Brain S100 Proteins

S100 proteins constitute a family of about 20 calcium-binding proteins. These small proteins (10-12 kDa) have 20-50% homology of amino acid sequences but differ by origin and functions and may serve as markers of different pathological states.

In brain tissue S100 proteins are represented mainly by S100BB homodimer and S100A1B heterodimer of approximately 21 kDa. They are synthesized in astroglial cells and can be used as sensitive and reliable markers for central nervous system damage. Structural damage of glial cells causes leakage of S100 protein into the extracellular matrix and cerebrospinal fluid, further releasing into the bloodstream. S100 protein appears to be a promising marker for the severity of brain injury and neuronal damage. There is a good correlation between S100 concentration in patients' serum samples and outcome following traumatic and ischemic brain injury. Measurements of S100 protein could prove to be very useful in the diagnosis and prognosis of clinical outcome in acute stroke and the estimation of the ischemic brain damage during cardiac surgery. Elevated serum levels of S100 correlate with duration of circulatory arrest.

Human brain S100 proteins

S100 proteins are purified from human brain tissue by several chromatographic methods including gel-filtration and ion-exchange chromatography. After native gel electrophoresis by Ornstein-Davis the protein is presented by two bands that correspond to A1B and BB forms (Fig. 1).

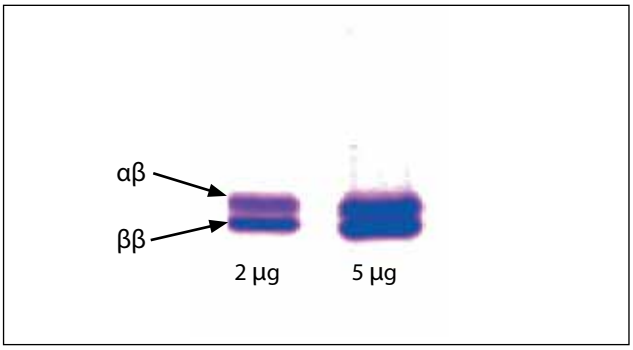

Figure 1. Native gel electrophoresis of S100 proteins (by Ornstein – Davis).
Antigen loaded:
Lane 1: 2 µg
Lane 2: 5 µg
Gel staining: Coomassie brilliant blue R-250

Monoclonal antibodies specific to S100

Sandwich immunoassay

The best combinations of MAbs for sandwich immunoassay:

8B10cc – 6G1cc (Fig. 2)
3B10 – 6G1cc

MAbs 8B10cc, 3B10 and especially 6G1cc are sensitive to EDTA or other bivalent-binding agents. Better performance can be obtained in presence of 5 mM $CaCl_2$ in the assay buffers.

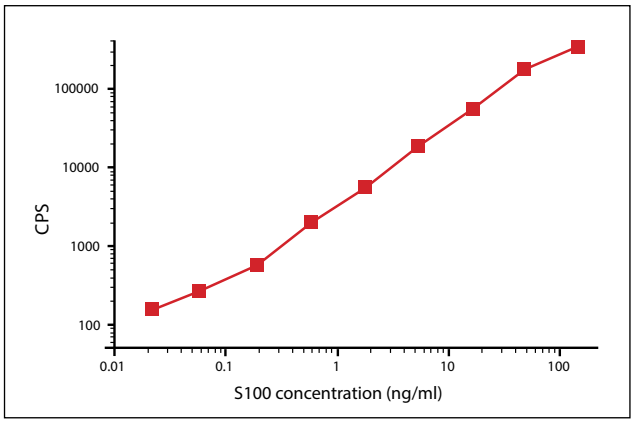

Figure 2. S100 calibration curve. One step assay in streptavidin coated plates.
Capture MAb: 8B10 (biotinylated), 200 ng/well
Detection MAb: 6G1 (Eu-labeled), 200 ng/well
Antigen: S100 proteins from human brain
Incubation time: 20 minutes
Temperature: 20°C

Western blotting

All anti-S100 anitbodies are working in Western blotting. MAbs 8B10cc, 6G1cc and 4B3 are specific to S100BB and S100A1B. MAb 3B10 is specific to S100BB.

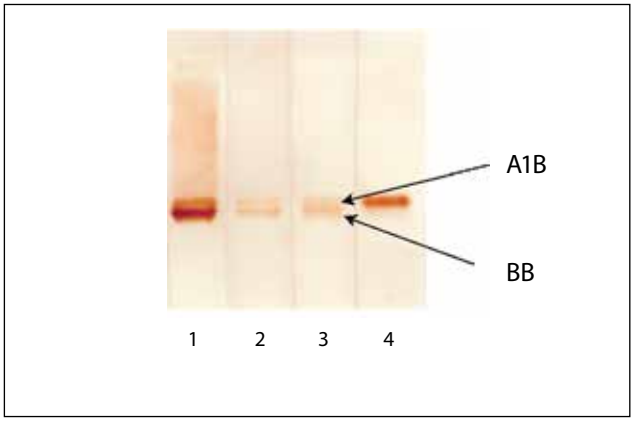

Figure 3. Interaction of monoclonal antibodies with S100 proteins from human brain in Western blotting (after native gel electrophoresis by Ornstein – Davis).
Antigen loaded: 1µg
Lane 1: MAb 4B3
Lane 2: MAb 8B10
Lane 3: MAb 6G1
Lane 4: MAb 3B10

Ordering information

MONOCLONAL ANTIBODIES

Product name	Cat. #	MAb	Subclass	Remarks
S100 proteins, human	4S37	8B10cc	IgG1	*In vitro*, EIA, WB, S100A1B and S100BB
		6G1cc	IgG1	*In vitro*, EIA, WB, S100A1B and S100BB
		3B10	IgG2a	EIA, WB, S100BB
		4B3	IgG2a	WB, S100A1B and S100BB

ANTIGEN

Product name	Cat. #	Purity	Source
S100BB homodimer and S100A1B heterodimer, human	8S9h	>95%	Human brain
S100BB homodimer and S100A1B heterodimer, bovine	8S9b	>95%	Bovine brain
S100BB homodimer, human	8S9-2h	>95%	Human brain
S100BB homodimer, bovine	8S9-2b	>95%	Bovine brain

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