**Presentation title:** Single-Cell RNA-Seq Analysis identifies ETS1 as a regulator of ETM

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**Presentation type:** Poster presentation

**Abstract (250-300 words):**

Worldwide, over one million new cases of upper aerodigestive tract cancers (UATC) are diagnosed each year. UATC are highly aggressive malignancies effecting the upper aerodigestive tract (oral cavity, larynx and oropharynx, and esophagus) which are derived from stratified epithelium. While the 5-year survival rate for patients with UATC ranges from ~ 20%- 50%, targeted therapies are mostly unavailable for UATCs. This study aims to identify specific transcription factors which promote UATC and have the potential to be used as therapeutic targets in patients. This approach combined single-cell RNA-Seq data analysis from both UATC patients and malignant cells using non-negative matrix factorization (NMF) to identify groups of genes that were co-expressed in UATC. Data analysis identified the transcription factors ETS1 in regulating epithelial mesenchymal transition (EMT). **Further supporting TCGA data found EMT to be the most enriched pathway in ETS1 high UATC patients.** **Using combined Patient and malignant cell data, a non-canonical metastatic gene signature was created.** We found that loss of ETS1 reduced the expression of our own EMT signature, while overexpression showed increased expression. Overexpressing ETS1 increased transwell migration and wound healing, while loss of ETS1 decreased these abilities. In vivo, injecting overexpressing ETS1 cells increased metastatic events and led to reduced overall survival. Additionally, we found that heat shock protein 90 (HSP90) is upstream of ETS1, which can mediate ETS1 through direct binding of hypoxia inducible factor 1-A (HIF1A) to the ETS1 promoter. Our results suggest that using specific ETS1 targeted or HSP90 inhibitors may provide potential therapeutic approaches for UATC.

**Biography (150-200 words):**

Benjamin graduated from UC Merced, earning his doctoral degree in Quantitative and Systems Biology. His thesis work focused on stem cells and organismal growth. Currently, he is a postdoctoral fellow working at the University of Southern California under the mentorship of Dr. Dechen Lin. His research focus is on investigating mechanisms for tumor immunity and metastasis in UATC.