Title:	**Characterizing the mechanism of action of local immunosuppression to achieve graft survival in a model of hand transplantation.**

Summary:

Vascularized composite allotransplantation (VCA) is the transfer of a body part containing multiple tissue types (skin, muscle, bone, nerves, blood vessels) such as hand, uterus, and penis. Hand transplantation is the most common example of VCA, which nowadays is a reliable treatment option for patients with traumatic amputation of their upper extremities. Thanks to the restoration of motor-function and sensitivity, this procedure is associated with high patient satisfaction especially when compared with the standard prosthetic treatments. The use of this promising alternative is hampered by the adverse effects related to the high-dose long-term immunosuppression needed to maintain graft survival. Looking to approach this dilemma our lab has been developing two novel drug delivery systems (DDS) which have proven to maintain graft survival in a rat model through a local immunosuppression regimen without the well-known off-target toxicity associated with standard systemic therapy. As our final goal is safe clinical use, we are currently validating this DDS in large animals by carrying out a porcine limb transplantation model. Moreover, we are trying to understand the complex immunogenicity related with this type of allograft.

The students will work with a PhD candidate and perform laboratory analyzes of tissue and plasma samples. Techniques can include, but are not limited to immunofluorescence staining / microscopy, FACS, mixed lymphocyte reaction, multiplex suspension array, ELISA.

Requirements:

Students selecting this module should be interested in translational biomedical research. Basic background knowledge on transplantation, immunosuppression and immunology in general are a plus.

Literature:

Gajanayake et al., Science Translational Medicine 2014; 249.
Dzhonova et al., Transplantation 2018; 102.
Dzhonova et al., PLoS ONE 2018; 13.
Sutter et al., Scientific Reports 2019; 9.

Time-slots & # of students:	Elective module series I :	1-2 students
	Elective module series II:	1-2 students

Location:

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