Killed in Cold Blood: An exploration of the efficacy of oncolytic adenoviruses in metastatic breast cancer

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In this study, we hypothesize that oncolytic virotherapy will elicit a robust antitumor immune response, which will exert abscopal effects and eradicate primary tumors and metastatic niches in metastatic breast cancer models.

**BACKGROUND**

- Metastatic breast cancer (MBC) is one of the most lethal cancer types worldwide.
- Current therapies include chemotherapy, radiotherapy, and surgery. However, these methods are ineffective with regards to improving long-term survival rates for patients with MBC.
- Delta-24-RGD has shown much success infecting and killing cancer cells in addition to inducing CD4+ T-Cell immune response. The response from the immune system inadvertently initiates abscopal effects, as indicated in a phase 1 clinical trial.

**RESULTS**

**IN VITRO**

- **Figure 5. Viability assay for murine (A) and human (B,C) MBC cell lines in vitro.** Cell lines were infected with appropriate MOI of viruses and monitored over a period of 144 hours. Cytotoxic effects are measured using Viral ToxGlo4®-Promega.

**IN VIVO**

- **Figure 6. Observation of breast cancer metastasis in female BALB/c murine populations.** BLI imaging was performed more than 2 weeks after 1st dose (5 weeks after cell implant).
- **Figure 7. Tumor volumes in murine population (mm²).**
- **Figure 8. Intensity of 4T1 primary breast tumor in murine population (p/s).** Luciferin expression via BLI.

**CONCLUSION**

- Delta-24-RGD and Delta-24-RGDOX show great efficacy infecting and killing human and murine breast cancer cells in vitro.
- Treatment of murine models with armed oncolytic viruses increased T-cell specific anti-tumor responses and thus controls primary tumor growth and metastasis.

**FUTURE INVESTIGATION:**

The development of oncolytic viruses has introduced a paradigm shift in our approach to cancer treatment. Our data may constitute the basis for the development of virotherapy in patients with metastatic breast cancer.

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**REFERENCES**