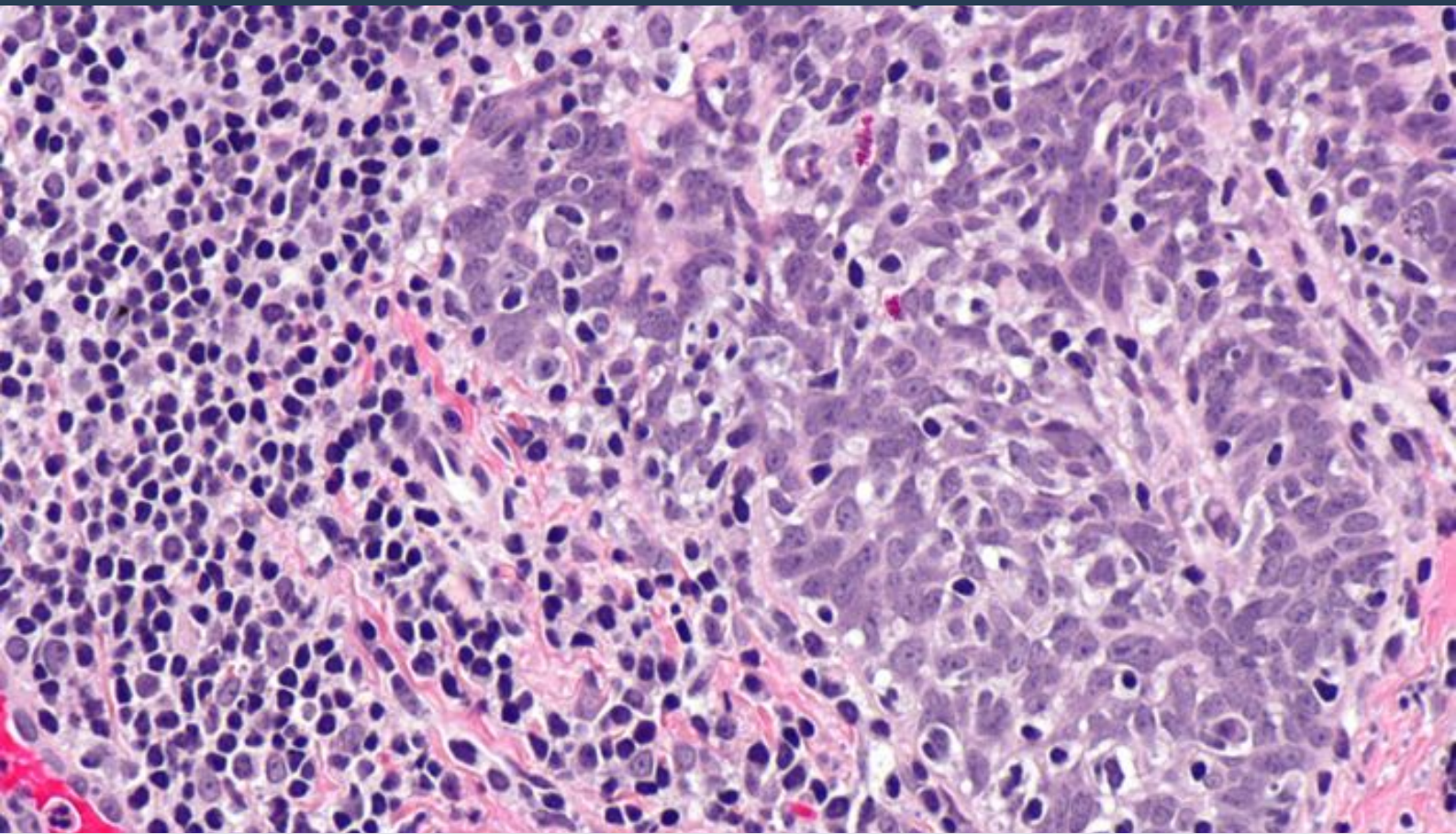# EGFR/EpCAM in the Regulation of Partial EMT in Head and Neck Squamous Cell Carcinomas

LMU Munich researchers have discovered novel potential for EpCAM as a therapeutic target for HNSCC

Please note, header image is purely illustrative. Source: Nephron, commons.wikimedia.org, CC-BY-3.0

Seeking

Development partner

About **LMU Munich**

Ludwig-Maximilians-Universität München is the University in the heart of Munich. LMU is recognized as one of Europe's premier academic and research institutions. The LMU Munich community is engaged in generating new knowledge for the benefit of society at large.

Background

Head and neck squamous cell carcinomas (HNSCC) are characterized by poor overall clinical performance and a 45% overall survival rate. Poor prognosis is associated with high recurrence and treatment resistance, which are both attributed to an outstandingly high inter- and intratumoural heterogeneity and phenotypic changes along the epithelial-mesenchymal transition (EMT). In this respect, Puram et al. (Cell 2017) defined a subgroup of cells within HNSCC that have adopted characteristics of a partial EMT, are located at the invasive edges of tumours, and correlate with poor clinical parameters and increased treatment resistance. Loss of epithelial (EpCAM) and gain of mesenchymal markers (vimentin) at the leading edges of tumours was simultaneously observed by our group in an HNSCC clinical cohort, which correlated with poor survival.

Epidermal growth factor receptor EGFR is, so far, so sole target in use for adjuvant therapies of progressed metastatic HNSCC patients (as well as colon and lung carcinomas). However, clinical benefits of drugs such as Cetuximab and tyrosine kinase inhibitors are not fully satisfying, which might be caused by pleiotropic effects of EGFR on cellular phenotypes. Defining exact functions of EGFR in the regulation of proliferation and EMT in HNSCC, colon and lung carcinomas will help defining and stratifying patients who would benefit from EGFR-specific treatment. Additionally, knowledge of signalling cross-talks of EGFR with other carcinoma-associated receptors such as EpCAM will pave the path for novel therapeutic regimens to inhibit EMT, and thus modulate therapy response.

Tech Overview

EGFR and EpCAM are two therapeutic targets expressed to varying levels on HNSCC. LMU Munich researchers have defined a subpopulation of EGFR^{low}/EpCAM^{high} HSNCC patients with significantly improved clinical performance as compared to EGFR^{high} patients. Hence, EGFR and EpCAM are targets with known pharmacology and targeting potential at the single receptor levels, but whose potential as a regulatory pair of receptors remained unexplored so far.

Data currently under consideration disclose an unknown regulatory axis of EGFR/EpCAM signalling, which instructs cells towards proliferation or EMT, and which is associated with patient outcome. The researchers have identified central switches within the EGFR/EpCAM pathway that integrate signals towards proliferation or EMT, and might thus represent suitable targets.

Further Details

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Stage of Development

- Cellular *in vitro* systems are established, which allow to screen for drug molecules that modulate EGFR/EpCAM-dependent proliferation and EMT in HNSCC (and further carcinoma enteties).
- RNA-seq. and proteomic approaches are currently deployed to generate a molecular map of EGFR/EpCAM-mediated effects on cell fate, and thus define potential prognostic and therapeutic targets.
- Clinical cohorts are available to test potential biomarkers in a retrospective manner with respect to clinical outcome.

Benefits

Novel potential for EpCAM as a therapeutic target

Applications

Development of new drug candidates for head and neck squamos cell carcinomas

Opportunity

Searching a partner with expertise and capability to identify and develop of EGFR/EpCAM-specific drugs to modulate proliferation versus EMT in HNSCC (and further carcinoma entities).

For further information, please contact us.

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