DEPARTMENT OF PEDIATRICS
Medical Center

SUMMER RESEARCH OPPORTUNITIES
FOR UNDERGRADUATE WOMEN

APPLICATION DEADLINE: MARCH 3, 2003

The Department of Pediatrics is pleased to offer the following research project(s) for the summer of 2003. Interested students are urged to contact the faculty member(s) directing the project(s) that most interest them. By contacting the faculty member, you can discover more about the project, learn what your responsibilities will be, and if possible, develop a timetable for the twelve-week research period.

Molecular Biology

Professor Sandra J. F. Degen
2031 CH-TCHRF 636-4816 FAX: (513) 636-4317
E-Mail: Sandra.Degen@UC.Edu

The research in my laboratory involves studying the regulation of expression of proteins involved in blood coagulation and growth control. These proteins are structurally related but have different biological functions. One of these proteins, prothrombin, has diverse biological roles. It is crucial for the clotting of blood and in the anticoagulation process, in the stimulation of platelets to undergo a shape change, causes mitogenesis in fibroblasts, is chemotactic for macrophages, and is involved in the regulation of proliferation of endothelial cells and possibly other cell types. We have recently generated mice that are deficient in prothrombin (FII-/-) in order to study the role of prothrombin in development and other biological processes. Half of the FII-/- mice die *in utero* due to bleeding events around E9.5 while the remainder die soon after birth from abdominal bleeding. Long term goals of this project include introducing mutant forms of prothrombin into the mouse for structure-function studies and the targeted ablation of prothrombin in tissues other than the liver, its primary site of synthesis. In this way we can learn more about the biology of prothrombin in an in vivo context.

Reproductive Biology

Professor Sandra J. F. Degen
2031 CH-TCHRF 636-4816 FAX: (513) 636-4317
E-Mail: Sandra.Degen@UC.Edu

The research in my laboratory involves studying the regulation of expression of proteins involved in blood coagulation and growth control. These proteins are structurally related but have different biological functions. Specifically, we work on hepatocyte growth factor-like protein (HGFL) and its membrane tyrosine kinase receptor (Ron). HGFL and Ron have been found to have diverse biological properties based on in vitro assays. These functions

include the activation of macrophage, invasiveness of trophoblasts, motility of keratinocytes and bone resorption of osteoclasts. Recently, we have successfully ablated the genes for HGFL and Ron in mice. HGFL null mice are born and appear to be normal. Deletion of the Ron gene is embryonic lethal during the peri-implantation time of development. Present studies include: the identification of additional HGF-like growth factors that might compensate for HGFL in the HGFL-deficient mice; characterization of tropohoblast cell lines expressing Ron; determination of the biological properties that result from the constitutive expression of Ron; structure-function studies on Ron; and determination of the role of Ron and HGFL during implantation using embryonic tetraploid analysis.