Docket #: S21-451

Compressed Collagen Composite Construct (4C) for cell or therapeutic delivery

Stanford inventors have developed a method for collagen compression along with a polymer mesh as a mechanical support to produce collagen-based composite grafts. These grafts have robust mechanical properties superior to typical collagen gels, and they maintain specific biological characteristics of collagen matrix and the viability of embedded cell types.

The clinical use of collagen is limited due to its poor mechanical properties. More mechanically stable and durable collagen constructs are desired in clinical applications. This novel method can generate collagen-based grafts with anchoring capabilities, sufficient flexibility, and mechanical strength to be manipulated, implanted, and sutured. These grafts are robust enough for surgical and clinical use. Moreover, these grafts can be loaded with autologous progenitor cells as well as growth factors and/or nanoparticles/microparticles. This suggests the potential of the grafts for drug delivery and tissue regenerative therapies.

Stage of development
Proof of concept

Applications

- Drug delivery platforms
- Tissue engineering
- Regenerative medicine
- Reconstructive surgery

Advantages

- Flexible
- Mechanically stable and durable
- High viability of embedded cells

Patents

- Published Application: WO2023147020
- Published Application: 20250082826

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