FACTORS INFLUENCING TOLERANCE/REJECTION OF SKIN IN FACE/HAND TRANSPLANTATION

More than 100 upper extremity and 20 facial transplantations (vascularized composite allografts, VCAs) have been performed in patients with an unprecedented level of success following limb amputation, craniofacial trauma, and burns. Children are not exempt from such devastating injuries and complex congenital anomalies however and VCA represents an attractive treatment option. However, the current risks of life-long immunosuppression required severely limits application of VCA to the pediatric population.

Our group at Shriners Hospitals for Children – Boston was the first to demonstrate that the mixed chimerism approach can be successfully extended to large animal, pre-clinical models to achieve immunosuppression-free, indefinite survival of VCAs. Researchers used a special breed of swine for the studies that have since led to further insight with regard to the possibility of predicting acceptance or rejection of the skin component in VCAs through genetic analysis between the donor and recipient pairs. Having established the proof-of-principle model for mixed chimerism as a clinically-relevant approach for VCA tolerance, our current efforts are focused on translating our findings into clinically-applicable protocols to achieve tolerance of all components of a VCA (i.e. skin, muscle, bone etc.)

Recent Publications:
Hypothesis: MHC class I/class II antigen sharing between recipients and donors may influence VCA skin tolerance.

MHC Class II Mismatched Chimeras Demonstrate Stable Mixed Chimerism

![Graph showing % Chimerism over time for different cell types.](image)
MHC class II mismatched chimeras demonstrate no significant clinical or histological signs of VCA rejection during the conditioning regimen or after cessation of immunosuppression.