NCI-Supported Informatics Technology Development

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Agenda

1. Funding Mechanisms for Informatics Technology Development
2. Motivation for the ITCR Program
3. Key tenants of the ITCR Program
4. Successes, Goals, Challenges
How Does NCI Fund Informatics Technology Development?

Contracts
- Procurement with requirements specified by the Government
- Governed by federal statues, rules, regulations (e.g., FAR, FISMA)
- Generally limited flexibility to change the scope of work
- Significant reporting requirements

Grants
- Need is specified by the applicant
- Flexibility to change the scope of work
- Reporting is annually

Cooperative agreements
- Similar to a grant, but with significant involvement of program staff during the performance of work activities
Examples

Contracts
- Cancer Genomics Cloud Pilots
- Genomic Data Commons
- CTRP, NBIA

Grants and Cooperative Agreements
- ITCR Program
- Genome Data Analysis Network (GDAN)
- BD2K & BISTI Programs (trans-NIH)
Motivations for ITCR

Internal Motivations (from 2011 portfolio analysis)

- NCI invests heavily in informatics development (contracts, FOAs)
- NCI issued and participated in over 14 FOAs related to informatics
- Lack of an Institute-wide informatics program for investigator-initiated software development
- NCI was not benefiting significantly from NIH-wide BISTI informatics initiative

External Motivations

- March 2011: Release of NCI’s BSA Working Group assessment and report on caBIG
- Feb 2012: Institute of Medicine Workshop on Informatics Needs and Challenges in Cancer Research
- 2011-2012: NIH Advisory Council to the Director’s Informatics Working Group Recommendations
ITCR Overview

Initiated May, 2012
Renewed May, 2015

33 funded projects
29 tools released
- 13 OMICS
- 8 Imaging
- 5 Data standards
- 4 Clinical
- 1 Network biology

http://itcr.nci.nih.gov
Key Tenants of the ITCR Program

1: Research Driven

- The potential impact to cancer research
- The significance of the proposed informatics technology to the collaborating cancer research projects
- The level of interaction with collaborators in the cancer research field
- The level of innovation of the proposed informatics technology and the advantage over competing technologies

Through the ITCR U24 grant, users of TIES have formed a federated research network in which they share more than 5 million clinical documents and associated FFPE samples.

Active Sites:
Georgia Regents University
Roswell Park Cancer Center
University of Pennsylvania
University of Pittsburgh

Example: TIES Research Network
Key Tenants of the ITCR Program
2: Support All Stages of the Informatics Technology Lifecycle

- Development support at all stages of the informatics technology lifecycle
- Can participate in the program at any point in the cycle. Existing technology funding outside of NCI can be supported through any of the U awards.
Key Tenants of the ITCR Program
3: Inter-project collaboration to enhance interoperability

- Working groups: Training and Outreach, Technical
- Administrative supplements
- 10% budget set-aside for collaborative projects

Example: Integrative pipeline for cancer annotation
Key Tenants of the ITCR Program
4: Software Dissemination Requirements

- The software should be **freely available** to biomedical researchers and educators in the non-profit sector, such as institutions of education, research institutions, and government laboratories.

- The terms of software availability should **permit the dissemination and commercialization** of enhanced or customized versions of the software, or incorporation of the software or pieces of it into other software packages.

- To preserve utility to the community, the software should be **transferable** such that another individual or team can continue development in the event that the original investigators are unwilling or unable to do so.

- The terms of software availability should include the **ability of researchers to modify the source code** and to share modifications with other colleagues.

- To further enhance the potential impact of their software, applicants may consider proposing a plan to **manage and disseminate the improvements or customizations of their tools** and resources by others…Accordingly, awardees are encouraged to manage and disseminate their source code through an open revision control and source code management system such as [GitHub](https://github.com).
ITCR Successes

- Connecting informatics tool development with cancer research needs
- Focused collaborative projects
- Support informatics tool needs of NCI programs (e.g., QIN)
- Coordinated outreach and training
- Improved adoption and citation of software tools
ITCR Goals and Challenges

Goals

- Larger collaborative efforts among this highly diverse set of informatics resources to advance integrative cancer research
- Collaboration with NCI programs such as the Innovative Molecular Analysis Technologies (IMAT) Program

Challenges

- Clinical application of these tools, outside of research
  - Effort and activities to meet compliance requirements is not generally well-suited to the academic research environment
- Long-term sustainment
  - Beyond the 5-yr Sustainment U24