Q & A

Transformation in 3 Minutes: TurboCells™ Chemically Competent *E. coli*

TurboCell™ Chemically Competent *E. coli*

Questions & Answers

1. What is the primary difference between the TurboCells™ Chemically Competent *E. coli* and standard competent *E. coli*?

The TurboCells Chemically Competent *E. coli* are specially optimized to achieve high transformation efficiency with a novel 3-minute transformation protocol. In contrast, transformation using standard competent cells typically requires a 1.5 – 2 hour protocol. Figure 1 demonstrates the efficiency of the TurboCells protocol compared to a standard transformation protocol.

2. What transformation efficiencies can be achieved using TurboCells Chemically Competent *E. coli*?

When using the 3-minute TurboCells transformation protocol, you can achieve efficiencies of 5 x 10^7 - 1 x 10^8 cfu/µg of supercoiled DNA. Also, when using a traditional 1.5 - 2 hour protocol with the TurboCells, greater than 1 x 10^9 cfu/µg of supercoiled DNA can be achieved.

3. What is the difference between TurboCells™ and TurboCells F´?

TurboCells F´ contain a self-transmissible, low-copy plasmid, called F´, that can be used for the generation of single strand DNA (e.g., using M13 bacteriophage techniques).

4. In addition to time-savings, what other advantages do TurboCells Chemically Competent E. coli offer?

TurboCells Chemically Competent *E. coli* are prepared according to a unique procedure that allows robust performance under normally deleterious transformation conditions. For example, it is not required to dilute or purify your ligation mix before transformation. If needed, over 10 µl of full strength ligation mix can be added to 50 µl of competent cells without significantly compromising transformation results. The genotype of TurboCells is suitable for most cloning needs, such as blue/white screening, generation of plasmid based libraries, and the ability to efficiently transform large plasmids.

5. What are the genotypes of the TurboCells Competent *E. coli*?

The genotypes of the TurboCells are summarized in the table 1.

Figure 1: Comparison of TurboCells™ Competent *E. coli* Protocol and Standard Competent *E. coli* Protocol

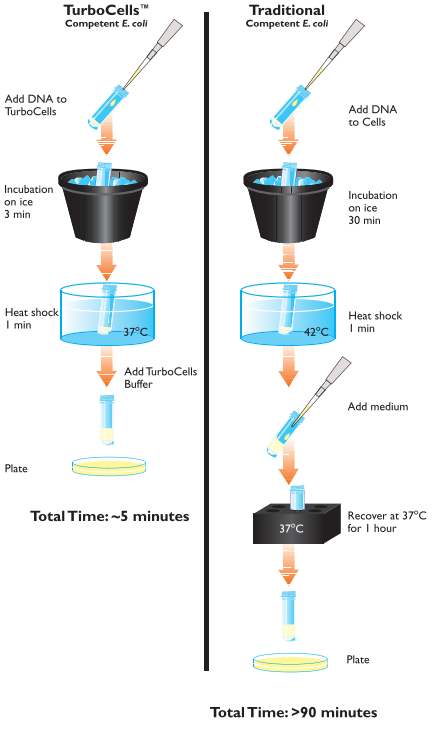
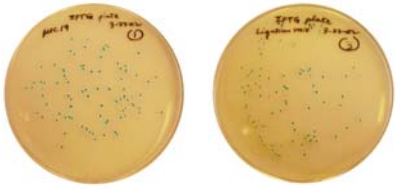


Figure 2. Transformation Results with TurboCells



pUC19 + TurboCells on IPTG/Amp plates

pUC19 self ligation+ TurboCells on IPTG/Amp plates

6. Why are TurboCells Competent *E. coli* packaged in single-use aliquots?

TurboCells are packaged in single-use aliquots to avoid efficiency-robbing freeze/thaws and wasted cells.

7. Are TurboCells available for protein expression?

Yes. TurboCells BL21(DE3) and BL21(DE3) pLysS offers 3-minute transformation of T7-promoter based expression vectors for protein expression.

8. What concentration of kanamycin and ampicillin should I use with/TurboCells?

We use 50 µg/ml and 100 µg/ml, respectively.

Table 1. Genotype of TurboCells™ Chemically Competent E. coli

TurboCells™ : *recA1 endA1 hsdR17 supE44 thi-1 gyrA96 relA1 ϕ80lacZΔM15 Δ(lacZYA-argF)U169*

TurboCells™ *F´*: *F recA1 endA1 hsdR17 supE44 thi-1 gyrA96 relA1 ϕ80lacZΔM15 Δ(lacZYA-argF)U169*

TurboCells™ BL21(DE3): *recA1 endA1 hsdR17 supE44 thi-1 gyrA96 relA1 ϕ80lacZΔM15 Δ(lacZYA-argF)U169 (DE3)*

TurboCells™ BL21(DE3)pLysS: *recA1 endA1 hsdR17 supE44 thi-1 gyrA96 relA1 ϕ80lacZΔM15 Δ(lacZYA-argF)U169 (DE3)pLysS(Cam^R)*

Genotype	Advantage
recA1	Mutation in gene(s) responsible for recombination of DNA. This genotype is particularly desirable when cloning genes with direct repeats.
endA	Mutation in the nonspecific endonuclease Endonuclease I. Eliminates non-specific endonuclease activity resulting in improved plasmid preps.
hsd	Mutations in the system of methylation and restriction which allows E. coli to recognize DNA as foreign. The hsd genotype allows efficient transformation of DNA generated from PCR reactions.
lacZΔM15	Element required for b-galactosidase complementation when plated on X-Gal. Used in blue/white screening of recombinants. Usually carried on the lambdoid prophage 80 or F´.
DE3	Lysogen that encodes T7 RNA polymerase. Used to induce expression in T7-driven expression systems.
pLysS	Plasmid that encodes T7 lysozyme. Used to reduce basal expression in T7-driven expression systems by inhibiting basal levels of T7 RNA polymerase.

Product	Quantity	Catalog no.
TurboCells™ Chemically Competent *E. coli*		
	20 x 50 µl	C300020
TurboCells™ F´ Chemically Competent *E. coli*		
	20 x 50 µl	C301020
TurboCells™ BL21 (DE3) Chemically Competent *E. coli*		
	20 x 50 µl	C302020
TurboCells™ BL21 (DE3) pLysS Chemically Competent *E. coli*		
	20 x 50 µl	C303020