Computational method maximizes applicable of existing osteochondral allografts

Technology #cu14124

While allografts represent a powerful treatment option in the repair of damaged articular cartilage, the wide variety of potential repair sites makes it difficult to identify structurally compatible allografts. Furthermore, a limited number of donor tissues result in high rates of graft expiration, as clinicians struggle to find appropriate anatomical matches. This technology provides a computational tool addressing this limitation through identification of and precise architectural modifications to existing allografts and host sites. These changes will provide for wider applicability of existing donor tissues, allowing donor grafts from one joint to be used in a host site from another, while at the same time improving outcomes by restoring the curvature of the articular surface.

Effective tool for reshaping allografts reduces waste while improving functional outcomes

Following structural profiling of a patient’s damaged joint, this technology analyzes possible allografts from multiple donor sites—emphasizing structural compatibility in lieu of restrictions regarding anatomical location. Modeling of structural compatibility ensures that allografts will be able to withstand mechanical stressors without compromising viability or function. Once a compatible match is found, this technology suggests a series of alterations to both the host site and donor tissue that ensures safe and effective reshaping of the tissue to generate customized, patient-specific allografts. Uniquely, this technology allows for the use of donor tissue from a different anatomical location from the host site. By allowing originally incongruous donor tissues to be reshaped to perfectly match the anatomy of the host site, this technology greatly increases the applicability and effectiveness of existing osteochondral allografts.

As a whole, this technology will aid in reducing allograft waste, increase allografts available to patients, and increase the viability and compatibility of allografts resulting in a more functional repaired joint.

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Applications:

- Improved allograft matching
- Allograft customization
- Increased allograft availability

Advantages:

- Decreased logistical strain of patient-donor matching
- Reduction of wasted allografts due to expiration
- Structural matching increases probability of viability and successful implantation
- Curvature matching

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