Potential target in treatment of oral cancer discovered

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For the first time, researchers have identified a reliable marker (PDGFRβ) to detect carcinoma-associated fibroblasts (cells within the tumor that encourage growth and metastasis) (CAFs) in oral cancer tissues. With this discovery, anti-PDGFRβ treatment could soon be combined with existing tumor treatments to provide a more effective cancer therapy.

The findings, which appear in *PLOS ONE*, represent a new strategy for marker discovery combining bioinformatics analysis of gathered gene expression datasets, along with experimental assays using oral cancer specimens and cell lines.

CAFs have been shown to be strongly predictive of disease severity, but their study has been hampered by a difficulty in identifying reliable markers for their isolation from tissue samples.

Researchers at Boston University School of Medicine (BUSM) identified a set of collagen genes they expected to be largely CAF-specific, namely COL1A1, COL1A2 and COL3A1. Using a large gene expression dataset from the cancer genome atlas comprising hundreds of oral cancer samples, they then looked for additional genes whose expression best-associated with the average expression of these three collagen genes. In doing so, they identified several markers, including PDGFRβ, which they confirmed to be CAF-specific using immunostaining assays in oral carcinoma specimens.

"Given the known association of CAFs with poor prognosis in certain cancers, including those of the head and neck, the identification of robust and reliable markers of these cells is necessary to further assess their role in tumor initiation and progression," explained Maria Trojanowska, PhD, professor of medicine at BUSM.

"This study highlights the power and importance of inter-disciplinary translational research applied to novel biomarker discovery. "Identifying fibroblast markers has always been a challenge in the past, with one often having to resort to large-scale staining assays, with limited success. For the first time, we show how one can leverage large publically-available datasets to help prioritize these experiments, and help identify markers that are more robust and reliable," added Stefano Monti, PhD, associate professor of medicine at BUSM.

It is hoped that these findings will help hasten the identification of potential mechanisms of action underlying the complex interplay between fibroblast and malignant cells, and the discovery of lasting targets for cancer therapy.

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