ZYMO RESEARCH

The Beauty of Science is to Make Things Simple®

***E. coli* Products *Made Simple*™**

Transform Your Research

Highly Cited

Nature

Gene Expression

Mix & Go!™ E. coli Transformation Kit & Buffer Set was used to make competent cells that aided in the development of a novel CRISPR-Cas system for DNA-based storage of transcriptional information in *E. coli*.

Transcriptional recording by CRISPR spacer acquisition from RNA
(Schmidt, F. et al. 2018)

Science Advances

Immunology

Mix & Go!™ E. coli Transformation Kit and Buffer Set helped identify several variable heavy chains of antibodies from Middle East respiratory syndrome coronavirus (MERS-CoV)-infected camels that are specific for MERS-CoV and efficiently block virus entry.

Chimeric camel/human heavy-chain antibodies protect against MERS-CoV infection
(Raj, V. S. et al. 2018)

Nature Protocols

Transgenics

Mix & Go!™ Competent Cells assisted in the development of a highly efficient CRISPR/Cas9-based genome editing method for creating knock-in and conditional knockout mouse models.

Easi-CRISPR for creating knock-in and conditional knockout mouse models using long ssDNA donors
(Miura, H. et al. 2018)

Proceedings of the National Academy of Sciences (PNAS)

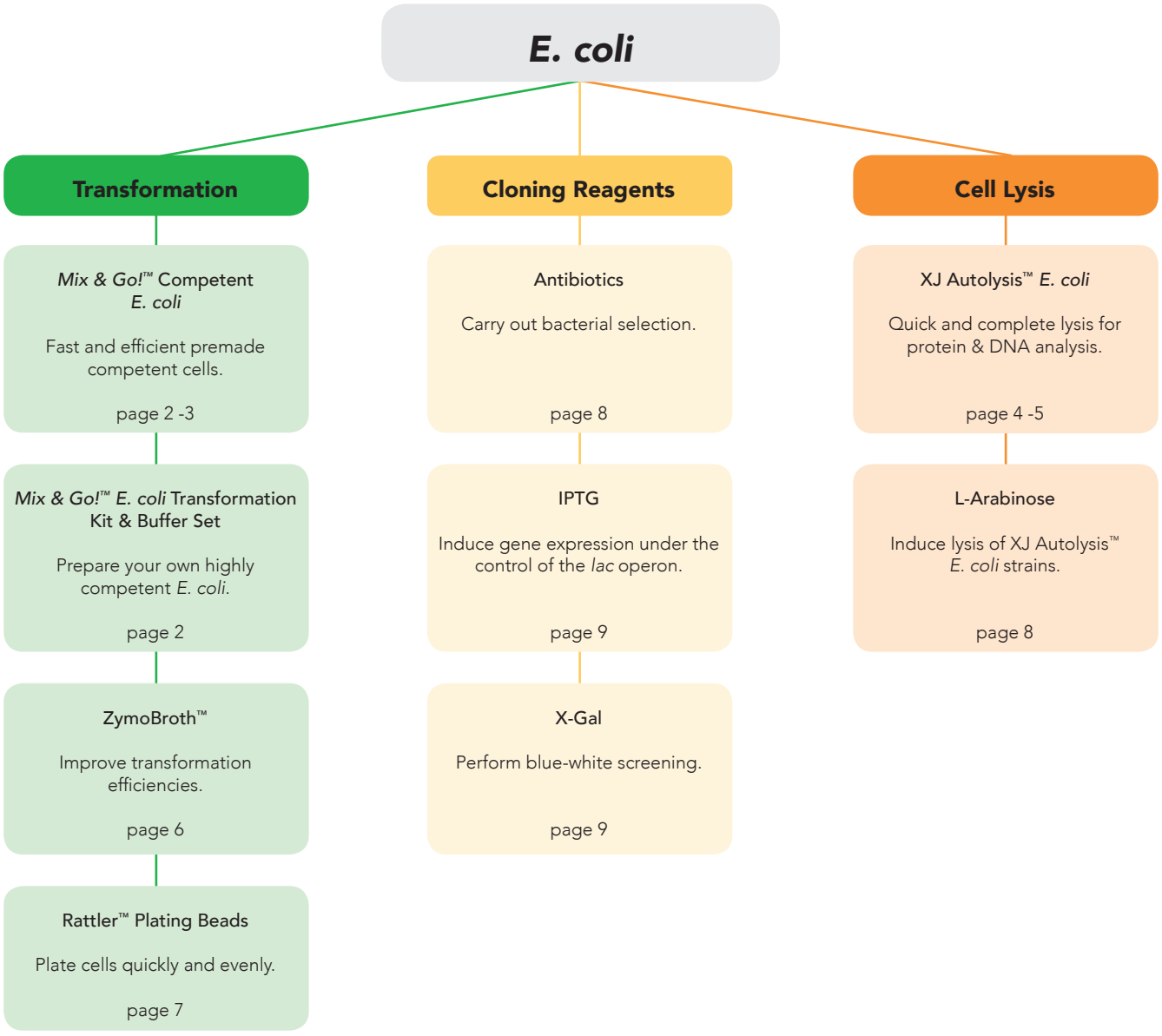
Microbiology

Mix & Go!™ Competent Cells were used to produce retroviral constructs that facilitated the discovery of a unique relationship between microbial colonization and regulation of T-cell apoptosis via suppression of the cytokine Erdr1.

Microbiota promotes systemic T-cell survival through suppression of an apoptotic factor
(Soto, R. et al. 2017)

Simplifying the Molecular Biology Workflow

Zymo Research strives to give researchers the best foundation possible through its large selection of innovative *E. coli* products that provide fast, simple, and efficient solutions for cloning and protein expression. Zymo Research's unique *Mix & Go!*™ competent *E. coli* streamlines the plasmid transformation process by eliminating the traditional long outgrowth times without sacrificing transformation efficiency (>10^8 transformants per µg pUC19 DNA). Avoid heat-shock and transform cells in less than 20 seconds with Zymo Research's highly efficient premade *Mix & Go!*™ Competent Cells. Want to make your own *Mix & Go!*™ *E. coli* competent cells? Zymo Research offers a complete buffer set that enables researchers to make their own homemade competent cells from any strain of *E. coli* to meet their exact needs. When used with the *Mix & Go!*™ system, ZymoBroth™ enhances the transformation efficiency of many K- and B-strains of *E. coli* while increasing transformation efficiency and decreasing transformation time. No matter your needs, set the right foundation for you next discovery with Zymo Research.



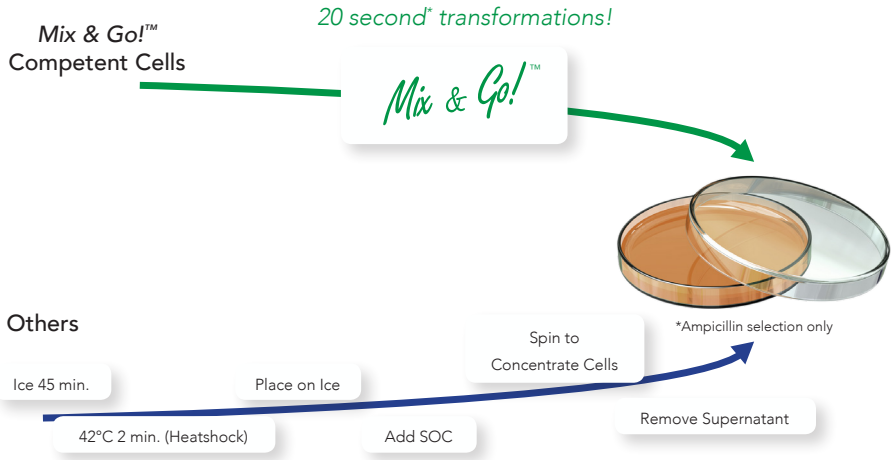
Fast and Efficient Competent *E. coli*

Premade strains available or kits to prepare your own

Mix & Go!™ Competent Cells

- **Simple 20 Second Transformation:** No heat shock! Just add DNA and spread on a plate.
- **High Transformation Efficiencies:** Achieve 10^8 – 10^9 transformants per µg of plasmid DNA.
- **Versatile:** Excellent for general cloning, blue-white screening, and plasmid isolation.
- **Prepare Your Own:** Easy 3 step protocol to produce reliable chemically competent *E. coli* in ≤ 45 minutes.

Simple 20 second Transformation



Product	Cat. No.	Size	Uses
Mix & Go!™ *E. coli* Transformation Kit	T3001	up to 20 ml	Preparation of competent *E. coli*
Mix & Go!™ *E. coli* Transformation Buffer Set	T3002	up to 60 ml	Preparation of competent *E. coli*

Strain	Cat. No.	Size
JM109	T3003 T3005	10 x 100 µl aliquots (10 tubes) 96 x 50 µl aliquots (12 x 8-tube strips)
DH5 Alpha	T3007 T3009 T3010	10 x 100 µl aliquots (10 tubes) 96 x 50 µl aliquots (12 x 8-tube strips) 96 x 50 µl aliquots (PCR plate)
HB101	T3011 T3013	10 x 100 µl aliquots (10 tubes) 96 x 50 µl aliquots (12 x 8-tube strips)
TG1	T3017	10 x 100 µl aliquots (10 tubes)
Zymo 10B	T3019 T3020	10 x 100 µl aliquots (10 tubes) 96 x 50 µl aliquots (12 x 8-tube strips)

Product Guide: *Mix & Go!™* Competent *E. coli*

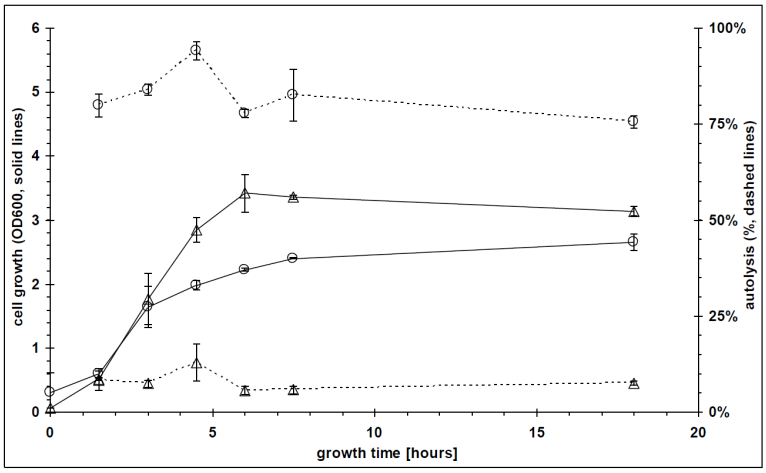
	JM109	DH5 Alpha	HB101	TG1	Zymo 10B
Specifications					
Strain Background	K-12	K-12	K-12	K-12	K-12
General Cloning	✓	✓	✓	✓	✓
Plasmid Isolation	✓	✓	✓	✓	✓
Recombinant Protein Expression	✓				
Production of ssDNA (F'episome)	✓			✓	
Suppression of Amber Mutations (glnV44 or supE44)	✓	✓	✓	✓	
Blue-White Selection (lacZΔM15)	✓	✓		✓	✓
High-quality and Yield of Plasmid DNA (endA1)	✓	✓			✓
Reduced Recombination & Insert Stability (recA1 or recA13)	✓	✓	✓		✓
Plasmid Size	Up to 10-15 kb		Up to 10-15 kb	Up to 10-15 kb	
Transformation of Large Plasmids (deoR)		Up to 20-32 kb			Up to 20-32 kb
Ampicillin Resistant (bla or ampR)					
Chloramphenicol Resistant (cat or CmR or CamR)					
Tetracycline Resistant (Tn10 or tetR)					
Kanamycin Resistant (KanR)					
Nalidixic Acid Resistant (gyrA96 or NalR)	✓	✓			
Streptomycin Resistant (StrR)			✓		✓
Genotype	F`[traD36 proA+B+ laclq Δ(lacZ)M15] Δ(lac-proAB) glnV44 (supE44) e14- (McrA-) thi gyrA96 (NalR) endA1 hsdR17(rk-mk+) relA1 recA1	F- φ80lacZΔM15 Δ(lacZYA-argF)U169 deoR nupG recA1 endA1 hsdR17(rK-mK+) phoA glnV44 (supE44) thi-1 gyrA96 relA1, λ-	F- Δ(gpt-proA)62 leuB6 glnV44 (supE44) ara-14 galK2 lacY1 Δ(mcrC-mrr) xyl-5 mtl-1 recA13 thi-1 rpsL20 (SmR)	F'[traD36 laclq Δ(lacZ) M15 proA+B+] glnV (supE) thi-1 Δ(mcrB-hsdSM)5 (rK- mK-McrB-) thi Δ(lac-proAB)	F- mcrA Δ(mrr-hsdRMS-mcrBC) Φ80lacZΔM15 ΔlacX74 recA1 endA1 araD139 Δ(ara leu) 7697 galU galK rpsL nupG λ-
Catalog Number	T3003	T3007	T3011	T3017	T3019

Quick and Complete Lysis for Protein & DNA Analysis

XJ Autolysis™ *E. coli* Strains

- **Fast Lysis:** 80 – 90% of *E. coli* are lysed after only one freeze-thaw cycle.
- **Simple 20 Second Transformation:** No heat shock! Just add DNA and spread using *Mix & Go!*™ Competent Cell technology.
- **High Transformation Efficiencies:** Achieve 10^8 – 10^9 transformants per µg of plasmid DNA.

≥ 80% Cells Lysed after One Freeze-Thaw Cycle



Autolysis of *E. coli* XJa strain grown in LB media supplemented with 3 mM arabinose. The chart shows the growth (open circle, solid line) and extent of autolysis (open circle, dashed line) of the autolysing strain XJa and growth (open triangle, solid line) and autolysis (open triangle, dashed line) of the control *E. coli* strain JM109. The autolysing activity is defined as the amount of cell protein released after one freeze-thaw cycle compared to the total protein in that sample (amount of protein released following sonication).

Product	Cat. No.	Size
XJa Autolysis™	T5021 T3021	1 glycerol stock, 1 ml 500X L-Arabinose 10 x 100 µl *Mix & Go!*™ Competent Cells, 1 ml 500X L-Arabinose
XJa (DE3) Autolysis™	T5031 T3031	1 glycerol stock, 1 ml 500X L-Arabinose 10 x 100 µl *Mix & Go!*™ Competent Cells, 1 ml 500X L-Arabinose
XJb Autolysis™	T5041 T3041	1 glycerol stock, 1 ml 500X L-Arabinose 10 x 100 µl *Mix & Go!*™ Competent Cells, 1 ml 500X L-Arabinose
XJb (DE3) Autolysis™	T5051 T3051	1 glycerol stock, 1 ml 500X L-Arabinose 10 x 100 µl *Mix & Go!*™ Competent Cells, 1 ml 500X L-Arabinose

Product Guide: XJ Autolysis™ *E. coli* Strains

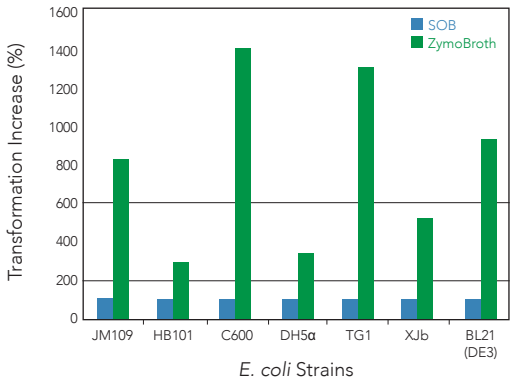
	XJa Autolysis™	XJa (DE3) Autolysis™	XJb Autolysis™	XJb (DE3) Autolysis™
Specifications				
Strain Background	K-12	K-12	B	B
General Cloning	✓	✓		
Plasmid Isolation	✓	✓		
General Screening	✓	✓		
Recombinant Protein Expression	✓	✓	✓	✓
Production of ssDNA (F'episome)	✓	✓		
T7 Promoter Transcription (λDE3)		✓		✓
Autolysis (ΔaraB::λR)	Autolysis inducible by Arabinose	Autolysis Inducible by Arabinose	Autolysis Inducible by Arabinose	Autolysis Inducible by Arabinose
Suppression of Amber Mutations (glnV44 or supE44)	✓	✓		
Blue-White Selection (lacZΔM15)	✓	✓		
High-quality and Yield of Plasmid Miniprep DNA (endA1)	✓	✓		
Reduced recombination & Insert Stability (recA1 or recA13)	✓	✓		
Plasmid Size	Up to 10 kb	Up to 10 kb	Up to 10 kb	Up to 10 kb
Transformation of Large Plasmids (deoR)				
Ampicillin Resistant (bla or ampR)				
Chloramphenicol Resistant (cat or CmR or CamR)	✓	✓	✓	✓
Tetracycline Resistant (Tn10 or tetR)				
Kanamycin Resistant (KanR)				
Nalidixic Acid Resistant (gyrA96 or NalR)				
Streptomycin Resistant (StrR)				
Genotype	F`[traD36 proA+B+ laclq Δ(lacZ)M15] Δ(lac-proAB) glnV44 (supE44) e14- (McrA-) thi gyrA96 (NalR) endA1 hsdR17(rK- mK+) relA1 recA1 ΔaraB::λR, cat (CmR)	F`[traD36 proA+B+ laclq Δ(lacZ)M15] Δ(lac-proAB) glnV44 (supE44)e14- (McrA-) thi gyrA96 (NalR) endA1 hsdR17(rK- mK+) relA1 recA1 ΔaraB::λR, cat (CmR), λ(DE3)	F- ompT hsdSB(rB- mB-) gal dcm ΔaraB::λR, cat (CmR)	F- ompT hsdSB(rB- mB-) gal dcm ΔaraB::λR, cat (CmR), λ(DE3)
Catalog Number	T3021/T5021	T3031/T5031	T3041/T5041	T3051/T5051

Improve Transformation Efficiencies

ZymoBroth™

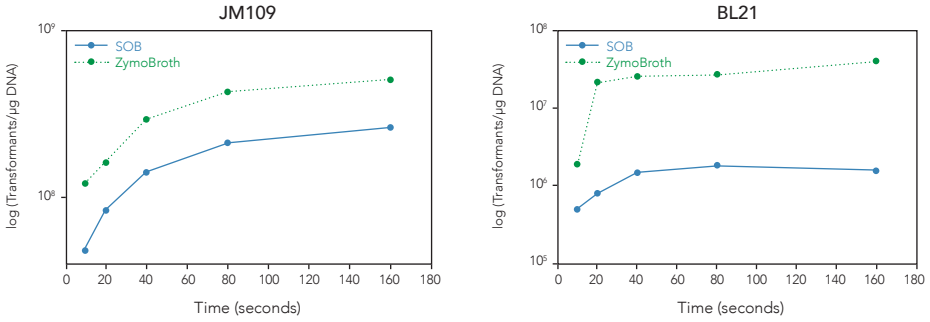
- **Prepare Highly Competent *E. coli*:** Increase transformation efficiency up to 100 fold.
- **Improves Transformation Efficiency:** ZymoBroth™ stimulates the transformation efficiency of a wide range of *E. coli* strains, including K12 derivatives (JM109, HB101, etc.) and B strain derivatives (BL21, etc.).
- **Better Results:** Ideal growth medium for generating competent cells with difficult-to-transform *E. coli* strains.

Improves Transformation Efficiency of *E. coli*



ZymoBroth™ dramatically increases the transformation efficiencies of a broad range of *E. coli* strains, including difficult-to-transform strains. The transformation efficiencies of strains generated with ZymoBroth™ (green bars) or SOB (blue bars) media are shown.

High Transformation Efficiencies



Mix & Go!™ E. coli cells prepared with ZymoBroth™ display fast transformation kinetics and high transformation efficiencies. The transformation kinetics for JM109 and BL21 strains of *E. coli* generated using ZymoBroth™ or SOB growth media are shown above. pUC19 DNA was used for transformation and the data are the averages of three individual experiments.

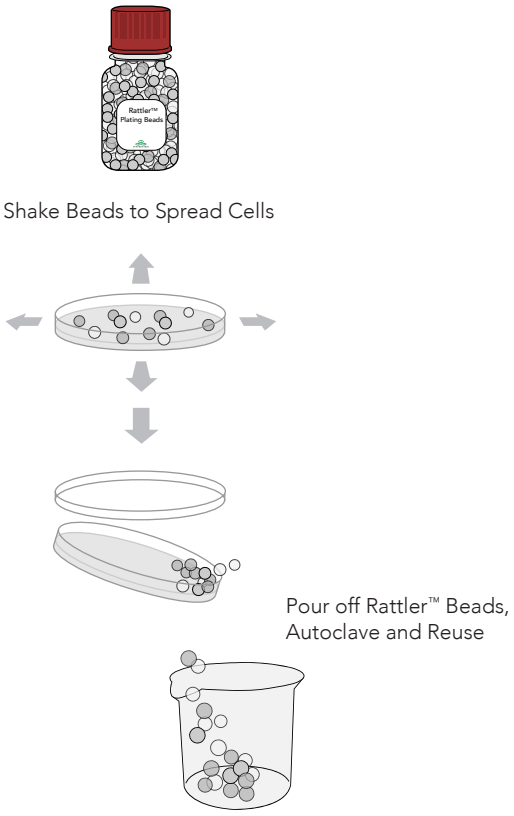
Product	Cat. No.	Size	Uses
ZymoBroth™	M3015-100 M3015-500	100 ml 500 ml	Prepare highly competent *E. coli* for DNA transformation.

Plate Cells Quickly and Evenly

Rattler™ Plating Beads

- **Fast & Easy-To-Use:** Simply pour beads onto the plate, and shake to quickly spread cells evenly over the entire surface. Ideal for processing multiple plates simultaneously.
- **No Flaming Required:** 4.5 mm glass plating beads are provided sterile in polycarbonate bottles.
- **Reusable:** Just clean and autoclave after use.

Plate Cells Quickly and Evenly Over the Entire Surface



Product	Cat. No.	Size	Specifications
Rattler™ Plating Beads - 230 g/bottle	S1001 S1001-5	1 bottle 5 bottles	**Material:** Solid, glass 4.5mm beads can be washed, autoclaved, and reused. **Packaging:** Polycarbonate, autoclavable wide mouth bottle. The bulk format is supplied non-sterile as a 25 kg bag.
Rattler™ Plating Beads - bulk format (non-sterile)	S1001-B	25 kg bag	

Antibiotics

- **Convenient:** Ready-to-use solutions for the most commonly used antibiotics for bacterial selection.
- **Ultra-Pure:** Purity ≥ 97%. Ideal for amplifying plasmids, cosmids, and BAC/PACs in *E. coli*.
- **Sterile:** Aqueous solutions are passed through a 0.2 µm filter to ensure sterility.

Product	Description	Cat. No.	Size	Purity	Stock Concentration	Recommended Working Concentration (*E. coli*)
Ampicillin Sodium Solution	For Gram (+) and (-) bacteria. Penicillin derivative that prevents bacterial cell wall synthesis.	A1001-5 A1001-25	5 ml 5 x 5 ml	≥ 98%	100 mg/ml	100 µg/ml
Chloramphenicol Solution	For Gram (+) and (-) bacteria and some mycobacteria. Chlorampenicol inhibits bacterial protein synthesis by binding the 50S ribosomal subunit.	A1002-5 A1002-25	5 ml 5 x 5 ml	≥ 97%	10 mg/ml	20 µg/ml
Kanamycin Sulfate Solution	For Gram (+) and (-) bacteria. Kanamycin binds to 70S ribosomes resulting in dysfunctional translation of mRNA.	A1003-5 A1003-25	5 ml 5 x 5 ml	≥ 98%	35 mg/ml	35 µg/ml
Tetracycline Hydrochloride Solution - Reagent Grade	For Gram (+) and (-) bacteria. Tetracycline inhibits bacterial protein synthesis by binding the 30S ribosomal subunit.	A1004-5 A1004-25	5 ml 5 x 5 ml	≥ 98%	10 mg/ml	10 µg/ml

Arabinose

- **Convenient:** Simply add the premade concentrated L-Arabinose solution to your XJ Autolysis™ *E. coli* culture.
- **Efficient:** Arabinose solution has been uniquely formulated for optimal induction of XJ Autolysis™ *E. coli* strains.
- **Economical:** 1 vial is sufficient for 500 ml of culture.

Efficient and Controlled Autolysis of *E. coli*

E. coli XJa cells (right) and control *E. coli* JM109 cells (left) were grown in LB for 24 hours and autolysis was induced by addition of Arabinose. 4 mg of wet cells were resuspended in 1 ml of water, frozen on dry ice, and then incubated for 5 minutes in a 15°C water bath. The OD_{600} values indicate cell density changes before and after the freeze-thaw cycle.

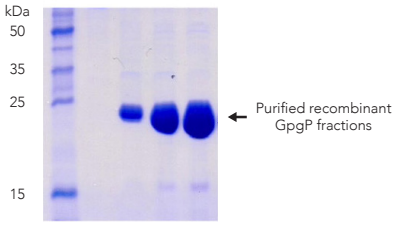
Product	Description	Cat. No.	Size	Concentration
Arabinose	Concentrated L-Arabinose solution for inducing XJ Autolysis™ strains.	A2001-1 A2001-10	1 ml 10 x 1 ml	500X solution (1.5 M L-Arabinose, 0.5 M $MgCl_2$)

IPTG

- **Convenient:** Simply add the premade sterile IPTG solution to your culture media or agar plates.
- **Consistent Results:** IPTG solution has been formulated for optimal inhibition of the *lac* repressor.
- **Versatile:** Use in conjunction with X-Gal for blue-white colony screening or by itself to induce expression of recombinant genes under the control of the *lac* operon.

Proven Performance

SDS-Page gel of purified recombinant *M. tuberculosis* Glucosyl-3-phosphoglycerate phosphotase (GpgP) from *E. coli* extracts induced with IPTG from Zymo Research at a final concentration of 0.5 mM (Shown are three consecutive elutions).
Image from: *Mendes, V., Maranha, A., Alarico, S., Costa, M. S. D. & Empadinhas, N. Mycobacterium tuberculosis Rv2419c, the missing glucosyl-3-phosphoglycerate phosphatase for the second step in methylglucose lipopolysaccharide biosynthesis. Nature Scientific Reports (2011) DOI: 10.1038/srep00177.*



Product	Description	Cat. No.	Size	Purity	Concentration
IPTG (Isopropyl-β-D-thiogalactopyranoside)	Premade sterile solution for induction of gene expression under control of the lac promoter.	I1001-5 I1001-25	5 ml 5 x 5 ml	≥ 98%	0.5 M in Water

X-GAL

- **Convenient:** Simply add the ready-to-use sterile solution to your agar plates.
- **Reliable Performance:** Uniquely formulated solution has been designed to minimize false-positives during blue-white screening.
- **Simple:** Generates a rich blue color that is easily distinguishable from background.

Minimize False-Positives

Consistently identify recombinant clones with the ready-to-use X-GAL solution.

Product	Description	Cat. No.	Size	Concentration
X-Gal (5-bromo-4-chloro-3-indolyl β-D-galactopyranoside)	Ready-to-use sterile solution for detecting β-galactosidase activity.	X1001-5 X1001-25	5 ml 5 x 5 ml	2% w/v in DMF

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Cat. No. B1009 Version 02

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