

## Product Information

### Monoclonal Anti-S-100 ( $\beta$ -Subunit), clone SH-B4

produced in mouse, ascites fluid

Catalog Number **S2657**

#### Product Description

Monoclonal Anti-S-100 ( $\beta$ -Subunit) (mouse IgG1 isotype) is derived from the SH-B4 hybridoma produced by the fusion of mouse myeloma cells and splenocytes from immunized BALB/c mice. Purified bovine brain S-100b preparation was used as immunogen. The isotype is determined by a double diffusion immunoassay using Mouse Monoclonal Antibody Isotyping Reagents, Catalog Number ISO2.

Monoclonal Anti-S-100 ( $\beta$ -Subunit) recognizes an epitope located on the  $\beta$  chain (i.e., in S-100a and S-100b), but not on the  $\alpha$  chain of S-100 (i.e., in S-100a and S-100ao). It is reactive in immunohistochemical techniques. Cross-reactivity has been observed with S-100 of human, bovine, rabbit, goat, sheep, pig, dog, cat, and rat. The product does not react with other members of the EF-hand family, such as calmodulin, parvalbumin, intestinal calcium-binding protein and myosin light chain. The product is useful in immunohistochemical staining of normal and neoplastic S-100  $\beta$ -subunit-containing cells (e.g., glial cells, Schwann cells, chondrocytes, melanocytes, and melanotic tumors) in protease-digested, formalin-fixed, paraffin-embedded tissues.

S-100 is a set of small, thermolabile, highly acidic dimer proteins, of ~20 kDa, widely distributed in different tissues.<sup>1</sup> Dimeric combinations of two chains; the  $\alpha$  chain (93 a.a., 10.4 kDa) and the  $\beta$  chain (91 a.a., 10.5 kDa), form the three known subtypes of S-100 [S-100ao ( $\alpha\alpha$ ), S-100a ( $\alpha\beta$ ) and S-100b ( $\beta\beta$ )]. Although there is slight variation in the primary structure in different species, the S-100 molecule is markedly conserved in the amino acid sequence, and the protein extracted from different organs of the same species is identical. The  $\alpha$  and  $\beta$  chains are 58% homologous (54 a.a.) and both have divalent-cation binding sites situated toward the carboxy terminus and apparently similar functional features.

S-100 can be grouped with other calcium binding proteins, to which it has a significant sequence homology, particularly around the calcium-binding domain, such as calmodulin, parvalbumin, intestinal calcium-binding protein, myosin light chain, and troponin-C. Hence, S-100 is a calcium-modulated protein<sup>2</sup> that binds calcium and zinc ions reversibly at physiologic pH and ionic strength, followed by a conformational change in the molecule.<sup>3</sup>

S-100 is considered to be a cell-growth regulator, but other functions have been suggested, e.g., increasing the membrane permeability to cations under physiologic conditions, stimulation of nucleolar RNA polymerase activity, interaction with the tumor suppressor protein p53 and as a carrier of proteins and free fatty acids in adipocytes.

Human S-100-containing cells are subdivided in three groups; S-100b-containing cells (such as Schwann cells, pituicytes of the neurohypophysis, Langerhan's cells, and interdigitating cells), S-100a-containing cells (such as glial cells and melanocytes) and S-100ao-containing cells (such as neurons, ganglion cells, slow skeletal muscle cells, cardiac cells, monocytes and some macrophages).<sup>4</sup>

Although the tissue distribution of S-100 is too broad to conform to a single histogenetic pattern, it is sufficiently restricted that the localization of this protein is useful in the differential diagnosis of neoplasms and proliferative processes. Monoclonal antibody reacting specifically with the  $\beta$ -subunit of S-100 may be used to distinguish malignant melanoma from undifferentiated carcinoma or lymphoma, and to distinguish leiomyomas from schwannomas and their counterparts in the gastrointestinal tract.<sup>1,4,5</sup>

Monoclonal Anti-S-100 ( $\beta$ -subunit) may be used for the detection and localization of S-100a and S-100b in various immunochemical assays including ELISA, immunoblotting, and immunohistochemistry.

### Reagents

Supplied as ascites fluid with 0.1% sodium azide as a preservative.

### 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, store at 2-8 °C for up to one month. For extended storage freeze in working aliquots. 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.

### Product Profile

Immunohistochemistry: an antibody titer of 1:100 was determined using protease-digested, formalin-fixed, paraffin-embedded sections of human tongue.

**Note:** In order to obtain best results, it is recommended that each user determine the optimal working dilution for individual applications by titration assay.

### References

1. Barwick, K., In: *Atlas of Diagnostic Immunohistopathology*, True, L. (ed.), Chapter 12, J.B. Lippincott Comp., Philadelphia, 1990).
2. Baudier, J., et al., *J. Biol. Chem.*, **261**, 8192 (1986).
3. Mani, R. S., et al., *Biochemistry*, **21**, 2607 (1982).
4. Takahashi, K., et al., *Virchows Arch. B Cell Pathol. Incl. Mol. Pathol.*, **45**, 385 (1984).
5. Kan-Mitchell, J., et al., *Invest. Ophthalm. Vis. Sci.*, **31**, 1492 (1990).

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