

Supplementary Material

***Clostridium acetobutylicum* atpG-knockdown mutants increase extracellular pH in batch cultures**

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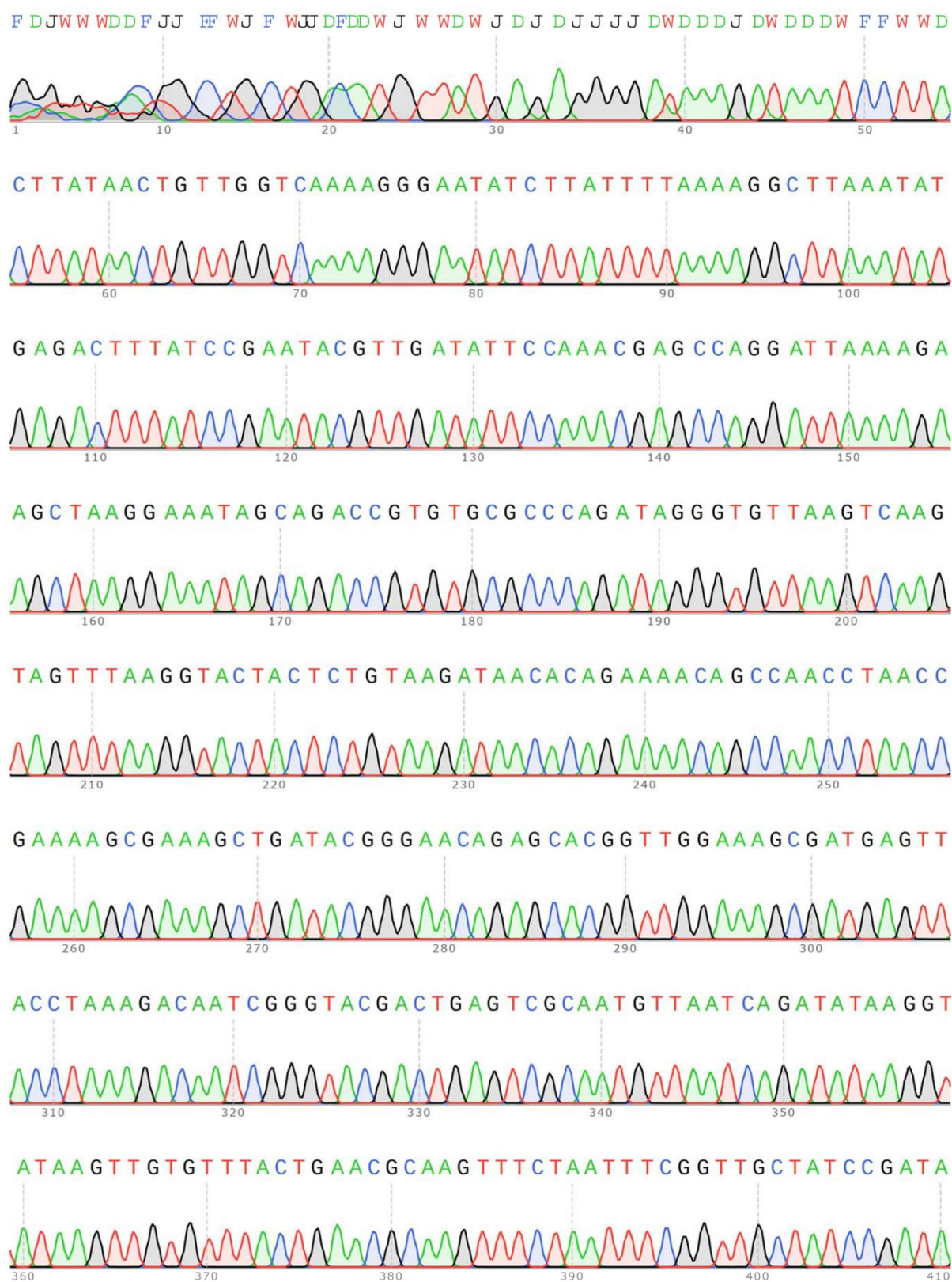
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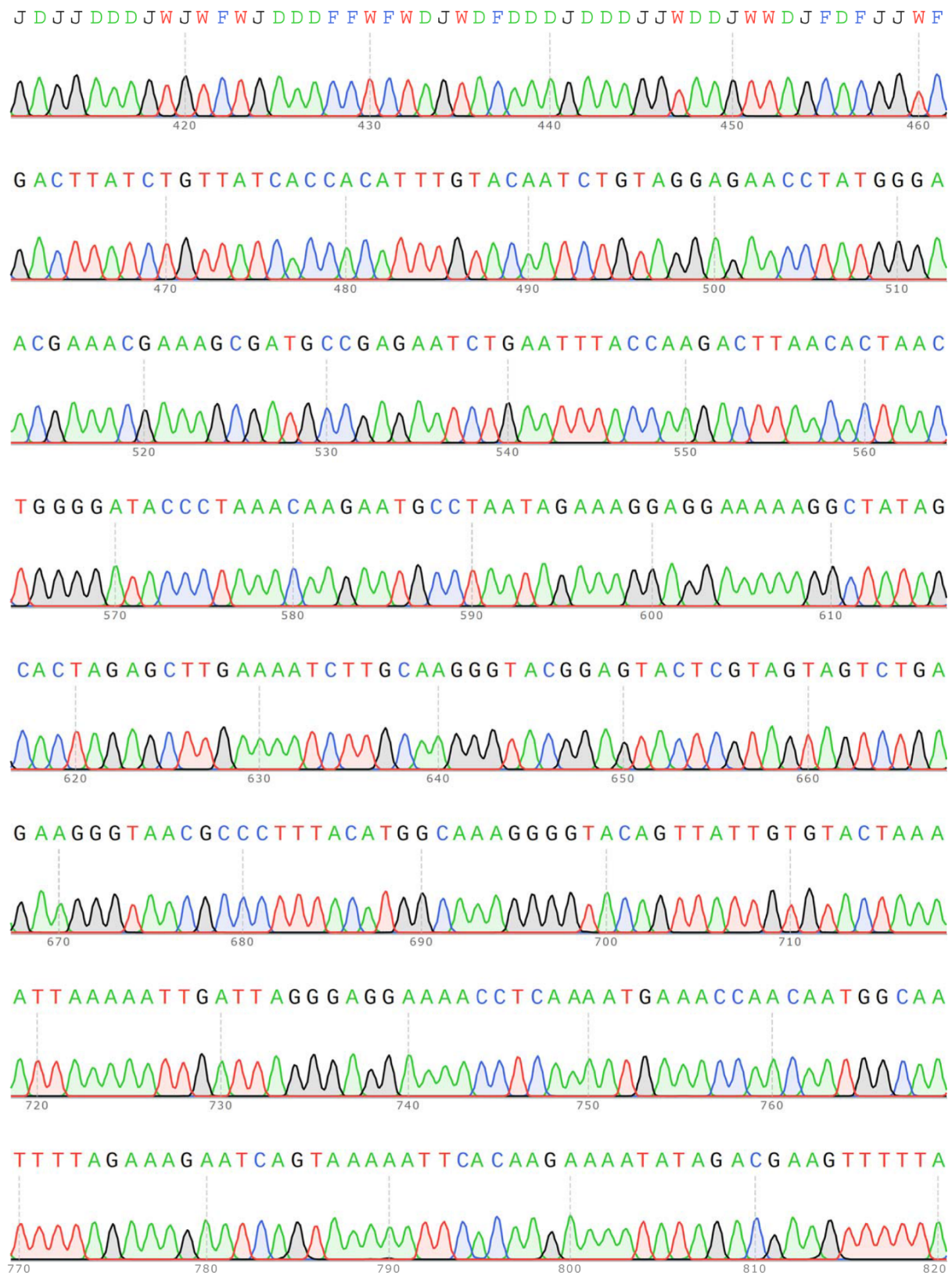
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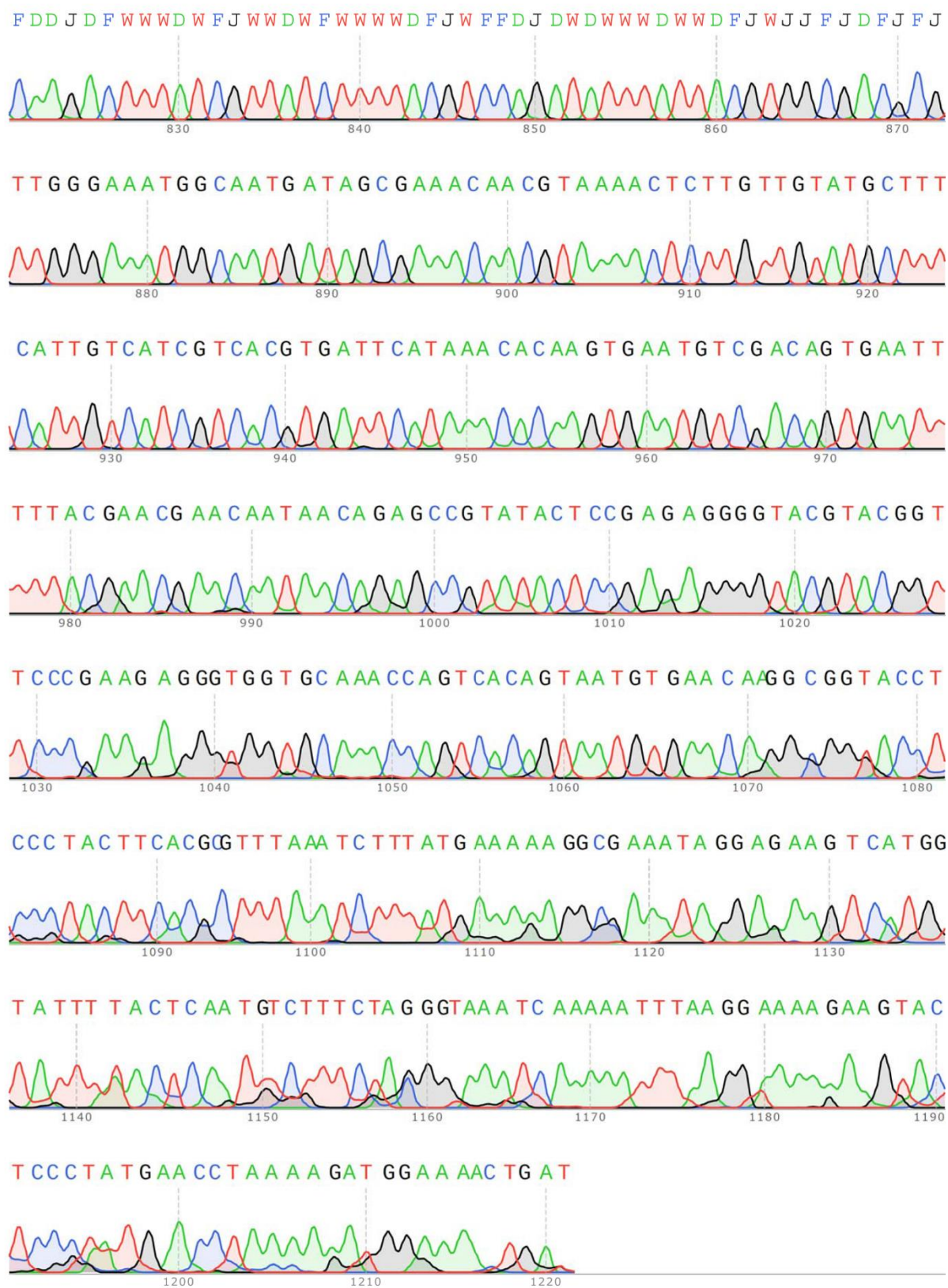
Sang Yup Lee (leesy@kaist.ac.kr)



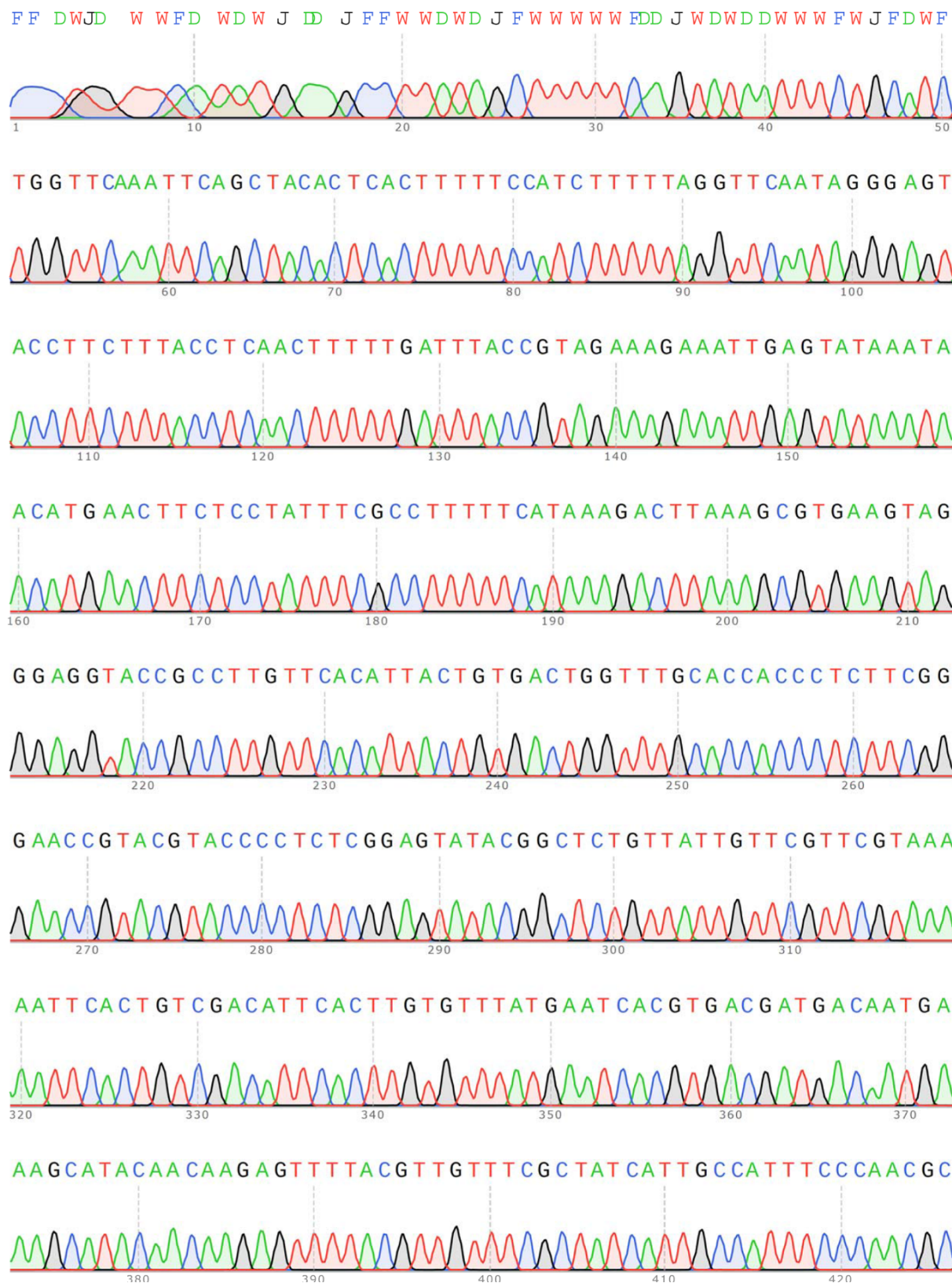
Supplementary Figure S1 DNA sequencing chromatogram for the mutated *atpG* gene in 824-2866KD using *atpG*-seq-F primer.



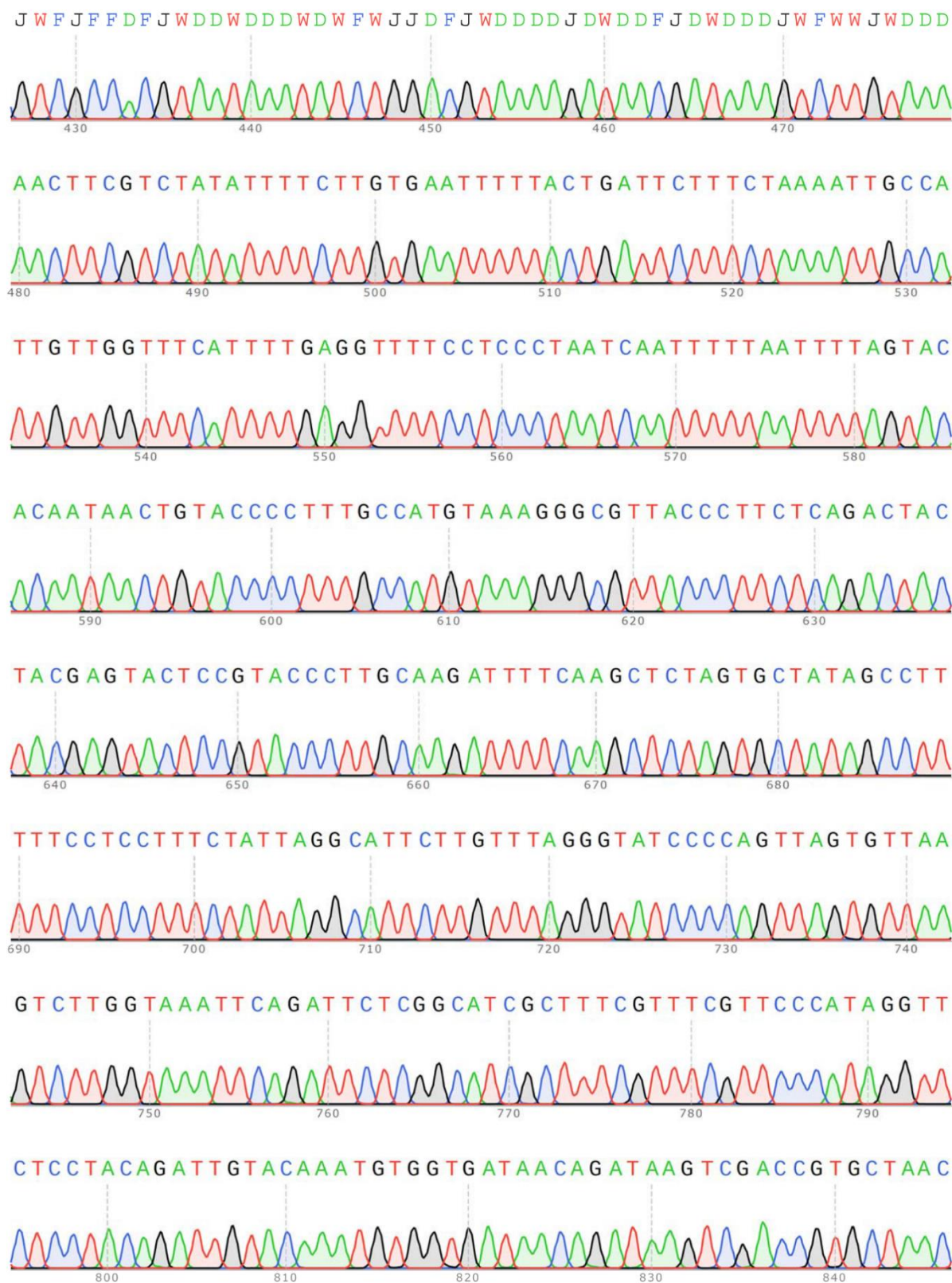
Supplementary Figure S1 (Continued).



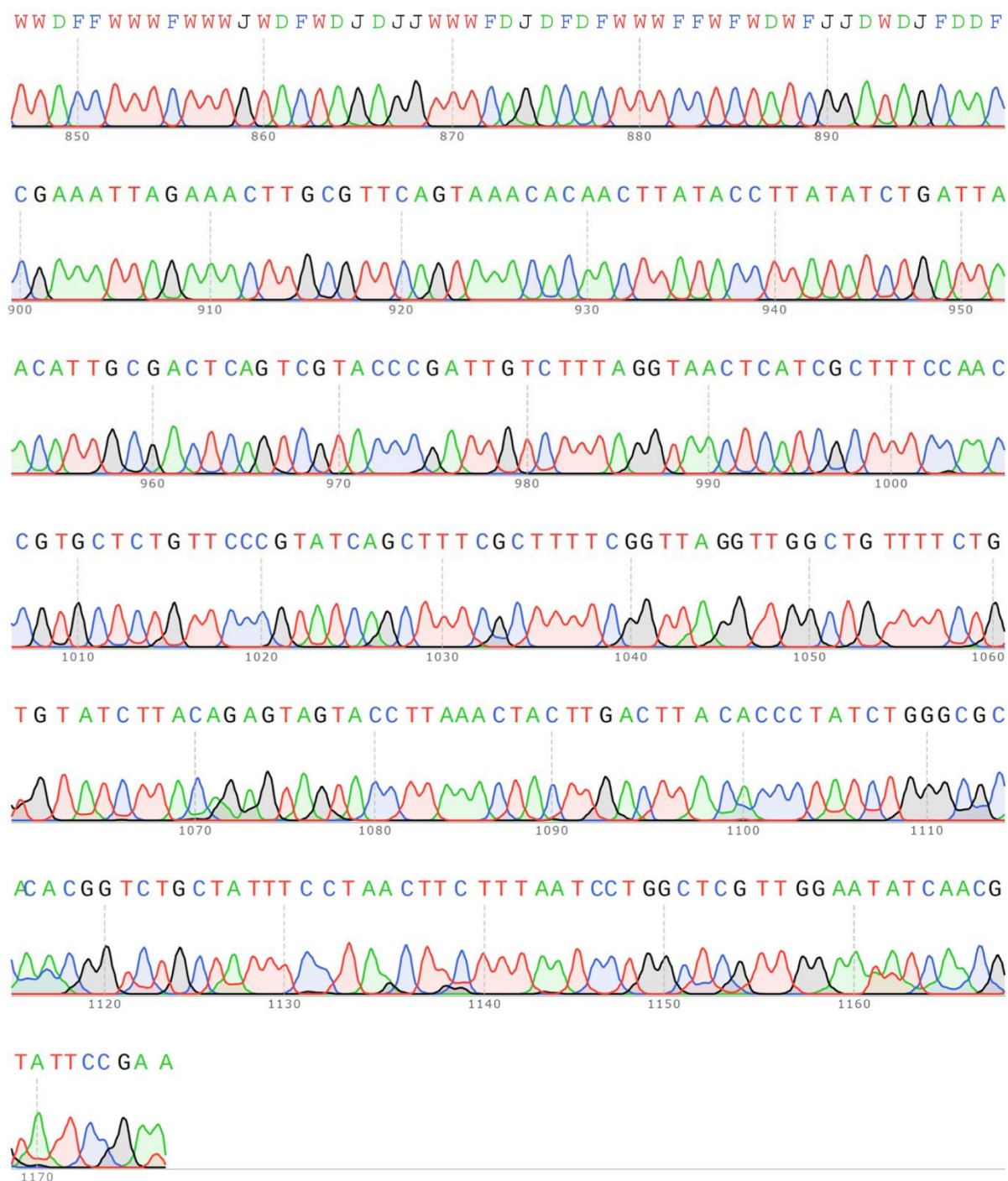
Supplementary Figure S1 (Continued).



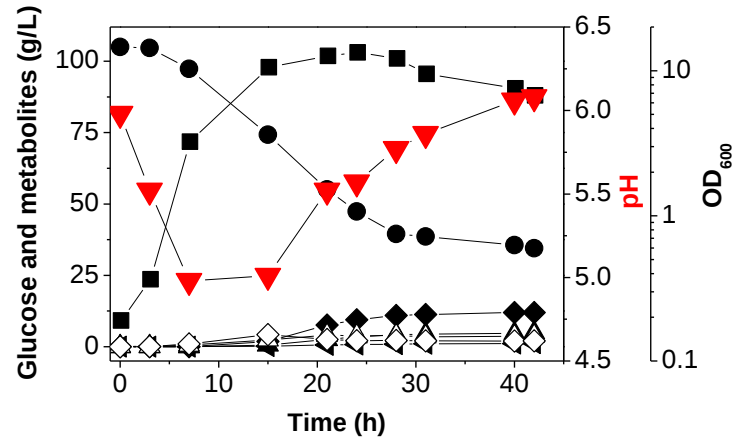
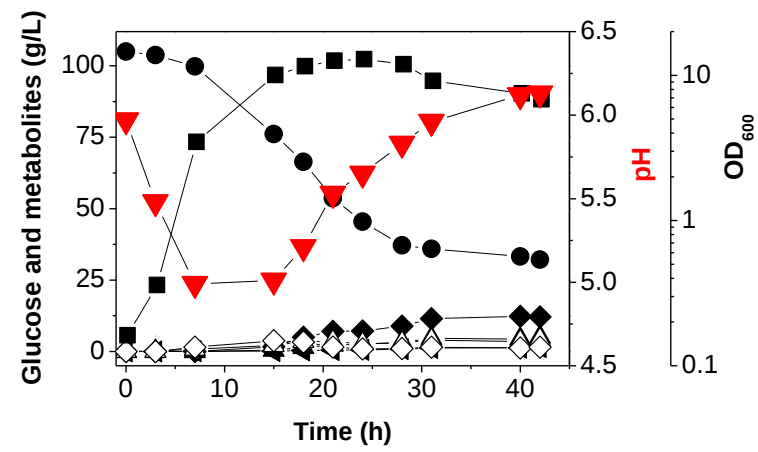
Supplementary Figure S2 DNA sequencing chromatogram for the mutated *atpG* gene in 824-2866KD using *atpG*-seq-R primer.



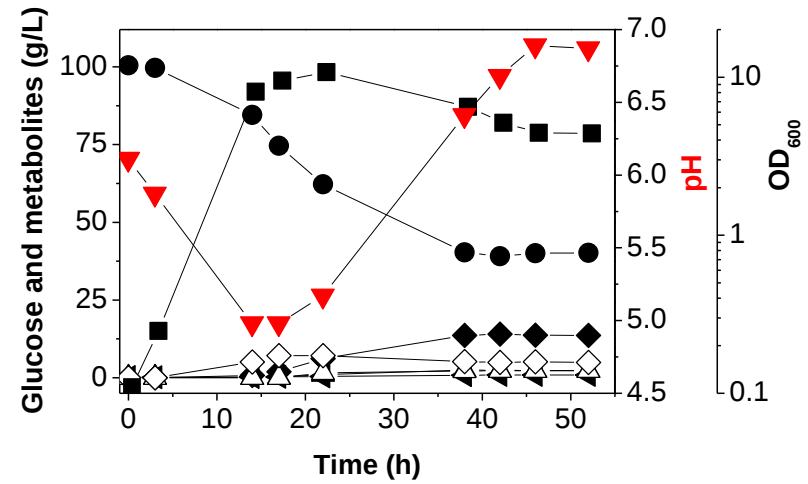
Supplementary Figure S2 (Continued).



Supplementary Figure S2 (Continued).

A**B**

Supplementary Figure S3 (A) Merged version of the batch fermentation profiles of *C. acetobutylicum* 824-2866KD presented in Figure 3. (B) Reproduced batch fermentation profiles of *C. acetobutylicum* 824-2866KD. Symbols: ●, glucose; ■, cell density (OD₆₀₀); ▼, extracellular pH; △, acetate; ◇, butyrate; ▲, acetone; ◀, ethanol; and ◆, butanol.



Supplementary Figure S4 Reproduced batch fermentation profiles of *C. acetobutylicum* BEKW-2866KD. Symbols: ●, glucose; ■, cell density (OD₆₀₀); ▼, extracellular pH; △, acetate; ◇, butyrate; ▲, acetone; ◀, ethanol; and ◆, butanol.

Supplementary Table S1 Oligonucleotides used in this study

Name	Sequences (5' → 3')	Reference
Oligonucleotides		This study
2866-IBS	AAAA <u>AAGCTT</u> AATAATTATCCTTAATAGCCGACCGTGTGCGCCCAGAT AGGGTG	This study
2866-EBS1	CAGATT <u>GTACA</u> AATGTGGTGATAACAGATAAGTCGACCGTGCTAACTTACCTTTCTTTGT	This study
2866-EBS2	TGAACGCAAGTTTCTAATTT CGGTTGCTATCCGATAGAGGAAAGTGTCT	This study
EBS universal	CGAAATTAGAAA CTTGCGTTCA GTAAAC	This study
atpG-F	AGTTCTTCTAGTAAGAGCAACTTATAT	This study
atpG-R	ATATTGAACAGCAGTTATTTAACTTGTTATT	This study
atpG-seq-F	GGTCTTTGTGGAGGTTTAAACG	This study
atpG-seq-R	TTGCCTTAGAATTTAATAACAAGTTAAATAACTG	This study