Electronic Supplementary Material (ESI) for Environmental Science: Nano.

Molecular mechanisms of plant salinity stress tolerance improvement by seed priming with cerium oxide nanoparticles

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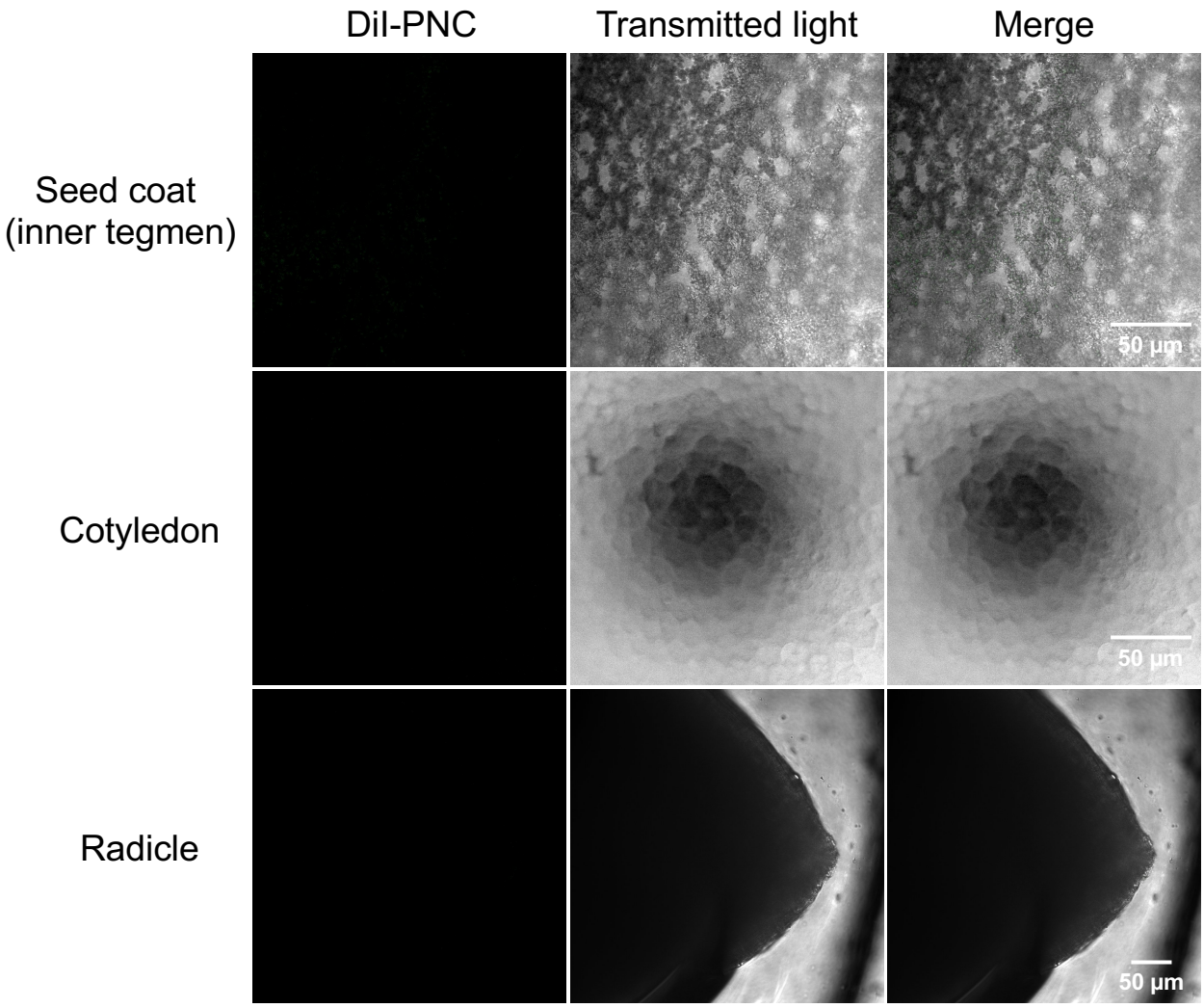

Figure S1. Representative confocal microscopy images showing no fluorescence of DiI-PNC in cotton seed coat inner tegmen, cotyledon, and radicle after priming with H_2O.

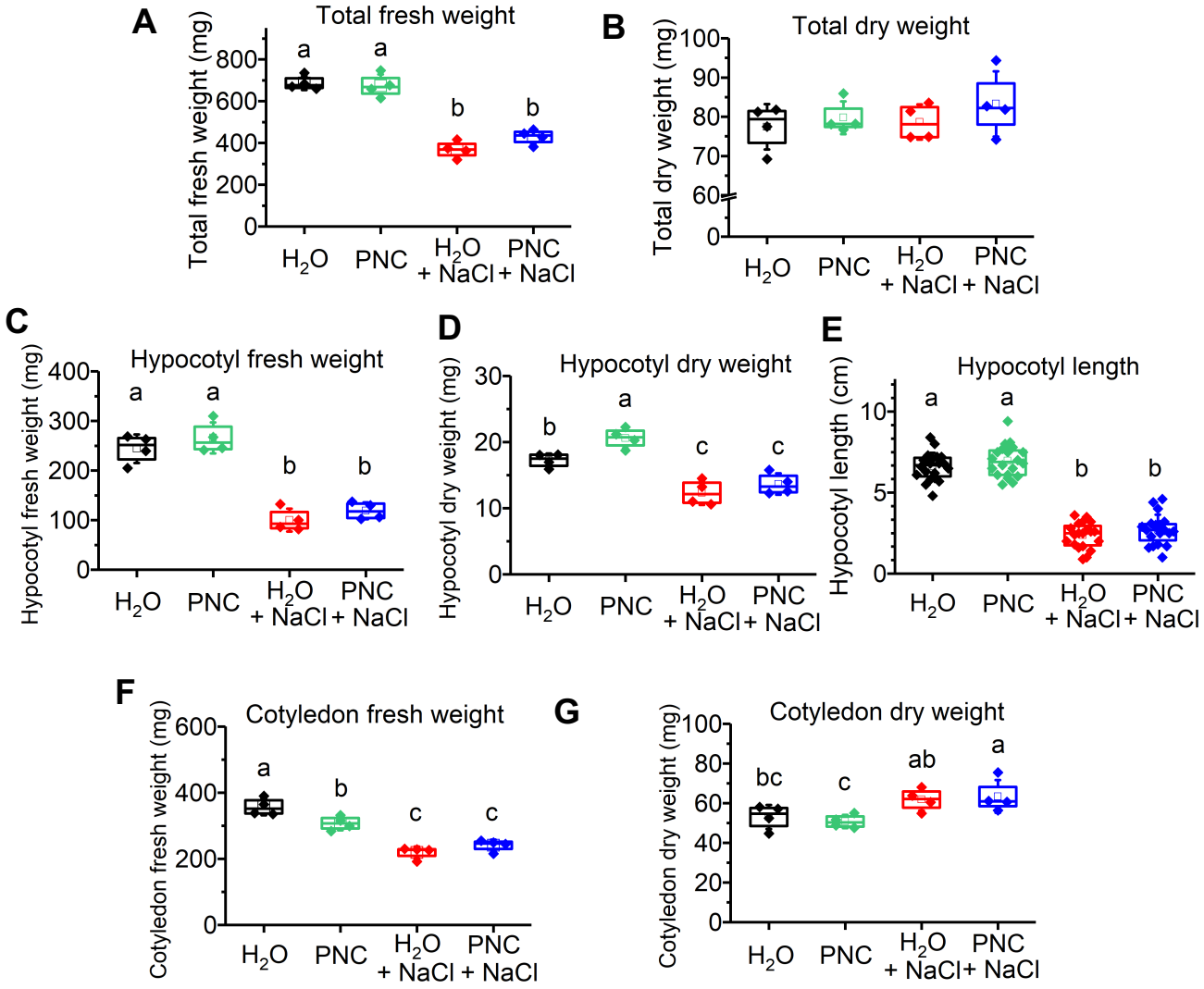

Figure S2. Cerium oxide nanoparticles (PNC) effect on cotton seedling biomass under salinity stress. PNC impact on root **A**, fresh weight, and **B**, dry weight; hypocotyl **C**, fresh weight, **D**, dry weight, and **E**, length; and cotyledon **F**, fresh weight, and **G**, dry weight. Boxes represent the interquartile range from the first to the third quartile with squares as the medians, error bars shows standard deviation, n ≧ 4. Statistical comparisons were performed by independent samples one-way ANOVA on Duncan's test (two tailed) or Kruskal Wallis test. Data with different lowercase letters are considered significantly different ($P < 0.05$).

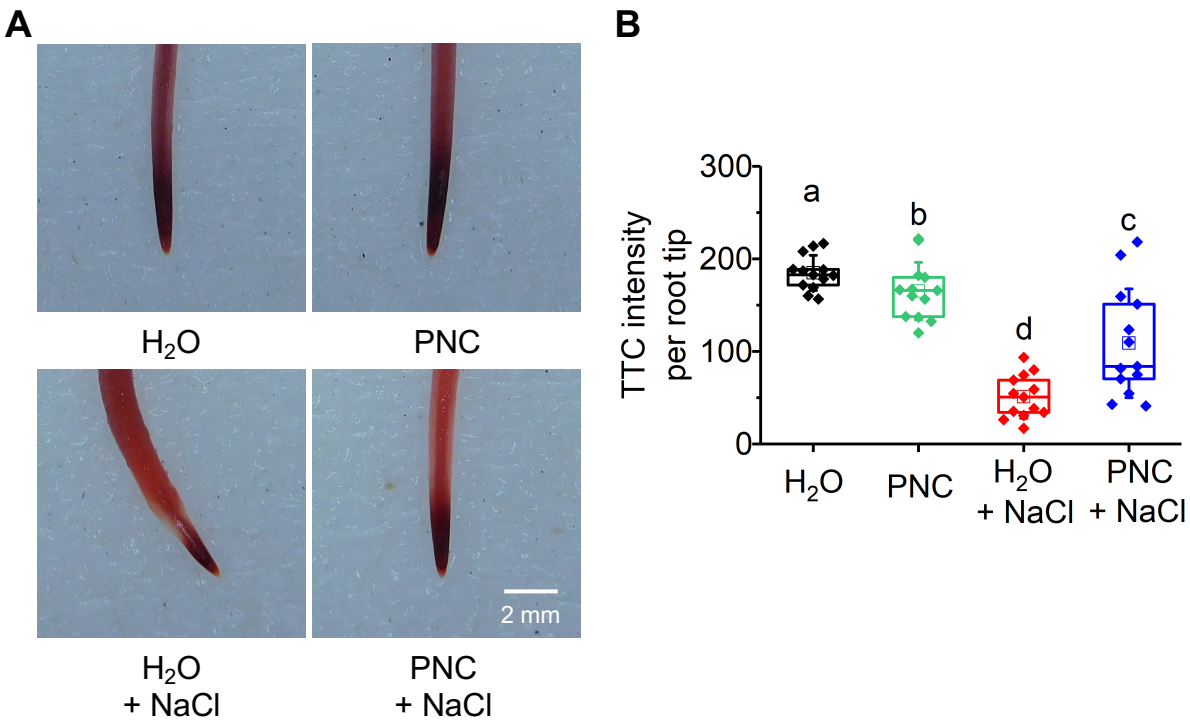

Figure S3. Cerium oxide nanoparticles (PNC) maintain cotton seedling root vitality under salinity stress. A, Representative TTC staining images for determination of root vitality. **B**, Box plots showing quantitative analysis of TTC intensity indicate higher vitality of seedling roots in plants exposed to PNC and grown under salt stress (200 mM NaCl) relative to non-stressed controls. Boxes represent the interquartile range from the first to the third quartile with squares as the medians, error bars shows standard deviation, n = 13. Statistical comparisons were performed by independent samples one-way ANOVA on Kruskal Wallis test. Data with different lowercase letters are considered significantly different ($P < 0.05$).

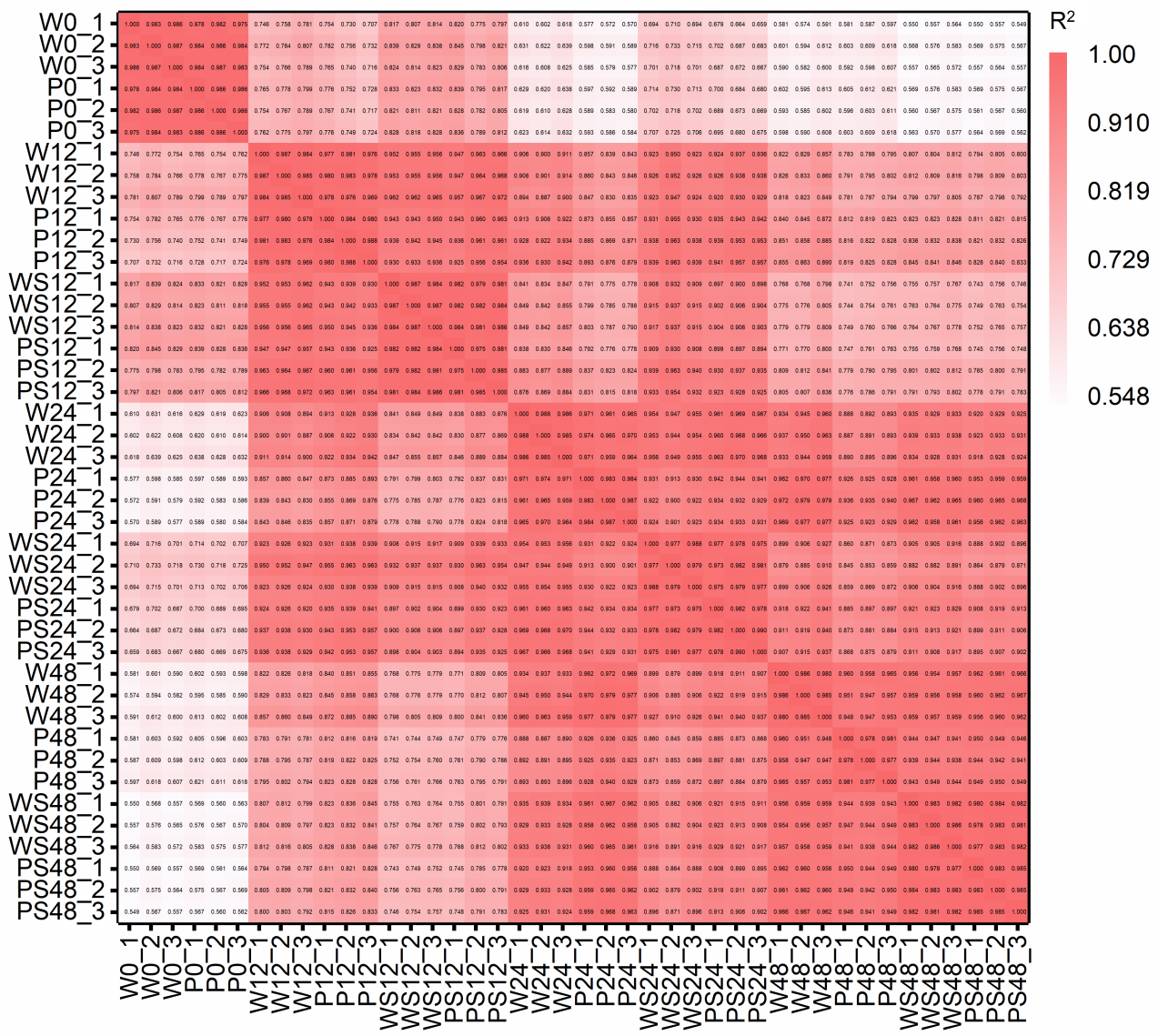

Figure S4. Pearson's correlation between RNA-seq samples. W0: after H_2O priming and before salinity stress. P0: after PNC priming and before salinity stress. W12, W24, W48: after H_2O priming and grown under normal conditions for 12, 24 and 48 h, respectively. P12, P24, P48: after PNC priming and grown under normal conditions for 12, 24 and 48 h, respectively. WS12, WS24, WS48: after H_2O priming and grown under salinity stress for 12, 24 and 48 h, respectively. PS12, PS24, PS48: after PNC priming and grown under salinity stress for 12, 24 and 48 h, respectively. Numbers 1, 2, 3 mean biological replicates.

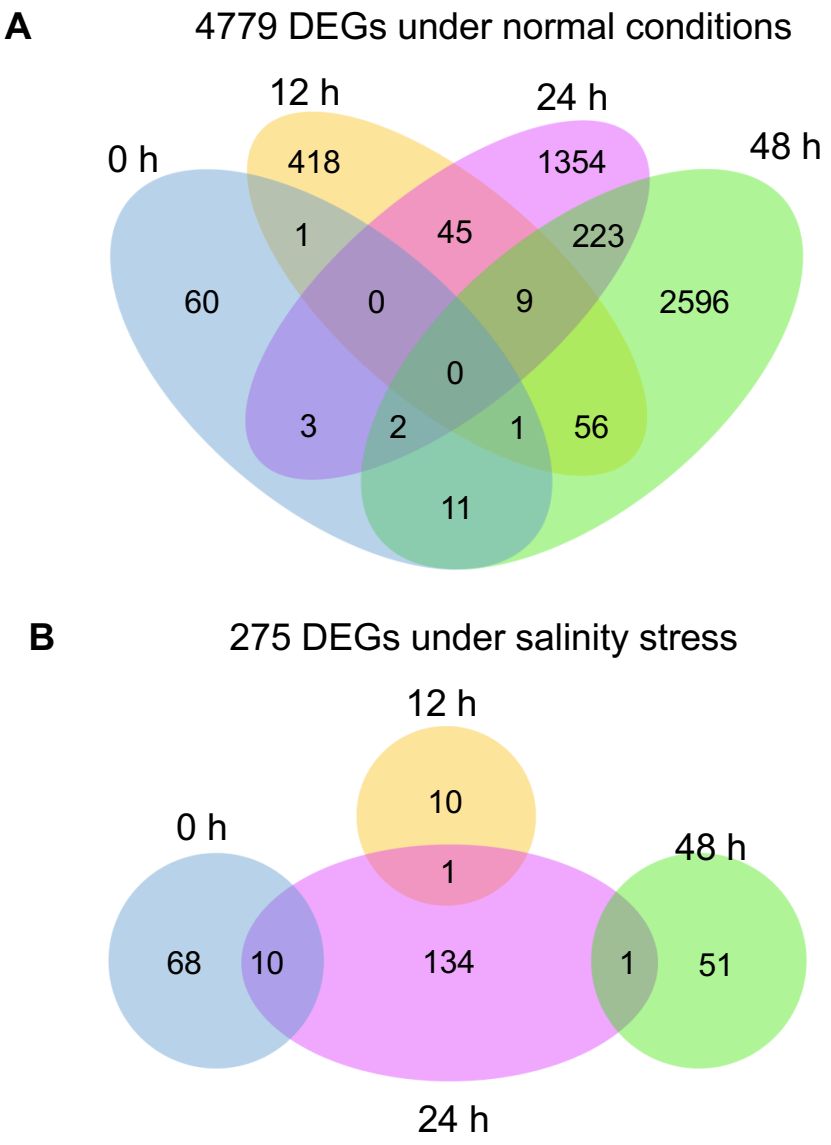

Figure S5. Differentially expressed genes (DEGs) associated with cotton seedling root development in response to cerium oxide nanoparticles (PNC). Venn diagrams overlap between DEGs for PNC treated and H_2O controls at 0, 12, 24, and 48 h under **A**, normal conditions, and **B**, salinity stress (200 mM NaCl).