"MODULATION OF STRUCTURE IN ELECTROSPUN SCAFFOLDS" VCU #08-030

Applications

- Electrospun materials
- Tissue engineering and artificial organ engineering
- Wound healing

Advantages

- Determine structural and functional properties of electrospun scaffolds
- Uses collagen, a biocompatible material

Inventors

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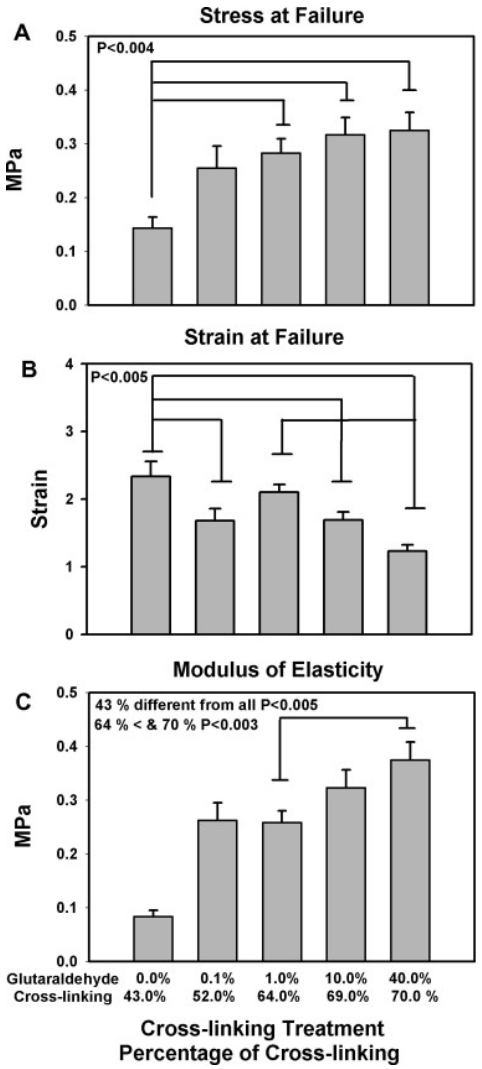
Market Need

Electrospun scaffolds need to possess several structural and functional properties in order to be effective in their applications. Firstly, they need to be able to mimic, as closely as possible, the natural structure along with material properties of the native tissue. Second, the microstructure needs to be able to provide the physiologically relevant binding sites necessary for proper, new cell attachment. In tissue engineering, this helps ensure that the new tissue will behave as the native tissue would have. Problems can sometimes occur when the structures or properties of the scaffolds are altered in some way including by processing, implantation, or unexpected strain. Some scaffolds can be electrospun to exact specifications, but when they are prepared for use *in situ,* effects from interventions can negatively impact the success of the scaffold.

Technology Summary

This technology describes how the structural and functional properties of electrospun collagen scaffolds can be altered at a post-electrospinning site. The inventors specifically examined the effects of how the amount of cross-linking in a scaffold will affect the scaffold's response to mechanical loads. The different ways a scaffold handles loading can change the topography of the scaffold, covering the binding sites or altering the macroscopic shape of the structure, and the mechanical properties of the scaffold. It is thus very important to understand what the later implications of cross-linking could be. In research described in the publication, glutaraldehyde was used as a cross-linking agent. The figure shows changes in various mechanical properties dependent on the percentage of glutaraldehyde and cross-linking.



Technology Status

Regular U.S. Patent Pending. Publication: Newton et al. 2009
This technology is available for licensing to industry for further development and commercialization.