

2017 Letter of Intent for Cancer Center Developmental Funds (Pilot Projects)

Deadline: Monday, May 22, 2017

Type of Application: Check one

- Prouty Pilot: Individual PI (\leq \$25,000) (new, early-stage investigators)
 Prouty Pilot: Multiple PI (\leq \$50,000)

Principal Investigator(s):

First Name, Last Name, Degree(s) _____

e-mail address: _____

telephone: _____

Mentor (if Individual PI application): _____

Project Title: _____

Eligibility for funds restricted to Leukemia? Yes No

Abstract (250-word maximum): Cite translational emphasis and intended use of pilot results. Multiple PI applications should note how disciplines represented address team science and translational considerations. Note if interventional study. Clinical or Population Science research abstracts should cite clearly this aspect of the work proposed.

Relevant to National Cancer Moonshot or NCI Provocative Questions emerging theme (see below)? _____

Has this proposal been submitted elsewhere for pilot funding:

- No
 Yes (specify: _____)

National Cancer Moonshot

Within the Department of Health and Human Services (HHS), these investments will support cutting edge research opportunities such as:

- **Prevention and Cancer Vaccine Development:** Cancers caused by viruses can often be prevented by vaccinating people before they become infected, as demonstrated by the vaccine for cervical cancer and other cancers caused by human papilloma virus (HPV). Unique or signature genetic changes in cancers may also be targeted by cancer vaccines. We will speed the development, evaluation, and optimization of safe cancer vaccines targeting unique features of individual cancers.
- **Early Cancer Detection:** Recent advances in genomic and proteomic technologies have greatly increased the sensitivity of methods to detect markers of cancer – raising the possibility of using such methods for screening and early detection of cancer. NIH will invest in the development and evaluation of minimally invasive screening assays to enable more sensitive diagnostic tests for cancer.
- **Cancer Immunotherapy and Combination Therapy:** This initiative will work to extend the early successes of immunotherapy for cancer treatment to virtually all solid tumors by harnessing the power of the body's immune system by supporting basic research to increase understanding of how the immune system can be used to modify cancer cells and their activities. In addition, the initiative aims to develop and test new combination therapies. Working with health care providers in the community, as well as through existing clinical trials networks, new approaches to prevent and treat cancer will be tested more quickly and efficiently, with special emphasis made to include under-represented populations. This outreach would also include concerted efforts to narrow cancer health disparity gaps by increasing utilization of standard of care recommendations for cancer prevention, screening, and treatment.
- **Genomic Analysis of Tumor and Surrounding Cells:** A greater understanding of the genetic changes that occur within the cancer cell, and in surrounding and immune cells responding to the cancer, will advance both immunotherapy and targeted drug therapy and help lead to an increased ability to enhance patient response to therapy.
- **Enhanced Data Sharing:** Data sharing can break down barriers between institutions, including those in the public and private sectors, to enable maximum knowledge gained and patients helped. The cancer initiative will encourage data sharing and support the development of new tools to leverage knowledge about genomic abnormalities, as well as the response to treatment and long-term outcomes.
- **Oncology Center of Excellence:** The FDA will develop a virtual Oncology Center of Excellence to leverage the combined skills of regulatory scientists and reviewers with expertise in drugs, biologics, and devices. This center will expedite the development of novel combination products and support an integrated approach in:
 - evaluating products for the prevention, screening, diagnosis, and treatment of cancer;
 - supporting the continued development of companion diagnostic tests, and the use of combinations of drugs, biologics and devices to treat cancer; and
 - developing and promoting the use of methods created through the science of precision medicine.
- **Pediatric Cancer:** New technology to develop drug libraries and screens for inhibitors against a wide variety of targets will find new therapies, which will be of particular benefit for pediatric populations. The initiative will intensify efforts to collect and analyze tumor specimens from the rarest childhood cancers, enlisting participation from the pediatric oncology community. Clinical data about course of disease and response to therapy will also be included to enable the research community to develop new approaches to treat childhood cancers.

2017 PQs

PQ1: What molecular mechanisms influence disease penetrance in individuals who inherit a cancer susceptibility gene?

PQ2: How do variations in immune function caused by comorbidities or observed among different populations affect response to cancer therapy?

PQ3: Do genetic interactions between germline variations and somatic mutations contribute to differences in tumor evolution or response to therapy?

PQ4: Can we develop tools to directly change the expression or function of multiple chosen genes simultaneously and use these tools to study the range of changes important for human cancer?

PQ5: How does mitochondrial heterogeneity influence tumorigenesis or progression?

PQ6: How do circadian processes affect tumor development, progression, and response to therapy?

PQ7: How do cancer-specific subcellular pathognomonic structures develop, what is their function, and can they be a source of novel therapeutic targets?

PQ8: What are the predictive biomarkers for the onset of immune-related adverse events associated with checkpoint inhibition, and are they related to markers for efficacy?

PQ9: Can we develop bifunctional small molecules that will couple oncoproteins or other cancer causing molecules of interest to inactivating processes such as degradation and achieve tissue-specific loss of function?

PQ10: How do microbiota affect the response to cancer therapies?

PQ11: Through what mechanisms do diet and nutritional interventions affect the response to cancer treatment?

PQ12: What are the molecular and/or cellular mechanisms that underlie the development of cancer therapy-induced severe adverse sequelae?