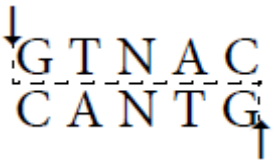
For life science research only.
Not for use in diagnostic procedures.

Restriction Endonuclease Mae III

from *Methanococcus aeolicus* PL-15/H



Version: 20
Content Version: March 2020

Cat. No. 10 822 230 001	50 U 1 - 5 U/µl
Cat. No. 10 822 248 001	250 U 1 - 5 U/µl

Store product at −15 to −25°C.

1. General Information

1.1. Contents

Vial / Bottle	Cap	Label	Function / Description	Catalog Number	Content
Mae III	colorless	Mae III	Contains 20 mM Tris-HCl, 100 mM NaCl, 0.1 mM EDTA, 10 mM 2-mercaptoethanol, 0.01% polydocanol, 0.01% gelatin, 50% glycerol (v/v), pH approximately 8.0 (+4°C).	10 822 230 001	1 vial, 50 U
				10 822 248 001	1 vial, 250 U
Mae III Buffer, 2x conc.	colorless	Incubation buffer for Mae III, 2x conc.	Contains 40 mM Tris-HCl, 550 mM NaCl, 12 mM $MgCl_2$, 14 mM 2-mercaptoethanol, pH 8.2 (+55°C).	10 822 230 001	1 vial, 1 ml
				10 822 248 001	3 vials, 1 ml each

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
Mae III	colorless	Mae III	Store at −15 to −25°C. ⚠ ***Do not store below −25°C.***
Mae III Buffer, 2x conc.	colorless	Incubation buffer for Mae III, 2x conc.	Store at −15 to −25°C.

1.3. Application

Mae III recognizes the sequence /GTNAC and generates fragments with 5′-cohesive termini (Schmid K, et al, 1984).

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
2x Mae III Incubation buffer	12.5 µl
Water, PCR Grade*	Up to total volume of 25 µl
Mae III	1 U

2. Incubate at +55°C for 1 hour.

2.2. Parameters

Activity in PCR Buffer

0%
Relative activity in PCR mix (Taq DNA Polymerase buffer) is 0%. The PCR mix contained λDNA, 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

⚠ ***Use the supplied 2x special incubation buffer for Mae III since the following activities were observed with the SuRE/Cut buffer system.***

A	H	M
0 to 10%	10 to 25%	0 to 10%

Cleavage Sites

Number of cleavage sites on different DNAs

λ	Ad2	SV40	ΦX174	M13mp7	pBR322	pBR328	pUC18
156	118	14	17	25	17	18	11

Compatible Ends

Mae III generates compatible ends to BstE II.

Enzyme with compatible ends	Recognition sequence	New sequence if Mae III is ligated to enzyme with compatible ends		Enzyme that can cut this new sequence
		Mae III – Enzyme	Enzyme – Mae III	
BstE II	G/GTNACC	/GTNACC	G/GTNAC	Mae III
Mae III	**/GTNAC**	**/GTNAC**	**/GTNAC**	**Mae III**

Inactivation

There is no information available about Mae III and heat inactivation.

Isoschizomers

The enzyme is not known to have isoschizomers.

Methylation Sensitivity

The enzyme is not known to be inhibited by methylation.

Recognition Sites

GTNAC

Temperature Optimum

+55°C

Mae III has a special incubation temperature.

Unit Definition

One unit is the enzyme activity that completely cleaves 1 µg λDNA in 1 hour at +55°C in a total volume of 25 µl incubation buffer.

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 Δ5 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

- Gibson, TJ. PhD Theses. Cambridge University, U.K 1984.
- 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.
- 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.
- Greener, A. Strategies 1990;3:5.
- 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.
- 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.
- Schmid K, Thomm M, Laminet A, Laue FG, Kessler C, Stetter KO, Schmitt R. Three new restriction endonucleases MaeI, MaeII and MaeIII from Methanococcus aeolicus. Nucleic Acids Res.1984;12:2619-2628.
- 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

Editorial changes.

5.3. Ordering Information

Product	Pack Size	Cat. No.
Reagents, kits		
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
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
SuRE/Cut Buffers	SuRE/Cut Buffer A, 5 x 1 ml	11 417 959 001
	SuRE/Cut Buffer M, 5 x 1 ml	11 417 983 001
	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

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:
List of biochemical reagent products.

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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