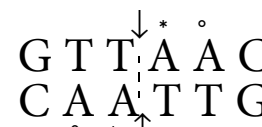


Restriction Endonuclease Hpa I

From *Haemophilus parainfluenza*

Cat. No. 10 380 385 001 100 units (3-10 U/μl)

Cat. No. 10 567 647 001 500 units (3-10 U/μl)



Version 15

Content version: June 2017

Store at -15 to -25°C

Stability/Storage	The undiluted enzyme solution is stable when stored at -15 to -25°C until the control date printed on the label. Do not store below -25°C to avoid freezing.										
Sequence specificity	<i>Hpa</i> I recognizes the sequence GTT/AAC and generates fragments with blunt ends (1).										
Compatible ends	The enzyme generates compatible ends to any blunt end.										
Isoschizomers	<i>Hpa</i> I is not known to have isoschizomers.										
Methylation sensitivity	<i>Hpa</i> I is inhibited by the presence of 6-methyladenine (*) and 5-hydroxymethylcytosine. 5-Methylcytosine does not influence the cleavage (*)										
Storage buffer	20 mM Tris-HCl, 50 mM KCl, 0.5 mM EDTA, 5 mM 2-Mercaptoethanol, 50% Glycerol (v/v), 0.01% Polydocanol, pH approx. 7.5 (at 4°C).										
Suppl. Incubation buffer, 10x	330 mM Tris-acetate, 660 mM K-acetate, 100 mM Mg-acetate, 5 mM Dithiothreitol, pH 7.9 (at 37°C), (= SuRE/Cut Buffer A)										
Activity in SuRE/Cut Buffer System	Bold face printed buffer indicates the recommended buffer for optimal activity:										
	<table border="1"> <thead> <tr> <th>A</th> <th>B</th> <th>L</th> <th>M</th> <th>H</th> </tr> </thead> <tbody> <tr> <td>100%</td> <td>25-50%</td> <td>25-50%</td> <td>50-75%</td> <td>25-50%</td> </tr> </tbody> </table>	A	B	L	M	H	100%	25-50%	25-50%	50-75%	25-50%
A	B	L	M	H							
100%	25-50%	25-50%	50-75%	25-50%							
Incubation temperature	37°C										
Unit definition	One unit is the enzyme activity that completely cleaves 1 μg λDNA in 1 h at 37°C in a total volume of 25 μl SuRE/Cut buffer A .										
Typical experiment	<table border="1"> <thead> <tr> <th>Component</th> <th>Final concentration</th> </tr> </thead> <tbody> <tr> <td>DNA</td> <td>1 μg</td> </tr> <tr> <td>10 × SuRE/Cut Buffer A</td> <td>2.5 μl</td> </tr> <tr> <td>Repurified water</td> <td>Up to a total volume of 25 μl</td> </tr> <tr> <td>Restriction enzyme</td> <td>1 unit</td> </tr> </tbody> </table> <p>Incubate at 37°C for 1 h.</p>	Component	Final concentration	DNA	1 μg	10 × SuRE/Cut Buffer A	2.5 μl	Repurified water	Up to a total volume of 25 μl	Restriction enzyme	1 unit
Component	Final concentration										
DNA	1 μg										
10 × SuRE/Cut Buffer A	2.5 μl										
Repurified water	Up to a total volume of 25 μl										
Restriction enzyme	1 unit										
Heat inactivation	<i>Hpa</i> I cannot be heat inactivated by heating to 65 °C for 15 min.										

Number of cleavage sites on different DNAs (2):

λ	Ad2	SV40	Φ X174	M13mp7	pBR322	pBR328	pUC18
14	6	4	3	0	0	0	0

Activity in PCR buffer

Relative activity in PCR mix (Taq DNA Polymerase buffer) is 100%. The PCR mix contained λ target DNA, primers, 10 mM Tris-HCl (pH 8.3, 20°C), 50 mM KCl, 1.5 mM MgCl₂, 200 μM dNTPs, 2.5 U Taq DNA polymerase. The mix was subjected to 25 amplification cycles.

Ligation and recutting assay

Hpa I fragments obtained by complete digestion of 1 μg λDNA are ligated with 1 U T4-DNA ligase (Cat. No. 10 481 220 001) in a volume of 10 μl by incubation for 16 h at 4°C in 66 mM Tris-HCl, 5 mM MgCl₂, 5 mM Dithiothreitol, 1 mM ATP, pH 7.5 (at 20°C) resulting in >80 % recovery of 1 μg λDNA × *Hpa* I fragments. Subsequent re-cutting with *Hpa* I yields > 95% of the typical pattern of λDNA × *Hpa* I fragments

Troubleshooting

A critical component is the DNA substrate. Many compounds used in the isolation of DNA such as phenol, chloroform, ethanol, SDS, high levels of NaCl, metal ions (e.g., Hg²⁺, Mn²⁺) inhibit or alter recognition specificity of many restriction enzymes. Such compounds should be removed by ethanol precipitation followed by drying, before the DNA is added to the restriction digest reaction. Appropriate mixing of the enzyme is recommended.

Quality control

Lot-specific certificates of analysis are available at www.lifescience.roche.com/certificates.

Absence of unspecific endonuclease activities

1 μg λDNA is incubated for 16 h in 50 μl SuRE/Cut buffer A with excess of *Hpa* I. The number of enzyme units which do not change the enzymespecific pattern is stated in the certificate of analysis.

Absence of exonuclease activity

Approx. 5 μg [³H] labeled calf thymus DNA are incubated with 3 μl *Hpa* I for 4 h at 37°C in a total volume of 100 μl 50 mM Tris-HCl, 10 mM MgCl₂, 1 mM Dithioerythritol, pH approx. 7.5. Under these conditions, no release of radioactivity is detectable, as stated in the certificate of analysis.

References

- 1 Garfin, D. E. & Goodman, H. M. (1974) *Biochem. Biophys. Res. Commun.* **59**, 108.
- 2 Kessler, C. & Manta V. (1990) *Gene* **92**, 1-248.
- 3 Rebase The Restriction Enzyme Database: <http://rebase.neb.com>

Ordering Information

Product	Application	Packsizes	Cat. No.
Restriction Enzymes	DNA restriction digestion	Please refer to website	
T4 DNA Ligase	Ligation of sticky- and blunt- ended DNA fragments.	100 U 500 units (1 U/μl)	10 481 220 001 10 716 359 001
SuRE/Cut Buffer Set for Restriction Enzymes	Incubation buffers A, B, L, M and H for restriction enzymes	1 ml each (10× conc. solutions)	11 082 035 001
SuRE/Cut Buffer A	Restriction enzyme incubation	5 × 1 ml (10× conc. solution)	11 417 959 001
SuRE/Cut Buffer B	Restriction enzyme incubation	5 × 1 ml (10× conc. solution)	11 417 967 001
SuRE/Cut Buffer H	Restriction enzyme incubation	5 × 1 ml (10× conc. solution)	11 417 991 001
SuRE/Cut Buffer L	Restriction enzyme incubation	5 × 1 ml (10× conc. solution)	11 417 975 001
SuRE/Cut Buffer M	Restriction enzyme incubation	5 × 1 ml (10× conc. solution)	11 417 983 001
Water, PCR Grade	Specially purified, double-distilled, deionized, and autoclaved	100 ml (4 vials of 25 ml)	03 315 843 001
		25 ml (25 vials of 1 ml)	03 315 932 001
		25 ml (1 vial of 25 ml)	03 315 959 001

Changes to previous version

Editorial changes

Trademarks

HIGH PURE and SURE/CUT are trademarks of Roche. All other product names and trademarks are the property of their respective owners.

Regulatory Disclaimer

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

Disclaimer of License

For patent license limitations for individual products please refer to: [List of biochemical reagent products](#)

Commonly used bacterial strains

Strain	Genotype
BL21	<i>E. coli</i> B F ⁻ <i>dcm ompT hsdS</i> (r _B - m _B -) <i>gal</i> (Studier, F.W. <i>et al</i> (1986) <i>J. Mol. Biol.</i> , 189 , 113.)
C600 ^e	<i>supE44 hsdR2 thi-1 thr-1 leuB6 lacY1 tonA21</i> ; (Hanahan, D. (1983) <i>J. Mol. Biol.</i> 166 , 557.)
DH5α	<i>supE44 Δ(lacU169 (φ80d/lacZΔM15) hsdR17 recA1 endA1 gyrA96 thi-1 relA1</i> ; (Hanahan, D. (1983) <i>J. Mol. Biol.</i> 166 , 557.)
HB101	<i>supE44 hsdS20 recA13 ara-14 proA2 lacY1 galK2 rpsL20 xyl-5 mtl-1</i> ; (Hanahan, D., (1983) <i>J. Mol. Biol.</i> 166 , 557.)
JM108	<i>recA1 supE44 endA1 hsdR17 gyrA96 relA1 thi Δ(lac-proAB)</i> ; (Yanisch- Perron, C. <i>et al.</i> , (1985) <i>Gene</i> 33 , 103.)
JM109	<i>recA1 supE44 endA1 hsdR17 gyrA96 relA1 thi Δ(lac-proAB) F[traD36proAB⁺, lac^q lacZΔM15]</i> ; (Yanisch- Perron, C. <i>et al.</i> , (1985) <i>Gene</i> 33 , 103.)
JM110	<i>rpsL (Str^r) thr leu thi-1 lacY galK galT ara tonA tsx dam dcm supE44 Δ(lac-proAB) F[traD36proAB⁺, lac^q lacZΔM15]</i> ; (Yanisch- Perron, C. <i>et al.</i> , (1985) <i>Gene</i> 33 , 103.)
K802	<i>supE hsdR gal metB</i> ; (Raleigh, E. <i>et al.</i> , (1986) <i>Proc.Natl. Acad.Sci USA</i> , 83, 9070.; Wood, W.B. (1966) <i>J. Mol. Biol.</i> , 16 , 118.)
SURE ^f	<i>recB recJ sbc C201 uvrC umuC::Tn5(kan^r) lac</i> , Δ(<i>hsdRMS</i>) <i>endA1 gyrA96 thi relA1 supE44 F[proAB⁺ lac^q lacZΔM15 Tn10 (tet^r)</i> ; (Greener, A. (1990) <i>Stratagies</i> , 3 , 5.)
TG1	<i>supE hsd Δ5 thi Δ(lac-proAB) F[traD36proAB⁺, lac^q lacZΔM15]</i> ; (Gibson, T.J. (1984) <i>PhD Theses. Cambridge University, U.K.</i>)
XL1-Blue ^f	<i>supE44 hsdR17 recA1 endA1 gyrA46 thi relA1 lac F[proAB⁺, lac^q lacZΔM15 Tn10 (tet^r)</i> ; (Bullock <i>et al.</i> , (1987) <i>BioTechniques</i> , 5, 376.)

Contact and Support

To ask questions, solve problems, suggest enhancements and 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.



Roche Diagnostics GmbH
Sandhofer Strasse 116
68305 Mannheim
Germany