Immunohistochemical Analyses of Cytokeratin in Breast Cancers
from Old and New Eras

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Breast cancers can be classified with multigene assays into the following subtypes: luminal A, luminal B,
human epidermal growth factor receptor 2 (HER2)-enriched, and basal1. These subtypes are constitutively
defined by means of immunohistochemical staining for estrogen receptor (ER), progesterone receptor, HER2,
and Ki675, and the basal subtype is uniquely negative for ER, progesterone receptor, and HER25. Most cases of
the basal subtype are positive for cytokeratins 5, 6, 14, and 1711.

High molecular weight (HMW) cytokeratins (cytokeratins 1, 5, 10, and 14) are reportedly present in 21% of
cases of invasive carcinoma of the breast6 (Fig. 1), which are also positive for myoepithelial cells7 (Fig. 2).
Expression of HMW cytokeratins is significantly correlated with high histological grades and the absence of ER6.
Furthermore, HMW cytokeratins are positive in all cases of ductal hyperplasia but is negative in most cases of
atypical ductal hyperplasia and ductal carcinoma in situ.

A low molecular weight (LMW) cytokeratin (cytokeratin 8) is reportedly present in 65% of cases of invasive
carcinoma of the breast6 (Fig. 3). Cytokeratin 8 is also significantly correlated with low histological grades and
ER positivity6. Cytokeratin 8 is present in most breast epithelial cells in cases of ductal hyperplasia, atypical
ductal hyperplasia, and ductal carcinoma in situ6. A high level of cytokeratin 8 immunostaining is associated with
a favorable prognosis of breast cancer, and reduced or absent staining is associated with an unfavorable
outcome19.

Conflict of Interest: The authors have no conflicts of interest to declare.

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Fig. 1 Immunohistochemical staining for high molecular weight (HMW) cytokeratin in an invasive ductal carcinoma of the breast
Staining for HMW cytokeratins was observed in the cytoplasm and membranes of cancer cells that had invaded the stroma (original magnification, ×200). A monoclonal antibody 34betaE12 (Enzo Life Sciences, Inc., Farmingdale, NY, USA) against HMW cytokeratins (cytokeratins 1, 5, 10, and 14) was applied to formalin-fixed, paraffin-embedded tissue.
Immunohistochemical methods have been described in detail in previous studies.

Fig. 2 Immunohistochemical staining for high molecular weight (HMW) cytokeratins in a nonmalignant mammary duct
Staining for HMW cytokeratins was observed in nonmalignant myoepithelial and epithelial cells (original magnification, ×400). The monoclonal antibody 34betaE12 against HMW cytokeratins was applied to formalin-fixed, paraffin-embedded tissue.
Immunohistochemical methods have been described in detail in previous studies.

Fig. 3 Immunohistochemical staining for cytokeratin 8 in an invasive ductal carcinoma of the breast
Staining for cytokeratin 8 was observed in cytoplasm of cancer cells that had invaded the stroma (original magnification, ×200). The monoclonal antibody 35betaH11 (Enzo Life Sciences, Inc.) against cytokeratin 8 was applied to formalin-fixed, paraffin-embedded tissue.
Immunohistochemical methods have been described in detail in previous studies.

References


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