Title: **Modeling and Design of Local Drug Delivery Modalities**

Discrepancy between drug potency as observed in the laboratory and clinical efficacy is a recurrent problem in pharmaceutical science and is one of the major stumbling blocks in effective drug design. The last three decades have witnessed the development of sophisticated drug targeting controlled release technologies for overcoming and circumventing the "physiological barriers" to drug delivery. These technologies have already impacted the treatment of many diseases, yet there is growing recognition in both academia and industry that the prevailing trial an error design of drug delivery techniques is a serious limiting factor and mathematical modeling has been suggested as an important tool in the design of drug delivery protocols.

Integrative computational modeling that iteratively builds on experimental data and motivates experimental verification is an invaluable tool for gaining insight on these biological systems. Although, realistic integrative models can be quite complex, mathematical analysis can be used to identify underlying trends. Through examples from my own research on drug eluting stents and intratumoral drug delivery I will illustrate how this modeling paradigm has yielded critical insights, shifted established paradigms in drug delivery and may provide a rational basis for designing local therapy.

Bio:

Rami Tzafriri is a Postdoctoral Associate at The Biomedical Engineering Center, at The Harvard-MIT Division of Health Sciences and Technology. He is using quantitative techniques to analyze the spatiotemporal dynamics of local drug delivery to tissue targets. Applications range from endovascular and intratumoral delivery of antiproliferatives to growth factor delivery to ischemic tissues (therapeutic angiogenesis). He earned his MS in Physics and his Ph.D. in Computer Science and Engineering, both from the Hebrew University of Jerusalem.