The Tissue Sciences and Biomaterials Laboratory at the University of Washington is committed to the characterization of skin biological response to mechanical stress, the design of implantable biomaterials that support the body’s natural healing mechanisms, and the development of scientific tools to measure these behaviors. This research will allow the pursuit of therapeutic treatments strategies that encourage load tolerance in skin that would otherwise be susceptible to breakdown and the development of biomaterials that work with the body’s healing physiology rather than undergoing the normal rejection process typical of many biomaterials.

**Tissue Sciences:** In many rehabilitation treatments (e.g. use of a prosthesis or a wheelchair), the skin is subjected to pressures and shear stresses far greater than normal, a circumstance that can lead to discomfort, pain, and in some cases skin ulceration and a worsened disability. The purpose of this research is to better understand bioprocesses of skin adaptation so as to develop therapeutic methods to enhance the tolerance of skin to repetitive mechanical loading. Current research involves both *in vivo* and an *in vitro* models investigating skin adaptation.

**Biomaterials:** The Biomaterials effort is part of the UWEB (University of Washington Engineered Biomaterials) Program, an Engineering Research Center in the Bioengineering Department supported by the National Science Foundation. The goal of UWEB is to pursue a new approach to biomaterials design, to engineer "biomaterials that heal," i.e. materials that the body recognizes as natural tissue rather than as foreign entities that it encapsulates with a fibrous layer. Current research includes investigation of the mechanical effects on cell signaling and receptors, the design of non-woven fibro-porous biomaterials for soft tissue applications, and a creation of a method for facilitating angiogenesis into porous biomaterials.

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**Selected Publications**


