

International Conference on

Pancreatic Disorders and Treatment

October 17-19, 2016 Chicago, USA

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Development of targeted therapies for pancreatic cancer

The study explores a novel strategy to deliver drugs to pancreatic ductal adenocarcinoma (PDA) to combat a) chemo-resistance and b) toxicity associated with systemic delivery of chemotherapeutic drugs. We also report the development of an accurate diagnostic/imaging test for PDA. Globally, this year, it is estimated that ~350,000 patients will die of PDA. Development of a biomarker for accurate diagnosis and targeted therapy to improve patient outcome are of paramount importance. Emerging evidence suggests that the capability of a tumor to propagate is dependent on a small subset of cells within the tumor, termed cancer stem cells (CSCs). Traditional treatments can miss the CSCs due to its quiescent property. We have developed a novel monoclonal antibody (designated TAB004) that recognizes a previously hidden cancer biomarker tMUC1 (tumor-specific MUC1). We have reported that tMUC1 is expressed on 95% of PDA and on all PDA-associated CSCs. In this study, we have covalently bound TAB004 to various drug-loaded PLGA (Poly lactic-co-glycolic acid) and silica-based nanoparticles (NPs). These formulations specifically target the tMUC1 on PDA, and associated CSCs sparing normal tissue. We hypothesize that NPs bound to TAB004 will enable the use of highly cytotoxic anti-cancer treatments at localized concentrations making the treatment more effective at lower doses, increasing its therapeutic index and limit toxicity. We will present the results on the localization and therapeutic efficacy of such formulations in appropriate mouse models. Further, we will report on the diagnostic/imaging application of TAB004 to monitor response to therapy.

Biography

Pinku Mukherjee has received her PhD in Immunology from London, UK. After Post-doctoral training at Pennsylvania State University, he held faculty appointments at IU Medical Center, Mayo Clinic, and is currently Chair and Belk Endowed Professor of Cancer Research at University of North Carolina at Charlotte. He has published ~100 articles including patents. Her lab has received major federal/foundation grants totaling >\$13MM. She Co-founded OncoTab Inc., a biotechnology company. She is the 2015 recipient of the O. Max Gardner award, the highest faculty accolade given by the Board of Governors of the University of North Carolina.

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