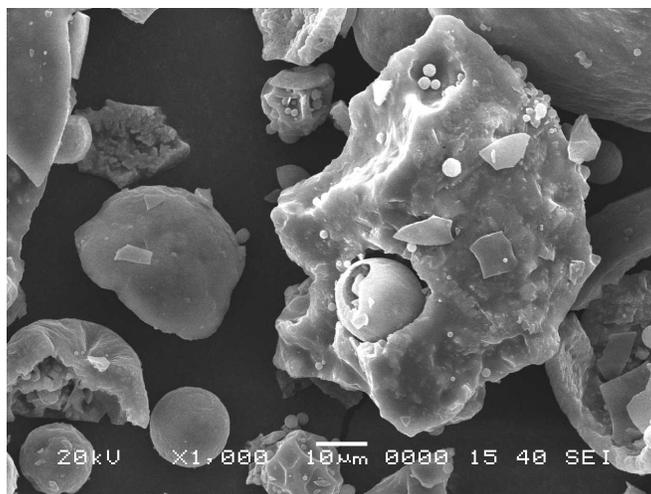
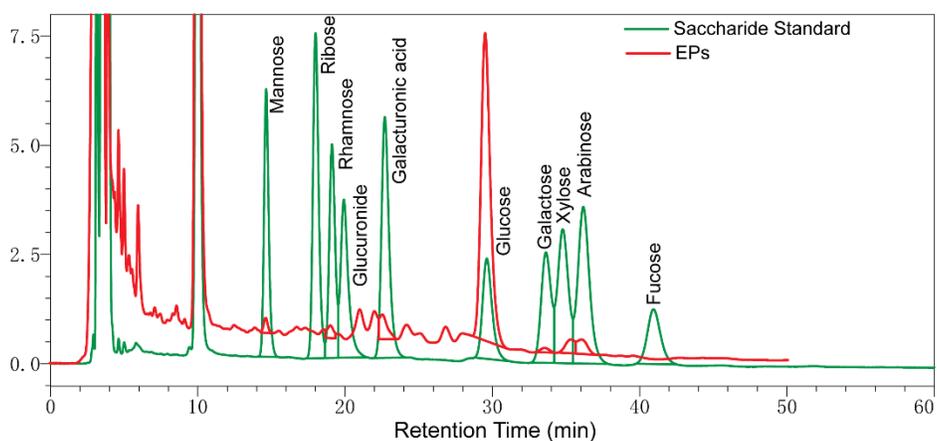


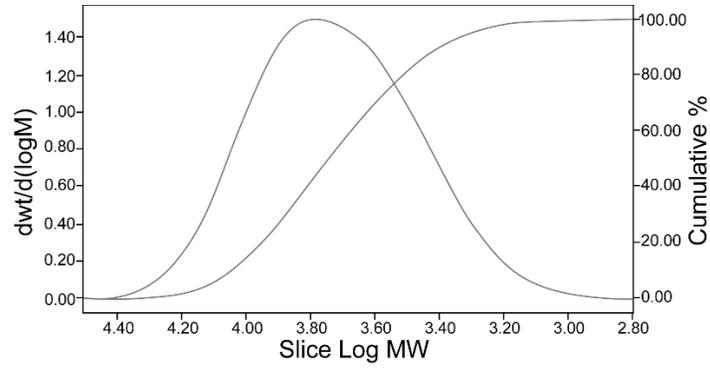
## Supplementary Information



**Figure S1.** Scanning electron microscope image for EPs.



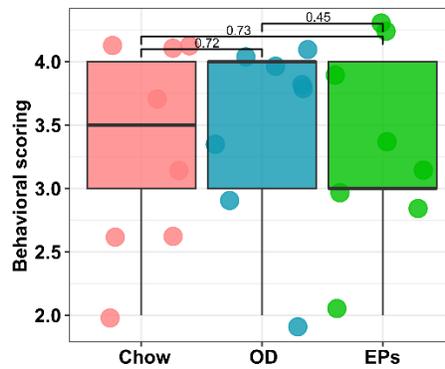
**Figure S2.** The elution profile of the saccharide standard and EPs by high-performance liquid chromatography.



10

11 **Figure S3.** The molecular weight distribution of EPs.

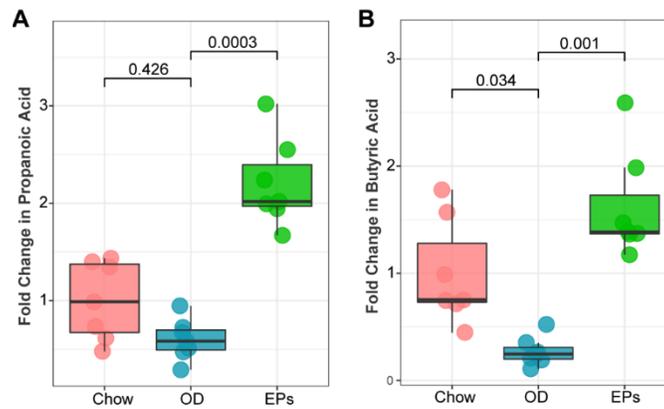
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14 **Figure S4.** Behavioral scoring of the rotarod test ( $n = 8$  individuals/group). Statistical significance  
 15 compared to each group by one-way ANOVA, adjusted for multiple comparisons by Dunnett post-hoc  
 16 test.

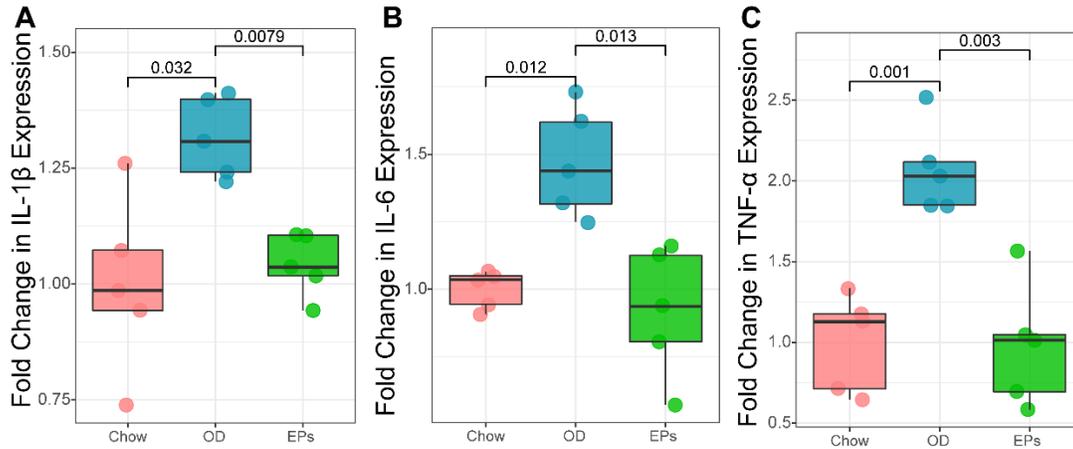
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18

19 **Figure S5.** Quantitative analysis of SCFAs concentration, including propanoic acid (A) and butyric acid  
20 (B), in colon contents from three groups ( $n = 7$  individuals/group). Statistical significance compared to  
21 OD group by one-way ANOVA, adjusted for multiple comparisons by Dunnett post-hoc test.

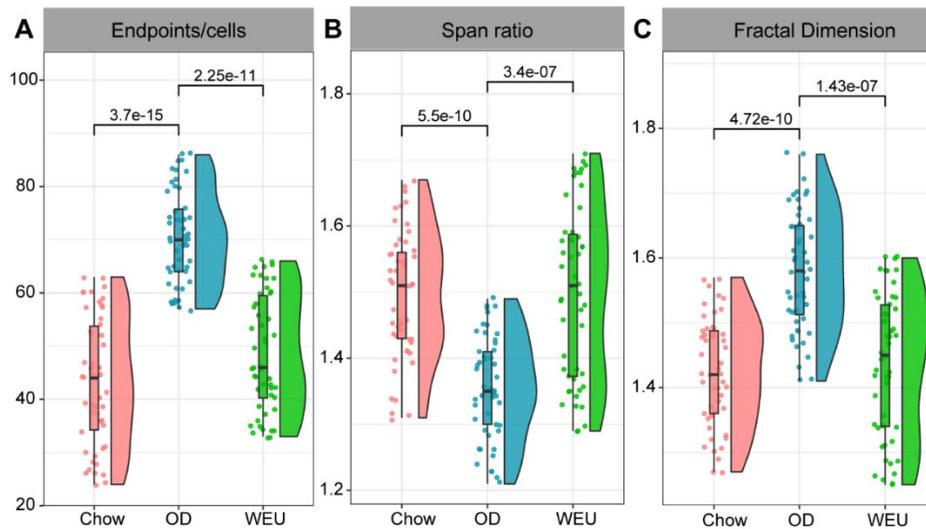
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24 **Figure S6.** Concentrations of three representative proinflammatory cytokines, IL-1 $\beta$  (A), IL-6 (B), and  
25 TNF- $\alpha$  (C) in the hippocampus ( $n = 5$  individuals/group). Statistical significance compared to OD group  
26 by one-way ANOVA, adjusted for multiple comparisons by Dunnett post-hoc test.

27



28

29 **Figure S7. Morphological analysis of microglia.**

30 Summary data and statistical analysis of endpoints (A), span ratio (B), and fractal dimension (C) between  
31 three groups.  $n = 50$  cells from 3 mice. Statistical significance compared to OD group by one-way  
32 ANOVA, adjusted for multiple comparisons by Dunnett post-hoc test.

33 **Table S1. The monosaccharide of EPs.**

Monosaccharide (% w/w)	
Mannose	1.12872
Rhamnose	2.18416
Galacturonic acid	3.15037
Glucose	82.70771
Galactose	0.79398
Xylose	2.01605
Arabinose	1.99197

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