

University of Massachusetts Medical School

eScholarship@UMMS

UMass Center for Clinical and Translational
Science Research Retreat

2014 UMass Center for Clinical and
Translational Science Research Retreat

May 20th, 12:30 PM


A Novel Approach to Targeted Oncologic Therapy - Co-culture Viability of Polymer Prodrug Conjugation to Mesenchymal Stem Cells

Kaitlyn Wong
University of Massachusetts Amherst

Et al.

Let us know how access to this document benefits you.

Follow this and additional works at: https://escholarship.umassmed.edu/cts_retreat

 Part of the [Cancer Biology Commons](#), [Medicinal Chemistry and Pharmaceutics Commons](#), [Oncology Commons](#), [Therapeutics Commons](#), and the [Translational Medical Research Commons](#)

Wong K, Panzarino N, Page SM, Arenas R, Schneider SS, Emrick TS. (2014). A Novel Approach to Targeted Oncologic Therapy - Co-culture Viability of Polymer Prodrug Conjugation to Mesenchymal Stem Cells. UMass Center for Clinical and Translational Science Research Retreat. Retrieved from https://escholarship.umassmed.edu/cts_retreat/2014/posters/108

Creative Commons License



This work is licensed under a [Creative Commons Attribution-NonCommercial-Share Alike 3.0 License](#). This material is brought to you by eScholarship@UMMS. It has been accepted for inclusion in UMass Center for Clinical and Translational Science Research Retreat by an authorized administrator of eScholarship@UMMS. For more information, please contact Lisa.Palmer@umassmed.edu.

UMASS ABSTRACT

Name: Kaitlyn Wong
Phone: 516-381-3998

Address: 759 Chestnut Street, Springfield, MA
01199

email: kaitlyn.wong@baystatehealth.org

Poster Title: A Novel Approach to Targeted Oncologic Therapy - Co-culture Viability of Polymer Prodrug Conjugation to Mesenchymal Stem Cells

Authors:

Authors: Kaitlyn Wong^{1,2,4}, Nicholas Panzarino^{1,2,3}, Samantha McRae Page³, Richard Arenas^{1,2,4}, Sallie Schneider^{1,2}, Todd Emrick³

1. Pioneer Valley Life Sciences Institute, Springfield, MA 01199 USA

2. Molecular and Cellular Biology Program, University of Massachusetts, Amherst, MA 01003 USA

3. Polymer Science and Engineering Program, University of Massachusetts, Amherst, MA 01003 USA

4. Baystate Medical Center, Tufts Medical School, Springfield, MA 01199 USA

ABSTRACT

Background/Purpose:

Conjugation of polymer prodrugs to tumor homing cells, such as Mesenchymal Stem Cells (MSCs), could provide a vehicle for actively targeted delivery of polymer prodrugs.

Methods:

Human Bone Marrow MSCs were conjugated to either a doxorubicin polymer prodrug or free doxorubicin and were co-cultured with T-cells. Viability was assessed through the use of a Vi-cell counter.

In Vivo Migration Analysis was performed NOD SCID mice implanted with subcutaneous MDA MB-231 breast cancer xenografts. Following tumor establishment, mice were injected via lateral tail vein injection with either saline or polymer loaded MSCs. Five days following stem cell injection, mice were euthanized, tumors were harvested and sections were analyzed using fluorescent microscopy and immuno-histochemical staining for cd105.

Results:

T-cell viability was reduced when co-cultured with MSCs conjugated to free doxorubicin although cells co-cultured with MSCs conjugated to doxorubicin polymer did not exhibit reduced viability. Polymer loaded MSCs displayed intact tumor homing migratory ability *in vivo* (Figure 1).

Conclusion:

MSCs conjugated to doxorubicin released the drug, resulting in reduced neighboring T-cells viability. MSCs loaded with polymer maintained their migratory capacity were able to migrate to tumors *in vivo*. MSCs therefore represent a potential vehicle for targeted

drug delivery. Future work will focus on developing methods for releasing the drug upon successful delivery to the target *in vivo*.