

## Product Information

### Monoclonal Anti-Thymine Dimer, Clone H3 produced in mouse, purified immunoglobulin

Catalog Number **T1192**

#### Product Description

Monoclonal Anti-Thymine Dimer (mouse IgG1 isotype) is derived from the H3 hybridoma produced by the fusion of mouse myeloma cells and splenocytes from a BALB/c mouse immunized with a tetra nucleotide containing cyclobutane thymine dimer (GTTG) conjugated to chicken  $\gamma$ -globulin.<sup>1</sup> The isotype is determined using Mouse Monoclonal Antibody Isotyping Reagents, Catalog Number ISO2.

Monoclonal Anti-Thymine Dimer reacts specifically with the (5'-6') cyclobutane type of homothymine or thymine-cytosine heterodimers.<sup>1,2</sup> The antibody reacts with thymine dimers in single-stranded DNA, and has a lower affinity for the dimer in short oligonucleotides (a tail of minimum 10-20 thymine residues is required for efficient labeling of oligonucleotide probes).<sup>1</sup> The product enables a sensitive and non-radioactive method for the labeling, detection, and quantification of DNA fragments using ELISA<sup>1</sup>, competitive ELISA<sup>1</sup>, immunocytochemistry (laser-scan microscopy)<sup>1</sup> and Southern immunoblotting.<sup>2</sup>

Non-radioactive labeling of DNA is typically based on the enzymatic incorporation of modified nucleotides, carrying a small chemical moiety such as biotin, digoxigenin or fluorescein. These tags are subsequently detected by specific reagents such as streptavidin or a specific antibody coupled to a signal-producing enzyme.<sup>2</sup> Although very efficient and reliable, labeling by *in vitro* polymerization is time-consuming, expensive, and may require various post-label purification steps to remove an excess of unincorporated precursors. An alternative strategy for DNA labeling, is based on the UV-induced formation of cyclobutane thymine dimers.<sup>1-3</sup> Several methods have been described for the detection of thymine dimers, which are based on chromatographic analysis, and on biochemical analysis with endonucleases specific for UV-irradiated DNA. In addition, methods utilizing antibodies specific for pyrimidine dimers and other UV-induced DNA lesions have evolved, which permit the study of the induction and repair of these lesions without the requirement of *in vivo* radiolabeling of DNA. Photoimmunodetection, is a rapid, reliable and low-cost supplement to existing methods for nonradioactive DNA labeling. It enables a

sensitive and non-radioactive method for labeling, detection, and quantification of high molecular weight (HMW) DNA fragments. The method is based on the introduction of thymine dimers into DNA after separation by pulse field gel electrophoresis (PFGE), followed by detection with thymine dimer specific antibodies. The method does not require any enzymatic or chemical manipulation of the DNA sample. Monoclonal antibodies reacting specifically with thymine dimer facilitate investigations on the apoptotic process and the role of UV-induced pyrimidine dimers in the process of photocarcinogenesis.<sup>1</sup>

#### Reagents

Supplied as a solution in 0.01M phosphate buffered saline, pH 7.4, containing 15 mM sodium azide.

Antibody concentration: ~2 mg/mL

#### Precautions and Disclaimer

This product is for R&D use only, not for drug, household, or other uses. Please consult the Material Safety Data Sheet for information regarding hazards and safe handling practices.

#### Storage/Stability

For continuous use, the product may be stored at 2-8 °C for up to one month. For extended storage, freeze in working aliquots at -20 °C. Repeated freezing and thawing, or storage in "frost-free" freezers, is not recommended. If slight turbidity occurs upon prolonged storage, clarify the solution by centrifugation before use. Working dilution samples should be discarded if not used within 12 hours.

#### Product Profile

A working antibody concentration of 0.5-1  $\mu$ g/mL is determined by indirect dot blot.

**Note:** In order to obtain best results in different techniques and preparations we recommend determining optimal working concentration by titration.

## References

1. Roza, L., et al., Detection of Cyclobutane Thymine Dimers in DNA of Human Cells with Monoclonal Antibodies Raised Against a Thymine Dimer-Containing Tetranucleotide, *Photochem. Photobiol.*, **48**, 627-633 (1988).
2. Marvik, O.J., et al., Photodetection: A Nonradioactive Labeling and Detection Method for DNA, *BioTechniques*, **23**, 892-896 (1997).
3. Patric, M.H., and Rahn, R.O., In: *Photochemistry and Photobiology of Nucleic Acids* (Wang, S.Y., ed.), Vol. II, Biology, pp. 35-95, Academic Press, New York (1976).

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