

## NIH LIBRARY SERVICES: POPULAR BIOINFORMATICS TRAINER JOINS NIH LIBRARY STAFF

By Cindy Clark, NIH Library

**M**edha Bhagwat holds the key to unleashing the power of bioinformatics. As a newly minted NIH Library informationist and an experienced bioinformatics trainer, she is teaching NIH researchers to unleash, and harness, that power, too.

Bioinformatics—the intersection of biology, computer science, and mathematics—provides researchers with powerful tools to analyze and understand the biologic significance of a variety of data. The tools can supply information on specific genes; map, analyze, and compare different DNA and proteins; predict gene expression and protein-protein interactions; and more.

But not all researchers know how to use these tools to analyze their data. They turn to experienced bioinformatics trainers such as Bhagwat for help.

“There is a lot of information there,” said Bhagwat’s first Informationist Service customer, Yi Ding, a Clinical Center postdoctoral and visiting fellow. “We knew that, but we needed help.” Bhagwat assisted Ding in downloading the upstream sequence of a specific gene. Within an hour Bhagwat taught Ding, who is part of a Critical Care Medicine Department research team, how to use the National Center for Biotechnology Information’s (NCBI) Basic Local Alignment Search Tool (BLAST) for comparing gene and protein sequences against others in public databases. The solution saved Ding hours, possibly days, of work.

Bhagwat, a molecular biologist and biochemist with a Ph.D. from the University of Maryland (College Park), did her postdoctoral training at the National Institute of Diabetes and Digestive and Kidney Disorders. She honed her skills in bioinformatics during the 11 years she worked at NCBI. A division of the National Library of Medicine, NCBI was established in 1988 as a national resource for molecular biology information. It creates public databases, conducts research in computational biology, develops software tools for analyzing genome data, and disseminates biomedical information.

From 2001 to 2008, Bhagwat taught courses through NCBI’s Core-Bioinformatics program and trained NIHers in the use of NCBI bioinformatics tools. She also published several articles and book chapters on her research and on bioinformatics and protocols.

Her courses, including a series of two-hour minicourses that she developed, were taught more than 400 times to about 12,000 participants. The popular instructor has made presentations on bioinformatics throughout the United States at professional meetings and universities, including Stanford (Palo Alto, Calif.), Purdue (West Lafayette, Ind.), and the Massachusetts Institute of Technology (Cambridge, Mass.).



*Clinical Center postdoc Yi Ding and NIH Library Informationist Medha Bhagwat discuss how a chain of events, which began with a bioinformatics consultation, led to Ding’s successful cloning of a gene promoter sequence.*

Bhagwat is especially helpful to researchers because “she was a bench scientist and she knows what scientists need,” said Mary Ann Robinson, a microbiologist in the Research Technologies Branch at the National Institute of Allergy and Infectious Diseases (NIAID). “She knows computers; writes scripts; extracts data from databases.”

She has a knack for teaching, too. “Her main strength is her ability to teach,” said Robinson who took one of Bhagwat’s courses. “She takes a topic, and in two hours, she takes people through a tool with the ability to use it.”

And people flock to her training sessions. “The fact that we had a packed house in Lipsett [Amphitheater] on a day with sub-freezing temperatures speaks volumes about [her] reputation as an excellent lecturer,” said Andy Baxevanis, Deputy Scientific Director, National Human Genome Research Institute (NHGRI).

Attendees have described Bhagwat’s teaching as practical, friendly, patient, encouraging, effective, and gifted. “This is very helpful guidance for me to proceed on my own,” wrote one minicourse respondent. “Without this tutorial today I would have to spend several hours by myself” learning to use the databases.

Some of the people Bhagwat trained via the NCBI courses have become the

bioinformatics go-to people for their institutes. Two of those go-to people—staff scientist Tyra Wolfsberg at NHGRI and Robinson at NIAID—emphasized the value of having dedicated, trained bioinformatics experts who can address an institute’s research questions. But for institutes that don’t have their own bioinformatics experts, “Medha is a resource,” said Wolfsberg.

When NCBI ended its bioinformatics training program in 2008, the NIH Library wasted no time in filling the gap. In keeping with its objective to support genetics and bioinformatics research more aggressively, the Library hired Bhagwat in February 2009. She conducts tutorials for individuals, labs, and groups on using bioinformatics resources available through NCBI, the NIH Library (such as GeneGo, Ingenuity, and Protein Lounge), and elsewhere. And she will begin teaching courses at the NIH Library in September.

John Paul SanGiovanni, staff scientist at the National Eye Institute (NEI) and project officer for the Age-Related Eye Disease Study 2 in NEI’s Clinical Trials Branch, met Bhagwat more than two years ago when he was a student in one of her courses. Today they are collaborators. Bioinformatics has proved invaluable to him. “In the study of certain diseases it will be informative to move away from a single-gene hypothesis to examination of combined actions of genes with moderate effect sizes,” he explained. “Looking at the key aspects of a biologic process will eventually help us identify promising drug targets.”

Bhagwat aims to all show other researchers how bioinformatics can help them, too.

“Over the years, I’ve received a number of letters from people who’ve attended Bhagwat’s training courses, all of them praising her teaching skills,” said NCBI Director David Lipman, who oversaw NCBI’s bioinformatics training program. “These days, it’s rare for someone to take the trouble to write a letter [instead of] an e-mail.” ■

*To find out more about the NIH Library’s bioinformatics resources, visit <http://niblibrary.nih.gov/Research-Tools/Bioinformatics.htm>. For details on bioinformatics classes, or to request a consultation, contact Bhagwat at 301-496-2185 or [bbagwat@mail.nih.gov](mailto:bbagwat@mail.nih.gov). Her first class, “Sequence Analysis: Making Sense of DNA and Protein Sequences,” will be held at the NIH Library on September 16, 1:30–3:30 p.m. Registration required.*