Title:	**Mapping the binding pattern of plasma proteins to the glycocalyx of Endothelial Cells**

Summary:

The endothelial glycocalyx, a sugar-rich network that covers the apical surface of endothelial cells is a key player in vascular integrity and cardiovascular homeostasis. Degradation and/or shedding of the endothelial glycocalyx impairs the protection against endothelial activation leading to leucocyte adhesion, and possibly to thrombosis. Although, endothelial glycocalyx shedding is observed in several pathological conditions such as sepsis, traumatic injury, cancer, diabetes and most importantly ischemia/reperfusion injury, what exactly happens on a molecular basis is still unknown. Our laboratory is currently investigating the "fingerprint" of plasma proteins that bind to quiescent endothelial cells (EC), where the glycocalyx is intact, and compare it to the fingerprint of differentially activated EC, where the shedding of the glycocalyx occurs. The students will work with a PhD candidate and will be involved in isolating porcine microvascular endothelial cells from several anatomical areas such as liver, kidney, lung and heart, and analyze their interaction with plasma proteins using a *3D* microfluidic chip and confocal microscopy. Binding will also be analyzed after removal/shedding of the glycocalyx by heparinase treatment or upon EC activation by antibodies, complement and inflammatory mediators. Techniques can include immunofluorescence / confocal microscopy, cell culturing and isolation, setting up the microfluidic chip, but details have not been determined yet.

Requirements:

Students selecting this module should be interested in biomedical research. Some background knowledge on endothelial cell, inflammation and coagulation are a plus. There will be no in vivo work.

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

Location:

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