For life science research only.
Not for use in diagnostic procedures.

Restriction Endonuclease Xba I

from *Xanthomonas campestris pv. Badrii,* expressed in *E. coli,* solution

Version: 23
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Cat. No. 10 674 257 001	1,000 U 10 U/µl
Cat. No. 10 674 265 001	5,000 U 10 U/µl

Store product at −15 to −25°C.

1. General Information

1.1. Contents

Vial / Bottle	Cap	Label	Function / Description	Catalog Number	Content
Xba I	red	Xba I	Contains 20 mM Trometamol /HCl, 1 mM EDTA, 5 mM DTT, 100 mM NaCl, 50 % Glycerin and 0.02 % polydocanol, pH approximately 8.0 (+4 °C).	10 674 257 001	1 vial, 1,000 U (10 U/ µl)
				10 674 265 001	1 vial, 5,000 U (10 U/µl)
H	red	SuRE/Cut Buffer H for Restriction Enzymes, 10x conc.	Contains 0.5 M Tris-HCl, 1 M NaCl, 0.1 M $MgCl_2$, 10 mM dithioerythritol, pH 7.5 (+37°C).	10 674 257 001	1 vial, 1 ml
				10 674 265 001	1 vial, 1 ml

1.2. Storage and Stability

Storage Conditions (Product)

The product is shipped on dry ice.
When stored at −15 to −25°C, the product is stable through the expiration date printed on the label.

Vial / Bottle	Cap	Label	Storage
Xba I	red	Xba I	Store at −15 to −25°C. ⚠ ***Do not store below −25°C.***
H	red	SuRE/Cut Buffer H, 10x conc.	Store at −15 to −25°C.

1.3. Application

Xba I recognizes the sequence T/CTAGA and generates fragments with 5′-cohesive termini (Zain BS, Roberts RJ, 1977). The enzyme needs at least two nucleotides around the target sequence for cleavage.

2. How to Use this Product

2.1. Protocols

The following steps describe a typical experiment.

1. Prepare the restriction digest according to the following table.

Reagent	Final conc.
DNA	1 µg
10x SuRE/Cut Buffer H	5 µl
Water, PCR Grade*	Up to total volume of 50 µl
Xba I	1 U

2. Incubate at +37°C for 1 hour.

2.2. Parameters

Activity in PCR Buffer

60%
Relative activity in PCR mix (Taq DNA Polymerase buffer) is 60%. The PCR mix contained λ target DNA, primers, 10 mM Tris-HCl (pH 8.3, +20°C), 50 mM KCl, 1.5 mM $MgCl_2$, 200 µM dNTPs, 2.5 U Taq DNA polymerase. The mix was subjected to 25 amplification cycles.

Buffers

Activity in SuRE/Cut Buffer System

A	H[1]	M
100%	**100%**[2]	75 to 100%

[1] Supplied Buffer
[2] Indicates recommended buffer for optimal activity.

Cleavage Sites

Number of cleavage sites on different DNAs

λ	Ad2	SV40	ΦX174	M13mp7	pBR322	pBR328	pUC18
1	5	0	0	0	0	0	1

Compatible Ends

Xba I generates compatible ends to Avr I, Nhe I, and Spe I.

Enzyme with compatible ends	Recognition sequence	New sequence if Xba I is ligated to enzyme with compatible ends		Enzyme that can cut this new sequence
		Xba I – Enzyme	Enzyme – Xba I	
Bln I	C/CTAGG	T/CTAGG	C/CTAGA	Mae I
Nhe I	G/CTAGC	T/CTAGCT	G/CTAGA	Mae I
Spe I	A/CTAGT	T/CTAGT	A/CTAGA	Mae I
Xba I	**T/CTAGA**	**T/CTAGA**	**T/CTAGA**	**Xba I**, Mae I

Inactivation

Xba I can be heat inactivated by incubation at +65°C for 15 minutes, up to a concentration of 15 U/µg DNA. Concentrations >15 U/µg DNA cannot be completely inactivated under these conditions.

Isoschizomers

The enzyme is not known to have isoschizomers.

Methylation Sensitivity

Xba I digestion of DNA is inhibited by the dam gene product of *E. coli*, which methylates the ^{6}N position of adenine within the sequence GATC. 5-methylcytosine and 5-hydroxymethylcytosine are also inhibiting (*).

Recognition Sites

T*CTAG*A

i * *indicates methylation sensitivity.*

Specificity

Star activity

The Xba I sequence specificity is relaxed at low ionic strength or by addition of glycerol, ethanol, or DMSO to the incubation mixture.

Temperature Optimum

+37°C

Unit Definition

One unit is the enzyme activity that completely cleaves 1 µg λ dam^{-}, dcm^{-} DNA in 1 hour at +37°C in a total volume of 50 µl SuRE/Cut Buffer H.

3. Troubleshooting

Observation	Possible cause	Recommendation
Inhibition or alteration of recognition specificity of restriction enzyme.	Compounds were used in the isolation of the DNA substrate, such as phenol, chloroform, ethanol, SDS, high levels of NaCl, and metal ions, such as Hg^{2+} and Mn^{2+}.	Remove compounds by ethanol precipitation followed by drying, before adding DNA to the restriction digest reaction.
		Mix vial of restriction enzyme gently but completely prior to use.

4. Additional Information on this Product

4.1. Test Principle

Commonly used bacterial strains

Strain	Genotype
BL21	*E. coli B F*$^{-}$ *dcm ompT hsdS*(r_B- m_B-) *gal* (Studier FW, et al, 1986).
C600^{e}	*supE44 hsd R2 thi-1 thr-1 leuB6 lacY1 tonA21* (Hanahan D, 1983).
DH5α	*supE44* Δ(*lac*U169 (Φ80d*lac*ZΔM15) *hsd*R17 *rec*A1 *end*A1 *gyr*A96 *thi*-1 *rel*A1 (Hanahan D, 1983).
HB101	*supE44 hsdS20 recA13 ara-14 proA2 lacY1 galK2 rpsL20 xyl-5 mtl-1* (Hanahan D, 1983).
JM108	*recA1 supE44 endA1 hsdR17 gyrA96 relA1 thi* Δ(*lac-pro*AB) (Yanisch-Perron C, et al, 1985).
JM109	*recA1 supE44 endA1 hsdR17 gyrA96 relA1 thi* Δ(*lac-pro*AB) F′[*traD36proAB*$^{+}$, *lac*I^{q} *lac*ZΔM15] (Yanisch-Perron C, et al, 1985).
JM110	*rpsL (Str*^{r}*) thr leu thi-l lacY galK galT ara tonA tsx dam dcm supE44* Δ*(lac-proAB) F′[traD36proAB*$^{+}$*, lacI*^{q} *lacZΔM15]* (Yanisch-Perron C, et al, 1985).
K802	*supE hsdR gal metB* (Raleigh E, et al, 1986; Wood WB, 1966).
SURE^{r}	*recB recJ sbc C201 uvrC umuC::Tn5(kan*^{r}*) lac,* Δ(hsdRMS) endA1 gyrA96 thi relA1 supE44 F′[proAB^{+} lacI^{q} lacZΔM15 Tn10 (tet^{r}) (Greener A, 1990).
TG1	*supE hsd* Δ*5 thi* Δ(*lac-pro*AB) F′[*traD36proAB*$^{+}$, *lac*I^{q} *lac*ZΔM15] (Gibson TJ, 1984).
XL1-Blue^{r}	*supE44 hsdR17 recA1 endA1 gyrA46 thi relA1 lac* F′[*proAB*$^{+}$, *lac*I^{q} *lac*ZΔM15 Tn10 *(tet*^{r}*)*] (Bullock WO, et al, 1987).

4.2. References

- Greener, A. Strategies 1990;3:5.
- Yanisch-Perron C, Vieira J, Messing J. Improved M13 phage cloning vectors and host strains: nucleotide sequences of the M13mp18 and pUC19 vectors. Gene.1985;33:103-19.
- Wood WB. Host specificity of DNA produced by Escherichia coli: bacterial mutations affecting the restriction and modification of DNA. J Mol Biol.1966;16:118-133.
- Bullock WO, Fernandez JM, Short JM. XL1-Blue– a high-efficiency plasmid transforming recA Escherichia coli strain with β-galactosidase selection. BioTechniques. 1987;5:376-379.
- Hanahan D. Studies on transformation of Escherichia coli with plasmids. J Mol Biol.1983;166:557-580.
- Raleigh EA, Wilson G. Escherichia coli K-12 restricts DNA containing 5-methylcytosine. Proc Natl Acad Sci USA.1986;83:9070-9074.
- Zain BS, Roberts RJ. A new specific endonuclease from Xanthomonas badrii. J Mol Biol.1977;115:249-255.
- Gibson, TJ. PhD Theses. Cambridge University, U.K 1984.
- Studier FW, Moffatt BA. Use of bacteriophage T7 RNA polymerase to direct selective high-level expression of cloned genes. J Mol Biol.1986;189:113-130.

4.3. Quality Control

For lot-specific certificates of analysis, see section **Contact and Support**.

5. Supplementary Information

5.1. Conventions

To make information consistent and easier to read, the following text conventions and symbols are used in this document to highlight important information:

Text convention and symbols	
Information Note: Additional information about the current topic or procedure.	
Important Note: Information critical to the success of the current procedure or use of the product.	
① ② ③ etc.	Stages in a process that usually occur in the order listed.
❶ ❷ ❸ etc.	Steps in a procedure that must be performed in the order listed.
* (Asterisk)	The Asterisk denotes a product available from Roche Diagnostics.

5.2. Changes to previous version

Change of constituents of Xba I in the Content Chapter.
Removal of Catalog numbers 10674273001 and 11047663001.

5.3. Ordering Information

Product	Pack Size	Cat. No.
Reagents, kits		
SuRE/Cut Buffers	SuRE/Cut Buffer A, 5 x 1 ml	11 417 959 001
	SuRE/Cut Buffer H, 5 x 1 ml	11 417 991 001
1,4-Dithiothreitol	2 g	10 197 777 001
	10 g	10 708 984 001
	25 g	11 583 786 001
Water, PCR Grade	25 ml, 25 x 1 ml	03 315 932 001
	25 ml, 1 x 25 ml	03 315 959 001
	100 ml, 4 x 25 ml	03 315 843 001
T4 DNA Ligase	100 U, 1 U/µl	10 481 220 001
	500 U, 1 U/µl	10 716 359 001
	500 U, 5 U/µl	10 799 009 001

5.4. Trademarks

All product names and trademarks are the property of their respective owners.

5.5. License Disclaimer

For patent license limitations for individual products please refer to:
Product Disclaimers.

5.6. Regulatory Disclaimer

For life science research only. Not for use in diagnostic procedures.

5.7. Safety Data Sheet

Please follow the instructions in the Safety Data Sheet (SDS).

5.8. Contact and Support

To ask questions, solve problems, suggest enhancements or report new applications, please visit our **Online Technical Support Site**.

To call, write, fax, or email us, visit **sigma-aldrich.com**, and select your home country. Country-specific contact information will be displayed.

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