NCI Guidelines for ARRA Research and Research Infrastructure Grand Opportunities: Comparative Effectiveness Research in Genomic and Personalized Medicine

Announcement Number: RFA-OD-09-004

Title: Recovery Act Limited Competition for NIH Grants: Research and Research Infrastructure "Grand Opportunities" (RC2)

The NCI is participating in the Research and Research Infrastructure Grand Opportunities (GO) Program (RFA-OD-09-004; RC2 grant), which has been issued by the NIH to support research on high impact ideas that lend themselves to short-term, non-renewable funding, and may lay the foundation for new fields of investigation. Through its participation on this and other related funding initiatives, the NCI is committed to fulfilling the goals of the American Recovery and Reinvestment Act (ARRA) to help stimulate the economy through support of biomedical and behavioral research. Additional information the Recovery Act and related NIH opportunities is available through the Office of Extramural Research.

Areas of Scientific Priority:

Advances in cancer genomics and the recent progress in identifying susceptibility genes for a wide variety of cancers are ushering in a new era of personalized cancer care and prevention. Using pharmacogenomic testing, we expect that cancer drugs could become tailored by genetic backgrounds to minimize adverse effects and increase treatment effectiveness. Moreover, stratification of cancer risk using biological markers such as genetic variants and protein markers are expected to increase early detection and primary prevention efforts. Gene expression profiles in tumors may become prognostic markers that could direct personalized chemotherapies and other interventions. Several examples of genetic risk on stratification for treatment and prevention are already available in breast cancer, colorectal cancer, prostate cancer and leukemias. Nevertheless, to date, there has been no systematic research conducted to compare the clinical effectiveness and cost-effectiveness of cancer care and prevention based on genomic tools and markers compared to existing standards of care and prevention that do not use genome-based approaches. Without such research, the promise of genomics and personalized medicine may not be fulfilled.

For the purposes of this announcement, comparative effectiveness research (CER) is defined as a rigorous evaluation of the impact of different options that are available for treating or preventing a given medical condition for a particular set of subjects. Such a study may compare similar treatments or other interventions, such as competing drugs, or it may analyze very different approaches, such as surgery, drug therapy and behavioral interventions. Such research may include the development and use of clinical and population level registries, clinical data networks, and other forms of electronic health data that can be used to generate or obtain outcomes data as they apply to CER. Genomic and personalized medicine (GPM) refers to the applications of genome-based approaches

in cancer care and prevention through the use of inherited and somatic biomarkers for diagnosis and prediction and drug and other interventions based on these tools.

This funding opportunity will support two year efforts that will advance methods for analysis, synthesis, modeling and evaluation of the clinical validity and utility of existing and emerging GPM applications in cancer control and prevention, accelerate the development of GPM by planning CER initiatives, and enhance clinical and population data infrastructure to support CER initiatives in GPM.

- Develop and apply techniques and quantitative methods for analyzing and synthesizing evidence from basic, clinical and population sciences on genetic factors in cancer and the comparative effectiveness of GPM. These techniques involve the use of systematic reviews, meta- analyses, simulations and mathematical modeling as well as cost-effectiveness analyses and other decision models to assess the added value of GPM approaches in cancer care and prevention, both from individual and population perspectives. Evidence includes data and perspectives from multiple disciplines such as basic, clinical, epidemiologic, statistical, mathematical, behavioral, communication and social sciences, as well as ethical, legal and policy ramifications of personalized medicine in cancer care and prevention.

- Plan and implement proof of principles multidisciplinary initiatives for clinical and population studies, both observational studies and clinical trials. Examples include comparing the clinical validity and utility of risk stratification tools and algorithms for cancer prediction based on gene-based markers and/or family history to existing algorithms that currently do not use these tools and markers; comparing the clinical validity and utility of pharmacogenomic testing in cancer treatment and prophylaxis to existing treatments that do not use pharmacogenomic tests. These initiatives can use or enhance data systems and clinical registries that enable linkage of data with full interoperability from multiple sources including molecular and genetic data with electronic medical records, healthcare encounters and other information systems.

Funding Priorities:

We expect to make 3-5 awards for a period of 2 years and to develop a collaborative network that will interact with existing genomics knowledge synthesis efforts (such as the Evaluation of Genomic Applications in Practice and Prevention (EGAPP) initiative) to develop a road map for GPM in the 21st century.

The budget cap for each award proposal is 2 million dollars in total costs per year.

PIs would be expected to assemble multidisciplinary teams to develop new approaches and designs for comparative effectiveness research utilizing genomics and molecular biology in evidence-based medicine. Relevant disciplines might include, but would not be limited to, molecular biologists, clinical trialists, health services researchers,

epidemiologists, statisticians, informaticians, psychometricians, geneticists, pharmacologists, economists, psychologists, sociologists, behavioral scientists, anthropologists, medical ethicists, political scientists and public policy experts. These teams would function to develop multi-level and systems approaches to build CER capacity and tools in GPM, and define a new future for CER using accelerated timelines to transform clinical and public health practice.

Application Guidelines:

Applications for NCI funds supporting the scientific areas listed above **MUST** follow the guidelines listed in RFA-OD-09-004.

Key Dates (RFA-OD-09-004):

Letters of Intent Receipt Date:	April 27, 2009
Application Receipt Date:	**May 27, 2009**
Peer Review Date:	June/July 2009
Council Review Date:	August 2009
Earliest Anticipated Start Date:	September 30, 2009
Expiration Date:	May 28, 2009

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