

# Erythropoietin Promotes Invasion and Modulates the Response of Head and Neck Squamous Cell Carcinoma to Hypoxia and Cisplatin-Induced Death

Katherine Blair

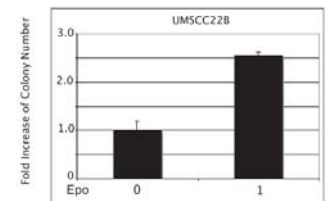
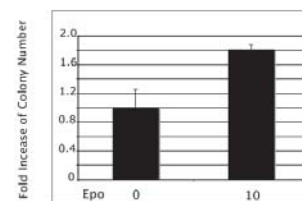
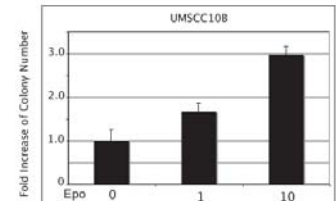
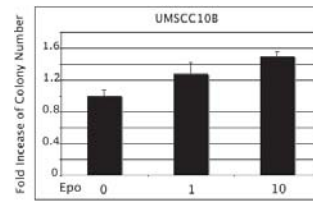
Advisor: Jessica Wang Rodriguez, M.D.- Department of Pathology, UCSD Medical Center



## Introduction

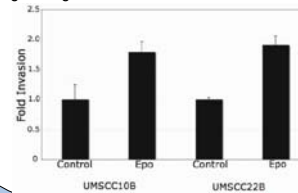
- Erythropoietin's (Epo) receptor is ubiquitously expressed in cancers
- Epo is used as a highly effective treatment for anemia
- A recent study showed that chemotherapy patients receiving Epo had a higher rate of metastasis and death than those not receiving Epo
- Here, we look at the effects of Epo on the function of the common head and neck squamous cell carcinoma chemotherapy drug, cisplatin

## Results

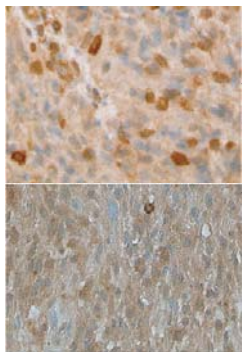


Epo promotes cell proliferation as measured by a colony formation assay in UMSCC10B (top panel) and UMSCC22B (bottom panel). Colonies are defined as having 50 or greater cells.

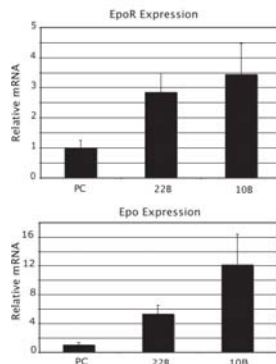
Epo protects HNSCC cell lines against cisplatin-induced cell death. UMSCC10B cells treated with 0.5 μM cisplatin, exposure to 1 and 10 units/mL of Epo compared to control cells not exposed to Epo, respectively (top panel). UMSCC22B treated with 1.0 μM cisplatin, 1 unit/mL of Epo compared to the control cells (bottom panel)



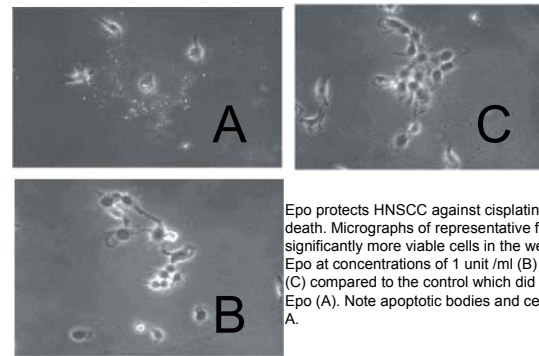
Exogenous Epo promotes invasion in established HNSCC cell lines. Exposure of cells to 1unit/ml of Epo for 48 h increased invasion by 80% in UMSCC10B and 90% in UMSCC22B compared to their respective controls.



Expression of EpoR and Epo in HNSCC tissue. Representative staining of EpoR localized primarily in the cytoplasm (top), and Epo expression in both the nucleus and cytoplasm (bottom)



Expression of EpoR and Epo in established HNSCC cell lines and a primary HNSCC cell culture. Quantitative polymerase chain reaction (qPCR) analysis demonstrating relatively higher expression of EpoR (top) and Epo (bottom) in established cell lines compared to a primary cell culture.



Epo protects HNSCC against cisplatin-induced cell death. Micrographs of representative fields reveal significantly more viable cells in the wells that received Epo at concentrations of 1 unit /ml (B) and 10 units/ml (C) compared to the control which did not receive any Epo (A). Note apoptotic bodies and cellular fragments in A.

## Methods

- Immunohistochemical Staining for Epo, EpoR of HNSCC tissue
- qPCR for Epo, EpoR expression in HNSCC cell lines
- Matrigel invasion assays
- Colony formation assays

## Conclusion

- Epo and EpoR are expressed in HNSCC tissue and cell lines
- Exogenous Epo promotes invasion, cell proliferation, and modulates the response of HNSCC cells to cisplatin and hypoxia which may contribute to tumor progression.