

BIOEN 509 – DEPARTMENTAL SEMINAR SERIES

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In vivo Imaging of siRNA Delivery and Silencing

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Since 2001, when Elbashir et al. demonstrated functional RNA interference (RNAi) in mammalian cells, RNAi has emerged as one of the most promising platforms for gene therapeutic product development. Its broad applicability, superior efficiency, and exquisite specificity could potentially be harnessed to develop a powerful novel treatment paradigm with global relevance to any disease amenable to manipulation at the level of gene expression. The fast developing field of RNA interference requires monitoring of siRNA delivery to targeted organs and evaluating the efficiency of target gene silencing. A major obstacle in applying RNA interference in vivo is adequate delivery of the siRNA molecule to the tissue of interest and monitoring this delivery in a non-invasive manner. Molecular imaging techniques represent a powerful tool for real-time non-invasive monitoring of various events at a near microscopic level and have superior advantages over conventional in vitro and cell culture research techniques in biology. Therefore, molecular imaging approach fits perfectly to fulfill the need to monitor siRNA delivery and provides information in a fast, reproducible and non-invasive manner. Studies that describe the imaging of RNA interference include fluorescence or bioluminescence reporter imaging, nuclear imaging, and magnetic resonance imaging. This presentation will summarize the existing information on various imaging modalities and their application for siRNA imaging.

Dr. Anna Moore graduated from Moscow State University, Moscow Russia. She holds a Ph.D. in bioorganic chemistry from the Russian Academy of Sciences. She moved to the United States in 1990 and joined a Molecular Imaging Program at Massachusetts General Hospital/Harvard Medical School in 1991, first as a postdoctoral fellow and then as a junior faculty. Currently, she is an Associate Professor in Radiology and a Director of Molecular Imaging Laboratory at the Martinos Center for Biomedical Imaging. She is a member of the Affiliated Faculty of the Harvard-MIT Division of Health Sciences and Technology. Her research deals with non-invasive imaging of molecular targets in cancer, diabetes and neurological disorders. She is a recipient of multiple grant awards from NIH and other agencies. Dr. Moore published her research in high impact journal including Nature Medicine, Cancer Research, Diabetes, Radiology and others.

