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# Transformation Protocol for BL21(DE3) Competent Cells (C2527H) V.2

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This transformation protocol is to be performed directly in the C2527H tubes. (For the C2527I protocol, see here.)

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https://www.neb.com/protocols/0001/01/01/transformation-protocol-for-bl21-de3-competent-cells-c2527

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T7 Expression Strain, comp cells, transforming for BL21(DE3)

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### Transformation Protocol Variables

**Thawing**: Cells are best thawed on ice and DNA added as soon as the last bit of ice in the tube disappears. Cells can also be thawed by hand, but warming above 0°C will decrease the transformation efficiency.

**Incubation of DNA with Cells on Ice:** For maximum transformation efficiency, cells and DNA should be incubated together on ice for 30 minutes. Expect a 2-fold loss in transformation efficiency for every 10 minutes you shorten this step.

**Heat Shock**: Both the temperature and the timing of the heat shock step are important and specific to the transformation volume and vessel. Using the transformation tube provided, 10 seconds at 42°C is optimal.

**Outgrowth**: Outgrowth at 37°C for 1 hour is best for cell recovery and for expression of antibiotic resistance. Expect a 2-fold loss in transformation efficiency for every 15 minutes you shorten this step. SOC gives 2-fold higher transformation efficiency than LB medium; and incubation with shaking or rotating the tube gives 2-fold higher transformation efficiency than incubation without shaking.

**Plating**: Selection plates can be used warm or cold, wet or dry without significantly affecting the transformation efficiency. However, warm, dry plates are easier to spread and allow for the most rapid colony formation.

Chemically competent *E. coli* cells suitable for transformation and protein expression.

### Highlights

- Transformation efficiency: 1–5 x $10^7$cfu/µg pUC19 DNA
- T7 Expression Strain
- Deficient in proteases Lon and OmpT
- Resistant to phage T1 (*fhu*A2)
- B Strain
- Free of animal products

### Genotype

*fhuA2 [lon] ompT gal (λ DE3) [dcm] ΔhsdS*
*λ DE3 = λ sBamHIo ΔEcoRI-B int::(lacI::PlacUV5::T7 gene1) i21 Δnin5*

MATERIALS

BL21(DE3) Competent E.coli - 20x0.05 ml **New England Biolabs Catalog #C2527H**

Please refer to the Safety Data Sheets (SDS) for health and environmental hazards.



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Perform steps 1–8 in the tube provided.

1 

Thaw a tube of BL21(DE3) Competent *E. coli* cells **On ice** for **00:10:00** .

2 

Add **1 µL** – **5 µL** containing **1 pg** – **100 ng plasmid DNA** to the cell mixture.

3 

Carefully flick the tube **4–5 times** to mix cells and DNA. **Do not vortex.**

4 

Place the mixture **On ice** for **00:30:00** . Do not mix.

5 

Heat shock at exactly **42 °C** for exactly **00:00:10** . Do not mix.

6 

Place **On ice** for **00:05:00** . Do not mix.

7 

Pipette **950 µL** of **Room temperature SOC** into the mixture.

8 

Place at **37 °C** for **01:00:00** . Shake vigorously ( **250 rpm** ) or rotate.

9 Warm selection plates to **37 °C** .



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10

Mix the cells thoroughly by flicking the tube and inverting.

11

Perform several 10-fold serial dilutions in SOC.

12

Spread **50 µL** – **100 µL** of each dilution onto a selection plate and incubate **Overnight** at **37 °C** .

> Alternatively, incubate at **30 °C** for **24:00:00** – **36:00:00** or at **25 °C** for **48:00:00** .



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