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DESIGN AND CHARACTERIZATION OF DECELLULARIZED ADIPOSE TISSUE (DAT) BIOSCAFFOLDS AS CELL-INSTRUCTIVE MATRICES FOR SOFT TISSUE REGENERATION AND WOUND HEALING

Lauren E. Flynn[a]
[a]The University of Western Ontario, Canada

Over the past 7 years, research in the Flynn lab has been focused on the rational design of novel tissue-derived bioscaffolds for applications in tissue regeneration of the integumentary system. More specifically, our group has pioneered the development of Decellularized Adipose Tissue (DAT) derived from human fat discarded as surgical waste as a platform scaffolding technology for soft tissue regeneration. Adipose tissue represents an abundant and accessible source of both bioactive ExtraCellular Matrix (ECM) components and pro-regenerative cell populations for use in advanced wound healing strategies. Our results have been extremely promising, indicating that the DAT is biocompatible, stimulates angiogenesis and is readily remodeled by infiltrating host cells to promote the regeneration of host soft tissues. Building the DAT as a platform technology, we have subsequently developed methods for fabricating an array of DAT bioscaffold formats including DAT microcarriers and 3-D porous foams, with properties tuned for a range of applications in cell delivery and wound healing. Using these engineered 3-D microenvironments, we have made important progress in understanding cell-cell and cell-ECM interactions in the context of soft tissue regeneration. Our most recent findings further support that DAT scaffolds provide a conducive microenvironment for *in vivo* soft tissue regeneration and demonstrate that seeding the scaffolds with allogeneic ASCs can help to orchestrate this response by promoting the recruitment of beneficial host cell populations that directly contribute to the formation of healthy host-derived soft tissues.

Biography

Lauren Flynn completed her Ph.D at the University of Toronto and subsequently started as an Assistant Professor at Queen's University in 2007 before being recruited to a joint Associate Professorship in Engineering and Medicine at Western in 2014. Dr. Flynn's research expertise focuses on cell-based regenerative therapies with Adipose-derived Stem/stromal Cells (ASCs) and bioscaffolds derived from the ExtraCellular Matrix (ECM) for applications in soft tissue regeneration and wound healing. In 2013, she co-founded a startup company (Adipologix Inc.) that is focused on the development of her decellularized adipose tissue (DAT) technology for use in plastic and reconstructive surgery.

mrburdettetaylor@uaa.alaska.edu

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