

Technical Bulletin

Immunohistochemical evaluation of Benign and Metastatic Melanoma - A panel of the novel antibodies of HMB45, MART-1 and Tyrosinase.

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Malignant melanoma is one of the deadliest forms of cancer that develops in melanocytes, the pigment cells present in the skin. Melanoma may spread rapidly to other parts of the body (metastasize) and cause severe illness and death. About 50,000 new cases of melanoma are diagnosed in the United States every year. Different types of malignant melanomas include: primary lesions, distant metastasis, rhabdoid, sarcomatoid, desmoplastic, neurotropic and myxoid subtypes.

Melanomas are linked with the development of functional heterogeneity, thus shown to express multiple antigenic targets. Recently several antibodies have been developed which are known to distinguish phenotypic differentiation of all types of benign and malignant melanoma.

Pan Melanoma Cocktail (HMB45, MART-1 and Tyrosinase) - A preferred diagnostic tool of metastatic melanoma.

Tyrosinase and MART-1 are known to be co-expressed in the majority of melanomas. So far, studies have not shown cases where HMB45 was positive but negative for both MART-1 and Tyrosinase. Therefore the combination of HMB45, MART-1, and Tyrosinase make this cocktail more sensitive and also a valuable diagnostic tool for metastatic melanoma.

Various Markers for Melanoma – available as individual products.

The MART-1 / Melan A - a protein of 18 kDa, known as MART-1 (Melanoma Antigen Recognized by T-cells 1) is recognized in a sub-cellular fraction in melanosomes. This antibody identifies melanomas and tumors showing melanocytic differentiation. Both HMB45 and MART-1 are co-expressed in the majority of melanomas. However, recent studies have shown that MART-1 is more sensitive marker than HMB45 when identifying metastatic melanomas.

Tyrosinase is a key enzyme involved in the initial stages of melanin biosynthesis. Some studies have distinctly elucidated Tyrosinase to be a more sensitive marker when compared to HMB45 and MART-1. Tyrosinase has also been reported to identify a higher percentage of desmoplastic melanomas than HMB45. Other studies have shown tyrosinase to be a more superior melanoma marker when compared to HMB45 as it does not cross react with other tumors or normal tissues.

HMB45 antibody is considered to be an identifier to the majority of melanomas hence it is most frequently used in clinical practice. HMB45 specifically recognizes a 100 kDa protein existing in pre-stage and early-stage melanosome and melanomas. The expression of the HMB45 antigen designates active melanosome formation and consequently melanocytic differentiation. The HMB45 reactive antigen is present in cutaneous melanocytes, prenatal and infantile retinal pigment epithelium (RPE), and melanoma cells.

S-100 protein has been used for many years in the diagnosis of malignant melanoma. This protein is expressed in almost all human benign and malignant melanocytic tumors of the skin and in metastases of human malignant melanomas. S-100 protein is frequently altered in many human tumors including melanoma which are often associated with tumor progression. S-100 protein is a potential tumor biomarker in staging malignant melanoma, in establishing prognosis, as well as in evaluating treatment success and also in predicting tumor relapse.

References:

Mahmood MN, Lee MW, Linden MD, Nathanson,SD, Hornyak TJ, Zarbo RJ. Diagnostic Value of HMB-45 and Anti-Melan a Staining of Sentinel Lymph Nodes with Isolated Positive Cells. Modern Pathology 2002;15(12):1288–1293.

Orchard GE. Melan A (MART-1): A new monoclonal antibody for malignant melanoma diagnosis. Br J Biomed Sci. 1998;55:9.

Jungbluth AA. T311-An anti-tyrosinase monoclonal antibody for the detection of melanocytic lesions in paraffin embedded tissues. Pathol Res Pract. 2000;196:235-242.

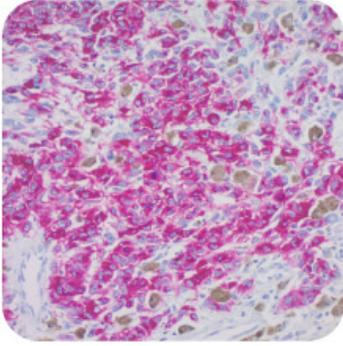
Orchard GE. Comparison of immunohistochemical labelling of melanocyte differentiation antibodies melan-A, tyrosinase and HMB45 with NKIC3 and S100 protein in the evaluation of benign nevi and malignant melanoma. Histochem J. 2000;32:475-481.

Products

Continuing with our firm belief that high quality reagents can be produced and delivered at reasonable pricing. ScyTek Laboratories offers the following panel of markers for Melanoma. Each item is available in both Ready-To-Use and Concentrated format. All have undergone extensive testing to provide consistent, high intensity results with virtually no lot-to-lot variability.

Catalog Number	Description	Clone
A00019	Melanoma	HMB45
A00087	S-100	4C4.9
A00115	MART-1	M2-7C10
A00116	MART-1	M2-9E3
A00132	Tyrosinase	T311
A00133	MART-1 Cocktail	M2-7C10 & M2-9E3
A00134	Melanoma, Pan	HMB45, M2-7C10, M2-9E3, & T311

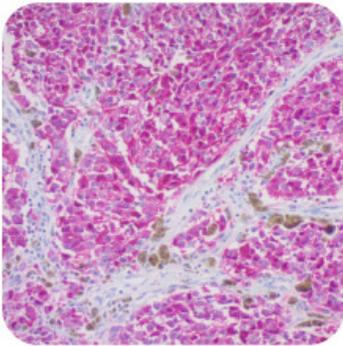
Product Reference Images



Antibody A00019

Melanoma; Clone HMB45

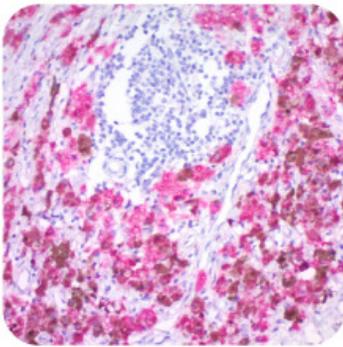
HMB45 is a mouse monoclonal antibody that reacts against an antigen present in melanocytic tumors such as melanomas.



Antibody A00087

S-100; Clone 4C4.9

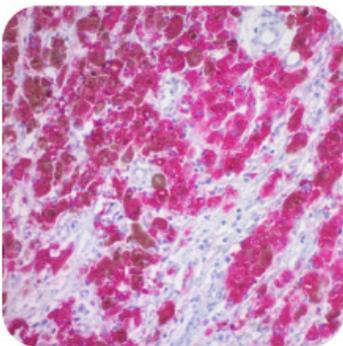
Antibody to S100 stains Schwannomas, ependyomas, astroglomas, almost all benign and malignant melanomas and their metastases.



Antibody A00115

MART-1; Clone M2-7C10

The MART-1 epitope recognized by this antibody appears to be different from that recognized by the M2-9E3 MART-1 antibody clone.

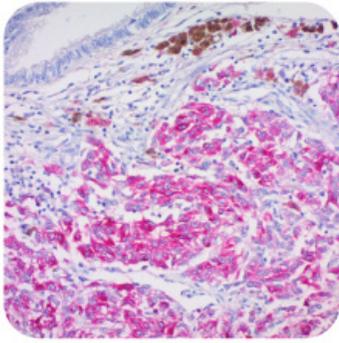


Antibody A00116

MART-1; Clone M2-9E3

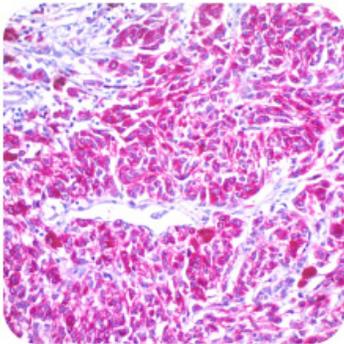
It may be useful to use both the A00115 and A00116 antibodies in parallel to obtain additional information about MART-1 expression.





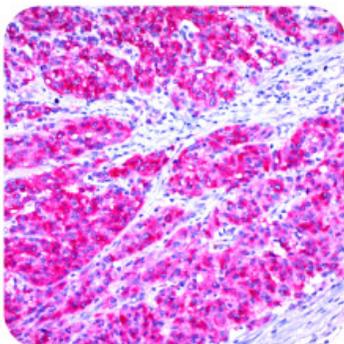
Antibody A00132
Tyrosinase; Clone T311

Tyrosinase (Tyr) is a trans-membrane glycoprotein, plays a key role in the melano synthetic pathway and is required for the synthesis of both types of melanin, eumelanin and pheomelanin.



Antibody A00133
MART-1; Clones M2-7C10 & M2-9E3

MART-1 epitope recognized by antibody to clone M2-9E3 appears to be different from that recognized by the MART-1 antibody clone M2-7C10. Hence, it may be useful to use both antibodies in combination in the differential diagnosis of melanocytic tumors.



Antibody A00134
Melanoma; Pan

Both Tyrosinase and MART-1 are known to be co-expressed in the majority of melanomas. Therefore, the combination of HMB45, MART-1 and Tyrosinase make this cocktail a valuable marker for metastatic melanoma in sentinel lymph nodes.

NOTE: Due to visual similarity of pigmented melanocytes to DAB chromogen it is often advisable to use an alternative such as Permanent Red Chromogen with Alkaline Phosphatase (as shown in photographs).

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