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CD56 (MRQ-42)

A novel CD56 rabbit clone showing increased staining intensity and sensitivity in hematolymphoid and neuroendocrine tissue

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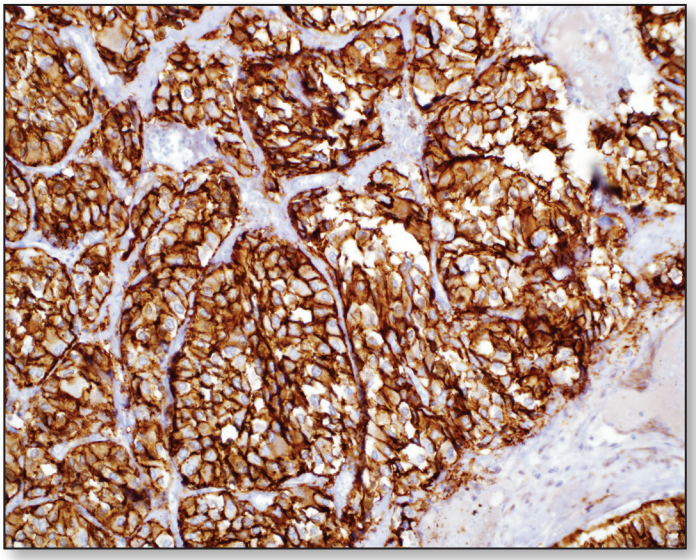
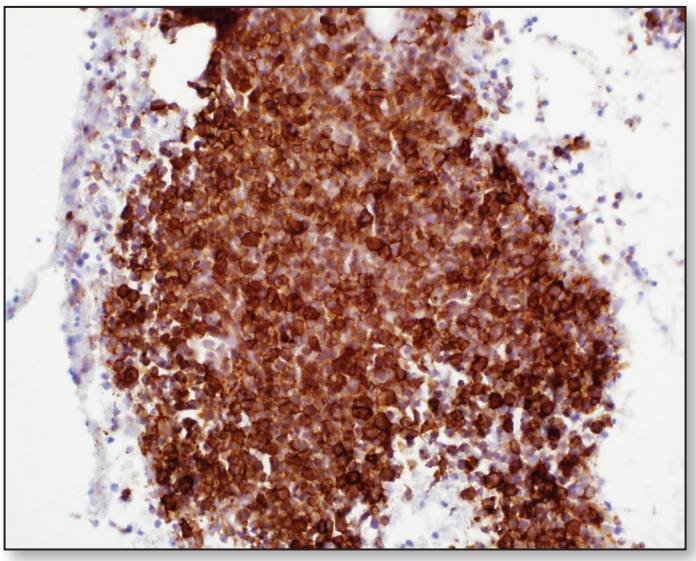
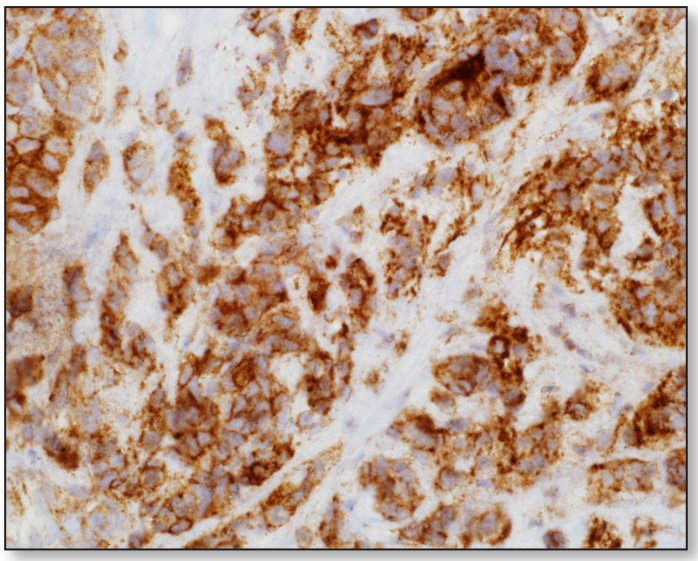


Abstract

CD56, also known as neural cell adhesion molecule, is a commonly utilized marker for neuroendocrine tumors, small cell lung carcinomas, and plasma cell myelomas. Another widely used application for CD56 is detecting natural killer cells and NK cell lymphoproliferative disorders. Established mouse monoclonal CD56 clones have historically shown variable or weak staining in certain applications, particularly the NK cell labeling in both benign tissue and NK/T-cell lymphoma. Cell Marque has developed a novel rabbit monoclonal CD56 antibody, clone MRQ-42, which has been tested in parallel, both internally and externally, with various other clones of CD56 such as 123C3, 1B6, and 56C04. The findings of these comparisons are presented here.





Top left: *Pancreatic neuroendocrine tumor cells are strongly stained with CD56.* **Bottom left:** *NK/T-cell lymphoma is immunoreactive for CD56.*
Bottom right: *Small cell lung carcinoma shows membranous/cytoplasmic staining with CD56.*

"MRQ-42 showed significant improvement in staining of tumors that express weakly or negligibly with the 123C3, 1B6, and 56C04 clones."

Introduction

CD56, known as neural cell adhesion molecule, was originally identified in the nervous system and belongs to a group of cell adhesion molecules including cadherins, selectins, and integrins. CD56 expression in neuroendocrine tumors, myelomas, and NK/T-cell lymphomas historically has varied among the different clones in terms of sensitivity and staining intensity. We report here a comparison of various clones of CD56 to find the relative performances when applied to small cell lung carcinoma, pancreatic neuroendocrine tumor, and NK/T-cell lymphoma.

Materials and Methods

Tissues of small cell lung carcinoma, plasma cell myeloma, and NK/T-cell lymphoma were fixed in 10% formalin, embedded in paraffin and cut into 4 µm sections, which were then immunostained. The tumor diagnoses had been previously confirmed by H&E as well as supportive immunohistochemistry. Immunohistochemical studies were performed on formalin-fixed, paraffin-embedded sections and Ventana® Benchmark®* was used for IHC stains. Protocols used were according to manufacturer's recommendations (Table 1).

Results

In all tested CD56-expressing tumors, the MRQ-42 clone exhibited the strongest staining with the shortest protocol of the tested clones. MRQ-42 exhibited intense staining of tumor cells, compared with light to moderate staining of tumor cells by clones 123C3, 1B6, and 56C04.

NordiQC Assessment

In this test, under the above mentioned test parameters, the best result was obtained with a protocol for the rmAb clone MRQ-42, CD56 based on a titer of 1:2000, 32 min. incubation time, standard CC1 and *ultra*View™ as the detection system.

With this protocol the rmAb clone MRQ-42 gave a different reaction profile compared to the profile obtained with the reference mAb clone 56C04.

First of all, the reaction obtained with the clone MRQ-42 was stronger and more distinct in structures with a low antigen expression (ie NK-cells) but also more intense in structures with a high antigen expression (ie peripheral nerves). The rmAb clone MRQ-42 also demonstrated weak to moderate staining in many endothelial cells as in placenta, tonsils and in the liver sinusoids, a weak to moderate staining in smooth muscle cells both in vessels and in tunica muscularis in the appendix, and finally a moderate reaction was observed in scattered epithelial cells of the collecting tubules in the kidney.

Virtually all normal plasma cells were negative (tonsils, appendix & bone marrow), whereas 2/2 plasma cell myelomas were strongly positive for CD56 indicating that the improved sensitivity did not affect the reaction pattern for CD56 in plasma cell diseases (normal plasma cells CD56 negative, myeloma cells CD56 positive).

No background or unspecific reaction was seen.

Conclusion

Our results, along with NordiQC's independent assessment data, indicate that MRQ-42 is a very sensitive and specific marker for CD56-expressing neoplasms such as neuroendocrine tumors, plasma cell myelomas, and small cell lung carcinomas. MRQ-42 showed significant improvement in staining of tumors that express weakly or negligibly with the 123C3, 1B6, and 56C04 clones.

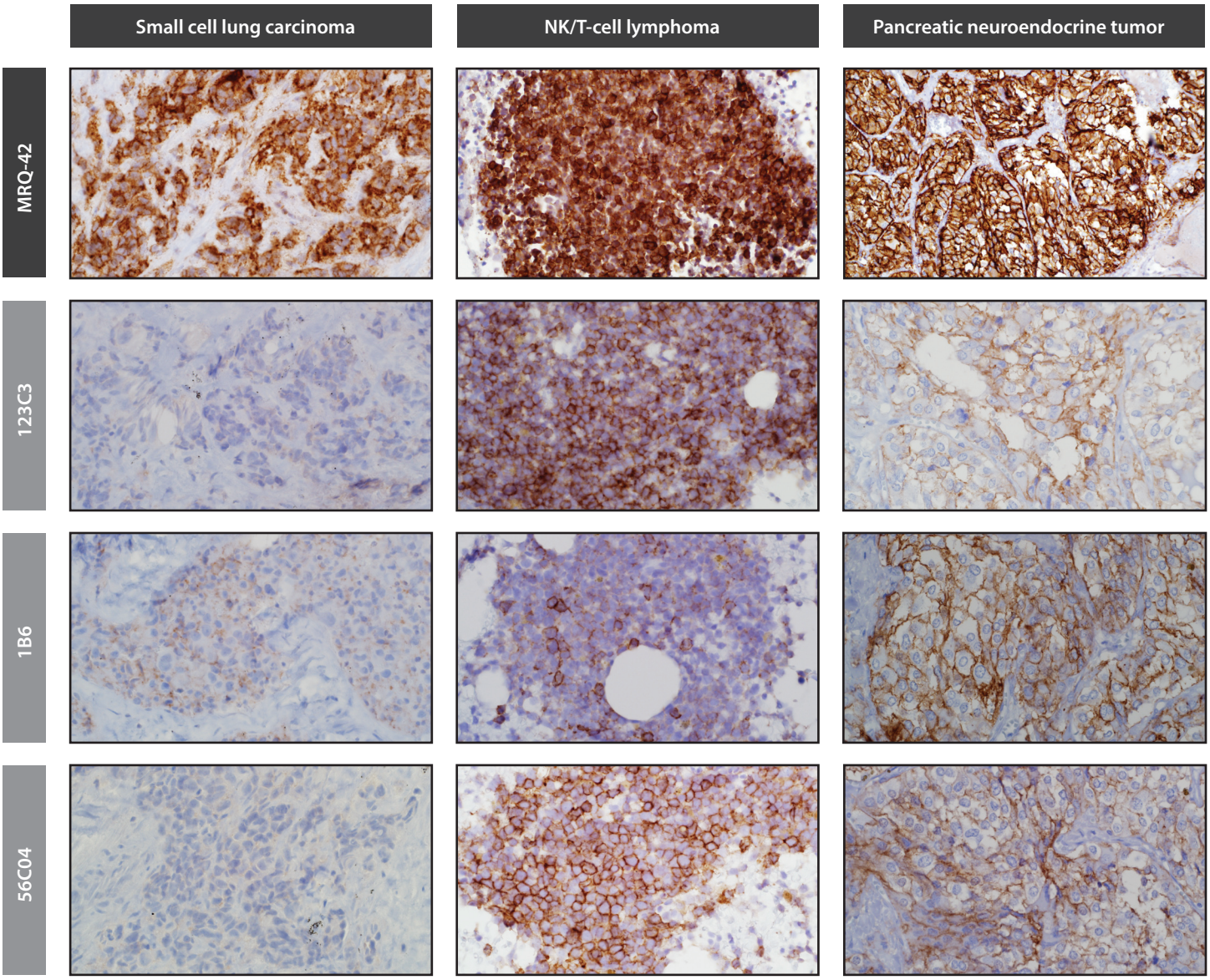
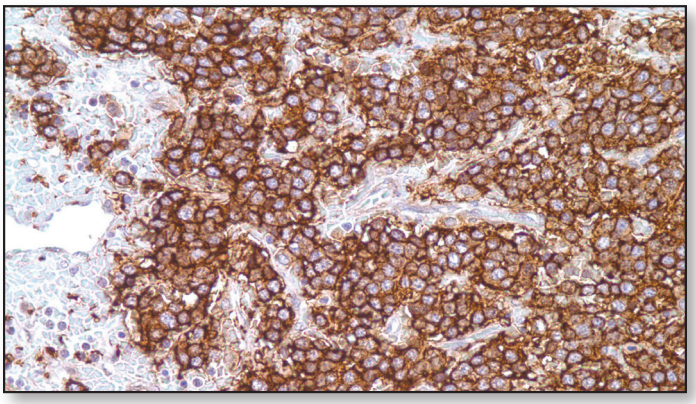


Table 1: Pretreatment and Dilution of Four Clones of CD56

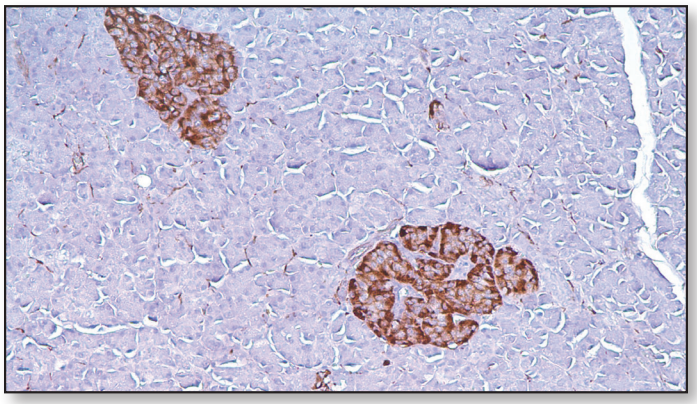
Clone	Supplier	Dilution	Protocol
MRQ-42	Cell Marque	predilute	CC1 Mild, 32 minute incubation at 37 degrees, *ultra*View™ detection
123C3	Invitrogen	1:50	CC2 Standard, 60 minute incubation at room temperature, *ultra*View™ detection
1B6	Leica	1:50	CC2 Standard, 60 minute incubation at room temperature, *ultra*View™ detection
56C04	DAKO	1:100	CC2 Standard, 30 minute incubation at room temperature, *ultra*View™ detection

"Although the numbers are small, the new rmAb clone MRQ-42 from Cell Marque looks promising… All of 5 laboratories produced a sufficient staining with the rmAb clone MRQ-42 on the Ventana® BenchMark® platform."*

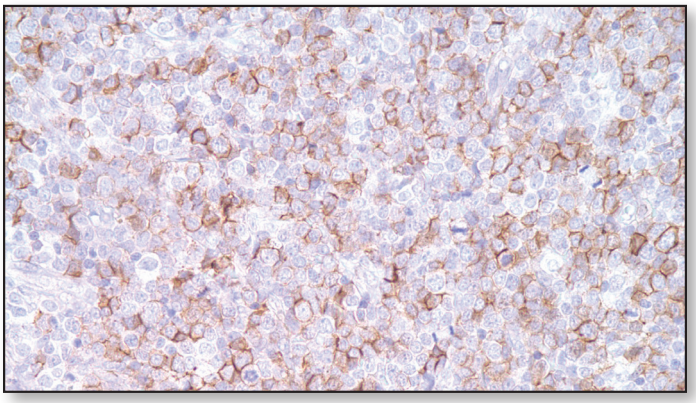
—NordiQC, http://www.nordiqc.org/Run-31-G1/Assessment/assessment-31-CD56.htm



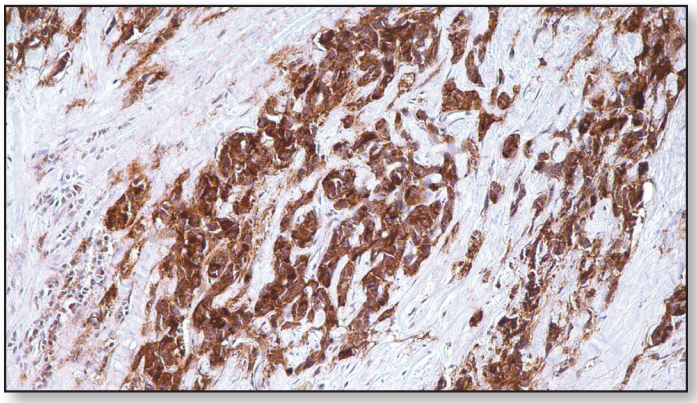
Neuroblastoma strongly expresses CD56 protein.



Pancreatic islet cells show CD56 staining.



NK/T-cell lymphoma cells are positive for CD56.



Small cell lung carcinoma shows membranous and cytoplasmic staining with CD56 antibody (MRQ-42).

CD56 (MRQ-42) Ordering Information:

0.1 ml, concentrate	156R-94
0.5 ml, concentrate	156R-95
1 ml, concentrate	156R-96
1 ml, predilute	156R-97
7 ml, predilute	156R-98
Positive control slides	156S

Rev. 0.1

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