Supporting information for

Assay for lignin breakdown based on lignin films: insights into the Fenton reaction with insoluble lignin

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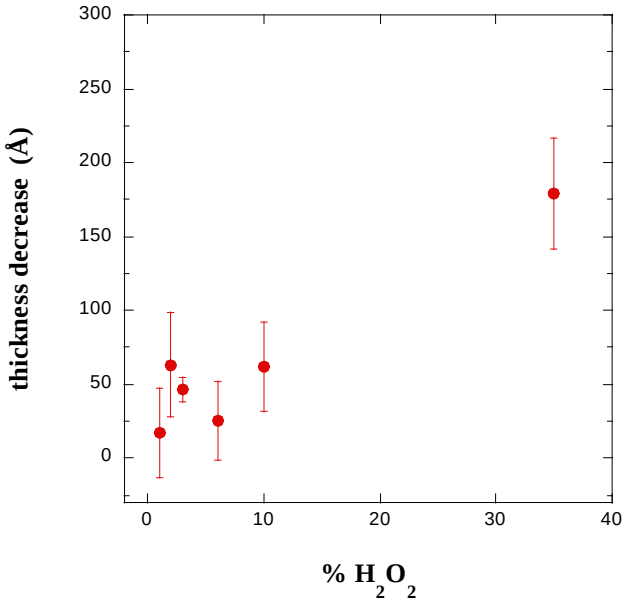


Figure S1. Mass loss for base lignin films upon incubation for 18 h in aqueous H_2O_2 solutions of different concentrations. Individual film pieces were submerged in 2 ml of liquid and the vials were placed on a shaker at 60 rpm.

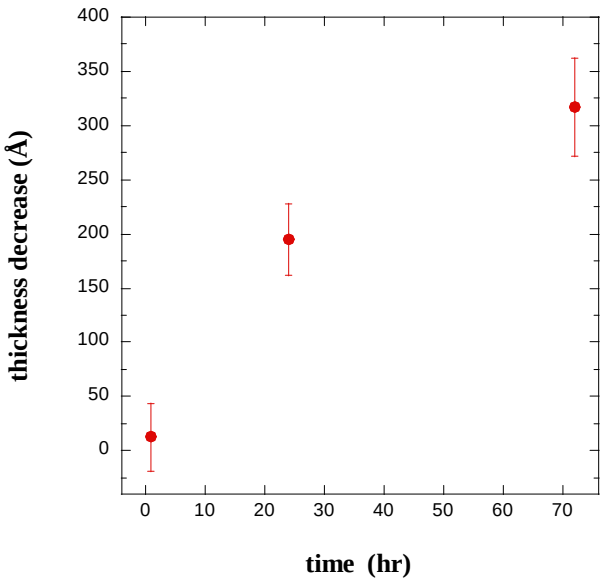
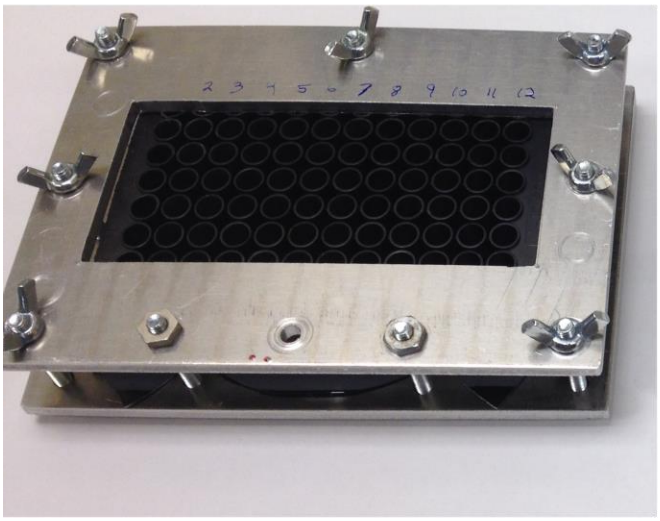


Figure S2. Mass loss for base lignin films upon incubation in 3% H_2O_2 solutions at 60 °C. Individual film pieces were submerged in 2 ml of liquid and the vials were placed in a convection oven at 60 °C.



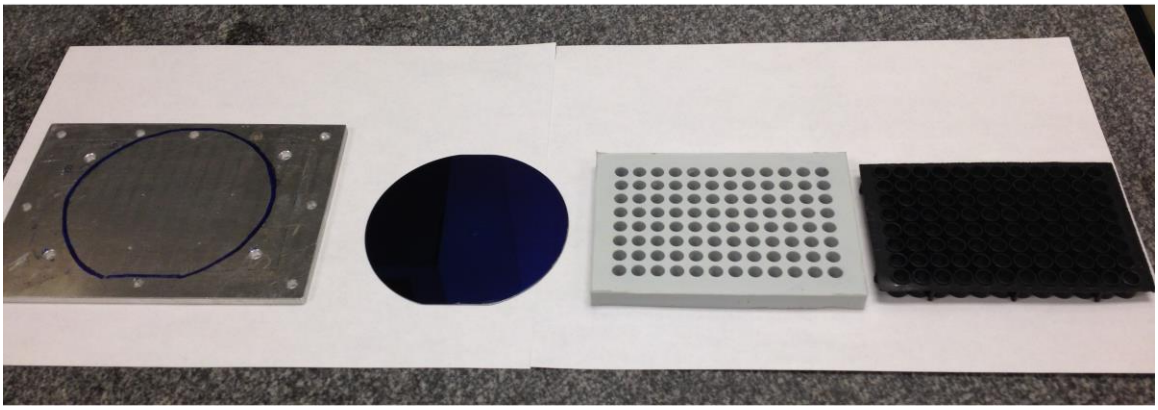


Figure S3. Photos of the assembled multiplexed test structure and the component parts.

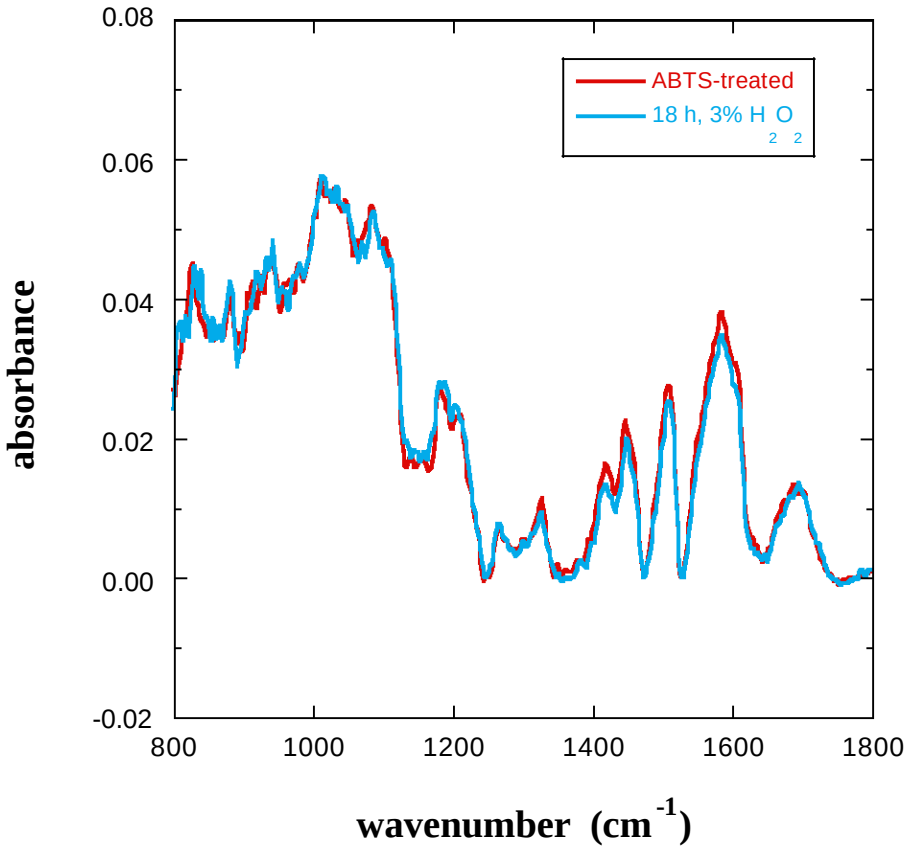


Figure S4. FTIR spectra from lignin film (spun from 3% solution) before and after incubating for 18 h in 3% H_2O_2.

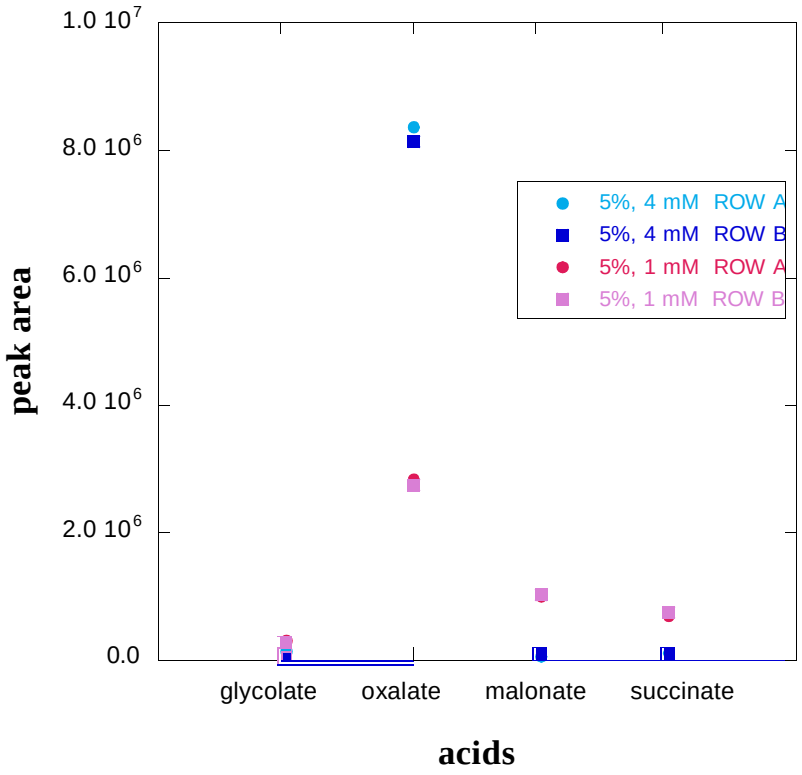


Figure S5. LC-MS results for low MW acids for liquids taken from wells from Row A and Row B in the trial shown in Figure 7 of the main text.

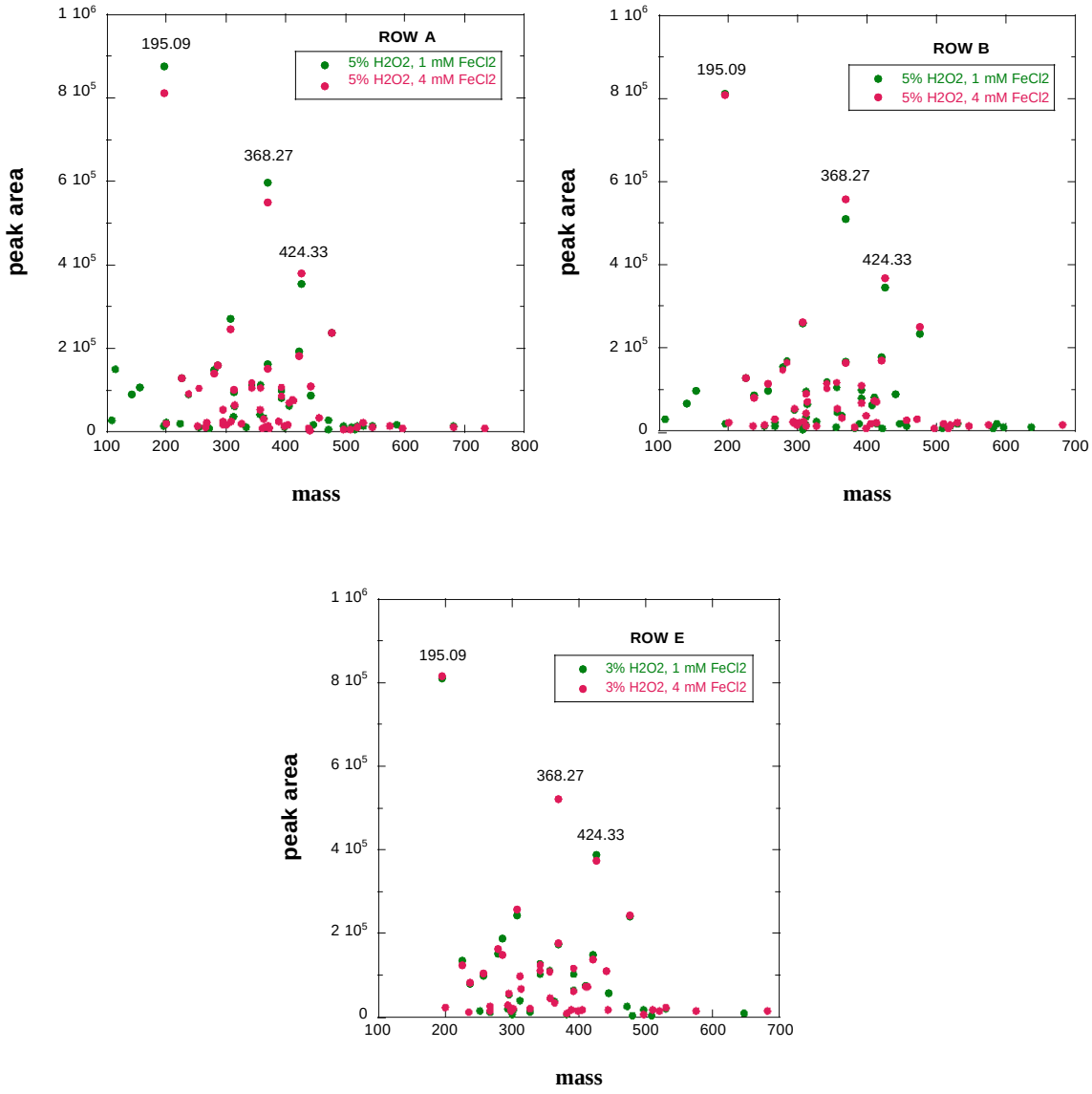


Figure S6. LC--MS results for aromatic acids and aldehydes, ESI protocol, for liquids taken from wells from Row A , Row B, and Row E in the trial shown in Figure 7 of the main text.

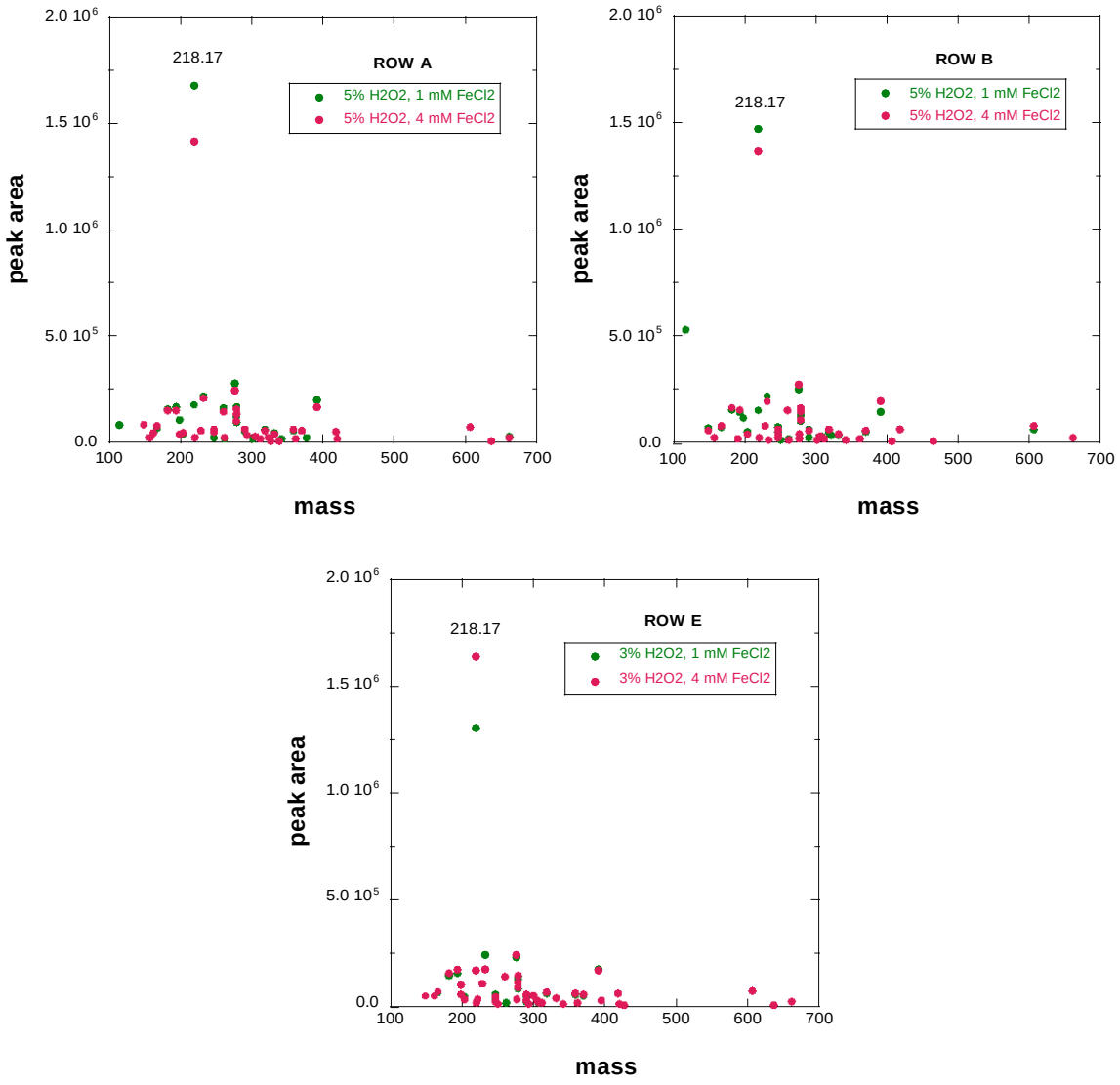
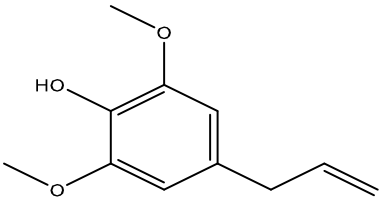
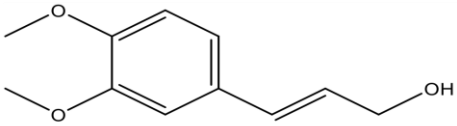


Figure S7. LC-MS results for aromatic, APCI protocol, for liquids taken from wells from Row A, Row B, and Row E in the trial shown in Figure 7 of the main text.



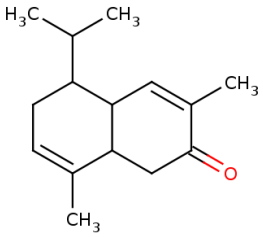
4-allyl-2,6-dimethoxyphenol

mass 195.1 Δm = 6.36 ppm



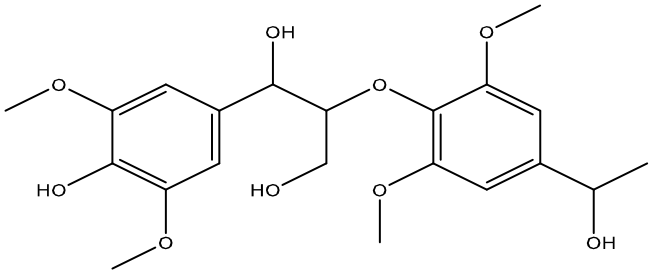
(E)-3-(3,4-dimethoxyphenyl)prop-2-en-1-ol

mass 195.1 Δm = 6.36 ppm



mass 218.167 Δm = 0.76 ppm

1-(4-hydroxy-3,5-dimethoxyphenyl)-2-(4-(1-hydroxyethyl)-2,6-dimethoxyphenoxy)propane-1,3-diol



mass 424.17 Δm = 7.85 ppm

Fig S8. Candidate structures for three of the most abundant species shown in Fig S6 and Fig S7.

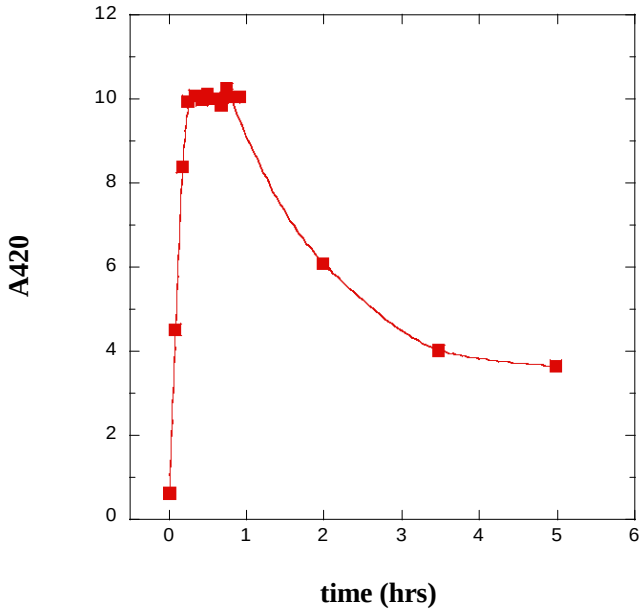


Figure S9. Absorbance at 420 nm indicating the oxidation of ABTS by laccase for the conditions described in the main text.