# Supplementary Materials

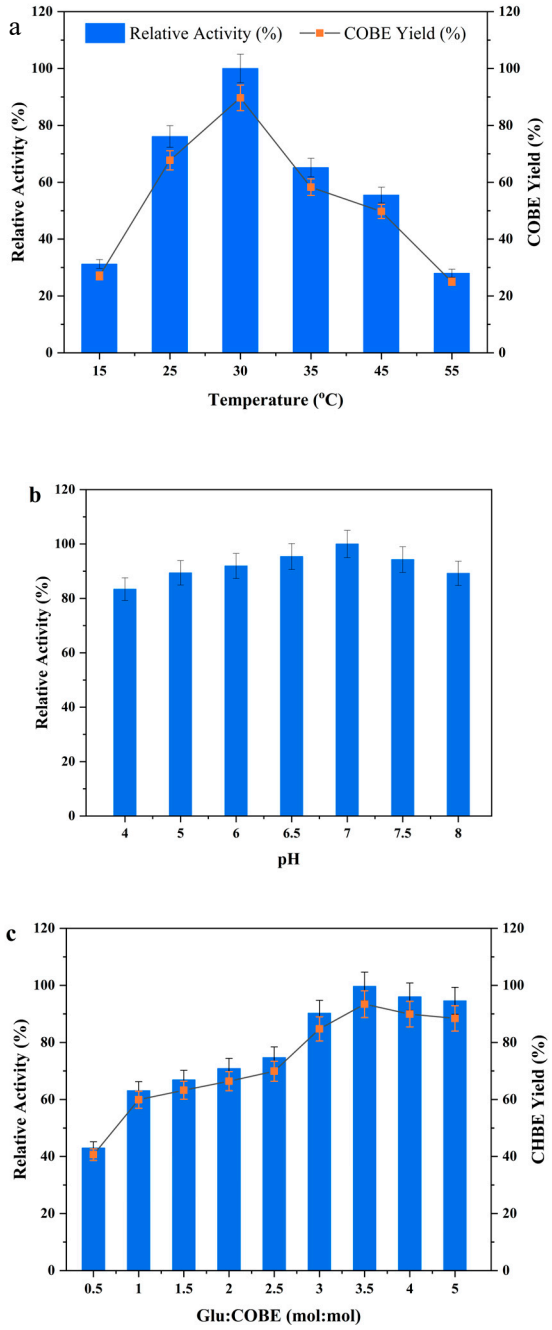


**Figure S1.** Effect of different temperatures (15~55 °C) on the catalytic reactions [100 mM COBE, pH 7.0] (**a**); Effect of different pH (4~8) on the catalytic reactions n [100 mM COBE, 30 °C] (**b**); Effect of different metal ions on the catalytic reactions (**c**); Effect of co-substrate glucose loading on the catalytic reactions [100 mM COBE, 30 °C and pH 7.0] (**d**).

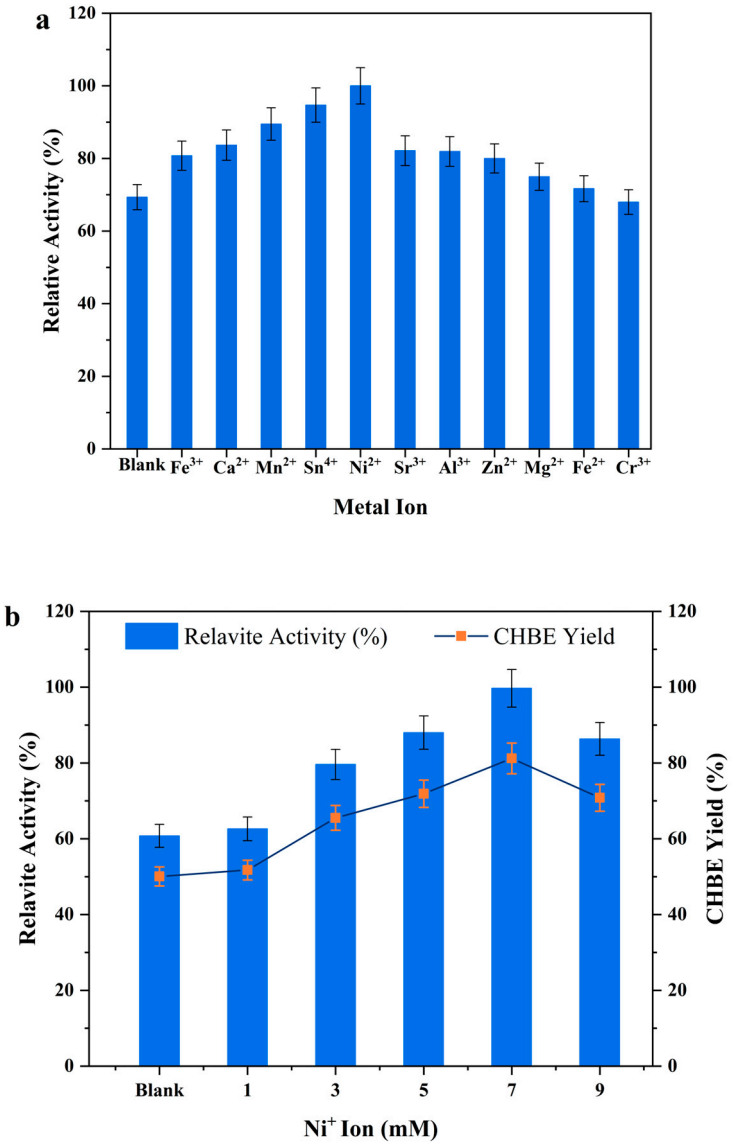


**Figure S2.** Effects of different metal ions on the catalytic reactions [100 mM COBE, 30 °C and pH 7.0] (**a**); Effects of different $Ni^{2+}$ concentration on the catalytic reactions [100 mM COBE, 30 °C and pH 7.0] (**b**).

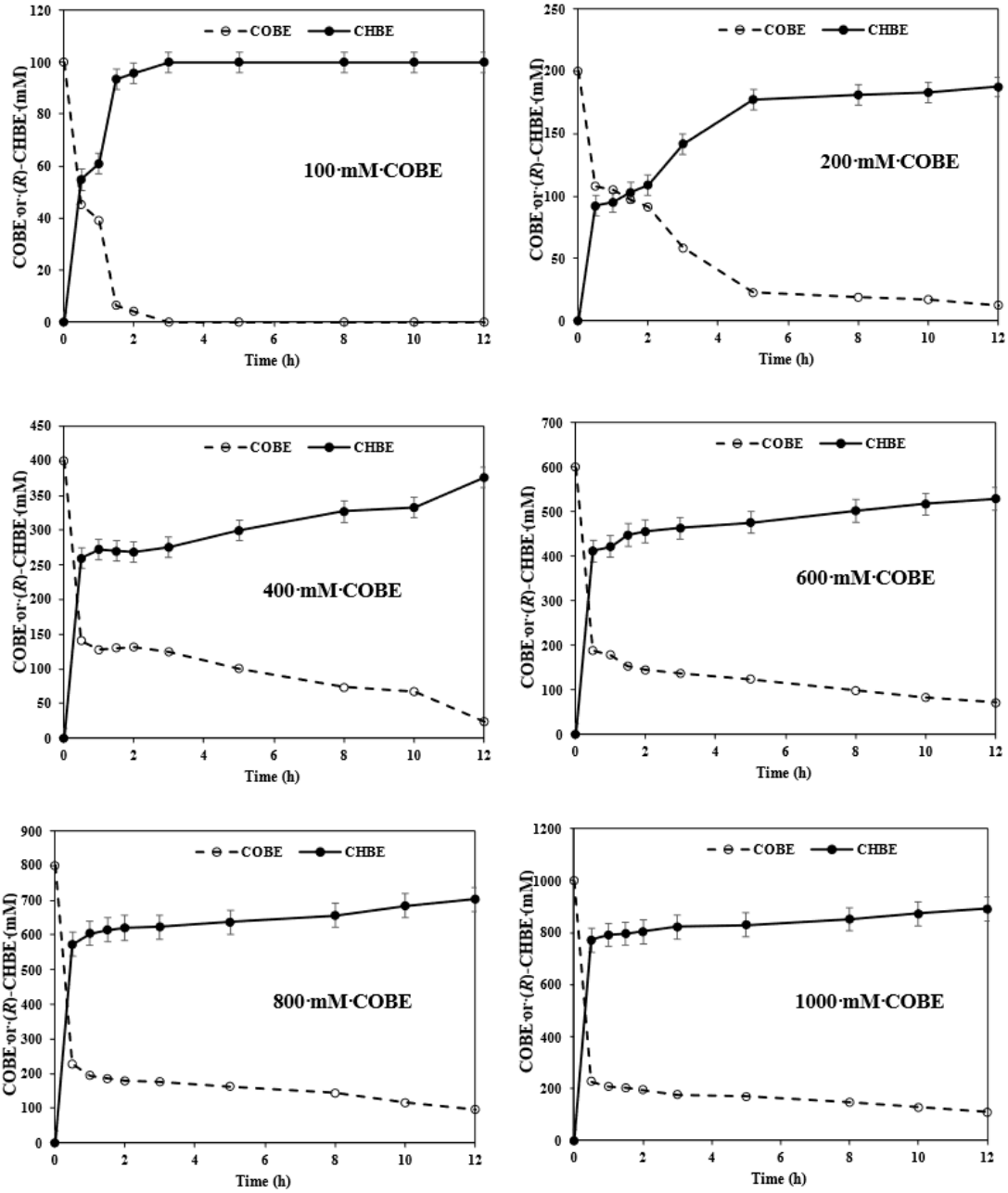


**Figure S3.** Effect of COBE concentration on the biocatalytic reaction [30 °C and pH 7.0].

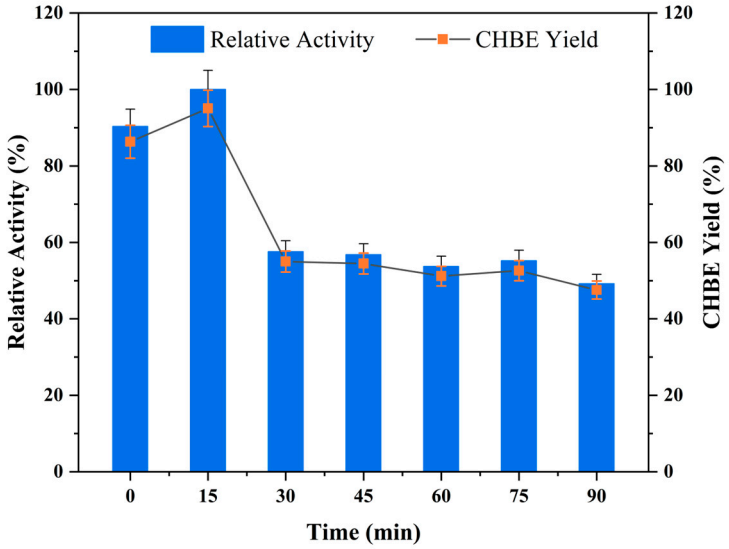


**Figure S4.** Influence of different crushing time on the cell catalytic reaction [100 mM COBE, 30 °C and pH 7.0]

**Table S1.** Effects of different additives on total cell membrane permeability of CgCR.

| Solvent | $OD_{260}$ | $OD_{280}$ |
|---|---|---|
| Blank | 0.108 ± 0.004 | 0.059 ± 0.003 |
| Betaine:lactic acid | 0.180 ± 0.001 | 0.098 ± 0.005 |
| Ethyl acetate | 1.013 ± 0.009 | 0.417 ± 0.008 |
| Betaine:lactic acid plus ethyl acetate | 1.211 ± 0.012 | 0.599 ± 0.011 |