

## Genotypes of Invitrogen™ competent cells

Product Name	Genotype
DH5α™	F <sup>-</sup> Φ80 <i>lacZ</i> ΔM15 Δ( <i>lacZ</i> YA- <i>argF</i> )U169 <i>recA1 endA1 hsdR17</i> (rK <sup>-</sup> , mK <sup>+</sup> ) <i>phoA supE44 λ<sup>-</sup> thi-1 gyrA96 relA1</i>
DH5α™ T1R	F <sup>-</sup> Φ80 <i>lacZ</i> ΔM15 Δ( <i>lacZ</i> YA- <i>argF</i> )U169 <i>recA1 endA1 hsdR17</i> (rK <sup>-</sup> , mK <sup>+</sup> ) <i>phoA supE44 thi-1 gyrA96 relA1 tonA</i>

## Genotype Key

Genotype	Description
<i>ara-14</i>	Blocks arabinose catabolism
<i>argF</i>	Ornithine carbamoyltransferase mutation blocks ability to use arginine
<i>dam/dcm</i>	Abolishes endogenous adenine methylation at GATC sequences ( <i>dam</i> ) or cytosine methylation at CCWGG sequences ( <i>dcm</i> ). Used to propagate DNA for cleavage with certain restriction enzymes (e.g. <i>Ava</i> II, <i>Bcl</i> I)
DE3	Lysogen that encodes T7 RNA polymerase. Used to induce expression in T7-driven expression systems
<i>endA</i>	<i>endA</i> Mutation in the non-specific endonuclease Endonuclease I; eliminates non-specific endonuclease activity, resulting in improved plasmid preps
F <sup>'</sup>	A self-transmissible, low-copy plasmid used for the generation of single-stranded DNA when infected with M13 phage; may contain a resistance marker to allow maintenance and will often carry the <i>lacI</i> and <i>lacZ</i> ΔM15 genotypes
<i>galK</i>	Galactokinase mutation blocks catabolism of galactose—cells that are <i>galK</i> minus cannot grow in the presence of galactose as the sole carbon source
<i>galU</i>	Glucose-1-phosphate uridylyltransferase mutation blocks ability to use galactose—cells that are <i>galU</i> minus cannot grow on media that contains galactose as the sole carbon source
<i>gyrA96</i>	DNA gyrase mutant produces resistance to nalidixic acid
<i>hsd</i>	Mutations in the system of methylation and restriction that allow <i>E. coli</i> to recognize DNA as foreign. The <i>hsd</i> genotype allows efficient transformation of DNA generated from PCR reactions * <i>hsdR</i> —eliminates restriction of unmethylated <i>EcoK</i> I sites. (1) ** <i>hs</i>
<i>lacI</i>	Encodes the <i>lac</i> repressor that controls expression from promoters that carry the <i>lac</i> operator; IPTG binds the <i>lac</i> repressor and derepresses the promoter; often used when performing blue/white screening or to control expression of recombinant genes
<i>lacY1</i>	Blocks use of lactose via β-D-galactosidase mutant
<i>lacZ</i>	β-D-galactosidase gene; mutations yield colorless (vs. blue) colonies in the presence of X-gal
<i>lacZ</i> ΔM15	Element required for β-galactosidase complementation when plated on X-gal; used in blue/white screening of recombinants; usually carried on the lambdoid prophage φ80 or F <sup>'</sup>
<i>leuB</i>	Requires leucine for growth on minimal media via β-isopropyl malate dehydrogenase mutation
<i>lon</i>	<i>lon</i> Deficiency in the <i>Lon</i> ATPase-dependent protease; decreases the degradation of recombinant proteins; all B strains carry this mutation

mcrA, mcrBC, or mrr	Mutations that allow methylated DNA to not be recognized as foreign; this genotype is necessary when cloning genomic DNA or methylated cDNA
nupG	Mutation for the transport of nucleosides
ompT	Indicates that the E. coli lack an outer membrane protease—reduces degradation of heterologous the strains and recovery of intact recombinant proteins is improved in ompT minus strains
P3	A 60-kb low-copy plasmid that carries the ampicillin and tetracycline resistance genes with amber mutations; used predominantly for selection of supF-containing plasmids; carries the kanamycin resistance gene for selection
pLys	pLys Plasmid that encodes T7 lysozyme; used to reduce basal expression in T7-driven expression systems by inhibiting basal levels of T7 RNA polymerase
proAB	proAB Requires proline for growth on minimal media
recA	Mutation in a gene responsible for general recombination of DNA; particularly desirable when cloning genes with direct repeats
relA	RNA is synthesized in absence of protein synthesis (relaxed phenotype) relA locus regulates the coupling between transcription and translation. In the wild type, limiting amino acid concentrations results in the shutdown of RNA synthesis (also known as th
rpsL	Confers resistance to streptomycin (this makes a mutant ribosomal protein, small subunit, the target of the drug)
supE,F	tRNA glutamine suppressor of amber (supE)(UAG) or tyrosine (supF)
thi-1	Requires thiamine for growth on minimal media
Tn10	Confers tetracycline resistance via a transposon
tonA	Confers resistance to the lytic bacteriophage T1, T5 and f80
traD, D36	Prevents transfer of F' episome via transfer factor mutation
tsx	Confers resistance to phage T6 and colicin K
xyl-5	Blocks catabolism of xylose