Progenitor cell population to generate functional blood vessels in vivo

Researchers at Stanford have developed methods to identify, isolate, and use specific progenitor cell populations to generate adipose tissue and functional blood vessels *in vivo*. Ischemic cardiovascular disease, including coronary artery disease (CAD), peripheral arterial disease (PAD) and stroke, is a leading cause of death in the developed world. New therapies to treat this disease are needed. As such, stem cell biologists are trying to identify a population of progenitor cells capable of treating vascular disease. Progress has been made, but the ability to isolate a pure population of such progenitor cells has been lacking. With this technology, the inventors have helped meet this need. They have identified a stromal progenitor cell subpopulation (that can be isolated from bone marrow, fat, and other tissues) and developed methods to use these cells to form adipose tissue and functional vasculature *in vivo*. This technology can be used to treat ischemic injury in the peripheral limbs and heart.

Stage of research
The inventors identified a progenitor cell subpopulation that can form functional vessels and adipose tissue. Using a mouse xenotransplant model of hindlimb ischemia they showed that this subpopulation of human cells significantly enhanced revascularization.

Applications

- Vascular therapy for cardiovascular ischemic disease including:
  - Myocardial infarction
  - Stroke
  - CAD

- PAD
- Reconstructive surgery

Advantages

- Promotes the formation of functional blood vessels *in vivo*
- Method can be applied autologously without *in vitro* culture
- Yields purer cell populations than competing techniques
   - Forms blood vessels that are functionally superior
   - More pure population of adipose cells allows for better augmentation with minimal reabsorption

Patents

- Published Application: [WO2018039588](#)
- Published Application: [20190183940](#)
- Issued: [11,369,641 (USA)](#)

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