# Computational Programs and Opportunities at NIGMS and BISTI

Eric Jakobsson

Chair, NIH Bioinformation Science and Technology Initiative Consortium

Director, NIGMS Center for Bioinformatics and Computational Biology

For the Computing Research Association

Snowbird Conference July 12, 2004

# User oriented mission statement

- In ten years, BISTI wants every person involved in the biomedical enterprise---basic researcher, clinical researcher, practitioner, student, teacher, policy maker---to have at their fingertips through their keyboard instant access to all the data sources, analysis tools, modeling tools, visualization tools, and interpretative materials necessary to do their jobs with no inefficiencies in computation or information technology being a rate-limiting step.
- In twenty years, much of the information retrieval, analysis, and modeling that people will be doing in ten years should be done by intelligent agents, so that people will be able to deal rapidly, effectively, and rigorously with biomedical issues at the highest conceptual level.

# For Computer Scientists Looking at the NIH for support I: General Issues

- First Principle: NIH is a mission-driven agency. We support basic science (lots of it) and technology and infrastructure development (on an increasing trend line), but it all must be justifiable by a payoff down the line in improving the health of the American people.
- Corollary Principle: We understand that the payoff may not be immediate, so we support work where the payoff is a decade or more in the future. It is better to present an justification for a reasonable but long-term payoff than an unrealistic short-term payoff.

# For Computer Scientists Looking at the NIH for support II: Perspectives on the Role of Computation in Biomedical Research and Health Care Delivery

- We see that non-trivial computation is critical to every aspect of our mission, from the most basic research to the efficient and effective delivery of health care in all venues.
- We see the corollary: Inefficiencies, gaps, and flaws in computation are limiting the pace and scope of all aspects of our mission.
- We have only gotten the message recently, so we are a work-in-progress with respect to implementing our understandings about computation in programs and practices.
- We need computer scientists, computational scientists, and information technologists to be partners with NIH in getting it right.

# “Poster” successes of computation in medicine.

- The computer model of interaction between the HIV virus and the human immune system that was essential for the design of the multi-drug therapy, which in turn has dramatically reduced deaths from HIV infection in the industrialized world.
- Algorithms and implementation to transform magnetic resonance spectra into images for medical diagnosis.
- Sad corollary for computer scientists: In these as well as other major advances, computer science and computational technology are not widely enough recognized as equally important as the biomedical concepts.

# For Computer Scientists Looking at the NIH for support III: Finding out what NIH actually funds

- CRISP data base (Google “NIH CRISP” provides keyword-searchable database of all NIH-funded projects from 1972-2004
- Comprehensive access to publications by NIH grantees provided by author-searchable Pubmed literature database (Google “pubmed”)
- You will note that it is hard for computer scientists to get funding from NIH without collaboration with biomedical researchers or care deliverers.
- Therefore, first step is to develop a potentially fundable concept in collaboration with somebody who is in one of the communities that NIH typically supports—basic research, translational research, clinical research, health care delivery.

# For Computer Scientists Looking at the NIH for support IV: Building on your knowledge of what we now do to what we might support you for doing

- First-stop (but not “one stop”) information source is the BISTI home page (Google “NIH BISTI”), button under “Funding”
- If you don’t find a funding announcement that fits your ideas/capabilities, but you feel you have something to contribute, don’t hesitate to send an unsolicited application. (Receipt dates February 1, June 1, and October 1 each year for new applications). Success rates for unsolicited applications are often as good as, in some cases better than, success rates for proposals submitted in response to specific funding announcements.
- Consult with an NIH Program Director at the concept development stage. This is easy if you are responding to a funding announcement—the right contact information is in the funding announcement. For an unsolicited application, you may need to browse through Web sites for many of the semi-autonomous 27 Institutes and Centers that comprise the NIH, as well as the NIH Roadmap site, that contains information on NIH-wide initiatives. But---NIH is a strongly interconnected community, so if you start calling program staff and the first person you call is not the right person, you will get good direction to the right person fairly quickly.

# For Computer Scientists Looking at the NIH for support IV: Building on your knowledge of what we now do to what we might support you for doing (continued)

- Research study sections as well as programs (Google NIH CSR), button under “Study Section Information.”
- On study section targeting, consult with Program Director and/or Scientific Review Administrator (Understand that program and review functions at NIH collaborate with each other but are independently accountable. This is different from NSF, where the same individuals are responsible for both creating program and overseeing review. With respect to NIH review issues, the AUTHORITATIVE information comes from the review side)
- FOLLOW THE RULES AND GUIDELINES! (Google “NIH 398” in addition to particular funding announcements.) That gives program and review staff more time to deal with your scientifically substantive concerns, because they won’t have to work around emergent procedural issues.

# For Computer Scientists Looking at the NIH for support IV: Building on your knowledge of what we now do to what we might support you for doing (final)

- Develop an NIH “grant journal club” (or comparable structure) at your institution where colleagues read and critique each other’s NIH grant applications and progress reports in preparation.

# Something computer scientists should know about: From the White House web site

**Transforming Health Care: The President's Health Information Technology Plan**

"By computerizing health records, we can avoid dangerous medical mistakes, reduce costs, and improve care."

--President George W. Bush, State of the Union Address, January 20, 2004

**President Bush has outlined a plan to ensure that most Americans have electronic health records within the next 10 years.**

# And farther down the page:

- To build upon the progress already made in the area of health information technology standards over the last several years, the President's proposed FY 2005 budget includes $100 million for demonstration projects that will help us test the effectiveness of health information technology and establish best practices for more widespread adoption in the health care industry.

# And Farther Yet:

- The President announced that he is creating a new sub-Cabinet level post at HHS, to provide national leadership and coordination necessary to achieve his 10-year goal. The individual will report directly to the HHS Secretary.

# Event to check out to get plugged in

- Secretarial Summit on Health Information Technology that will launch this year's national health information infrastructure (NHII) initiative, "Cornerstones for Electronic Healthcare." The conference will take place July 21-23 at the Washington Convention Center.

# For Up-to-date Background on Health Information Technology:

- Check out the comprehensive report on health information technology submitted in June to the President's Information Technology Advisory Committee (Google "PITAC"), click on link Revolutionizing Health Care Through Information Technology.

# NIGMS-BISTI Funding Mechanisms for Computational Biomedicine

- Unsolicited Proposals—Send your best idea.
- National Centers for Biomedical Computing - RFA-RM-04-003 (formerly RFA-RR-04-001) - Released September 29, 2003. Click here for an FAQ and detailed information page.
  Mechanism: U54
- Continued Development and Maintenance of Bioinformatics and Computational Biology Software - PA-02-141 - Released July 26, 2002
  Mechanism: R01

- Innovations in Biomedical Information Science and Technology: SBIR/STTR Initiative - PAR-03-119 - Released May 12, 2003. Note: Corrected dates listed in NOT-OD-03-044
  Mechanisms: R41, R42, R43, R44
- Innovations in Biomedical Information Science and Technology: SBIR/STTR Initiative - PAR-03-119 - Released May 12, 2003. Note: Corrected dates listed in NOT-OD-03-044
  Mechanisms: R41, R42, R43, R44

- Pilot Projects for Models of Infectious Disease Agent Study (MIDAS) - RFA-GM-03-008.
  Click here for an FAQ and detailed information page.
  Institute: NIGMS
  Mechanism: U01
- NIGMS Centers of Excellence in Complex Biomedical Systems Research - RFA-GM-03-009
  Institute: NIGMS
  Mechanism: P50

- Joint DMS/NIGMS Initiative to Support Research Grants in the Area of Mathematical Biology - NSF 01-128

# And finally, in September look for:

- Announcement of first awardees for National Centers for Biomedical Computing
- Announcement for investigator-initiated projects to collaborate with the National Centers for Biomedical Computing
- Announcement for second round competition for National Centers for Biomedical Computing.