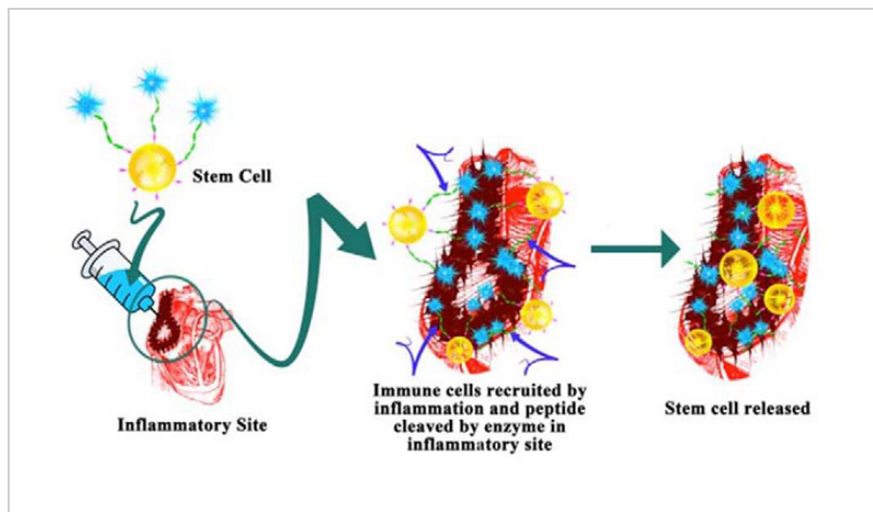


# Immune-Cell-Mediated Stem Cell Delivery for Tissue Regeneration

ID# 2015-4312



PennState



Immune-cell-mediated stem cell delivery

## Technology Summary

Using click chemistry to enable specific bioconjugations, Penn State researchers have leveraged the body's own immune cells to transform the way stem cells are delivered for tissue engineering. For instance, enzyme-sensitive degradable peptides can be used to link stem cells and immune cells together. When these cell assemblies are injected into muscle tissue, such as ischemic cardiac tissue, the immune cells bind and reside in the inflamed cardiac tissue, improving the immune response to promote vascularization and wound healing. Furthermore, the bound stem cells are retained at the site of inflammation and will eventually be released from the immune cells through degradation of the peptide linker by matrix metalloproteinases in ischemic cardiac tissue. The figure above is an illustration of immune-cell-mediated stem cell delivery for cardiac tissue regeneration.

## Application & Market Utility

Despite the enormous potential of tissue engineering, there are currently no successful strategies to repair thick, highly vascularized tissues (e.g., regeneration of ischemic cardiac tissue). This technology addresses this previously unmet need by providing a more efficient means for tissue regeneration by coupling stem cell delivery to the body's immune response.

## Next Steps

Seeking start-up investment, research collaboration, and/or licensing opportunities.

TECHNOLOGY READINESS LEVEL

1-3

### Seeking

Investment | Licensing | Research

### Keywords

- immune cells
- stem cells
- tissue engineering
- cardiac tissue regeneration
- click chemistry bioconjugations

### Researchers

#### Jian Yang

Professor of Biomedical Engineering

[Website](#)

#### Cheng Dong

Department Head of BME and Distinguished

Professor

[Website](#)

### Other Researchers

#### Zhiwei Xie

### Originating College

College of Engineering

### Office of Technology Management Contact

Ritter, Dustin

dwr18@psu.edu

814-863-7070



Invent Penn State is a Commonwealth-wide initiative to spur economic development, job creation, and student career success. Invent Penn State blends entrepreneurship-focused academic programs, business startup training and incubation, funding for commercialization, and university-community collaborations to facilitate the challenging process of turning research discoveries into valuable products and services that can benefit Pennsylvanians and humankind. Learn more at [invent.psu.edu](http://invent.psu.edu).

Penn State is an equal opportunity, affirmative action employer, and is committed to providing employment opportunities to all qualified applicants without regard to race, color, religion, age, sex, sexual orientation, gender identity, national origin, disability or protected veteran status.