

BIOEN 509 – DEPARTMENTAL SEMINAR SERIES

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Foegen Bioengineering Building N130A

Opportunities for Interaction of Bioengineering and Prostate Cancer Research: Basic and Clinical

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Solid tumors such as colon, breast, and prostate epithelial cancers grow in vivo in the three dimensional architecture of their respective organs. As such they develop in a three dimensional system where they have a specific cell-cell contact structure as well as a scaffold support system that appears to be critical in their growth. In addition this structure generates specific cell surface signaling systems from matrix proteins as well as non-epithelial mesenchymal cells, macrophages, immune cells, and secreted proteins from a plethora of sources. This in vivo environment poses challenges to our ability evaluate the contribution of the three dimensional structure to cancer growth development and growth from the basic biological perspective and precisely because of this environment can make the isolation of tumor cells from other cells within the organism difficult. In order to overcome these potential obstacles in the study of solid tumor growth and metastases cell biologists and clinical investigators interact with investigators in surface and structural engineering disciplines to the tools that will permit appropriate study of solid tumors in both the in vitro and in vivo arenas. In this seminar we will show examples of how interactions with bioengineers has led to the development of scaffold systems allow us a better model to study the growth of prostate cancer in a regulated three dimensional system and from the clinical perspective how the use of flow and surface dynamics leads to development of microfluidic devices that permit earlier and more accurate prediction of the clinical course and treatment efficacy of treatment men with prostate cancer.

Dr. Plymate is Professor of Medicine, Division of Gerontology and Geriatric Medicine, and Deputy Associate Director, GRECC, Puget Sound VAPSHCS, Seattle/Tacoma, WA. His laboratory has worked on the IGF system in prostate cancer since 1993. During that time they have described the preclinical biology of IGF in prostate cancer and since 2003 evaluated the use of fully human monoclonal antibodies against the IGF-IR in preclinical and phase I and investigator initiated phase I/II trials in prostate cancer. He leads a project in the Pacific Northwest Prostate Cancer SPORE and a prostate cancer PO1 that are directly related to the IGF system in prostate cancer. These two grants provide a strong collaborative effort in IGFs. Additionally, he is the PI of a Tumor Microenvironment Network NCI U54 grant in prostate disease. He is also an attending physician in the advanced prostate cancer clinic and a member of the Seattle Cancer Care Alliance clinic.

