

## **CAMB 701: The Tumor Microenvironment**

**Directors:** Celeste Simon, PhD and Todd Ridky, MD, PhD  
**TA:** Ariana Majer

**Tuesdays 3:30-5:30 pm**  
**BRB II/III**

### **Syllabus Spring 2023**

Class Format:

- Students present background (30-40 minutes).
- 10-minute break
- Students present key data in paper (45-50 minutes).
- Feedback from Celeste and Todd to presenters only (10 minutes).

*Reminder: each week, students that are not presenting that week will submit **two questions** they would like to discuss concerning impact/novelty/implications and/or general questions about the papers to Celeste, Todd, and Ariana the day of class.*

Class 1: (1/17/23). Organizational Meeting: Intro to Immunology, Tumor Microenvironment, etc. (Ariana)

Class 2: (1/24/23) Crosstalk between the Tumor and Microenvironment (Celeste)  
Banh et al. "**Neurons release serine to support mRNA translation in pancreatic cancer**", *Cell* (2020)

Reinfeld et al. "**Cell-programmed nutrient partitioning in the tumour microenvironment**", *Nature* (2021)

Class 3: (1/31/23) Immune Surveillance (Ariana)  
Li et al. "**The allergy mediator histamine confers resistance to immunotherapy in cancer patients via activation of the macrophage histamine receptor H1**," *Cancer Cell* (2021).

Herrera et al. "**Low dose radiotherapy reverses tumor immune desertification and resistance to immunotherapy**," *Cancer Discovery* (2021).

Class 4: (2/7/23) Cancer Heterogeneity, Plasticity, and Tumor Evolution (Celeste)  
Concepcion et al. "**SMARCA4 inactivation promotes lineage-specific transformation and early metastatic features in the lung**", *Cancer Discovery* (2021)

Class 5: (2/14/23) Metastatic Niche (Ariana)  
Mukherjee et al. "**Adipocyte-induced FABP4 expression in ovarian cancer cells promotes metastasis and mediates carboplatin resistance**," *Cancer Research* (2020).

Class 6: (2/21/23) Tumor Angiogenesis, Lymphangiogenesis (Todd)  
Garcia Silva et al. "**Melanoma-derived small extracellular vesicles induce lymphangiogenesis and metastasis through an NGFR-dependent mechanism**" *Nature Cancer* (2021)

Stella Stasso “**Lymphangiogenesis-inducing vaccines elicit potent and long-lasting T cell immunity against melanomas**” *Science Advances* (2021)

Class 7: (3/1/23) Mock Study Section (Celeste)

Spring Break: March 6-10, 2023

Class 8: (3/14/23) Systemic Factors and Tumor Progression (Celeste)

Talbert et al. “**Modeling human cancer-induced cachexia**” *Cell Reports* (2021)

Queiroz et al. “**Blocking ActRIIB signaling and restoring appetite reverses cachexia and improves survival in mice with lung cancer**” *Nature Communications* (2022)

Class 9: (3/21/23) The Tumor Stroma, Cancer Associated Fibroblasts (Todd)

Katarkar et al. “**NOTCH1 gene amplification promotes expansion of Cancer Associated Fibroblast populations in human skin**” *Nature Communications* (2020)

Zhang et al. “**Macropinocytosis in Cancer-Associated Fibroblasts Is Dependent on CaMKK2/ARHGEF2 Signaling and Functions to Support Tumor and Stromal Cell Fitness**” *Cancer Discovery* (2021)

Class 10: (3/28/23) Stressful Tumor Microenvironments (Hypoxia and Nutrient Scarcity) (Celeste)

Lien et al. “**Low glycaemic diets alter lipid metabolism to influence tumour growth**” *Nature* (2021)

Ubellacker et al. “**Lymph protects metastasizing melanoma cells from ferroptosis**” *Nature* (2020)

Class 11: (4/4/23) The Influence of Microbiome on Tumor Growth (Todd)

Lam et al. “**Microbiota triggers STING-type I IFN-dependent monocyte reprogramming of the tumor microenvironment**” *Cell* (2021)

Geller et al. “**Potential role of intratumoral bacteria in mediating tumor resistance to the chemotherapeutic drug gemcitabine**” *Science* (2017)

Class 12: (4/11/23) Inflammation and Tumor Progression (Celeste)

Liudahl et al. “**Leukocyte Heterogeneity in Pancreatic Ductal Adenocarcinoma: Phenotypic and Spatial Features Associated with Clinical Outcome**” *Cancer Discovery* (2021)

Cappellesso et al. “**Targeting the bicarbonate transporter SLC4A4 overcomes immunosuppression and immunotherapy resistance in pancreatic cancer**”, *Nature Cancer* (2022)

Class 13: (4/18/23) Tumor-Nervous System Interactions (Ariana)

Kamiya et al. “**Genetic manipulation of autonomic nerve fiber innervation and activity and its effect on breast cancer progression,**” *Nature Neuroscience* (2019).

Pan et al. “**NF1 mutation drives neuronal activity-dependent initiation of optic glioma,**” *Nature* (2021)

Class 14: (4/25/23) Sex as a Biological Variable in Tumor Progression (Todd)

Vellano et al. “**Androgen receptor blockade promotes response to BRAF/MEK-targeted therapy,**” *Nature* (2022)

Aguirre-Portoles et al. “**ZIP9 is a druggable determinant of Sex Differences in Melanoma**”  
*Cancer Research* (2021)

Class 15: (5/2/23) Tumor Dormancy (Ariana)

Albregues et al. “**Neutrophil extracellular traps produced during inflammation awaken dormant cancer cells in mice,**” *Science* (2018).

Correia et al. “**Hepatic stellate cells suppress NK cell-sustained breast cancer dormancy,**”  
*Nature* (2021)

**Mock Study Section:** each student submits a one page Specific Aims on an assigned paper from class. Each student will be assigned as the primary reviewer of someone else’s aims page to present that day.

**Course Grade:** 40% assigned presentations, 40% overall class participation (and weekly questions), and 20% Specific Aims for Mock Study Section.