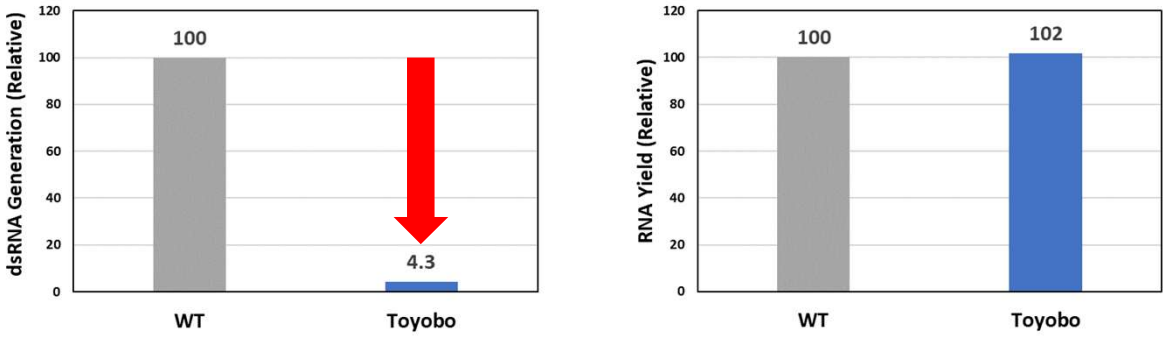
TOYOBO

Engineered T7 RNA polymerase
for RNA synthesis with reduced dsRNA byproducts

T7 RNA polymerase

Toyobo's T7 RNA polymerase is designed for mRNA synthesis with reduced dsRNA byproducts. During RNA synthesis with wild-type T7 RNA polymerase, double-stranded RNA (dsRNA) byproducts are generated. dsRNA stimulates innate immune responses and should be removed for therapeutic purposes. To overcome this challenge, we have engineered a novel RNA polymerase that produces substantially less dsRNA byproducts in RNA synthesis.

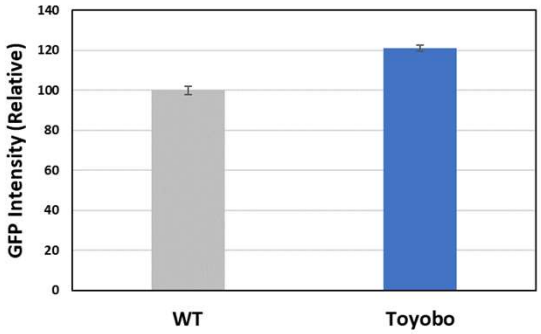
▶ Reduced dsRNA byproducts in mRNA synthesis



Comparison of dsRNA byproducts and RNA yield between WT and Toyobo's T7 RNA polymerase

Fluc mRNA was synthesized using wild-type(WT) and Toyobo's T7 RNA polymerase, and dsRNA formation was evaluated using ELISA. Toyobo's T7 RNA polymerase could synthesize mRNA with reduced dsRNA byproducts without lowering RNA yield.

▶ High-level protein expression



Comparison of EGFP expression after EGFP mRNA transfection

EGFP mRNA was synthesized using WT and Toyobo's T7 RNA polymerase. CHO cells were transfected with same amount of each mRNA, and EGFP expression was quantified by flow cytometry. Higher EGFP expression was observed when using mRNA synthesized by Toyobo's T7 RNA polymerase.

We offer a lineup of enzyme materials related to Genetic Engineering. Animal-origin free and beta-lactam free KOD DNA polymerase is under development, as a raw material for constructing viral vectors for gene therapy using PCR method, and for incorporating modified nucleic acids for oligonucleotide therapeutics etc.

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