

Description of Additional Supplementary Files

File Name: Supplementary Data 1

Description: Source data for Figure 3A

File Name: Supplementary Data 2

Description: Source data for Figure 3B

File Name: Supplementary Data 3

Description: Source data for Figure 4G and Supplementary Figure 9

File Name: Supplementary Data 4

Description: Source data for Table 1 (growth rate) and Supplementary Figure 6

File Name: Supplementary Data 5

Description: Source data for Table 1 (silica content) and Supplementary Table 2

File Name: Supplementary Movie 1

Description: A representative video recorded during a displacement controlled nanoindentation of a single cell wall from *T. pseudonana* wild type performed inside an SEM.

File Name: Supplementary Movie 2

Description: A representative video recorded during a displacement controlled nanoindentation of a single cell wall from *T. pseudonana* mutant knockout-1 performed inside an SEM.