
Protein tyrosine phosphatase - sigma inhibitors for hematopoietic regeneration

Grant Award Details

Protein tyrosine phosphatase - sigma inhibitors for hematopoietic regeneration

Grant Type: Quest - Discovery Stage Research Projects

Grant Number: DISC2-09624

Project Objective: Generate and functionally evaluate candidate PTP - sigma inhibitors that antagonize PTP - sigma mediated signaling in hematopoietic stem cells for the purpose of hematopoietic regeneration.

Investigator:

Name:	John Chute
Institution:	University of California, Los Angeles
Type:	PI

Disease Focus: Blood Cancer, Blood Disorders, Cancer

Human Stem Cell Use: Adult Stem Cell

Award Value: \$2,116,708

Status: Closed

Progress Reports

Reporting Period: Year 2

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Grant Application Details

Application Title: Protein tyrosine phosphatase - sigma inhibitors for hematopoietic regeneration

Public Abstract:**Research Objective**

We propose to develop a lead small molecule inhibitor of PTP σ , a receptor expressed by human blood stem cells, for the purpose of promoting human hematopoietic regeneration.

Impact

Systemic administration of a PTP σ inhibitor can accelerate hematologic recovery in thousands of patients who have received myelosuppressive chemo- or radiotherapy.

Major Proposed Activities

- Generate novel PTP σ inhibitors for functional screening.
- Develop and validate a PTP σ inhibition assay to allow direct testing of candidate PTP σ inhibitors in vitro.
- Develop and validate a Rac1 activation assay and a PTP σ specificity assay and test all candidate PTP σ inhibitors for these activities.
- Determine the in vitro and in vivo hematopoietic regenerative capacity of select PTP σ inhibitors.
- Test the efficacy of select PTP σ inhibitors in a model of BM transplantation and against human HSCs in vitro.
- Perform initial PK and toxicity studies of PTP σ inhibitors and select a lead compound for clinical development.

Statement of Benefit to California:

This research will benefit California in several ways. First, this research provides fundamental new knowledge regarding hematopoietic stem cell biology to the field. Second, we have generated new intellectual property around novel PTP σ inhibitors for which we have filed provisional patent applications with the USPTO. Third, our discoveries will provide the basis for licensure to biotechnology or pharmaceutical companies in California or raise investment from venture capitalists.

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