Title:	**Novel therapeutic approaches for immunomodulation in composite tissue allotransplantation**

Summary: Composite tissue allotransplantation (CTA), including hand transplantation, has become a promising clinical treatment. Sixty-nine hand, forearm and arm transplantations have been performed over the past 12 years. The major hurdle of hand transplantation is health complications associated with immunosuppressive drugs. Thus, the future of CTA will depend on discovery of novel strategies, which can be used in the clinics as a replacement for current immunosuppressive protocols. A composite tissue allograft is readily accessible for local immunosuppression, which may reduce overall systemic immunosuppression. Therefore, one potential method is to develop a local immunosuppressive drug delivery system. An efficient local drug delivery system increases bioavailability of drugs locally over many weeks while minimizing systemic concentration. This aids to avoid many drawbacks associated in current immunosuppressive drugs. Our current research aim is to investigate therapeutic potentials of an injectable self-assembled nanofibrous hydrogel system in which immunosuppressive agents are encapsulated. The hydrogel-laden drug delivery system is capable of releasing active immunosuppressives in response to enzymes that are significantly upregulated as a result of inflammation elicited by transplantation procedure and the immune responses from the recipient (on demand drug delivery).

Requirements: Students selecting this module should be interested in research, which covers transplantation, immunology, pharmacology and vascular biology. Our research is performed in close collaboration with clinical partners and we use methods ranging from molecular analyses of inflammation markers to animal experiments.

Literature:
Gajanayake, T. et al., Am J Transplant 2008; 8:1151-1162.
Spirig, R. et al. J Immunol. 2008 Jul 15;181(2):878-90

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

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