Penn Medicine

Department of Surgery
Division of Gastrointestinal Surgery

Hospital *of the* University *of* Pennsylvania

January 9, 2023

Dear IHPBA Research Committee,

I would like to express my utmost gratitude to the IHPBA Kenneth Warren Fellowship Committee for providing me with the unique opportunity to carry out my research project on pancreatic cancer at the University of Pennsylvania, under the invaluable supervision of Dr. Charles Vollmer, Chief of the Division of Gastrointestinal Surgery, and Dr. Erica Carpenter, Director of the Liquid Biopsy Laboratory.

My experience at Penn is more enlightening and gratifying with every passing day, and it is enriching me both scientifically and personally. I am excited by this world-renowned cutting-edge program with a strong sense of innovation and avant-garde technologies, as well as by the genuine understanding and sincere scientific complicity I developed with my mentors.

During these months, I have been working on my research project to better develop the concept of "liquid biopsy" for pancreatic cancer prediction and prognostication. We hypothesize that a multi-analyte liquid biopsy may be superior to routine imaging for the staging of PDAC in resectable and locally advanced patients who are candidates for curative-intent surgery. Using machine learning techniques, I am leading the work to algorithmically combine liquid biopsy analytes from a single tube of patient blood and to validate the performance of such classifiers in the prospective and growing cohort of 64 patients we have been accruing at the University of Pennsylvania since August 2022. This will serve as the foundation for a clinical multi-analyte test that might eventually support the selection of patients for surgery, thus improving the accuracy of PDAC diagnosis and therapy. In addition, these methods may be expanded into other clinical problems, such as surveillance of PDAC patients with metastatic illness, and other malignancies.

The benefits of this innovative approach have indeed spilled over into other research projects that I am simultaneously working on. For instance, I have been focusing on the analysis of pancreas-specific circulating cell-free DNA to detect occult metastases and predict survival in resectable pancreatic ductal adenocarcinoma. The results of this pilot study suggest that counting pancreas-specific cfDNA may be a promising biomarker of occult metastatic illness, metastatic progression, and overall survival in resectable PDAC at two years. This finding has important implications for treating pancreatic cancer. It suggests that small amounts of cancer cells may be present in the bloodstream before conventional imaging methods can detect the tumor. I have had the honor to present such unprecedented results at the 8th AACR Special Conference on Pancreatic Cancer in Boston, an international conference that addressed the latest developments in all areas of pancreatic cancer research.

Furthermore, we are currently employing Portal Vein sample analysis to provide liquid biopsy with higher yields of tumor signature biomarkers as opposed to peripheral blood draws, and we are evaluating the combination of mutant KRAS and CNI detection in plasma as a predictor of overall and progression-free survival in metastatic PDAC patients who received standard of care therapy.

In conjunction with my on-going research projects, I also had the opportunity to participate in multiple editorial projects in the field of pancreatic surgery, ranging from invited commentaries, reviews of the literature and writing of papers.

In conclusion, I am sincerely grateful for the once-in-a-lifetime opportunity to be a Kenneth Warren Fellow and to accomplish the type of advanced research I was striving for many years in the field of pancreatic surgery. I am truly looking forward to meeting you all and sharing the results of my researches at the IHPBA World Congress in South Africa, in 2024.

With great esteem and appreciation,

Samuele Cannas, MD, MS, MM