Bogazici-BME/Lifesci & İnovita & İSEK Ortak Semineri *(2017)*

24 EKİM(SALI)

13.00 - 14.00 (!)

Biyomedikal Mühendisliği Enstitüsü, AZ-19,
Boğaziçi Üniversitesi Kandilli Kampüsü, İstanbul

Development of Novel Nanomedicines for Treatment of Primary and Metastatic Prostate Cancer and Pulsed Focused Ultrasound (pFUS) Modulation of Tumor Microenvironments

Ömer AYDIN

Radiology and Imaging Sciences at the National Institute of Health (NIH, USA)

About The Seminar:

*• My research focuses on **i)** development of novel therapeutic approaches for focal ablation of primary prostate cancer and targeted chemotherapeutics of metastatic lesion in bone; **ii)** characterization of immunomodulation effect of pFUS in murine melanoma and breast cancer models with immunotherapy perspective. The success of **focal prostate cancer therapy** depends on the ability to selectively ablate cancer lesions, which is the objective of my research. Under this section I will discuss the engineered perfluorocarbon loaded-nanodroplets (NDs) that rapidly expand when exposed to therapeutic ultrasound before they collapse, which proved to mechanically fractionate neighboring cells with high precision in 3D cancer model. The second objective of my research focuses on targeting **metastatic prostate cancer lesions in bone**.*

•In the second part of the presentation I will briefly mention about my recent research related to immunotherapy enhancement via pFUS. Immunotherapy is a promising therapeutic modality. One obstacle to successful therapy is the immune suppressive character of the tumor microenvironment which limits treatment efficiency. Recent studies highlight a potential role for non-thermal pulsed focused ultrasound (pFUS) to initiate immune responses against tumors. Under this section I will discuss the results of sonicated breast or melanoma flank tumors in mice at different peak negative pressures (PNP) and show the tumor microenvironmental alterations with IHC and protein/cytokine analysis and changes in immune cell populations of the spleen, lymphoid tissues, and tumors with IHC, H&E staining and FACS methods

***About the Speaker*:**

•Omer Aydin is currently a post-doctoral fellow in the Radiology and Imaging Sciences at the National Institute of Health (NIH, USA). He received his B.S. from the Department of Biomedical Engineering, Baskent University, M.Sc. from Yeditepe University and a Ph.D. from Biomedical Engineering, the University of Michigan, Ann Arbor. In his graduate education, he studied nanomedicine specifically focusing on development of Surface-enhanced Raman Spectroscopy (SERS), PDMS surfaces desing and novel materials for SERS based diagnostics and biosensors applications. Furthermore, he has worked on the development of drug delivery systems that enhance the therapeutic activity of the incorporated drug molecules while eliminating or minimizing their potential side effects. He also designed and synthesized novel pH labeled polymeric carriers that can effectively target bone metastases and selectively deliver the therapeutic agents to the diseased part of bone, and designed perfluorocarbon-loaded nanodroplets for ultrasound mediated cellular ablation without using any drug. Further he is interested to engineer gene/drug loaded particle delivery to manipluate B and T cells by monitoring imaging systems such as ultrasound and MRI.