CANCER NANOTECHNOLOGY – CURRENT & FUTURE OPPORTUNITIES – VIEW FROM THE US NCI ALLIANCE FOR NANOTECHNOLOGY IN CANCER

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Nanotechnology has been providing novel, paradigm shifting solutions to medical problems, particularly in the domain of cancer-based research. In order to further these research goals, the NCI in 2004 initiated the Alliance for Nanotechnology in Cancer.

In this presentation I will discuss a current trend in cancer nanotechnology efforts funded by the Alliance, as well as examine future opportunities and strategies in the field. More specifically, I will discuss how further progress in cancer technology research is likely to follow two parallel tracks: the first being associated with on-going translation to the clinical environment; the second with the development of new tools and techniques in cancer research. It is expected that small molecule drugs in nanoparticle-based formulations currently undergoing clinical trials will be joined by other modes of therapy such as siRNAs and kinase inhibitors.

Additionally, the presentation will examine imaging techniques of nanoparticles and how they are designed to operate in multi-functional manner – whether it is the ability to probe and monitor tumor microenvironment or to use of theranostic functions of diagnosis and subsequent treatment. Lastly, I will discuss how in vitro diagnostic devices have matured to a stage in which the development of additional device modalities with new transduction methods does not seem necessary. That being said, I will explain how these devices are increasingly used to collect data for sophisticated multi-parameter analysis, allowing us to correlate levels of different biomarkers and to optimize reliable panels to determine presence of the disease.

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