### Geisinger IHC’s New Markers

<table>
<thead>
<tr>
<th>Genitourinary</th>
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<tbody>
<tr>
<td><strong>ERG</strong></td>
<td><strong>NANOG</strong></td>
<td><strong>NKX3.1</strong></td>
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<td>A highly sensitive and specific marker for benign and malignant vascular tumors; it also expresses in 50% of prostatic carcinomas.</td>
<td>For testicular intratubular germ cell neoplasia (ITGCN), classic seminomas and embryonal carcinomas; usually negative in yolk sac tumors or teratomas.</td>
<td>A highly sensitive and specific nuclear staining marker for both primary and metastatic prostatic adenocarcinomas, reported in virtually 100%.</td>
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<td><strong>SOX2</strong></td>
<td><strong>UPII</strong></td>
<td><strong>GATA3</strong></td>
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<td>Positive in a majority of squamous cell carcinomas and a high percentage of embryonal carcinomas and yolk sac tumors.</td>
<td>Uroplakin II has been demonstrated to be a useful marker in identifying urothelial tumors with a higher diagnostic sensitivity than uroplakin III and similar specificity.</td>
<td>A highly sensitive and specific marker for breast and urothelial primaries when working on a tumor of unknown origin.</td>
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<tr>
<td><strong>NKX2.2</strong></td>
<td><strong>Adipophilin</strong></td>
<td><strong>SOX10</strong></td>
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<td>A transcription factor with a crucial role in differentiation of central nervous system and pancreatic islets. Expressed in 93% of Ewing sarcomas/PNET; more sensitive and specific than CD99 and Fli-1.</td>
<td>A potential marker to discriminate sebaceous carcinoma from BCC or SCC. Also positive in xanthomatous lesions and renal cell carcinoma metastatic to skin.</td>
<td>A marker for melanocytic differentiation, particularly useful in making a diagnosis of desmoplastic melanoma because most of these tumors show strong diffuse positive nuclear reactivity.</td>
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</table>
Breast

GATA3

A highly sensitive and specific marker for breast and urothelial primaries when working on a tumor of unknown origin. Approximately 70% of ER-negative breast carcinomas are also positive for GATA3.

Pancreas

Maspin/VHL

Marker(s) for differentiation of ductal adenocarcinoma of the pancreas from non-neoplastic pancreatic tissues.

GI

Cadherin-17

Marker for intestinal differentiation. Usually positive in CDX2-, CK20-colorectal cancer.

Hematopathology

SOX11

Specifically expressed in the nucleus of mantle cell lymphomas (MCL) compared with other lymphomas and benign lymphoid tissue; a useful marker for both cyclin D1-positive and negative MCL.

Breast

TFF1

Usually positive in breast carcinomas and colon adenocarcinomas, and negative in lung adenocarcinomas, endometrial adenocarcinomas and ovarian serous carcinomas.

Breast

TFF3

Usually positive in breast carcinomas and colon adenocarcinoma, and negative in ovarian serous carcinomas.

Pancreas

S100P

Belongs to the family of S100 calcium-binding proteins. Nuclear and cytoplasmic staining in most DAC; usually negative or cytoplasmic staining in normal/reactive ducts.

Liver

Arginase-1

A highly sensitive and specific marker for hepatocellular carcinoma. It’s a more sensitive and specific marker than HepPar1 and glypican-3 for detecting HCC.

GI

SATB-2

Intestinal differentiation marker. Usually positive in CDX2-, CK20-colorectal cancer. Potential marker to discriminate small intestinal from colorectal cancer. A specific marker for osteoblastic differentiation.

Thyroid

TROP2

Marker for papillary thyroid carcinomas (PTC), positive in 90% of cases; usually negative in thyroid follicular adenoma or carcinoma.

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