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Dr. FAROKHZAD received his undergraduate degree B.S. (Biology) from University of Massachusetts, Boston, MA in 1991 and has done M.D. from Boston University School of Medicine, Boston, MA in 1999. His areas of specialization include polymeric biomaterials, Tissue Engineering, Biomedical Devices, Cancer Research nanomedical technologies.

Dr. FAROKHZAD has worked as a research Fellow in Chemical Engineering, Massachusetts Institute of Technology, Cambridge, MA from 2003-2004 and as research Fellow in Pain Medicine, Brigham and Women's Hospital from 2006-2007. over the last few years he became the member of large number of Professional Societies such as American Society of Anesthesiologists, Massachusetts Medical Society, Massachusetts Society of Anesthesiologists, European Association of Cancer Research, American Heart Association, American Association for Cancer Research and many more.

Dr. FAROKHZAD is currently Assistant Professor of Anesthesiology, Harvard Medical School, Brigham and Women's Hospital, Dept. of Anesthesiology, Boston, MA. He worked as a Ad-Hoc Reviewer in Biomaterials, Tissue Engineering, Pharmaceutical Research in the year 2005. In the year 2006 he worked as a Ad-Hoc Reviewer and Expert Reviewer in International Journal of Cancer and International Journal of Nanomedicine. In the year 2007 he worked as a Ad-Hoc Reviewer in Molecular Imaging, Molecular Cancer Therapeutics; Clinical Cancer Research, Angewandte Chemie , International Addition, ACS Nano. In the year 2008 he worked as a Ad-Hoc Reviewer in British Journal of Pharmacology, Analytical Chemistry, Trends in Biotechnology and Nature Biotechnology and also as Selection Committee for NASA Nanotech Briefs and has won numerous awards. He has a number of scientific publications in the last five years:

Dr. Farokhzad is responsible for teaching Anesthesiology residents and medical students in the operating rooms and research laboratory over the last few years.

Aptamer-Targeted Polymeric Nanoparticles for Cancer Therapy

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A variety of organic and inorganic materials have been utilized to generate nanoparticles for drug delivery applications, including polymeric nanoparticles, dendrimers, nanoshells, liposomes, nucleic acid based nanoparticles, magnetic nanoparticles, and virus nanoparticles. The two most commonly used systems are polymeric nanoparticles and liposomes [1, 2]. Controlled release polymer technology has impacted virtually every branch of medicine, including ophthalmology, pulmonary, pain medicine, endocrinology, cardiology, orthopedics, immunology, neurology and dentistry, with several numerous of these systems in clinical practice today such as Atridox, Lupron Depot, Gliadel, Zoladex, Trelstart Depot, Risperidol Consta and Sandostatin LAR. The annual worldwide market of controlled release polymer systems which extends beyond drug delivery is now estimated at $100 billion and these systems are used by over 100 million people each year. Polymeric nanoparticles can deliver drugs in the optimum dosage over time, thus increasing the efficacy of the drug, maximizing patient compliance and enhancing the ability to use highly toxic, poorly soluble, or relatively unstable drugs. These systems can also be used to co-deliver two or more drugs for combination therapy [3]. The surface engineering of these nanoparticles may yield them "stealth" to prolong their residence in blood [4] and the functionalization of these particles with targeting ligands can differentially target their delivery or update by a subset of cells [5], further increasing their specificity and efficacy [6]. The successful clinical translation of therapeutic nanoparticles requires optimization of many distinct parameters including: variation in the composition of the carrier system, drug loading efficiency, surface hydrophilicity, surface charge, particle size, density of possible ligands for targeting, etc., resulting in a large number of potential variables for optimization which is impractical to achieve using a low throughput approach. More recently combinatorial approaches have been developed to precisely engineer nanoparticles and screen multiple nanoparticle characteristics simultaneously with the goal of identifying formulations with the desired physical and biochemical properties for each specific application [7]. The goal of this talk is to summarize the key components required for creating effective targeted nanoparticle conjugates. The structure and properties of various targeting ligands, as well as the development and evaluation of therapeutic and imaging conjugates that take advantage of the unique properties of these of these ligands will be discussed.