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Chemically Competent Cells

For use with Chemically Competent TG1, SS320 Cells
Catalog Numbers: CC001, CC002
Version: A1 – February 2026
Limited Use & License

Product Information

Contents:

Each kit includes 12 x 0.1 mL vials of frozen cells and a tube of pUC18 control plasmid (50 pg/µL in 25 µL of Tris-EDTA buffer, pH 8.5).

PRODUCT	CATALOG NUMBER	TUBE CAP COLOR
Chemically Competent TG1	CC001	YELLOW
Chemically Competent SS320	CC002	GREEN

Storage: The cells are shipped on dry ice. Upon receipt, vials should be thawed and used immediately, or transferred to storage at -80°C. Contact support@abdesignlabs.com if the cells are not frozen upon arrival.

Product Description

Chemically competent *E. coli* cell lines are highly efficient host strains designed for routine molecular cloning, plasmid amplification, and library construction. Following the described transformation protocol these cells deliver a guaranteed transformation efficiency of ≥ 1 x 10^8 cfu/µg using the supplied pUC18 control DNA.

Cells are provided in a convenient 100 µL single-use format to ensure consistent, reproducible results across experiments. These cells are compatible with standard heat-shock transformation protocols. The included pUC18 plasmid is provided as a positive control to verify transformation efficiency

Genotypes:

TG1: *supE thi-1 Δ(lac-proAB) Δ(mcrB-hsdSM)5, ($r_K^-m_K^-$) F' [traD36 $proAB^+$ $lacI^q$ lacZΔM15]*

A high-efficiency, F' pilus-containing strain used for library construction and screening, cloning and protein expression of M13 phage display libraries.

SS320: *hsdR2 mcrA0 araD139 Δ(araA-leu)7697 ΔlacX74 galK16 galE15(GalS) λe14⁻ rpsL150(Str^R) spoT1 thi F'[proAB+lacIqlacZΔM15 Tn10 (tet^r)]*

A non-amber suppressor, F' pilus-containing strain used for large-scale amplification of M13 phage libraries and phage display protein expression.

Required Reagents Not Supplied

- SOC Medium
- Antibiotic Supplemented Agar Plates

Protocols

Handling

All reagents and equipment that come in contact with the cells should be sterile. Handle gently as they are highly sensitive to changes in temperature or mechanical lysis. Vigorous shaking or pipetting when working with the cells should be avoided to maintain cell health.

Transformation Protocol

1. Pre-chill two 15 mL culture tubes on ice (one for experimental DNA, one for control pUC18). Pre-warm nutrient agar plates with appropriate selective antibiotic and SOC Medium at 37°C.

   Note: For the control pUC18 transformation, use agar plates supplemented with 100 µg/mL ampicillin or carbenicillin.

2. Remove a vial of chemically competent cells from storage at -80°C and immediately place on ice for approximately 15-20 minutes. Ensure cells remain at ≤4°C at all times.

   Note: Leaving the cells too long on ice will result in loss of viability.

3. Gently pipette 100 µL of the thawed competent cells into each pre-chilled, sterile culture tube.

4. Add 10 - 50 pg of plasmid DNA to the cells. For the positive control, add 1 µL (50 pg) of the supplied pUC18 control plasmid.

   Note: Swirl the tube gently to mix. Avoid pipetting up and down or vortexing, as this can damage the competent cells.

5. Incubate the cell-DNA mixture on ice for 30 minutes.
6. Transfer the tubes directly from ice to a pre-heated 42°C water bath for exactly 45 seconds. Do not shake. This timing of the heat shock is **critical** for maximum efficiency.
7. Immediately return the tubes to ice for 2 minutes.
8. Add 0.9 mL of pre-warmed SOC Medium to each tube and incubate the tubes at 37°C for 1 h with shaking at 225-250 rpm.
9. Spread 20-200 µL from each transformation on a pre-warmed agar plates containing the appropriate antibiotic. We recommend plating two different volumes to ensure obtaining countable colonies (i.e., 10 µL and 100 µL)
10. Incubate plates inverted at 37°C overnight.

Calculating Transformation Efficiency

Use the following formula to calculate transformation efficiency as transformants (cfu) per µg of plasmid DNA:

$$\frac{\text{cfu}}{\mu\text{g}} = \frac{\text{cfu count}}{\text{pg DNA}} \times \frac{10^6\ \text{pg}}{\mu\text{g}} \times \frac{\mu\text{L transformation}}{\mu\text{L plated}} \times \text{dilution factor}$$

For example, if transformation with 50 pg of pUC18 yields 50 colonies when 10 µL of a 1 mL total transformation is plated, then:

$$\frac{50\ \text{cfu}}{50\ \text{pg DNA}} \times \frac{10^6\ \text{pg}}{\mu\text{g}} \times \frac{1000\ \mu\text{L}}{10\ \mu\text{L}} = 1 \times 10^8 \text{cfu} — \mu\text{g pUC18}$$

Media Recipes

SOB Medium (per Liter):

20 g Tryptone
0.58 g NaCl (or 2 mL of 5M NaCl)
10 mL 1M $MgCl_2$
5.0 g Yeast extract
0.19 g KCl (or 0.5 ml 1M KCl)
10 mL 1M $MgSO_4$

Add ddH2O to a total volume of 1 liter

Adjust pH to 6.0-7.0 with NaOH

Sterilize by autoclaving

SOC Medium:

Add 1 ml of filter-sterilized 2 M glucose or 2 ml of 20% (w/v) glucose solution to 100 ml of SOB medium. Prepare fresh solution on day of use.

LB Agar (per Liter):

10 g NaCl
10 g Tryptone
5 g Yeast extract
20 g of agar
Add ddH_2O to a final volume of 1 L
Adjust pH to 7.0 with 5 N NaOH
Sterilize by autoclaving

LB-Ampicillin Agar (per Liter):

1 L autoclaved LB agar
Cool to 55°C
Add 10 ml of 10 mg/ml filter-sterilized ampicillin
Pour into petri dishes (approx. 25 ml per 10-cm plate)

Limited Product Warranty

By using this product, the user agrees to the following terms of limited use (https://www.abdesignlabs.com/terms/):

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