

ATP Update

NOVEMBER 23, 2007

VOLUME 1, NO.4
PAGE 1 OF 5

Director's Point of View



Tim Harris, Ph.D.,
Director, ATP

At our recent retreat in Shepherdstown, WV, details of which you will find in this edition of the *ATP Update*, I announced a new structure for the ATP to make it more streamlined. Five "supergroups" comprising existing laboratories and programs have been organized around common functions.

The *Proteins and Proteomics Group* (PPG) will be directed by Dr. Robert Fisher. Laboratories include the Laboratory of Proteomics and Analytical Technologies, directed by Dr. Timothy Veenstra; the Protein Chemistry Laboratory, directed by Dr. Fisher; and the Protein Expression Laboratory (PEL), directed by Dr. James Hartley. The Viral Technology Laboratory, led by Dr. Betty Conde, will become part of the PEL.

The *Genetics and Genomics Group* (GG) will consist of the Core Genotyping Facility, directed by Robert Welch, and the Laboratory of Molecular Technology, directed by Dr. David Munroe.

The *Imaging and Nanotechnology Laboratories* (INL) will be directed by Dr. Scott McNeil. Laboratories include the Image Analysis Laboratory, directed by Dr. Stephen Lockett, and the Nanotechnology Characterization Laboratory, directed by Dr. McNeil.

The *Information Technology Group*, consisting of the Advanced Biomedical Computing Center, will be managed by a new director of information systems, a position we are currently hiring. The new director will also have management oversight for the CaBIG projects undertaken by SAIC-Frederick, Inc.

The *Visual Communications and Support Services Group* will be managed by Ken Michaels. This group consists of Scientific Publications, Graphics & Media, the Conference Center and Events Planning groups, and Central Glassware Services.

INSIDE THIS ISSUE

Director's Point of View	1
ATP Retreat: "Best Retreat Ever"	1
ABCC Retreat Emphasizes Strengths	2
Netezza System Accelerates Queries	3
Tour of HudsonAlpha Generates Ideas	4
SPGM Retreat Focused on Teamwork.	4
On Effective Communication	5

I believe this structure will foster increased efficiency and accountability, which are important now and will become even more so as we enter the new contract.

Other news to note is that we are making progress towards the new building and research park. Two local sites have been identified, and we will be choosing the preferred one very soon. Jim Hartley and I recently traveled to Huntsville, AL, to visit the new building for the HudsonAlpha Institute for Biotechnology, which Dr. Richard Myers will direct (see the article on page 4). If our building is anything like this one (and it will be), it will be very good indeed.

ATP Retreat: "Best Retreat Ever"

By Ken Michaels

The Advanced Technology Program's (ATP's) first Scientific Retreat was held November 6 at the Clarion Hotel in Shepherdstown, WV. Its overall purpose was to provide an overview of the program, to describe some of the program's current technologies and research directions, and to provide a forum for exchange of information with non-ATP partners and collaborators, primarily from the NIH.

ATP Director Dr. Tim Harris emceed the event, beginning the day with a welcome keynote and program overview. Invited speakers included Dr. Thomas Reid, Genetics Branch, NCI; Dr. Robert Hoover, Division of Cancer Epidemiology and Genetics, NCI; Dr. Terry Van

Dyke, Mouse Cancer Genetics Program, NCI; and Dr. Stephen Hughes, HIV-DRP, NCI.



Twenty scientific posters were on display during the afternoon session of the ATP retreat.

A number of ATP scientists gave presentations highlighting state-of-the-art genomic, proteomic, imaging, and computational technologies, among others, that are available within the program. Presentations were given by Dr. David Munroe, Laboratory of Molecular Technology; Dr. Bob Welch, Core Genotyping Facility; Dr. Scott McNeil, Nanotechnology Characterization Laboratory; Dr. Tim Veenstra, Laboratory of Proteomics and Analytical Technologies; Drs. Jack Collins and Bob Stephens, Advanced Biomedical Computing Center; Dr. Stephen Lockett, Image Analysis Laboratory; Dr. Bob Fisher, Protein Chemistry Laboratory; Dr. Jim Hartley, Protein Expression Laboratory; and Dr. Betty Conde, Viral Technology Laboratory.

The all-day retreat included posters and “buzz sessions” during lunch time, as well as time for



Lunch break featured informal buzz sessions on a variety of topics.

networking during breaks. The buzz sessions provided an informal time for scientists to discuss specific topics

related to the scientific capabilities and needs within the ATP. The event drew 114 attendees, which included 36 non-SAIC-Frederick, Inc., people, and by all indications, was a great success. One NCI investigator commented that it was the best retreat he had ever attended. Thanks are due to Tim Veenstra, who planned and organized the event, assisted by Sandy Walker and Barbara McElroy.

ABCC Retreat Emphasizes Strengths

By Dr. Robert Stephens

The Advanced Biomedical Computing Center (ABCC) recently held a scientific retreat at the Antrim 1844 in Taneytown, MD. The event was attended by all ABCC staff and several representatives from SAIC–Frederick, Inc., and NCI. Of particular note was the attendance of individuals from several large laboratories that work with the ABCC and of Dr. Craig Reynolds from the Office of the Director. The four managers of the ABCC outlined ABCC’s mission during a lively, interactive session at which several questions about the organization and its priorities were addressed.

Following the outline session and an excellent luncheon, several speakers presented some of the scientific projects and initiatives underway at the ABCC. The presenters gave an overview of the strengths and capabilities of the ABCC staff and emphasized the importance of integrating the scientific and computational arenas.

As a follow-up to the retreat, ABCC managers will construct a business plan and revised mission statement that details the activities and priorities of the ABCC in the larger community. The objective of this effort is to make the ABCC more efficient in its operations by removing some of the ambiguities in the current mission statement.

The retreat highlighted the importance of the ABCC’s remaining current with and testing cutting-edge computational and database technologies. An example of such technology is the database appliance box from Netezza that is currently being evaluated by the ABCC.



Retreat planner Tim Veenstra and assistant Sandy Walker. Barbara McElroy (not pictured) also assisted.

Netezza System Accelerates Queries More Than 200-Fold

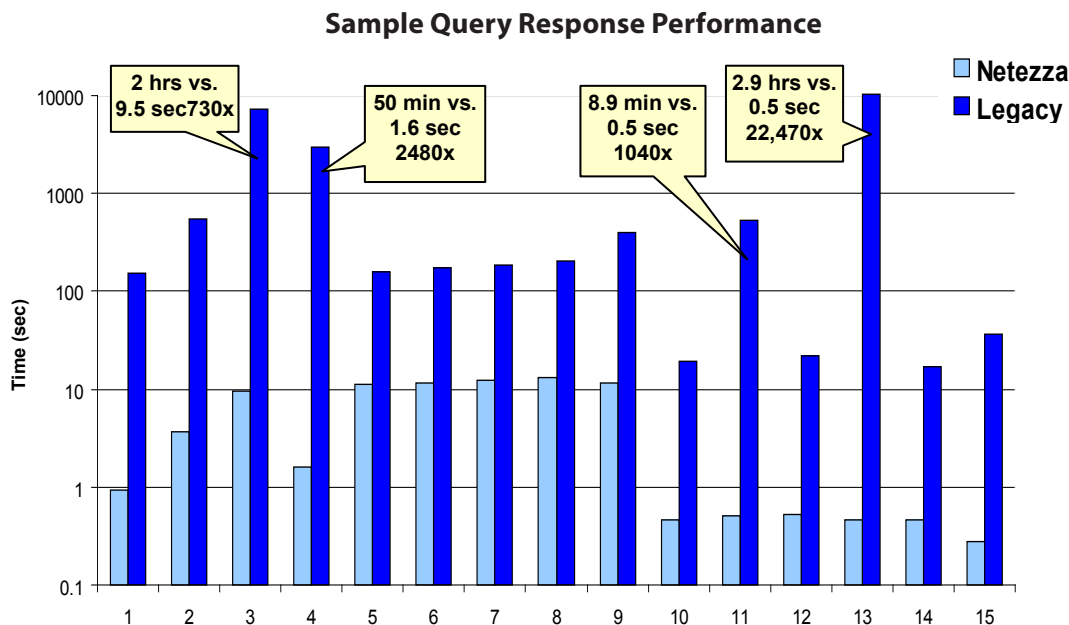
By Drs. Jack Collins and Robert Stephens

A new company, called Netezza, has built a hardware-based database management system (DBMS), which uses a specially built, parallel-query computer designed specifically for very large, terabyte and larger, complex analytical queries. In a recent evaluation by the Advanced Biomedical Computing Center (ABCC), the new Netezza system accelerated queries by more than two orders of magnitude and performed analyses that were previously not possible with traditional DBMS.

The Netezza database appliance is built up from individual units called Snippet Processing Units (SPUs), each composed of a hard disk, an FPGA that performs the ANSI SQL queries, and a PowerPC processor to aggregate the results. The system spreads the data across hundreds of SPUs, and, in some of the tests performed at the ABCC, queries were processed at the total rate of data transfer from all of the disks simultaneously, enabling dramatic speedups over traditional database architectures by as much as two to three orders of magnitude. With its unique architecture, the Netezza DB appliance operates without creating indexes of the data, a simple feature that can significantly decrease the database preparation time (often days) required for the creation of indexes for large databases. The evaluation

performed at the ABCC on complex analytical queries demonstrated an average speedup of 350-fold with the Netezza appliance. For example, a query that currently returns results in 10 hours can be executed in less than 2 minutes, and those that require 10 minutes return in 1.7 seconds. As illustrated in the graph below, the Netezza appliance was found to be faster for all of the complex queries across large databases. Scaling studies revealed that the Netezza appliance scaled linearly, suggesting that, as biological databases continue to grow, specialized database appliances like Netezza's will provide the performance necessary to integrate data across multiple databases and disciplines in such a way as to enable true integrative or systems biology.

So now we come to the real question to be addressed: are traditional relational database architectures, such as Oracle, a thing of the past? No! As with all specialized appliances, the Netezza DBMS applies to a certain set of problems. Several tests run on small queries that used the computer's local memory were several times faster in a traditional DBMS; transaction processing is faster in a traditional, well-tuned, DBMS. However, for the complex analytical tasks associated with the data mining that is now a necessity in biomedical sciences, the Netezza appliance can enable some questions to be asked that would simply not be feasible in the past. Therefore,



A comparison of query times between the current database servers maintained by the ABCC and the Netezza database appliance. The dark blue, legacy, times refer to the current DBMS systems at the ABCC.

new database appliances such as Netezza will form a powerful complement to current database systems and vastly increase their power.

Tour of HudsonAlpha Generates Ideas

By Nancy Parrish

Dr. Timothy Harris and Dr. James Hartley recently traveled to Huntsville, AL, to tour the new HudsonAlpha Institute for Biotechnology (HudsonAlpha) facility. According to its web site (<http://www.hudsonalpha.org/pages/EcoDevelopment.html>), HudsonAlpha intends to be "an economic engine, creating quality jobs and opportunity by supporting the commercialization of research results through the establishment of a biotechnology campus that will be a synergistic cluster of researchers and entrepreneurs."

The facility will house two groups of tenants in 270,000 square feet of space, Dr. Hartley noted. One side of the building, approximately two-thirds of the space, he said, will hold about a dozen biotech companies, while the remaining third will be occupied by the Institute itself.

Dr. Hartley was impressed by the amount of glass and light throughout the facility. The labs are located on the outside of the building and have large windows that reach from bench height to ceiling. The doors to the labs are also made of glass, with floor to ceiling glass panels on either side, so that you can see into the entire lab from the corridor. Labs are also interconnected along the outside wall. Hallways were constructed wide enough for two people to walk side by side easily.

Some of the labs, Dr. Hartley observed, had spaces for missing lab benches. These areas, he was told, are for robots that will be on carts.

The building does not have any central supply of gas, air, or high-quality water. There are closets for gas cylinders. Every lab will make water to its needs.

An atrium with a coffee bar, cafeteria, and a "pub"-type room is designed to increase contacts and communication among the tenants. Other amenities include an exercise room and two locker rooms in the lower level; private FedEx access lockers for each commercial tenant; coffee areas on each floor; and desks in each lab for technicians.

"It's useful to see what the new research facilities are doing," Dr. Hartley commented. "It helps to generate ideas for what to do, as well as what to avoid."

SPGM Retreat Focused on Teamwork

By Nancy Parrish

Scientific Publications, Graphics & Media (SPGM) held its annual retreat on October 31 at ThorpeWood, in the Catoclin Mountains. The purpose of the retreat was to improve teamwork skills among staff members. "We function pretty well as a team," said SPGM Manager Ken Michaels, "but we can always use a refresher."

In preparation for the retreat, Mr. Michaels had his staff members complete the Myers-Briggs Type Indicator (MBTI) questionnaire. This well-known and -respected instrument profiles personality preferences and helps individuals understand their own behavior as well as differences in the behavior of others. During the morning session, Ms. Sukanya Bora, Manager of Training and Development, who is certified as an MBTI trainer, explained the 16 personality preferences and how our understanding of these preferences can improve communication in teams.

Dr. Tim Harris, ATP Director, joined the group for lunch and gave some informal remarks about the upcoming contract renewal and shared some reflections on the importance of setting realistic and obtainable goals. During the afternoon session, Mr. Michaels led the group in a teamwork exercise that was a hands-on demonstration of putting knowledge of the personality preferences discussed in the morning into practice.

On Effective Communication

By Ken Michaels

Communication Tip: Finish strong!

In the last *ATP Update*, I called attention to the importance of the introductory words of an effective oral presentation, pointing out that the very first words out of a speaker’s mouth set the tone for the presentation and establish a connection with the audience. The simple formula for an understandable presentation that many experts propose can be stated as:

- Tell them what you’re going to tell them.
- Tell them.
- Tell them what you told them.

The audience benefits from a brief introduction from the speaker that prepares them for what’s to come. The other end of the presentation—the other “bookend,” so to speak—is just as important. The very last words uttered, especially when well chosen, tend to be the ones that your audience is likely to remember most clearly.

The conclusion of a presentation, when effectively used, performs a vital task. A typical scientific presentation includes data, hypothesis, supposition, interpretation, postulation, etc.; in other words, it is jam-packed with information. The presentation’s conclusion is the

speaker’s opportunity to extract the key items and drive home the most important concepts.

More than once I’ve heard a presenter, part way through a talk, pause and say something along the lines of “... if you remember nothing else from this talk, please remember this ...” Personally, I appreciate this. This simple technique makes abundantly clear what the speaker considers the most significant message to be. (In truth, it’s not always easy to tell, because there’s so much information there!) And of course, I would hope that the speaker will repeat this same declaration in the conclusion of the talk.

A suggestion: summarize the key points on the final slide of the talk.

Although it’s very common for the final slide in the presentation to be a listing of acknowledgments, contributions, collaborations, and such, I would suggest that, important though it is to acknowledge the contributions of others, it’s not the ideal final image to leave with the audience. Especially if it stays on the screen during question-and-answer time, a summary of your key messages as the last thing your audience sees serves to reinforce what your talk was all about.

A strong finish is a valuable tool for effective communication!

Advanced Technology Program: Director Tim Harris 301-846-1144 Director of Business Development Bruce Crise 301-846-5739 Director of Business Operations Carl Garland 301-846-5425 Program Coordinator Barbara McElroy 301-846-1144 Secretary Debbie Shiben 301-846-7448			ATP Update is published quarterly by the Scientific Publications, Graphics & Media department for the Advanced Technology Program of SAIC-Frederick, Inc., Operations and Technical Support Contractor for the National Cancer Institute at Frederick in Frederick, Maryland. The content of this publication does not necessarily reflect the views or policies of the Department of Health and Human Services, nor does mention of trade names, commercial products, or organizations imply endorsement by the U.S. Government.
ATP Laboratories: Proteins and Proteomics Group: Robert Fisher, Director Protein Chemistry Laboratory Robert Fisher 301-846-5154 Laboratory of Proteomics and Analytical Technologies Timothy Veenstra 301-846-7286 Protein Expression Laboratory James Hartley 301-846-7375 Virus Technology Laboratory Betty Conde 301-846-7533 Genetics and Genomics Group Laboratory of Molecular Technology David Munroe 301-846-1697 Core Genotyping Facility Robert Welch 301-435-7615 Information Technology Group: Tim Harris, Acting Director Advanced Biomedical Computing Center 301-846-5763 Imaging and Nanotechnology Group: Scott McNeil, Director Nanotechnology Characterization Laboratory Scott McNeil 301-846-6939 Image Analysis Laboratory Stephen Lockett 301-846-5515 Visual Communications and Support Services Group: Ken Michaels, Manager Scientific Publications, Graphics & Media Ken Michaels 301-846-1055 Conference Center and Events Planning Colin Celaya 301-846-1995 Central Glassware Services Mike Lind 301-846-5058			
ATP Update: Executive editor Tim Harris Managing editor Ken Michaels Associate editors Maritta Grau, Nancy Parrish, Lisa Simpson Editorial office 301-846-1055			

