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Immunohistochemical Comparison of Napsin A Monoclonal Antibodies Used for Identification of Lung Carcinomas

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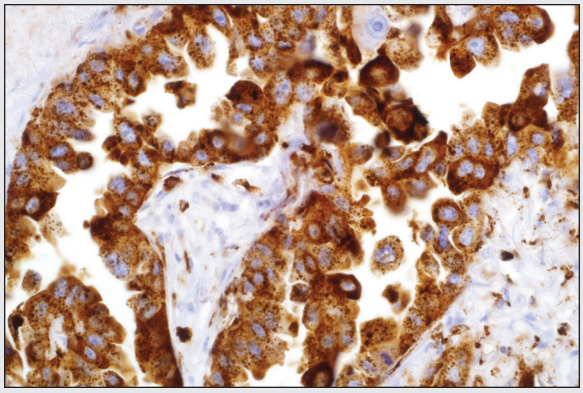

Fig 1. *Napsin A clone MRQ-60 strongly and diffusely stains cytoplasm of lung adenocarcinoma (400x).*

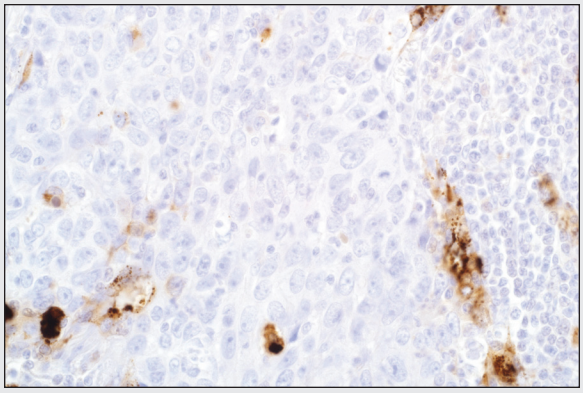

Fig 2. *Napsin A clone MRQ-60 is negative for lung squamous carcinoma. Note napsin A positive alveoli are entrapped in tumor cells (400x).*

Introduction

Napsin A is an enzyme of the aspartic protease family that is expressed in type II cells of the lung and thought to be involved in the processing of surfactant protein B. Antibodies raised against napsin A have recently emerged as a valuable diagnostic immunohistochemical (IHC) marker for lung carcinomas. Even though, several monoclonal antibodies are commercially available there have been few studies comparing their usefulness in the clinical detection of lung carcinomas. There is a recent study comparing monoclonal and polyclonal napsin A antibodies for the detection of lung carcinomas.[1] However, this study compared only one monoclonal and one polyclonal napsin A antibody, thereby limiting the comparison of what is commercially available. We have conducted a broader study that compares five napsin A monoclonal antibodies for the identification of lung carcinomas.

Design

Five commercially available monoclonal anti-napsin A antibodies, clones MRQ-60 (mouse), IP64 (mouse), EP205 (rabbit), KCG1.1 (mouse), and TMU-Ad02 (mouse), were evaluated by IHC. Whole slide surgical specimens of 22 cases of lung adenocarcinoma and 24 cases of lung squamous carcinoma were stained with each antibody according to protocols recommended by their respective manufacturers. As shown in table 1, staining intensity was scored as 0 (negative), 1-2 (weak), 3 (moderate), 4 (strong); the labeling extent was tabulated as 0 (less than 5% positive cells), 1-2 (5-25% positive cells), 3 (26-75% positive cells), and 4 (greater than 75% positive cells). The two scores were added to generate a final score. All final scores >2 were considered positive. Furthermore, only a cytoplasmic granular staining pattern was considered to be positive.

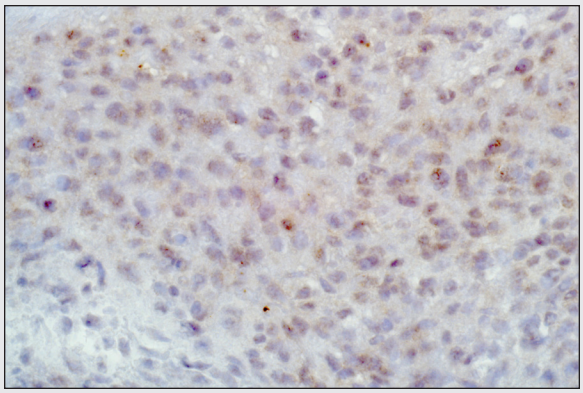

Fig 3. *Napsin A clone KCG1.1 stains lung squamous carcinoma in a nuclear pattern (400x).*

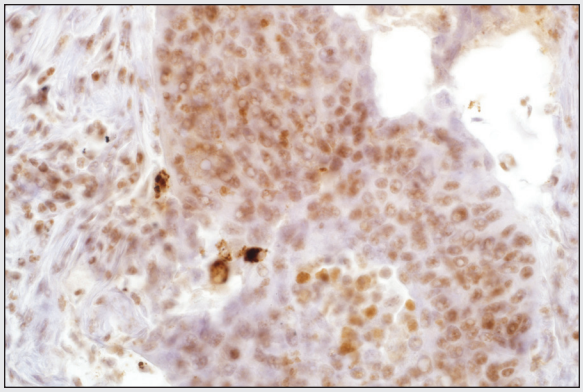

Fig 4. *Napsin A clone TMU-Ad02 stains lung squamous carcinoma in a nuclear pattern (400x).*

Table 1
Criteria for Scoring Immunohistochemical Staining

	0	1-2	3	4
Intensity	No staining	Weak	Moderate	Strong
Extent	<5%	6%-25%	26%-75%	>75%

Results

Of twenty-two cases of lung adenocarcinoma (LAC), all five antibodies showed napsin A expression in eighteen cases (sensitivity, 81.8%). Further detail on the performance of each individual clone follows:

1) For clone MRQ-60, seventeen LAC cases displayed strong staining of all tumor cells (100%) (Fig 1). One case presented with strong staining of 20% of tumor cells.

2) For clone IP64, out of the eighteen LAC cases, one case demonstrated strong staining of greater than 75% of tumor cells. Nine cases revealed moderate staining of 20-100% of tumor cells, while 8 cases displayed weak staining of 10-75% of tumor cells.

3) For clone EP205, out of the eighteen LAC cases, four cases presented strong staining of 50-75% of tumor cells. Ten cases showed moderate staining of 50-75% of tumor cells. Four cases revealed weak staining of 20-100% of tumor cells.

4) Clones KCG1.1 and TMU-Ad02 performed in like fashion in that fifteen cases showed strong staining of greater than 50% of tumor cells, and three cases showed moderate staining of 25-50% of tumor cells.

Of twenty-four cases of lung squamous carcinoma, none of the five antibodies tested detected any cytoplasmic expression of napsin A in tumor cells (Fig 2). The specificity for all five monoclonal anti-napsin A was 100%. However, clones KCG1.1 (Fig 3) and TMU-Ad02 (Fig 4) displayed a strong, non-specific nuclear staining of tumor cells in ten cases and fourteen cases of lung squamous carcinoma, respectively. This non-specific staining was not removed even when alternate protocols were attempted.

Conclusion

1) All five commercially available monoclonal anti-napsin A antibodies have similar sensitivity and specificity in the detection of lung adenocarcinoma and squamous carcinoma.

2) Clone MRQ-60 yielded the greatest staining intensity and highest percentage of positive tumor cells.

3) Clones KCG1.1 and TMU-Ad02 showed strong, non-specific nuclear staining for lung squamous cell carcinoma, which may cause difficulties in pathologic and immunohistochemical interpretation.

Reference

1. Mukhopadhyay, S, et al. Am J Clin Pathol 2012;138: 703-711.