

Electronic Supplementary Information

Laccase aggregates *via* poly-lysine-supported immobilization onto PEGA resin, with efficient activity and high operational stability and can be used to degrade endocrine-disrupting chemicals

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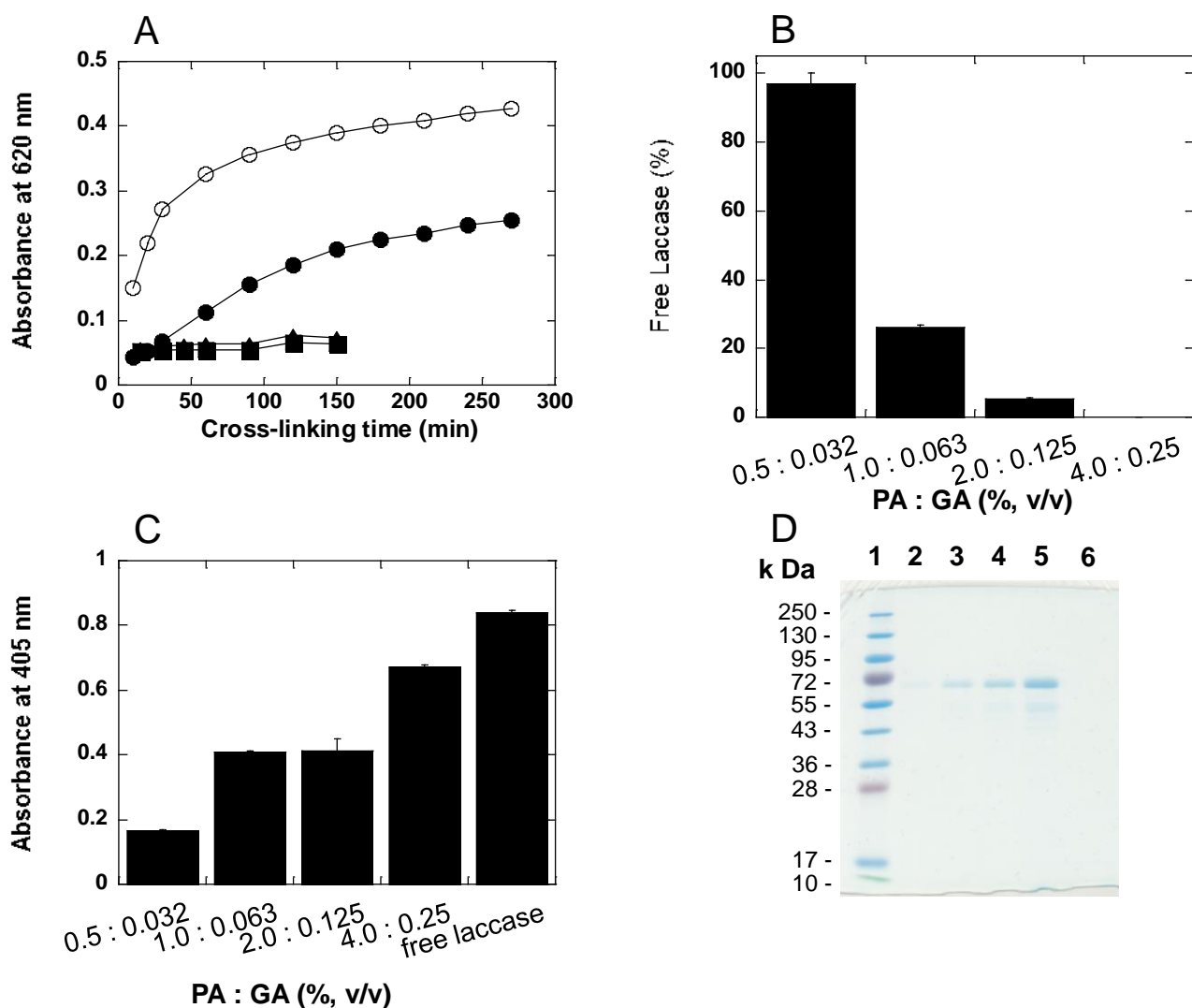


Fig. S1 Cross-linking conditions of poly-Lys supported laccase immobilization. (A) Effect of poly-Lys ratio. Poly-Lys/laccase ratios: 0.5 (closed square), 1.0 (closed triangle), 2.0 (closed circle) and 4.0 (open circle). (B) Effect of cross-linker concentration on cross-linking yield. (C) Effect of cross-linker concentration on the activity of immobilized laccase. A mixture of GA and PA was used at a ratio of 1:16 (v/v). The graphs show the mean \pm standard error of at least three experiments. (D) SDS-PAGE analysis of Lac-PEGA, 12% stacking gel, dyed by Coomassie R250. The lane 1 is the marker of standard proteins, lane 2-5 show free laccase (1, 3, 5 and 10 μ g). Sample that was prepared from Lac-PEGA (15 μ g) was applied in lane 6.

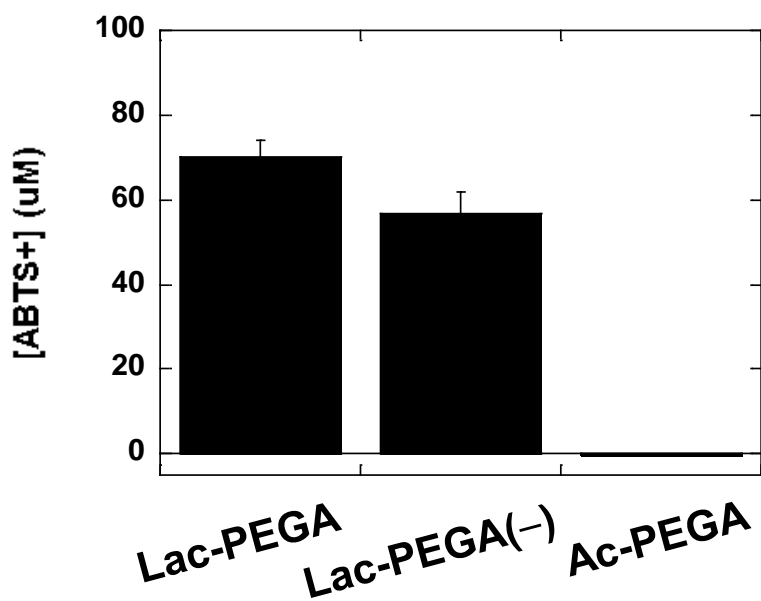


Fig. S2 Enzymatic activity of Lac-PEGA, Lac-PEGA(-) and Ac-PEGA. The activity was measured in 50 mM acetate buffer (pH 4.5) at 30°C for 10 min. The concentration of ABTS was 100 μ M. The graphs show the mean \pm standard error of at least three experiments.

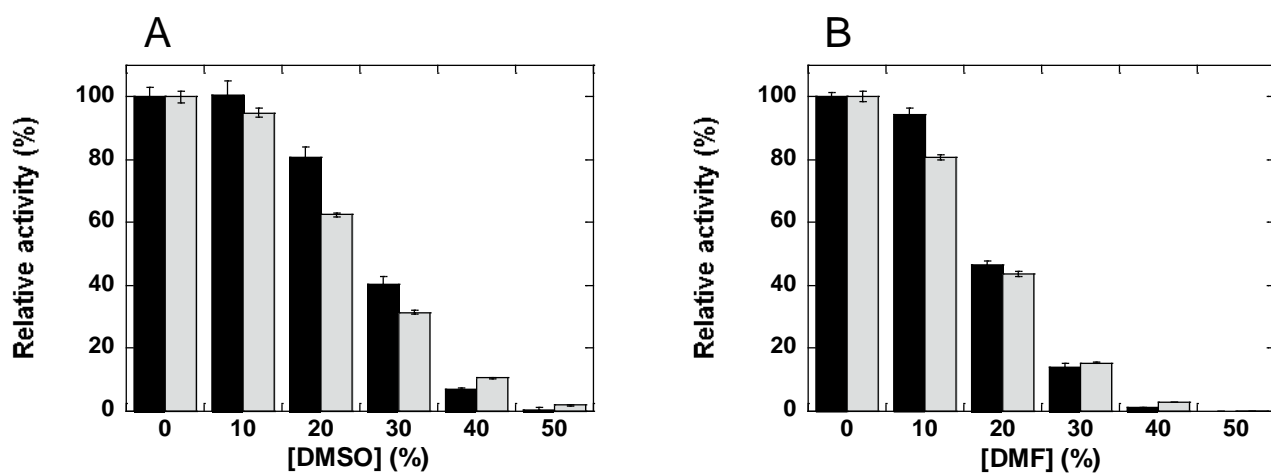


Fig. S3 Effect of DMSO (A) or DMF (B) on activity of Lac-PEGA (black) and free laccase (gray). The activity was measured in 50 mM acetate buffer (pH 4.5) at 30°C for 10 min. The results are presented as relative activity with respect to the activity of a single laccase molecule in the absence of each organic solvent. The concentration of ABTS, Lac-PEGA and free laccase was 100 μM , 15 $\mu\text{g mL}^{-1}$ and 10 $\mu\text{g mL}^{-1}$, respectively. The graphs show the mean \pm standard error of at least three experiments.