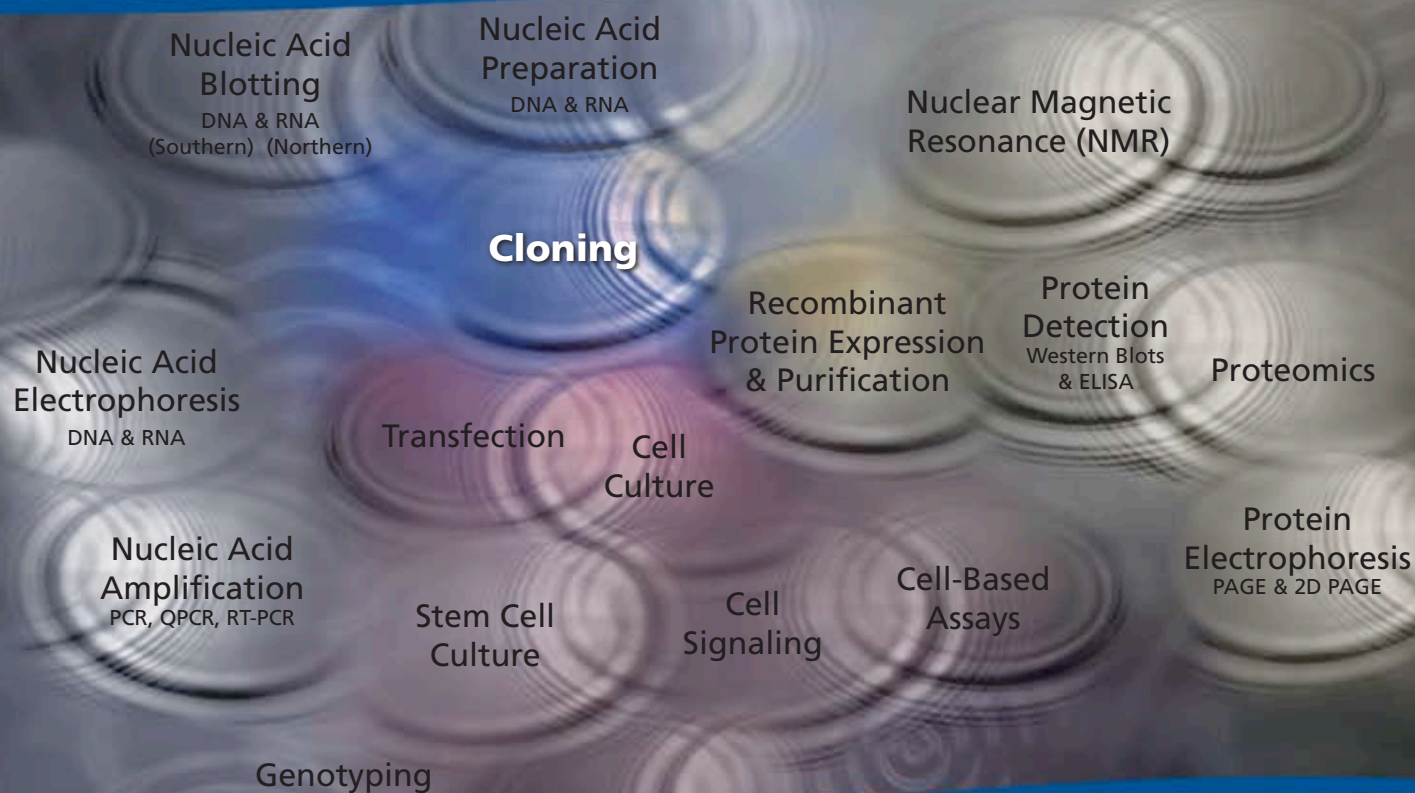


# Life Science Reagents for Cloning from Sigma-Aldrich®



## *We Ripple Through Everything You Do!*

- Extensive reagent offering to support your Cloning based research needs.
- Full line of media and specialty media
- Quality and availability assured
- Market leading Technical Service
- Leading Web support tools:

**Cloning and Expression** — [sigma-aldrich.com/cloning](http://sigma-aldrich.com/cloning)

**Competent Cells** — [sigma-aldrich.com/competentcells](http://sigma-aldrich.com/competentcells)

**Virtual Stockroom** — [sigma-aldrich.com/virtualstockroom](http://sigma-aldrich.com/virtualstockroom)

# Life Science Reagents for Cloning from Sigma-Aldrich®

## Ready-made versions of the most commonly used microbial media

### • S-Gal®

- Safe, fast, easy method to differentiate between *lac+* and *lac-* colonies
- Superior to X-gal for clonal selection
- Color determination of black S-Gal colonies begins in as little as 14 hours with sharper contrast for easier colony determination
- Temperature stable, can be autoclaved or microwaved
- Safe, water-soluble reagent

### • Pre-poured agar plates

- Sigma-Aldrich carries the following pre-poured plates:
  - LB
  - LB Ampicillin
  - LB Kanamycin
  - LB Carbenicillin
- Tested with at least four different strains of *E. coli* to demonstrate efficacy of antibiotics.

### • Culture media

- Full line of dehydrated media, broth and agar
- Full line of fluorescent and Chromogenic media

To view our full line cloning products, please visit [sigma-aldrich.com/cloning](http://sigma-aldrich.com/cloning).

| Cat. No.                 | Description   |
|--------------------------|---|
| <b>Acids &amp; Bases</b> |   |
| H1758                    | Hydrochloric acid Molecular Biology Grade, 36.5-38.0 %                |
| P5811                    | Phosphoric acid insect cell culture tested, 85%                       |
| P5958                    | Potassium hydroxide SigmaUltra, ≥85% as KOH                           |
| S2770                    | Sodium hydroxide solution 1.0 N, cell culture tested                  |
| <b>Agarose</b>           |   |
| A9539                    | Agarose for molecular biology   |
| A4718                    | Agarose High resolution, DNase, RNase, NICKase, none detected         |
| A5093                    | Agarose Low EEO, for molecular biology                                |
| A6013                    | Agarose Type I, Low EEO   |
| A0169                    | AGAROSE TYPE I-A LOW EEO  |
| A6877                    | Agarose Type II, Medium EEO   |
| A7431                    | Agarose Wide range/Standard 3:1, DNase, RNase, NICKase, none detected |
| <b>Antibiotics</b>       |   |
| A0166                    | Ampicillin sodium salt cell culture tested, 91.0-100.5                |
| C1863                    | Chloramphenicol Biotechnology Performance Certified                   |
| K1377                    | Kanamycin sulfate from Streptomyces kanamyceticus cell culture tested |
| S9137                    | Streptomycin sulfate salt cell culture tested, ≥98%                   |
| T7660                    | Tetracycline hydrochloride powder, cell culture tested                |
| <b>Broth / Media</b>     |   |
| A5306                    | Bacteriological agar for molecular biology                            |
| T2559                    | EZMix™ Tryptone Pancreatic digest of casein                           |
| L5667                    | LB Agar Ampicillin-100, Plates  |
| L7533                    | LB Agar EZMix Powder  |
| L0543                    | LB Agar Kanamycin-50, Plates  |
| L5542                    | LB Agar Plates  |
| L2897                    | LB Agar powder  |
| L7658                    | LB Broth EZMix Powder   |
| L3022                    | LB Broth powder   |
| L7275                    | LB Broth tablet   |
| L3147                    | Luria Agar  |
| L3522                    | Luria Broth   |
| C4478                    | S-Gal/LB Agar Blend   |
| S1797                    | SOC Medium  |
| T9179                    | Terrific Broth, Modified EZMix Powder                                 |
| Y1625                    | Yeast Extract powder  |
| Y2627                    | 2X YT Microbial Medium EZMix Powder                                   |
| S9811                    | S-Gal powder  |
| S9938                    | S-Gal/LB Agar Blend, without IPTG                                     |
| S1813                    | S-Gal/LB Agar/Kanamycin Blend powder                                  |
| S7313                    | S-Ga sodium salt powder   |

| Cat. No.               | Description   |
|------------------------|---|
| <b>Buffers</b>         |   |
| <b>A1542</b>           | Ammonium acetate for molecular biology, ~98%  |
| <b>B4679</b>           | BIS-TRIS propane Biotechnology Performance Certified, cell culture tested, ≥99.0%                                     |
| <b>H4034</b>           | HEPES Biotechnology Performance Certified, ≥99.5% (titration), cell culture tested                                    |
| <b>H3537</b>           | HEPES solution 1 M, Cell Culture tested, Biotechnology Performance Certified  |
| <b>H3784</b>           | HEPES sodium salt Biotechnology Performance Certified, cell culture tested, ≥99.5%                                    |
| <b>P1190</b>           | Potassium acetate for molecular biology, ≥99%   |
| <b>P9541</b>           | Potassium chloride for molecular biology, ≥99%  |
| <b>S2889</b>           | Sodium acetate anhydrous for molecular biology  |
| <b>S3014</b>           | Sodium chloride for molecular biology, ≥98%   |
| <b>C8532</b>           | Sodium citrate tribasic dihydrate Molecular Biology, ~99% capillary GC  |
| <b>S3264</b>           | Sodium phosphate dibasic for molecular biology, ≥98.5%  |
| <b>T9285</b>           | Tris-EDTA buffer solution 100 ×, for molecular biology  |
| <b>T6066</b>           | Trizma® base Biotechnology Performance Certified, meets EP, USP testing specifications, cell culture tested, ≥99.9%   |
| <b>Competent Cells</b> |   |
| <b>J3895</b>           | JM109 Competent Cells, Uni-pack   |
| <b>G3169</b>           | GC5™ Competent Cells Uni-pack   |
| <b>G2919</b>           | GC10™ Competent Cells Uni-pack  |
| <b>B2685</b>           | BL21 Competent Cells, Uni-pack T1 <sup>R</sup>  |
| <b>Enzymes</b>         |   |
| <b>R0260</b>           | BamH I from <i>Bacillus amyloliquefaciens</i> H buffered aqueous glycerol solution                                    |
| <b>D2886</b>           | DNA Ligase from T4-infected <i>Escherichia coli</i> buffered aqueous glycerol solution                                |
| <b>R6265</b>           | EcoR I from <i>Escherichia coli</i> B55 buffered aqueous glycerol solution  |
| <b>R1137</b>           | Hind III from <i>Haemophilus influenzae</i> buffered aqueous glycerol solution  |
| <b>R8506</b>           | Not I from <i>Nocardia otidiscaviarum</i> buffered aqueous glycerol solution  |
| <b>P2308</b>           | Proteinase K from <i>Tritirachium album</i> BioUltra, for molecular biology, ≥30 units/mg protein, lyophilized powder |
| <b>R7023</b>           | Pst I from <i>Providencia stuartii</i> buffered aqueous glycerol solution   |
| <b>R6513</b>           | Ribonuclease A from bovine pancreas for molecular biology, ≥70 Kunitz units/mg protein, lyophilized powder            |
| <b>R0754</b>           | Sal I from <i>Streptomyces albus</i> G buffered aqueous glycerol solution   |
| <b>T4427</b>           | Terminal Transferase from calf thymus buffered aqueous glycerol solution  |
| <b>R6379</b>           | Xho I from <i>Xanthomonas holcicola</i> buffered aqueous glycerol solution  |

| Cat. No.                | Description  |
|-------------------------|--|
| <b>General Reagents</b> |  |
| <b>B4252</b>            | X-gal  |
| <b>A3059</b>            | Albumin from bovine serum Further purified Fraction V, ~99% (agarose gel electrophoresis), lyophilized powder, Essentially γ-globulin free |
| <b>APF</b>              | Alkaline Phosphatase Detection Kit, Fluorescence   |
| <b>B3928</b>            | Blue-White Select™ Screening Reagent   |
| <b>C3032</b>            | Cesium chloride for molecular biology, ≥99%  |
| <b>C2432</b>            | Chloroform ≥99%, contains amylenes as stabilizer   |
| <b>G5400</b>            | D-(+)-Glucose for culture media, ≥99%  |
| <b>D0632</b>            | DL-Dithiothreitol ≥98% (TLC), ≥99% (titration)   |
| <b>D9779</b>            | DL-Dithiothreitol for molecular biology, ≥98% (TLC), ≥99% (titration)  |
| <b>S6021</b>            | D-Sorbitol for molecular biology, ≥98%   |
| <b>E5134</b>            | EDTA disodium salt dihydrate for molecular biology, ≥99%   |
| <b>E7023</b>            | Ethanol 200 proof (absolute), for molecular biology  |
| <b>E1510</b>            | Ethidium bromide solution 10 mg/mL, for molecular biology, aqueous solution  |
| <b>G7663</b>            | Gelatin blocking buffer for molecular biology, powder blend  |
| <b>G5516</b>            | Glycerol for molecular biology, ≥99%   |
| <b>I5502</b>            | IPTG ≥99%  |
| <b>M2545</b>            | Magnesium acetate tetrahydrate SigmaUltra, ≥98 %   |
| <b>M1028</b>            | Magnesium chloride solution for molecular biology, 1.00 M±0.01 M   |
| <b>M3409</b>            | Magnesium sulfate solution for molecular biology   |
| <b>C4523</b>            | N-Z-Case® TT Moderately digested casein enzymatic hydrolysate, from bovine milk  |
| <b>D9893</b>            | pBR322 Plasmid DNA from <i>Escherichia coli</i> RRI lyophilized powder   |
| <b>P5905</b>            | Peptone powder, from meat, cell culture tested   |
| <b>P1037</b>            | Phenol for molecular biology   |
| <b>P2069</b>            | Phenol:Chloroform:Isoamyl Alcohol 25:24:1 Saturated with 10 mM Tris, pH 8.0, 1 mM EDTA. for molecular biology                              |
| <b>P5413</b>            | Poly(ethylene glycol) for molecular biology, average mol wt. 8,000   |
| <b>82514</b>            | Protein Hydrolysate Amicase® BioChemika, for microbiology  |
| <b>L4390</b>            | Sodium dodecyl sulfate for molecular biology, ≥98.5%   |
| <b>T7293</b>            | Tryptone Microbiologically tested  |
| <b>W4502</b>            | Water Molecular Biology Reagent  |
| <b>Y1625</b>            | Yeast Extract, powder  |
| <b>YEAST1</b>           | Yeast Transformation Kit   |
| <b>Z0173</b>            | Zinc chloride for molecular biology, ≥97.0%  |

# Competent Cells from Sigma-Aldrich®

## High Efficiency Chemically Competent and Electrocompetent Cells

### GC5

- Comparable to DH5a
- Highest efficiency for chemically competent cells
- Suitable for larger plasmids
- New 96-well format for high-throughput cloning

### GC10 and Thunderbolt

- Comparable to DH10B
- Suitable for methylated DNA and larger plasmids
- Recommended for cDNA and genomic library construction

| Cat. No.     | Description                             | Package Size             |
|--------------|---|--------------------------|
| <b>G3169</b> | GC5 Competent Cells, Uni-Pack           | 10 x 50 µl<br>20 x 50 µl |
| <b>G3044</b> | GC5 Competent Cells, Standard Aliquots  | 5 x 200 µl<br>200 µl     |
| <b>G7419</b> | GC5 Competent Cells, 96-well            | 1 ea.<br>4 ea.           |
| <b>G2919</b> | GC10 Competent Cells, Uni-Pack          | 10 x 50 µl<br>20 x 50 µl |
| <b>G2794</b> | GC10 Competent Cells, Standard Aliquots | 5 x 200 µl               |
| <b>T7699</b> | Thunderbolt GC10                        | 5 x 80 µl<br>5 x 100 µl  |

**tonA** – GC5 and GC10 Strains are T1 and T5 bacteriophage resistant!

### JM109 and HB101

- High efficiency classic strains for routine cloning
- Cloning of genomic DNA with HB101
- Blue/white screening and IPTG induction with JM109
- Single-strand DNA propagation with JM109

| Cat. No.     | Description                     | Package Size |
|--------------|---------------------------------|--------------|
| <b>J3895</b> | JM109 Competent Cells, Uni-Pack | 10 x 50 µl   |

### BL21

- High-level protein expression
- Increased stability of recombinant protein
- DE3 strains for expression with T7 promoter systems
- Tighter control of protein expression with pLysS and pLysE strains

| Cat. No.     | Description                                    | Package Size |
|--------------|--|--------------|
| <b>B2685</b> | BL21–T1R Competent Cells, Uni-Pack             | 10 x 50 µl   |
| <b>B2935</b> | BL21 (DE3)–T1R Competent Cells, Uni-Pack       | 10 x 50 µl   |
| <b>B3310</b> | BL21 (DE3) pLysS–T1R Competent Cells, Uni-Pack | 10 x 50 µl   |
| <b>B3435</b> | BL21 (DE3) pLysE–T1R Competent Cells, Uni-Pack | 10 x 50 µl   |

**tonA** – All BL21 strains are T1 and T5 bacteriophage resistant!

## Competent Cell Strain Selection Table

| FEATURE   | GC5             | GC10            | Thunderbolt<br>GC10 | JM109           | HB101           | BL21–T1 <sup>R</sup> | BL21<br>(DE3)–T1 <sup>R</sup> | BL21 (DE3)<br>pLysS–T1 <sup>R</sup> | BL21 (DE3)<br>pLysE–T1 <sup>R</sup> |
|---|-----------------|-----------------|---------------------|-----------------|-----------------|----------------------|-------------------------------|-------------------------------------|-------------------------------------|
| Analogous to DH5a   | √               |                 |                     |                 |                 |                      |                               |                                     |                                     |
| Analogous to NovaBlue and XL1 Blue                          |                 |                 |                     | √               |                 |                      |                               |                                     |                                     |
| Analogous to DH10B  |                 | √               | √                   |                 |                 |                      |                               |                                     |                                     |
| Strain Background   | K12             | K12             | K12                 | K12             | K12xB           | B                    | B                             | B                                   | B                                   |
| Transformation Efficiency (cfu/µg pUC plasmid DNA)          | 10 <sup>9</sup> | 10 <sup>9</sup> | 10 <sup>10</sup>    | 10 <sup>9</sup> | 10 <sup>9</sup> | 10 <sup>6</sup>      | 10 <sup>7</sup>               | 10 <sup>6</sup>                     | 10 <sup>6</sup>                     |
| Cloning Strain  | √               | √               | √                   | √               | √               |                      |                               |                                     |                                     |
| Expression Strain (lon and ompT protease deficient)         |                 |                 |                     |                 |                 | √                    | √                             | √                                   | √                                   |
| Blue/White Selection (with appropriate construct)           | √               | √               | √                   | √               |                 |                      |                               |                                     |                                     |
| T1 and T5 bacteriophage resistant (tonA)                    | √               | √               | √                   |                 |                 | √                    | √                             | √                                   | √                                   |
| T7 promoter systems   |                 |                 |                     |                 |                 |                      | √                             | √                                   | √                                   |
| F' episome for single strand rescue                         |                 |                 |                     | √               |                 |                      |                               |                                     |                                     |
| Ideal for cloning methylated DNA                            |                 | √               | √                   |                 | √               |                      |                               |                                     |                                     |
| lacIq (higher level of lac repressor)                       |                 |                 |                     | √               |                 |                      |                               |                                     |                                     |
| Highest quality DNA preparation (endA)                      | √               | √               | √                   | √               |                 |                      |                               |                                     |                                     |
| General recombination deficient for insert stability (recA) | √               | √               | √                   | √               | √               |                      |                               |                                     |                                     |
| Electrocompetent  |                 |                 | √                   |                 |                 |                      |                               |                                     |                                     |

### World Headquarters

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