

Description of Additional Supplementary Files

File Name: Supplementary Data 1

Description: Summary of intersectional mutated genes in STALE1-STALE9.

File Name: Supplementary Data 2

Description: All bacterial strains used.

File Name: Supplementary Data 3

Description: All engineered plasmids and their information.

File Name: Supplementary Data 4

Description: Primers used to construct plasmids in this study.

File Name: Supplementary Data 5

Description: Raw data and fitting parameters for Isothermal titration calorimetry of *p*-CA with PhdR.

File Name: Supplementary Data 6

Description: Raw data and fitting parameters for Isothermal titration calorimetry of FA with PhdR.

File Name: Supplementary Data 7

Description: Raw data and fitting parameters for Isothermal titration calorimetry of CaA with PhdR.