NCI Extramural Support in Bioinformatics and Computational Biology

Jerry Li
Program Director
Division of Cancer Biology
National Cancer Institute
Email: jerry.li@nih.gov
**FY 2009 Appropriation for NCI:** $4.97 Billion

<table>
<thead>
<tr>
<th>Category</th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
</tr>
</thead>
<tbody>
<tr>
<td>Research Project Grants</td>
<td>45.8%</td>
<td>45.6%</td>
<td>45.4%</td>
<td>44.1%</td>
<td>43.3%</td>
</tr>
<tr>
<td>Cancer Centers</td>
<td>5.2%</td>
<td>5.3%</td>
<td>5.6%</td>
<td>5.7%</td>
<td>5.7%</td>
</tr>
<tr>
<td>Specialized Centers</td>
<td>0.6%</td>
<td>1.4%</td>
<td>1.6%</td>
<td>1.6%</td>
<td>1.6%</td>
</tr>
<tr>
<td>SPOREs</td>
<td>2.9%</td>
<td>2.8%</td>
<td>2.6%</td>
<td>2.6%</td>
<td>2.6%</td>
</tr>
<tr>
<td>Clinical Cooperative Groups</td>
<td>3.3%</td>
<td>3.0%</td>
<td>3.1%</td>
<td>3.1%</td>
<td>3.0%</td>
</tr>
<tr>
<td>Intramural Research</td>
<td>15.0%</td>
<td>14.8%</td>
<td>14.5%</td>
<td>14.7%</td>
<td>14.9%</td>
</tr>
<tr>
<td>R&amp;D Contracts</td>
<td>7.7%</td>
<td>7.3%</td>
<td>7.3%</td>
<td>8.7%</td>
<td>9.2%</td>
</tr>
<tr>
<td>Cancer Prevention &amp; Control</td>
<td>11.2%</td>
<td>11.1%</td>
<td>10.7%</td>
<td>10.4%</td>
<td>9.8%</td>
</tr>
<tr>
<td>Other Mechanisms</td>
<td>8.3%</td>
<td>8.7%</td>
<td>9.3%</td>
<td>9.2%</td>
<td>9.9%</td>
</tr>
</tbody>
</table>
**NCI Extramural Support in Computational Biology**

- **Investigator-Initiated Research Project (PA-07-070, Parent R01)**
  
  NCI OD, Division of Cancer Biology, Division of Cancer Control and Population Sciences, Division of Cancer Prevention, Division of Cancer Treatment and Diagnosis

- **Integrative Cancer Biology Program (Cancer Systems Biology Centers, U54)**
  
  The Integrative Cancer Biology Program (ICBP) focuses on the analysis of cancer as a complex biological system. A cornerstone of the program is the development and implementation of **computational models** of processes relevant to cancer prevention, diagnostics and therapeutics..
  
  FOA: Collaborative Research in ICBP (U01), PAR-09-026
  

- **Physical Sciences – Oncology Centers (PS-OC, U54)**
  
  The National Cancer Institute (NCI) is exploring new and innovative approaches to better understand and control cancer through initiatives that enable the convergence of the **physical sciences** with cancer biology. Building on stunning progress in the molecular sciences and advanced technologies, we envision the development of new fields of study based on the application of physical sciences approaches to address major questions and barriers in cancer research.
  
NCI Extramural Support in Computational Biology

• Cancer Biomedical Informatics Grid (caBIG)
  – The **mission** of caBIG® is to develop a truly collaborative information network that accelerates the discovery of new approaches for the detection, diagnosis, treatment, and prevention of cancer, ultimately improving patient outcomes.
  – The **goals** of caBIG® are to:
    o Connect scientists and practitioners through a shareable and interoperable infrastructure
    o Develop standard rules and a common language to more easily share information
    o Build or adapt tools for collecting, analyzing, integrating, and disseminating information associated with cancer research and care.
  – FOA: Sharing Data and Tools (PAR-07-426, R01)
**NCI Extramural Support in Computational Biology**

- **The Cancer Genome Atlas (TCGA)**
  - TCGA is a large-scale collaborative effort supported by the National Cancer Institute (NCI) and the National Human Genome Research Institute (NHGRI) to systematically characterize the genomic changes that occur in cancer.
  - **Types of Cancer**: TCGA is currently in the process of selecting the 20 cancers to be mapped over the next five years. The pilot effort focused on brain (glioblastoma), lung (squamous carcinoma) and ovarian (serous cystadenocarcinoma) cancers.
  - [http://cancergenome.nih.gov/about/funding.asp](http://cancergenome.nih.gov/about/funding.asp)

- **Cancer Intervention and Surveillance Modeling Network (CISNET)**
  - CISNET is a consortium of NCI-sponsored investigators that use statistical modeling to improve our understanding of cancer control interventions in prevention, screening, and treatment and their effects on population trends in incidence and mortality. These models can be used to guide public health research and priorities.
  - RFA-CA-09-025 (U01)
  - [http://cisnet.cancer.gov/about/history.html](http://cisnet.cancer.gov/about/history.html)
NCI Extramural Support in Computational Biology and Bioengineering

• **NCI Alliance for Nanotechnology in Cancer (U54, U01)**
  – The NCI Alliance for Nanotechnology in Cancer is engaged in efforts to harness the power of nanotechnology to radically change the way we diagnose, treat, and prevent cancer. Through its programs and initiatives, the Alliance is committed to building a community of researchers dedicated to using nanotechnology to advance the fight against cancer.
  – Focus areas include: target discovery, molecular imaging and early detection, in vivo nanotechnology imaging systems, reporters of efficacy, multifunctional therapeutics, and prevention and control

• **Innovative Molecular Analysis Technologies Program (IMAT, R21, R33)**
  – The Innovative Molecular Analysis Technologies (IMAT) program was established to support the development, technical maturation, and dissemination of novel and potentially transformative next-generation technologies through an approach of balanced but targeted innovation
  – FOAs: RFA-CA-09-004, RFA-CA-09-005, RFA-CA-09-006, RFA-CA-09-007, RFA-CA-09-008
NCI Participation in NIH-wide Programs

• BISTI Programs

• NIH Roadmap and Neuroscience Blueprint Programs
  (PAR-07-425, PAR-07-426)

• NIH Bioengineering Research Programs
  (PAR-07-352, PA-07-279, PA-10-010)

• NIH Nanoscience and Nanotechnology
  (PA-08-052, PA-08-053)

• Multiscale Modeling Program
  (PAR-08-023)
NIH Pathway to Independence Award (K99/R00)

• **Goals**
  – Assist new investigators as they transition to their first independent position
  – Reduce time to first R01

• **Award**
  – **Phase 1 (K99)** – 1-2 years of mentored support (at least 75% effort)
    • Total cost of $90,000/yr including 8% F&A
  – **Phase 2 (R00)** – up to 3 years of independent support contingent on securing an independent research position and administrative review (75% effort)
    • Total cost of $249,000/yr including F&A

• **Eligibility**
  – U.S. citizens and non-citizens are eligible to apply
  – No more than 5 years of postdoctoral experience
  – Independent investigators, NIH grantees of research project, career development awardees, and non-NIH grants over $100,000 DC/year recipients are ineligible

• **Success Rate (K99)**
  – 18% in FY2007, 19% in FY2008, 26% in FY2009
    Note: revisions in the same year were counted as different applications