

# S-100B Protein, Serum

## FOR PROGNOSIS AND TREATMENT MONITORING OF PATIENTS WITH MALIGNANT MELANOMA

### Test Highlights

- Concentrations of serum S-100B correlate with stage of disease.
- An increased concentration of S-100B in serum is associated with decreased disease-free and overall survival.
- Rising concentrations of serum S-100B indicate disease progression.
- Serum concentrations of S-100B increase with disease progression and decrease with disease remission.

### Disease Overview

- Malignant melanoma, a cancer of melanocytes, is a rare but serious form of skin cancer and is responsible for the greatest number of skin cancer-related deaths worldwide.
- Risk factors include extensive and repeated exposure to the sun and ultraviolet light, as well as the timing and pattern of sun exposure. A new or changing skin mole is a common warning sign of melanoma.
- The ABCD guideline refers to a system of criteria for identifying a potential melanoma, which includes asymmetry of the lesion, border irregularity, color variation, and diameter greater than six millimeters. Melanomas are aggressive cancers with unpredictable patterns of metastases. Prognostic factors include tumor thickness and the presence of metastatic disease.

### Epidemiology

The incidence of malignant melanoma has tripled over the last 20 years and occurs more frequently in Caucasians. Each year in the United States approximately 60,000 people are diagnosed with malignant melanoma, and 8,100 deaths occur due to the disease. Melanoma is rare in children.

### Pathophysiology

- S-100B is a member of the S-100 family of calcium-binding proteins involved in signal transduction. S-100B is found in glial cells of the nervous system, melanocytes, adipocytes, and chondrocytes. It can be present as a monomer but is most often present as a homodimer (S-100BB) or a heterodimer with S-100A1 (S-100AB).
- Because melanoma cells over express S-100B, its presence is often used in the histopathological differential diagnosis of melanoma and is an appropriate serum marker for managing the disease. S-100B is normally not detectable in serum.

### Indications for Ordering

- Determining prognosis in patients with malignant melanoma.
- Monitoring treatment of malignant melanoma.

### Interpretation

- A reference interval study was conducted by ARUP using serum samples collected from 150 healthy volunteers (75 males, 75 females, age 19–60 years). Non-parametric analysis revealed an upper limit of 96 ng/L at the 97.5th percentile.
- In 1,007 patients with stage I to III melanoma, a serum S-100B >0.1 µg/L (>100 ng/L) after resection was associated with decreased five-year survival in all patients (51 vs. 91 percent in those with a concentration of ≤0.1 µg/L [≤100 ng/L]), and in those with stage II to III disease (6 vs. 30 percent).
- In 53 patients with stage IV melanoma, a significant decrease in serum S-100B was observed in those with responsive (0.39 to 0.13 µg/L [390–130 ng/L]) or stable disease (0.47 to 0.23 µg/L [470–230 ng/L]). Patients with disease progression demonstrated an insignificant decrease (1.70 to 1.37 µg/L [1700–1370 ng/L]).

### Limitations

S-100B is not specific for malignant melanoma. Increase serum concentrations are found in patients with liver and renal injury, inflammation, infection, and brain injury.

### Methodology

S-100B is measured using a commercially available two-site, one-step enzyme linked immunosorbent assay (CanAg S100, CanAg Diagnostics AB, Sweden). This assay utilizes monoclonal antibodies to S-100B and will detect both S-100BB and S-100AB. It shows no cross-reactivity to other S-100 proteins.

### References

1. Harpiro R, Einarsson R. S100 proteins as cancer biomarkers with focus on S100B in malignant melanoma. *Clin Biochem* 2004;37:512–8.
2. Mårtensson ED, et al. Serum S-100B protein as a prognostic marker in malignant cutaneous melanoma. *J Clin Oncol* 2001;19:824–31.
3. Hamberg AP, et al. Serum S100B is suitable for prediction and monitoring of response to chemoimmunotherapy in metastatic malignant melanoma. *Melanoma Res* 2003;13:45–9.

## Test Information

**2001766**

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For specific collection, transport, and testing information, refer to the ARUP Web site at [www.aruplab.com](http://www.aruplab.com).

For information on test selection, ordering, and interpretation, refer to ARUP Consult® at [www.arupconsult.com](http://www.arupconsult.com).