

Visiting Scholar Opportunity



Proteomics

Cancer Challenge

One of the most significant challenges facing oncologists is having access to an array of next-generation tools for early diagnosis and treatment of cancer patients—tools that provide quantitative results, are user friendly in clinical settings, and are of reasonable cost.

It has been observed that proteomics lags behind genomics as a basis for developing more effective diagnostics and treatments. The inherent complexity of the biology of the proteome renders it difficult to focus on tumor-relevant subsets.

Visiting Scholar Opportunity

We are interested in exploring the feasibility of developing a cost-attractive, multiplexed assay that is easily accessible to physicians and uses mass spectrometry to quantitatively measure approximately 100 cancer-associated proteins in tissue or fluid clinical samples. We envision providing a mass spectrometry-based assay that will be readily accessible to physicians as an integrated component of the diagnosis-through-treatment cycle.

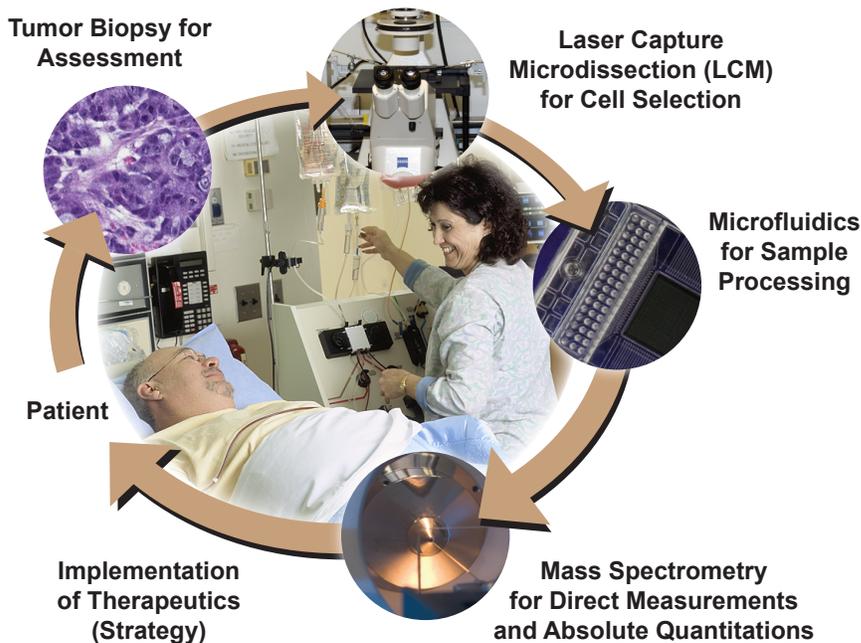
Research efforts are expected to focus on the following technological challenges:

- Prioritization/selection of target biomarkers
- Sample acquisition and processing protocols that address quality and quantity of sample (e.g., heterogeneity of tumor samples; size of sample)

- Development of microfluidic technologies to enable analysis on very small sample sizes (e.g., fewer than 100 cells); integration of microfluidic technology (e.g., devices that conduct cell lysis, protein extraction, chromatography, and electrospray ionization) with the mass spectrometer.
- Development of a prototype for a mass spectrometer clinical analyzer, including working with an industrial partner to develop specifications for a user-friendly, clinical-grade instrument for quantification of specific proteins
- Development of internal standards for reagents
- Integration of bioinformatics to support data acquisition, storage, access, and output

Who Should Apply?

- Oncologists and pathologists are needed to help us identify and prioritize issues, technical challenges, and end-product requirements from the perspective of physicians.



- Industrial partners who have a stake in translating the technology into practical use are also needed.
- Applicants should become familiar with the Frederick National Laboratory programs and core capabilities that either are being or can be applied to this challenge. Applicants are encouraged to contact FrederickVisitingScholar@NIH.gov to inquire about the compatibility of their ideas with the mission focus and current research activities of each of the following laboratories:

Advanced Technology Program

Laboratory of Proteomics and Analytical Technologies

Protein Expression Laboratory

Protein Chemistry Laboratory

Antibody Characterization Laboratory

Advanced Biomedical Computing Center
(Bioinformatics)

