

Increasing Recombinant Yields from Cloning Reactions

Recombinant yield is often the rate-limiting step in obtaining a desired cloned gene or sequence. The number of recombinants resulting from a given cloning reaction is a function of both vector ligation efficiency and competent cell transformation efficiency. Lucigen has developed tools that increase the efficiency of both of these critical cloning steps, resulting in much higher recombinant yields from any cloning vector.

UltraClone™ DNA Ligation & Transformation Kits

UltraClone Kits incorporate Lucigen's engineered CloneSmart® DNA Ligase, *E. cloni*® Competent Cells, and a unique transformation-boosting technology to greatly increase both ligation and transformation efficiencies using any insert and any *E. coli*-compatible cloning vector. Figures 1 & 2 show the many-fold increase in recombinants obtained by using the UltraClone Kit for the ligation and transformation reactions.

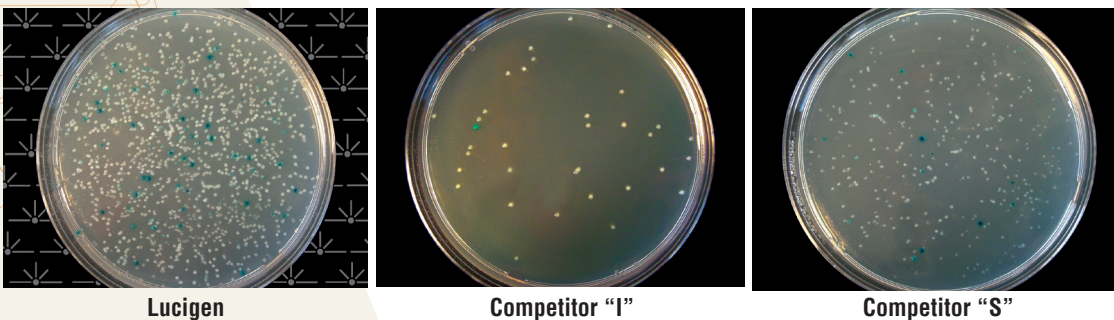


Figure 1. Comparison of results obtained with a control insert and a standard pUC 19 vector using the ligation and transformation reagents in the UltraClone Kit or from two other suppliers.

UltraClone Kits include a choice of *E. cloni* 10G Chemically Competent or Electrocompetent Cells. Typically, the UltraClone procedure gives a 3-fold increase in recombinants using the Kit with *E. cloni* Chemically Competent Cells, and up to a 10-fold increase using the Kit with Electrocompetent Cells.

E. cloni™ Chemically Competent or Electrocompetent Cells

E. cloni 10G Cells are *E. coli* strains optimized for high efficiency transformation using Lucigen's proprietary competent cell manufacturing methods. *E. coli* 10G Cells offer these advantages:

- Higher transformation efficiencies than competent cells from any other supplier (*E. cloni* SUPREME and ELITE Cells)
- Increased recombinant yields with all *E. coli* vectors
- Stable, unbiased cloning of genomic DNAs, cDNAs, PCR products, BACs, and cosmids
- Phage T1-resistant
- Suitable for cloning methylated DNA
- Directly replace commonly used *E. coli* competent cells like DH10B or DH5α
- Best value available in performance and price

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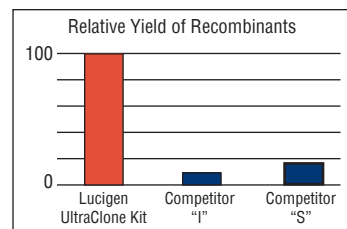


Figure 2. Recombinant colony count in Fig. 1 expressed as relative cloning efficiency.

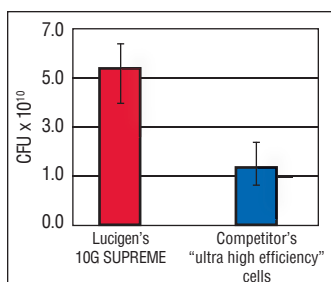


Figure 3. Transformation efficiency comparison. Both strains were transformed with 10 pg of pUC19 (n=16).

E. coli 10G genotype: F- *mcrA* D(*mrr-hsdRMS-mcrBC*) f80*dlacZ*DM15 D*lacX*74 *endA*1 *recA*1 *araD*139 D(*ara, leu*)7697 *galJ galK rpsL nupG* l- *tonA*

E. coli 10GF' Cells have the same 10G genotype, except these cells also harbor the F' plasmid which confers tetracycline resistance and allows the cells to be infected with bacteriophage M13 for ssDNA production.

Because the F' plasmid also carries the *lacIq* repressor allele, addition of IPTG is necessary to induce expression of the *lacZ*alpha peptide when using a blue/white screening vector.

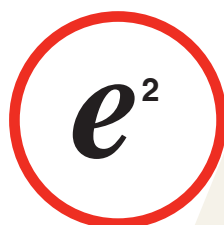
Figure 3 shows the increase in transformation efficiency, and therefore in recombinant yield, that can be obtained simply by using higher efficiency competent cells in the transformation step.

ORDER INFORMATION

UltraClone™ DNA Ligation & Transformation Kits

Kit contents: CloneSmart® engineered DNA Ligase, CloneDirect™ 10X Ligation Buffer, *E. coli* 10G or 10GF' Electrocompetent or Chemically Competent Cells in DUO (2 rxns per tube) or SixPack (6 rxns per tube) packaging, pUC19 Positive Control Plasmid, Recovery Medium, and a complete protocol.

Product	Cat. No.	Size
UltraClone Kit with 10G SUPREME Electrocompetent Cells (≥4 x 10 ¹⁰ cfu/μg)	40008-1	12 reactions (DUOs)
	40008-2	24 reactions (DUOs)
UltraClone Kit with 10G ELITE Electrocompetent Cells (≥2 x 10 ¹⁰ cfu/μg)	40002-1	12 reactions (DUOs)
	40002-2	24 reactions (DUOs)
UltraClone Kit with 10G ELITE Electrocompetent Cells (≥2 x 10 ¹⁰ cfu/μg)	40003-2	24 reactions (SixPacks)
	40003-4	48 reactions (SixPacks)
UltraClone Kit with 10GF' ELITE Electrocompetent Cells (≥2 x 10 ¹⁰ cfu/μg)	40004-1	12 reactions (DUOs)
	40004-2	24 reactions (DUOs)
UltraClone Kit with 10G Chemically Competent Cells (≥3 x 10 ⁸ cfu/μg)	40012-1	12 reactions (DUOs)
	40012-2	24 reactions (DUOs)



*E. coli*TM Chemically Competent & Electrocompetent Cells

Kit contents: *E. coli* Cells in DUO (2 rxns/tube), SixPack (6 rxns/tube), or OCTET (8 rxns/tube) packaging, Recovery Medium, pUC19 Positive Control Plasmid, and a complete protocol. ■

Product	Cat. No.	Size
Electrocompetent Cells		
<i>E. coli</i> 10G SUPREME Cells ($\geq 4 \times 10^{10}$ cfu/ μ g)	60080-1	12 reactions (DUOs)
	60080-2	24 reactions (DUOs)
<i>E. coli</i> 10G ELITE Cells ($\geq 2 \times 10^{10}$ cfu/ μ g)	60052-1	12 reactions (DUOs)
	60052-2	24 reactions (DUOs)
<i>E. coli</i> 10G ELITE Cells ($\geq 2 \times 10^{10}$ cfu/ μ g)	60052-3	24 reactions (SixPacks)
	60052-4	48 reactions (SixPacks)
<i>E. coli</i> 10G CLASSIC Cells ($\geq 5 \times 10^9$ cfu/ μ g)	60117-1	24 reactions (SixPacks)
	60117-2	48 reactions (SixPacks)
<i>E. coli</i> 10GF' ELITE Cells ($\geq 2 \times 10^{10}$ cfu/ μ g)	60061-1	12 reactions (DUOs)
	60061-2	24 reactions (DUOs)
Chemically Competent Cells		
<i>E. coli</i> 10G Chemically Competent Cells ($\geq 3 \times 10^8$ cfu/ μ g)	60107-1	12 reactions (DUOs)
	60107-2	24 reactions (DUOs)
	60107-3	48 reactions (DUOs)
	60107-4	96 reactions (DUOs)
	60107-5	96 reactions (OCTETs)

