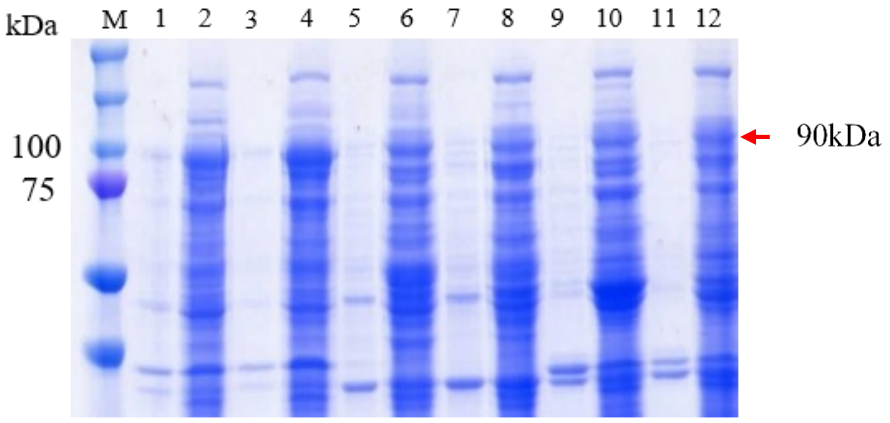
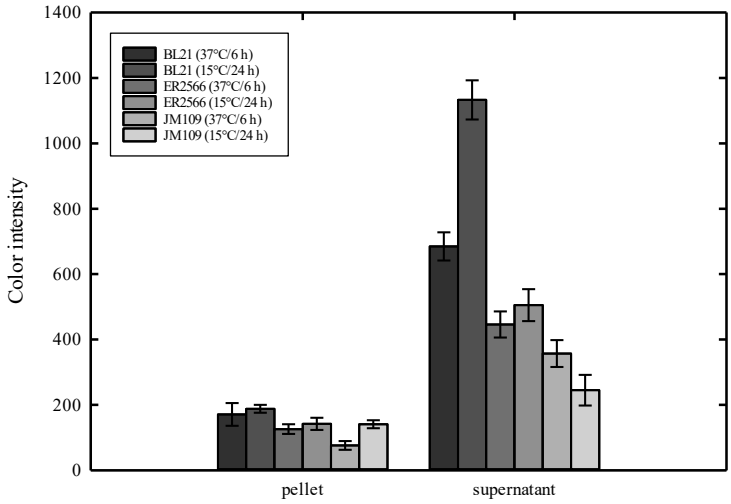
Supplementary Materials



(a)



(b)

Figure S1. Expression levels of CipA protein using pET21d-CipA plasmid transformed in different *E. coli* expression strains as analyzed by sulfate/polyacrylamide gel electrophoresis (SDS-PAGE) and their relative color intensities. (**a**) Lane M: marker (kDa); lanes 1–2: BL21, pellet, and supernatant induced at 37 °C/6 h; lanes 3–4: BL21, pellet, and supernatant induced at 15 °C/24 h; lanes 5–6: ER2566, pellet, and supernatant induced at 37 °C/6 h; lanes 7–8: ER2566 pellet and supernatant induced at 15 °C/24 h; lanes 9–10: JM109, pellet, and supernatant induced at 37 °C/6 h; lanes 11–12: JM109, pellet, and supernatant induced at 15 °C/24 h. (**b**) Color intensities of the target protein as quantified using ImageJ. The intensities are categorized into pellet (lanes 1, 3, 5, 7, 9 and 11) and supernatant (lanes 2, 4, 6, 8, 10 and 12). The error bars represent SD, n=3.

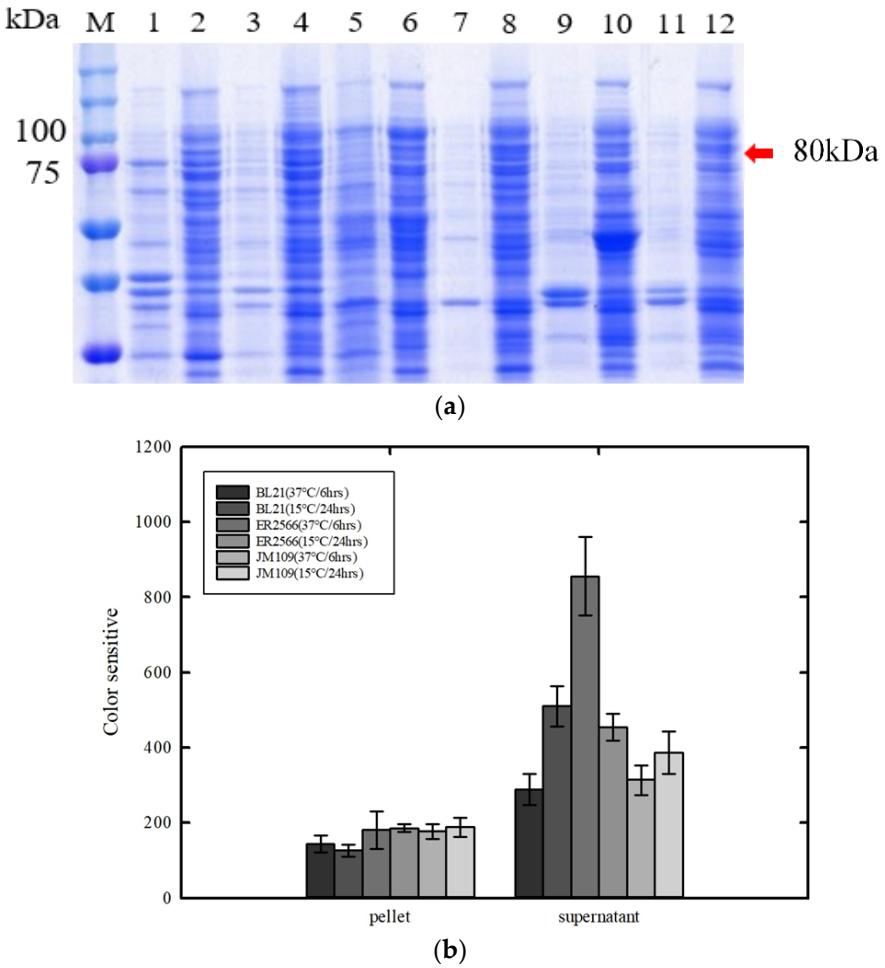
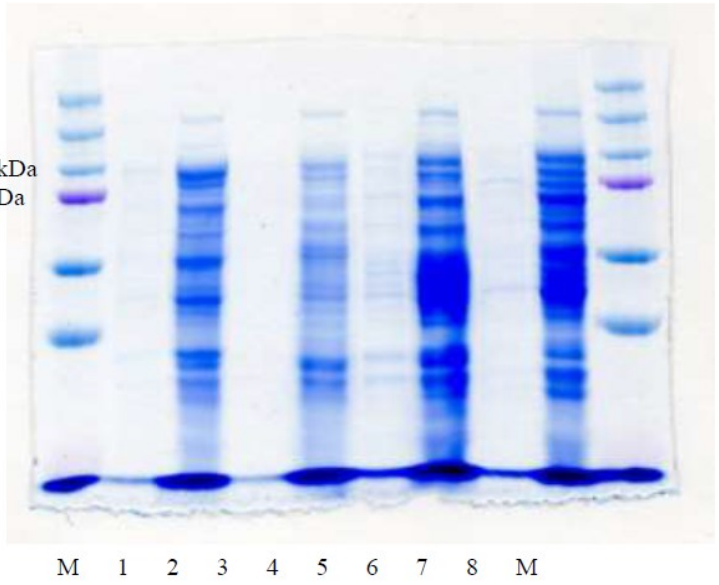


Figure S2. Expression levels of XynCt using pET21b-XynCt plasmid transformed in different *E. coli* expression strains as analyzed by SDS-PAGE and their relative color intensities. (**a**) Lane M: marker; lanes 1–2: BL21, pellet, and supernatant induced at 37 °C/6 h; lanes 3–4: BL21, pellet, and supernatant induced at 15 °C/24 h; lanes 5–6: ER2566, pellet, and supernatant induced at 37 °C/6 h; lanes 7–8: ER2566 pellet and supernatant induced at 15 °C/24 h; lanes 9–10: JM109, pellet, and supernatant induced at 37 °C/6 h; lanes 11–12: JM109, pellet, and supernatant induced at 15 °C/24 h. (**b**) Color intensities of the target protein as quantified using ImageJ. The intensities are categorized into pellet (lanes 1, 3, 5, 7, 9 and 11) and supernatant (lanes 2, 4, 6, 8, 10 and 12). The error bars represent SD, n=3.



All the processes were conducted with the cells lysate

M: Marker(kDa)

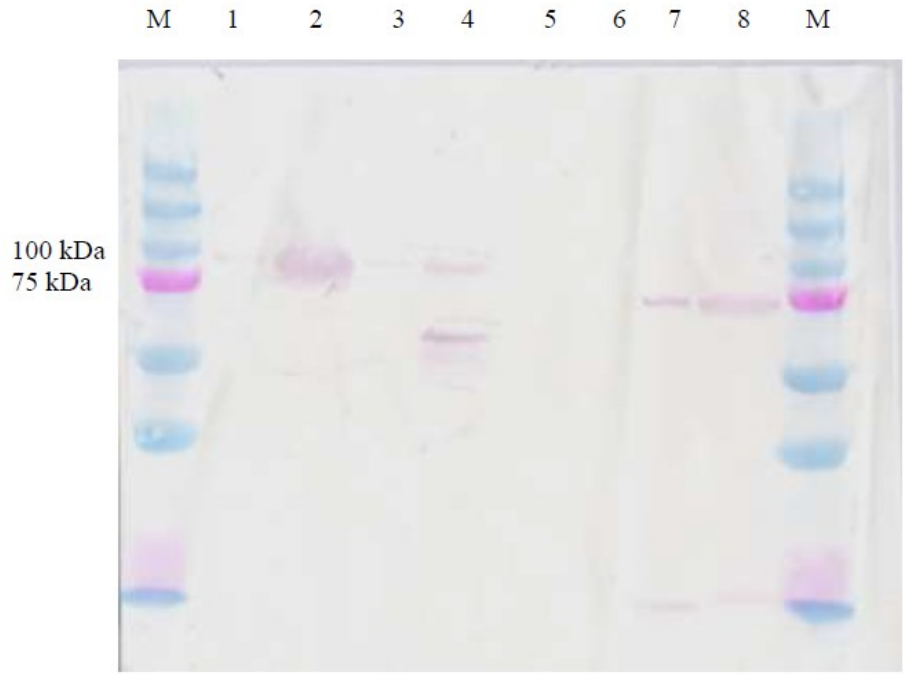
Lane1-2: pET21d-CipA/BL21(DE3) pellet and supernatant

Lane3-4: pET21d-CipA/ER2566 pellet and supernatant

Lane5-6: pET21b-XynCt/BL21(DE3) pellet and supernatant

Lane7-8: pET21b-XynCt/ER2566 pellet and supernatant

(**a**)



M: Marker(kDa)

Lane1-2: CipA-1B3C/BL21(DE3) pellet and supernatant

Lane3-4: CipA-1B3C/ER2566 pellet and supernatant

Lane5-6: XynC-DocT/BL21(DE3) pellet and supernatant

Lane7-8: XynC-DocT/ER2566 pellet and supernatant

(**b**)

Figure S3. (**a**) SDS-PAGE and (**b**) Western blots for the target proteins. The cell lysates were separated to pellet and supernatant under centrifugation (8500g, 4°C, 20 min).

Table S1. PCR amplification conditions for DocT, XynC, and CipA genes

(a) DocT PCR condition:

Step	Temp	Time	# of cycles
Initial Denaturation	95°C	3 min	
Denaturation	95°C	30 sec	
Primer Annealing	56°C	30 sec	34
Extension	72°C	30 sec	
Final Extension	72°C	5 min	

- The obtained PCR product was analyzed via gel electrophoresis.

(b) XynC PCR condition:

Step	Temp	Time	# of cycles
Initial Denaturation	95°C	3 min	
Denaturation	95°C	2 min	
Primer Annealing	68°C	1.25 min	34
Extension	72°C	3 min	
Final Extension	72°C	10 min	

- The obtained PCR product was analyzed via gel electrophoresis.

(c) CipA condition:

Step	Temp	Time	# of cycles
Initial Denaturation	95°C	3 min	
Denaturation	95°C	1 min	
Primer Annealing	55°C	30 sec	34
Extension	72°C	2 min	

Final Extension	72°C	5 min

- The obtained PCR product was analyzed via gel electrophoresis.

  The whole genes are expressed below:

  - Gene of CipA

ATGgcaaccatgacagtggaaataggtaaagtcacagccgcagttggaagcaaagtggagattccaatcactctcaagggcgtgcccagtaaag
ggatggcaaactgtgacttcgttttaggatatgacccgaatgtactcgaggtgacggaggtcaaaccaggttcgattatcaaggacccagacccgtct
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  - Gene of XynCt (DocT+Xylanase)

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