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**Title:** BIOMECHANICAL PROPERTIES OF DERMIS AND FASCIA: DIFFERENCES IN SPECIFIC TESTING MODALITIES

**Aims of Study:**

Collagen fibril orientation affects the biomechanical properties of tissue. Dermis contains a biaxially oriented collagen fibril network parallel to the plane of the skin whereas collagen fibrils in fascia are oriented in a parallel, one directional orientation along the long axis of the fascial segment. These differences in tissue architecture may affect the biomechanical properties of the specific tissue type and therefore the suitability of that tissue type as a structural substitute. This study was undertaken to evaluate the differences between the biomechanical Properties of different tissue types.

**Methods:**

Human dermal strips (2 cm x 4 cm dimensions) from two different sources (Urogen, Collagenesis, Inc., Beverly, MA and Alloderm, LifeCell Corp., Branchburg, NJ) and fascia lata tissue (TranZgraft, Northern California Transplant Bank, San Rafael, CA) were compared for differences in suture retention strength, ultimate tensile strength (UTS) (force required to cause tissue failure as demonstrated by breakage), and ultimate tensile strain (an expression of pliability). All materials were rehydrated similarly and subjected to identical testing methodologies.

**Results:**

Test	Urogen	Alloderm	TranZgraft,along length	TranZgraft, along width
Suture Retention	29.32+/- 11.17	20.4+/-6	1.6	1.6
Ultimate Tensile Strength(Mpa)	10.11+/-4.7	9.41+/-2.92	-6.3	-6.3
Ultimate Tensile Strength(PSI)	1440+/-667	1340+/-416	897	42.7
Ultimate Tensile Strain (%)	85+/-915	59.5+/-19.3	-50	-20

**Conclusions:**

Significant differences were noted between dermal strips and fascia lata. In all modalities dermis was superior to fascia lata. Different processing appears to produce some differences between dermal preparations. Urogen demonstrated better pliability and suture retention than did Alloderm.

Study sponsored by Collagenesis, Inc., Beverly , MA.