



## **Molecular targeting of tumor cells using aptamer conjugated nanomaterials**

**Wednesday, March 26, 2008**

**Babbio 122, Time NOON**

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For certain types of cancer, targeted drugs have demonstrated superior effectiveness in reducing or eliminating tumors. They have also allowed patients to maintain quality of life without the side effects of chemotherapy. The key comes from a better understanding of the molecular specificity for cancers. For specific targeting, molecular probes are critically important for the recognition of cancer cells. We will discuss the generation of a panel of designer DNA probes, called aptamers, for cancer clinical studies and application. Aptamers are small oligonucleotides which can be selected from a random DNA library for binding with proteins, peptides and other small molecules. The selection process is called SELEX. In order to select effective molecular probes for cancer, we have developed a cell based aptamer selection (cell-SELEX) to generate a group of aptamers for specific tumor cell recognition. Cell-SELEX uses a tumor cell as the target, and a control cell line is used for negative selection. We have produced a group of highly specific aptamers for the recognition of tumor cells. These aptamers have  $K_d$  values ranging from sub-microM to pM against the target cells. The newly selected aptamers, combined with both magnetic and luminescent nanomaterials, can be used for ultrasensitive detection of cancer tumors, for molecular profiling of individual cancer patients, for targeted drug delivery, and for cancer biomarker discovery.

**Dr. Weihong Tan** received a Ph.D. in Physical Chemistry from the University of Michigan in 1993. He was then named a Distinguished Postdoctoral Researcher by the US DOE and worked at Ames Laboratory-USDOE for about two years. In 1996, he joined the University of Florida as an Assistant Professor of Chemistry and a Faculty Member at the McKnight Brain Institute, and was promoted to Associate Professor (2001) and Professor (2003) ranks. He now is a University of Florida Research Foundation professor, the Associate Director of the Center of Research at Bio/nano Interface and a Faculty Member at the McKnight Brain Institute, at Shands Cancer Center, at the UF Genetics Institute and at the NSF Engineering Research Center of Particle Science and Technology. Tan's group has developed internationally recognized research programs in chemical biology, molecular engineering and bionanotechnology. Currently, the Tan group is working on synthesizing a variety of DNA probes for biomedical studies, in developing new nanomaterials and bionanotechnology for bioanalysis, molecular imaging and drug delivery, and in elucidating molecular foundation of diseases using a newly developed cell based chemical biology approach. His work has been recognized by many awards, and received the Pittcon Achievement Award in 2004. In 2005, he was elected as a fellow of American Association for the Advancement of Science.



**Light refreshments will be served prior to seminar**  
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