Thermo Scientific SP1 and SP3 Rabbit Monoclonal Antibodies: Real world advantages in breast cancer analysis

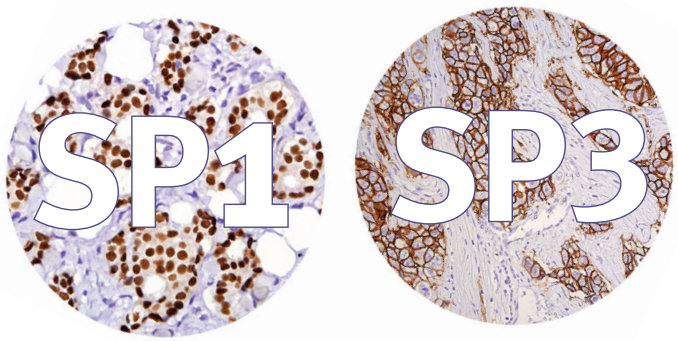
Allen M. Gown, M.D.
Medical Director and Chief Pathologist
PhenoPath Laboratories - Seattle, WA

Two Thermo Scientific rabbit monoclonal antibodies are poised to have a significant impact on the immunohistochemical analysis of prognostic and predictive breast cancer markers: Thermo Scientific SP1, a rabbit monoclonal antibody directed against the estrogen receptor alpha molecule, and target of tamoxifen; and Thermo Scientific SP3, a rabbit monoclonal antibody directed against the HER2 transmembrane receptor, the target of trastuzumab (Herceptin™).

SP1 has been demonstrated to have an eight fold higher affinity for the estrogen receptor compared with the 1D5 mouse monoclonal antibody that has been widely used in immunohistochemical analyses of breast cancer.[1] This higher affinity translates into a more robust immunohistochemical reagent, as was demonstrated in the paper published by Cheang et al,[2] describing a collaborative study performed by the British Columbia Cancer Agency and PhenoPath Laboratories. In this tissue microarray-based study of 4,150 patients in which determination of ER status with SP1 was compared with 1D5, with a median follow-up, of 12.4 years, SP1 was found in multivariate analyses to be a better independent prognostic factor than 1D5. Furthermore, determination of ER status using the SP1 antibody was more precise compared with the 1D5 antibody. The cohort, corresponding to 8% of the patients, who were SP1+ and 1D5-, i.e., who would have been classified as negative based on 1D5, were found to have a good outcome indicative of ER positive breast cancer. SP1-determined ER status also correlated better with ligand binding ER assay results. The study concluded that SP1 may represent an improved standard for ER assessment by immunohistochemistry in breast cancer.

More recent studies performed at PhenoPath Laboratories and presented this past spring at the USCAP meeting in Denver[3] document the potential advantages of SP3 as an immunohistochemical reagent in the assessment of HER2 status. In a series of 421 breast cancers analyzed for HER2 by immunohistochemistry, comparing the SP3 rabbit monoclonal antibody with a rabbit polyclonal antibody (Dako A0485), SP3 was found to be a more robust reagent, producing more consistent run-to-run immunostaining with fewer run failures. The study also showed that while both antibodies produced results that were greater than 95% concordant with those of FISH, the SP3 antibody was more "efficient" in yielding fewer 2+ cases.

SP1 and SP3 will undoubtedly be the subject of future studies, but the data to date suggest that both could well become the new gold standard for immunohistochemical analysis of breast cancer markers.



References:

1. Huang Z., at el Appl Immunohistochem Mol Morphol. 2005; 13: 91-95.
2. Gown AM., at el. J Clin Oncol. 2006; 24: 5626-7.
3. Gown AM., at el. Mod Pathol. 2008.

Thermo SCIENTIFIC