**Motivation**

- **Triple Negative Breast Cancer (TNBC):**
  - TNBC demonstrates relatively high rate of locoregional recurrence after radiation therapy (13.5%)\(^1\)

- **Circulating Breast Cancer Cell Invasion:**
  - Lack of lymphocytes encourages macrophage infiltration tumor cell infiltration, indicating lymphocytes play a role in preventing tumor recurrence\(^2\)
  - Cellular mechanisms behind increased invasion are unknown

**Significance of The Extracellular Matrix (ECM):**

- Focal adhesions are promoted by ECM stiffness, which mediates cell to cell interactions\(^3\)
- Radiation induces fibrosis in the tumor microenvironment by inducing fibrosis, leading to changes tumor progression

**Hypothesis**

- **Tumor Microenvironment:**
  - Irradiated ECM promotes displaced cell invasion
- **Chemotherapy:**
  - Increases E-Cadherin expression and decreases Vimentin

**Changes in the ECM Induced by Radiation Therapy**

- Astromicroenvironment transition is characterized by increased Vimentin expression and decreased E-Cadherin expression, leading to increased cell invasion\(^4\) 4T1 cells express higher levels of vimentin when seeded into irradiated ECM microenvironments, however, increases in E-cadherin were also noted.

**Conclusions & Future Work**

- **4T1 cell invasion properties observed:**
  - F-actin/cortactin colocalization and invasion assay quantification indicate 4T1 cells experienced increased invasiveness in irradiated ECM microenvironments derived from CD6+T cell depleted Balb/c mice
  - General trend of higher vimentin and E-cadherin expression in irradiated ECM microenvironments
  - Limited by lack of quantitative analysis

**Future work:**

- Developing methodology for quantifying expression of vimentin and E-cadherin in cells
- Expand mouse model to include bone marrow-derived macrophages to understand differences in 4T1 cell invasion for immunocompetent vs lymphopenic mice
- Determine changes in other ECM components after radiation to examine immune response effects

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\(^3\) Rafat M., et al. (2014, November 13). The extracellular matrix modulates the hallmarks of cancer. 3DROD Reports, 1(2), 184-185.