

EXact-Cut™ ClaI Restriction Endonuclease

Catalog Number: EXNA010

Size: 500 Units

For Research Use Only. Not Intended for Diagnostic or Therapeutic Use.

EXREprotein™

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Product Details

| | | |
|--|--|---------------------------|
| Description | EXact-Cut™ ClaI Restriction Endonuclease is engineered for high specificity, reduced star activity, and time saving DNA digestion in 5-15 minutes. To simplify experimental design using multiple restriction enzymes, our entire range of EXact-Cut™ restriction endonucleases are 100% active in our EXact-Cut™ buffer (included) and are optimized for single-tube reactions along with digestion and ligation protocols. | |
| Restriction Enzyme Site | 5'...AT↓CG AT...3' 3'...TA GC↑TA...5' Isoschizomers: BspDI, BanIII, Bsa29I, BseCI, BshVI, BsiXI, Bsp106I, BspXI, Bsu15I, BsuTUI, ZhoI (Isoschizomers may have different methylation sensitivities) | |
| Unit Definition | One unit is defined as the amount of enzyme required to digest 1 µg of λ DNA in 1 hour at 37°C in a total reaction volume of 50 µL. | |
| Recommended Reaction Conditions | 1X EXact-Cut™ Buffer Incubate at 37°C Refer to Protocol for reaction setup | |
| Heat Inactivation | 1. Incubate at 80°C for 20 minutes 2. Add appropriate volume of 6X Gel Loading Dye, according to the reaction system | |
| Components | EXact-Cut™ ClaI (10 Units/µL) EXact-Cut™ 10X Buffer 6X Gel Loading Dye, Purple | 500 Units 1 mL 1 mL |

Storage and Preparation

| | |
|------------------------------|-------------------------------------|
| Shipping | Shipped on blue ice. |
| Stability and Storage | Store at -20°C for up to 24 months. |

Protocol

Protocol for Rapid DNA Digestion

1. Add the following components on ice in the indicated order:

| | Plasmid DNA | PCR Product | Genomic DNA |
|--|-------------|-------------|-------------|
| DNA | ≤ 1 µg | ≤ 0.2 µg | ≤ 5 µg |
| EXact-Cut™ 10X Buffer | 2 µL | 3 µL | 5 µL |
| ddH ₂ O, make up to final volume indicated: | 20 µL | 30 µL | 50 µL |
| EXact-Cut™ ClaI | 10 Units | 10 Units | 30-50 Units |

Note: DNA should be free of phenol, chloroform, ethanol, EDTA, detergents or high concentrations of salts. For compatibility with other common buffers, see the chart on page 2.

2. Gently mix or flick the tube to mix (do not vortex), then immediately follow with a quick spin-down in a microcentrifuge.

Protocol is continued on page 2.

Protocol (continued)

Protocol for Rapid DNA Digestion (continued)

3. Incubate at 37°C for the indicated sample type: plasmid DNA (15 minutes), PCR product (15-30 minutes), or genomic DNA (30-60 minutes)
4. Optional: inactivate the enzyme at 80°C for 20 minutes and add an appropriate amount of 6X Gel Loading Dye, according to the reaction system.

Protocol for Multiple Digestion of DNA

1. Use 10 Units of each enzyme and scale up to the reaction conditions accordingly.
2. The combined volume of the enzymes in the reaction mixture **should not** exceed **1/10** of the total reaction volume.
3. If the enzymes require different reaction temperatures, start with the enzyme requiring the lowest temperature, followed by the next enzyme(s) and incubate at the higher temperature.

Note: For total reaction volumes > 20 µL, the incubation time should be increased accordingly in a water bath.

Number of Recognition Sites in DNA

| λDNA | ΦX174 | pBR322 | pUC57 | pUC18/19 | SV40 | M13mp18/19 | Adeno2 |
|------|-------|--------|-------|----------|------|------------|--------|
| 15 | 0 | 1 | 0 | 0 | 0 | 2 | 2 |

Methylation Effects on Digestion

| Dam | Dcm | CpG | EcoKI | EcoBI |
|---------|-----------|---------|-----------|----------|
| Blocked | No effect | Blocked | No effect | Impaired |

Activity in Common Buffers

| | EXact-Cut™ Buffer | Takara QuickCut™ Buffer | Thermo Scientific FastDigest Buffer | NEB CutSmart® Buffer |
|----------|-------------------|-------------------------|-------------------------------------|----------------------|
| Activity | 100% | 100% | 100% | 100% |

Application Notes

| | |
|--|--|
| Functional Test | A 20 µL reaction in EXact-Cut Buffer containing 1 µg of λDNA (Dam) and 10 Units of EXact-Cut Clal incubated for 15 minutes at 37°C results in complete digestion as determined by agarose gel electrophoresis. |
| Digestion-Ligation Test | At the optimal reaction temperature, the DNA was digested using 10 Units of EXact-Cut Clal and the digestion product was recovered. The DNA fragments were ligated using an appropriate amount of T4 DNA Ligase at 22°C. After the ligation product was recovered, it was able to be recut with EXact-Cut Clal. |
| Non-Specific Endonuclease Activity Test | At the optimal reaction temperature, 10 Units of EXact-Cut Clal was incubated in 20 µL reaction volume in EXact-Cut Buffer with 1 µg of supercoiled plasmid DNA for 4 hours. Undigested, supercoiled plasmid DNA was detected using agarose gel electrophoresis. |
| Blue/White Screening Assay | An appropriate vector containing the <i>lacZ</i> gene was digested using 10 Units of EXact-Cut Clal. The digested product was ligated and transformed into <i>E. coli</i> cells plated on plates with X-Gal, IPTG and appropriate antibiotic. The successfully ligated <i>lacZ</i> gene expresses beta-galactosidase and gives rise to a blue colony, while an interrupted gene (due to degraded DNA end) gives rise to a white colony. Less than 1% white colonies were observed. |