The Role of Thrombomodulin in Virus Induced Stress Responses

Yuk Ting Siu

Type 1 diabetes (T1D) is an insulin-dependent disease caused by the destruction of insulin-producing β cells in the human islets. The incidence rate of T1D varies among age groups and countries. Many cases are diagnosed before the age of 30 and there is a tendency of childhood onset (< 15 years old). Northern European countries have a relatively high incidence rate of T1D and Finland has the highest incidence rate in the world, reaching the mean 62.5 per 100 000 persons between 2006 and 2011. It is believed that both gene predisposition and environmental triggers play an important role in the development of T1D but the exact etiology and pathogenesis of this disease remains unclear.

Thrombomodulin (TM) is a cofactor on the endothelial cell surface which serves as an anticoagulant and anti-inflammatory protein. The human pancreatic biopsies showed that TM is not only expressed in the microvasculature of human islets, but also in the endocrine cells. However, the function of TM in endocrine cells is unknown. In addition, dilated endothelium and intra-islet bleeding can be observed in the pancreatic biopsies from the recent onset T1D patients. Since the infection with human enteroviruses (HEVs) has been associated to the development of T1D and β cell tropism of HEVs has been studied *in vitro* and *in vivo*, it would be interesting to study the effect of virus-induced stress on TM expression of the islet microvasculature and endocrine cells *in vitro.*

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Biology Education Centre and Department of Immunology, Genetics and Pathology, Rudbeck Laboratory, Uppsala University
Supervisors: Gun Frisk and Peetra Magnusson