# Targeting Protein Tyrosine Phosphatase-Sigma to Augment Hematopoietic Reconstitution

Tech ID: 29772 / UC Case 2015-365-0

## SUMMARY

UCLA researchers from the Department of Medicine have developed a novel technique for inducing increased hematopoietic recovery after HSC transplantation by targeting the protein tyrosine phosphatase-sigma (PTP-sigma) pathway.

## BACKGROUND

Receptor tyrosine kinases (RTKs) regulate the maintenance, differentiation, and growth of Hematopoietic Stem Cells (HSCs), the precursors of all blood cells. The depletion of circulating blood cells is a problem in many clinical situations, in malignant conditions (such as leukemia) and non-malignant conditions (such as thalassemia and anemia). Current yields for autologous (self) HSC transplantation can be quite low, and could be improved via artificially augmenting HSC activity. UCLA researchers have recently discovered that the protein tyrosine phosphatase-sigma (PTP-sigma), which is expressed on HSCs, counteracts the proliferative effects of RTKs and therefore may be a target for artificially increasing hematopoietic recovery.

## INNOVATION

The inventors have developed a novel method to increase the rate of hematopoietic recovery and blood cell production. By selecting only for PTP-sigma negative HSCs before transplantation, the suppressive activity of PTP-sigma on hematopoietic proliferation is eliminated, allowing for improved HSC engraftment and capacity for reconstitution. This technique has been shown in experiments to result in a 15-fold increase of HSC engraftment after HSC-transplant and can also be used accelerate hematological recovery in cancer patients after anemia caused by chemotherapy agents.

## APPLICATIONS

- Increased yield of hemopoietic stem cell engraftment after transplantation
- Adjunctive therapy after myelosuppressive chemotherapy
- Treatment of anemia disorders

## ADVANTAGES

- Vastly increased HSC engraftment over current methods
- Stimulates HSC engraftment and production simply by cell selection instead of reagents
- Works in conjunction with many existing HSC transplantation methods

## RELATED MATERIALS

- Quarmyne, M., Doan, P. L., Himburg, H.A., Yan, X., Nakamura, M., Zhao, L., Chao, N. J., Chute, J. P. Protein tyrosine phosphatase-s regulates hematopoietic stem cell-repopulating capacity, J Clin Invest., 2015.

## PATENT STATUS

| Country | Type | Number | Dated | Case |
|---|---|---|---|---|
| United States Of America | Issued Patent | 10517898 | 12/31/2019 | 2015-365 |

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## INVENTORS

- Chute, John P.

## OTHER INFORMATION

### KEYWORDS

Hemopoietic stem cell, hematological recovery, blood transplant, HSC transplant, anemia, blood, proliferation, growth factor

### CATEGORIZED AS

- **Medical**
  - Disease: Blood and Lymphatic System
  - Therapeutics

### RELATED CASES

2015-365-0

## ADDITIONAL TECHNOLOGIES BY THESE INVENTORS

- Inhibition Of Protein Tyrosine Phosphatase - Sigma For Hematopoietic Regeneration



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