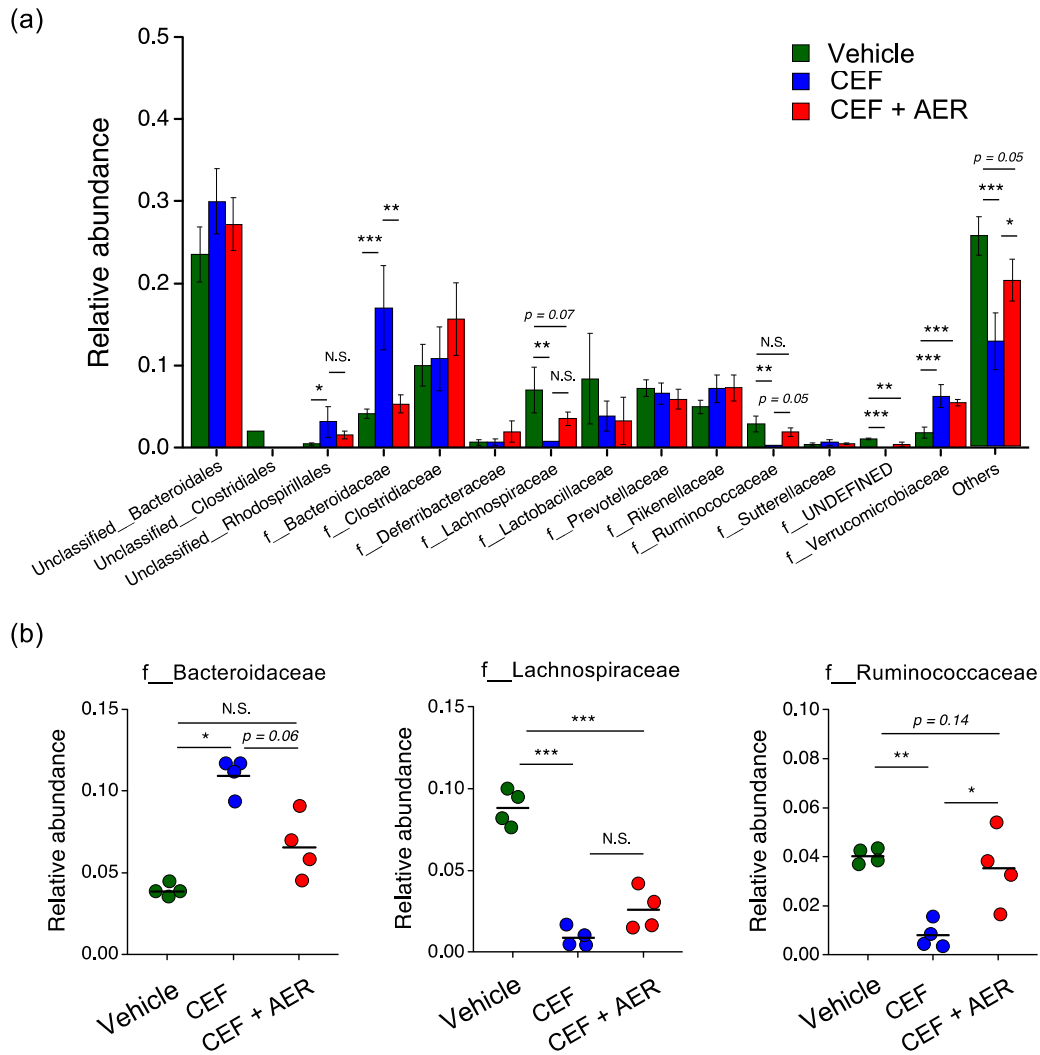
**Table S1** Primers for 16S rDNA gene amplification

Forward	5'TCGTCGGCAGCGTCAGATGTGTATAAGAGACAGGTGCCAGCMGCCG CGGTAA-3'
Reverse	5'GTCTCGTGGGCTCGGAGATGTGTATAAGAGACAGGGACTACHVGGG TWTCTAAT-3'

M: A or C; H: A, T or C; V: A, G or C



**Fig. S1** Viability of *E.coli* co-culture with AER. Data are represented by the mean  $\pm$  SEM (n = 3)



**Fig. S2** Pre-administration of AER prevents CEF-induced perturbation in gut microbiota. (a) The relative abundance of all detected bacteria of vehicle (green), CEF (blue), or CEF with AER (red)-treated groups on day 3 (Vehicle: n = 4, CEF: n = 3, CEF + AER: n = 4). (b) The relative abundance of Bacteroidaceae, Ruminococcaceae, and Lachnospiraceae in the fecal samples of vehicle (green), CEF (blue), or CEF with AER (red)-treated groups on day 7 (n = 4). Each circle indicates the individual mice of each group.