May 20th, 12:30 PM

Anti-pPKCθ (T538) Delivery via Cell Penetrating Peptide Mimics as a Novel Treatment of Aplastic Anemia

Emrah Ilker Ozay  
*University of Massachusetts Amherst, eozay@mcub.mass.edu*

Gabriela Gonzalez-Perez  
*University of Massachusetts Amherst*

Joe Torres  
*University of Massachusetts Amherst*

*See next page for additional authors*

Follow this and additional works at: [http://escholarship.umassmed.edu/cts_retreat](http://escholarship.umassmed.edu/cts_retreat)

Part of the [Cancer Biology Commons](http://escholarship.umassmed.edu/cts_retreat), [Cell Biology Commons](http://escholarship.umassmed.edu/cts_retreat), [Cellular and Molecular Physiology Commons](http://escholarship.umassmed.edu/cts_retreat), [Hemic and Lymphatic Diseases Commons](http://escholarship.umassmed.edu/cts_retreat), [Immunoprophylaxis and Therapy Commons](http://escholarship.umassmed.edu/cts_retreat), [Therapeutics Commons](http://escholarship.umassmed.edu/cts_retreat), and the [Translational Medical Research Commons](http://escholarship.umassmed.edu/cts_retreat)


[http://escholarship.umassmed.edu/cts_retreat/2014/posters/91](http://escholarship.umassmed.edu/cts_retreat/2014/posters/91)

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.
Presenter Information
Emrah Ilker Ozay, Gabriela Gonzalez-Perez, Joe Torres, Gregory N. Tew, and Lisa M. Minter

Comments
Abstract of poster presented at the 2014 UMass Center for Clinical and Translational Science Research Retreat, held on May 20, 2014 at the University of Massachusetts Medical School, Worcester, Mass.

Creative Commons License
This work is licensed under a Creative Commons Attribution-Noncommercial-Share Alike 3.0 License.

This is available at eScholarship@UMMS: http://escholarship.umassmed.edu/cts_retreat/2014/posters/91
Anti-pPKCθ (T538) Delivery via Cell Penetrating Peptide Mimics as a Novel Treatment of Aplastic Anemia

Emrah Ilker Ozay1,2,3, Gabriela Gonzalez-Perez2, Joe Torres1,2 Gregory N. Tew1,2,3, and Lisa M. Minter1,2

1Program in Molecular and Cellular Biology, 2Department of Veterinary and Animal Sciences, 3Department of Polymer Science and Engineering, University of Massachusetts, Amherst, MA, 01003

Contact information: eozay@mcb.umass.edu

The objective of this study is to deliver anti-pPKCθ (T538) into T cells (hPBMCs) by using cell penetrating peptide mimics (CPPMs) to neutralize PKCθ activity both in vitro and in vivo, with the eventual goal of treating aplastic anemia (AA). AA is an immune-mediated bone marrow failure disease caused by T helper type 1 (Th1) autoimmune responses, which destroy blood cell progenitors. It was previously reported that protein kinase C theta (PKCθ), expressed specifically in T cells, plays an important role in T cell signaling by mediating Th1 differentiation. Mice treated with Rottlerin, a pharmacological inhibitor of PKCθ, are rescued from the disease when PKCθ phosphorylation was inhibited. Furthermore, humanized antibodies are increasingly gaining attention as therapies. The delivery of antibodies could be achieved via cell penetrating peptides (CPPs), which are able to internalize cargo into cells. Here, we designed, synthesized and characterized CPPMs to increase delivery efficiency of an antibody against phosphorylated PKCθ (T538), which subsequently interfered with the function of the kinase. We designed an in vitro delivery method for the CPPM/Anti-pPKCθ complex then assessed T cell activation and AA disease marker expression. Also, we generated an in vivo humanized mouse model of AA and tested the complex for delivery and effect on survival of these mice. Altogether the results reveal that PKCθ may be an optimal target for bone marrow failure treatment and intracellular antibody delivery may represent a novel approach for AA treatment.