Proposal for an elective module:

Title:	**Composite tissue preservation by extracorporeal blood perfusion and vascular cytoprotection to extend the time limit to limb replantation**
Summary:	Trauma is the main cause of lower limb amputation in the developing countries. Usually the traumatic amputees are young with long life expectancy. Revascularization of the amputated limb within 4 – 6 hours is essential to avoid extensive reperfusion injury due to vascular leakage, edema and tissue necrosis. Ischemia reperfusion injury (IRI) is a pathological inflammatory condition that occurs during reperfusion of an organ after prolonged ischemia. Clinical and experimental studies showed that ischemia over 4 – 6 hours can adversely affect the success of revascularization surgery as well as lead to damage of distant organs like lungs and kidneys. However, it is not always possible to maintain that time period especially if the patient has to be treated first for a life threatening condition. Several strategies have therefore been tested to reduce IRI, including extracorporeal perfusion before replantation of the amputated extremities. Our lab has used extracorporeal perfusion of amputated porcine extremities using the heart lung machine as a potential limb preserving technique in addition to cytoprotective agents to prevent reperfusion injury. In this module the students will work hand-in-hand with a PhD student to perform immunofluorescence staining analyses of cryosections from pig forelimbs which were subjected to prolonged ischemia and perfusion on the heart lung machine. Attendance of pig limb perfusion experiments, which will be done probably in March / April 2015, is possible.
Requirements:	Students selecting this module should be interested in translational biomedical research. Some background knowledge on complement, coagulation and the endothelium are a plus. The students will get a thorough introduction into state-of-the-art analysis of immunofluorescence analysis as testing of activation markers of innate immunity in general. The topic involves no animal experimentation, but will be based on pig limb reperfusions performed before the elective modules.
Literature:	Müller S et al., Journal of Surgical Research 2013; 181: 170-182. Perkins ZB et al., British Journal of Surgery 2012; 9(1): 75-86.
Time-slots & # of students:	Elective module series I : 1-2 students Elective module series II: 1-2 students
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