CEACAM5: A CLUE TO CANCER CELLS HIDING IN PLAIN SIGHT

Investigating the role of an emerging biomarker

Carcinoembryonic antigen-related cell adhesion molecule 5 (CEACAM5) is currently being explored as a potential biomarker. In early investigational studies, up to 25% of non-squamous (NSQ) non-small cell lung cancer (NSCLC) patients had evidence of high CEACAM5 expression. CEACAM5 has higher differential expression in NSCLC tumor vs healthy lung tissue. Understanding CEACAM5 may potentially give us more insights to target this malignancy with a poor prognosis.

CEACAM5 expression in NSQ NSCLC

Early investigational studies show CEACAM5 may be highly expressed in up to 25% of NSQ NSCLC. Other biomarkers currently included in testing panels are seen less frequently with NSCLC: 1%-5% BRAF, 4%-5% ALK, 2% ROS1, 13% KRAS–G12C, and (in North America) 9% EGFR.

High differential expression in tumors vs healthy cells

CEACAM5 has been shown to have higher expression in NSQ NSCLC and lower expression in healthy lung tissue. This may ultimately allow CEACAM5 to become a potential target in NSCLC.

Poor prognosis, limited post-immunotherapy options in NSCLC

NSCLC treatment has been transformed by recent advances, and immunotherapy with or without platinum chemotherapy has increasingly become the first-line standard of care in the absence of oncogenic driver alterations. This has certainly extended survival, but the reality is most patients will still experience disease progression with immunotherapy. And when their disease progresses, they have a poor prognosis with current therapies.

Innovation is critically needed post-immunotherapy. There are limited sequencing options once resistance develops to immunotherapy. Investigating novel targets and biomarkers could possibly help us address resistance in NSCLC – ideally while also addressing heterogeneity of resistance with current biomarkers (eg, PD-L1, EGFR, ROS1, BRAF, ALK).

CEACAM5 high expression

Up to 25% of NSQ NSCLC

*Defined as expression at ≥2+ intensity in ≥50% of tumor cell population.

ALK=anaplastic lymphoma kinase; BRAF=v-Raf murine sarcoma viral oncogene homolog B; EGFR=epidermal growth factor receptor; OS=overall survival; PD-L1=programmed death ligand 1; PFS=progression-free survival; ROS1=ROS proto-oncogene 1;
Role of CEACAM5 in the CEA family

CEACAM5 is a member of the carcinoembryonic antigen (CEA) family of 12 glycoproteins, not to be confused with the serum CEA tumor marker for colorectal cancer prognosis that was identified years ago.1,4,37 CEACAM5 cell-surface glycoproteins expressed on epithelial tumor cells may play a potential role in tumor progression, metastasis, and cell adhesion – inhibiting differentiation and apoptosis and disrupting tissue architecture.1,3

High CEACAM5 expression is also potentially associated with tumor progression in NSCLC by promoting cell proliferation and migration.18

12 glycoproteins of the human CEACAM family

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<tr>
<th>Epithelial CEACAMs</th>
<th>Other CEACAMs</th>
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<td>CEACAM1</td>
<td>CEACAM6</td>
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<td>12 glycoproteins of the human CEACAM family</td>
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Detectable via immunohistochemistry

CEACAM5 may potentially represent an important advance in detecting cancer cells using tissue-based immunohistochemistry.2,3 Pathologists could assess the immunohistochemistry slides to determine the percentage of tumor cells and the intensity of staining.2 Testing may be performed with new or archival biopsy tissue to inform treatment planning.2,3

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