DEPARTMENT OF HEALTH AND HUMAN SERVICES
NATIONAL INSTITUTES OF HEALTH
NATIONAL CENTER FOR RESEARCH RESOURCES

NATIONAL ADVISORY RESEARCH RESOURCES COUNCIL MEETING MINUTES
May 14, 2008

The National Advisory Research Resources Council convened its 139th session at 8:00 a.m. on Wednesday, May 14, 2008, in Conference Room 10, Building 31, on the National Institutes of Health main campus. Dr. Barbara M. Alving, Director, National Center for Research Resources (NCRR), National Institutes of Health (NIH), presided as Chair. The meeting was open to the public until 1:11 p.m., at which time it was closed to the public for the review, discussion, and evaluation of grant applications as provided in Sections 552b(c)(4) and 552b(c)(6), Title 5, U.S. Code, and Section 10(d) of Public Law 92-463.

COUNCIL MEMBERS PRESENT

Dr. William F. Bria, II
Dr. Nancy J. Brown
Ms. Wendy Chaite, Esq.
Dr. Valerie Copié
Dr. Henry N. Ginsberg
Dr. James E. Heubi
Dr. Roland F. Hirsch, Liaison Member, Department of Energy
Dr. Dallas M. Hyde
Dr. Barbara B. Knowles
Dr. Henry Lewis, III
Dr. Mark V. Pauly
Dr. Thomas J. Rosol
Dr. Richard A. Rudick
Dr. Janet L. Smith
Dr. Arthur W. Toga
Dr. M. Roy Wilson
Dr. Tilahun D. Yilma

COUNCIL MEMBERS ABSENT

Dr. James P. Collins, Liaison Member, National Science Foundation
Dr. Kevin B. Johnson
Dr. Bettie Sue Masters

SPECIAL INVITED GUESTS FOR OPEN SESSION

Dr. Sergio Aguilar-Gaxiola, University of California, Davis
Dr. Jay R. Hove, University of Cincinnati
Dr. J. Lloyd Michener, Duke University
Ms. Sarah L. Young, Montana State University

STAFF OF OTHER NIH COMPONENTS

Dr. John L. Bowers, CSR
Ms. Sarah E. Harding, NHGRI
Dr. Kathryn M. Koeller, CSR
Dr. Khalid Masood, CSR
Dr. Margaret D. Snyder, OER/OD
Dr. Derrick C. Tabor, NCMHD
Dr. Rachael L. Tracy, NHLBI
Mr. Carlos A. Yancy, NIAMS

OTHERS PRESENT

Mr. Dane Christiansen, Association for Clinical Research Training
Dr. Donna J. Dean, Lewis-Burke Associates, LLC, Washington, DC
Mr. Stephen J. Heinig, Association of American Medical Colleges, Washington, DC
Ms. Jean C. Stanford, MITRE Corporation, McLean, VA
Dr. Alan Trachtenberg, Indian Health Service, Washington, DC
Mr. Lamont Williams, Palladian Partners, Inc., Silver Spring, MD
Mr. Wilbur Woodis, Office of Minority Health, Washington, DC

OPEN SESSION

I. Call to Order: Dr. Barbara M. Alving, Director, NCRR

Dr. Alving welcomed Council members and guests to the 139th meeting of the National Advisory Research Resources Council.

II. Consideration of Minutes: Dr. Barbara M. Alving

The minutes of the Council meeting held on January 30, 2008, were approved as written.

III. Report of the Director: Dr. Barbara M. Alving

A. Introduction of New Council Members

Four new Council members were introduced: Dr. William F. Bria, II, Ms. Wendy Chaite, Dr. Henry N. Ginsberg, and Dr. Dallas M. Hyde.

Dr. William F. Bria, II, is a pulmonary/critical care physician and adjunct clinical associate professor at the University of Michigan and the University of South Florida. He is president of the Association of Medical Directors of Information Systems, chairman of the Healthcare Information Management Systems Society Physician Community, and a fellow of the American College of Chest Physicians. He serves on the editorial boards of *Healthcare Informatics* and the *Journal of Healthcare Information Management*. Dr. Bria has been a leader in medical informatics for more than 25 years and authored several articles and books; he was recently named as one of the 50 Most Powerful Physician Executives in Healthcare by *Modern Healthcare* magazine. He is developing a 5-year combined M.D./master's program for informatics at the University of Michigan.

Ms. Wendy Chaite, whose daughter was born with systemic visceral and peripheral lymphatic disease and lymphedema, left her legal career in 1998 to found the Lymphatic Research Foundation. Throughout the Foundation's brief history, Ms. Chaite has played a central role in several organizational accomplishments, including establishment of the first-ever endowed chair of Lymphatic Research and Medicine (at Stanford University), a Gordon Research Conference Series on lymphatic research and biology, an NIH Trans-IC Coordinating Committee for Lymphatic Research, an international peer-reviewed scientific journal (*Lymphatic Research and Biology),* an international postdoctoral

fellowship program, and the platform for a National Lymphatic Disease Patient Registry and Tissue Bank. Ms. Chaite, an Emeritus Director of Research!America, previously served on the NIH Council of Public Representatives. She has been recognized extensively for her leadership throughout her educational and professional career.

Dr. Henry N. Ginsberg is the Irving Professor of Medicine at Columbia University College of Physicians and Surgeons, Associate Dean for Clinical and Translational Research, and Director of the Irving Institute for Clinical and Translational Research at Columbia University Medical Center. He serves as principal investigator for one of the first CTSAs; as principal investigator on two R01 projects supported by the National Heart, Lung, and Blood Institute; and as co-principal investigator at Columbia on the Action to Control Cardiovascular Risk in Diabetes Trial. His research focuses on the regulation of plasma cholesterol and blood triglyceride levels in cells, mice, and humans. He has authored or co-authored more than 200 articles, reviews, and chapters on lipids, diabetes, and heart disease.

Dr. Dallas M. Hyde is Director of the California National Primate Research Center and professor in the Department of Anatomy, Physiology, and Cell Biology in the School of Veterinary Medicine at the University of California, Davis. Internationally known for his work in pulmonary inflammation and asthma, Dr. Hyde has served as Associate Dean for Research and Graduate Education Programs and chair of the Department of Anatomy, Physiology, and Cell Biology at UC-Davis. He now serves as Vice President of the Americas for the International Society for Stereology and as associate editor for the *Anatomical Record*. He leads a project—supported by the National Institute of Environmental Health Sciences—that investigates mechanisms underlying the exacerbation of infant asthma in nonhuman primates by ozone.

Dr. Alving announced that NCRR is seeking new *ex officio* members to replace Colonel (Dr.) Debra M. Niemeyer and Dr. Kelly D. Garcia.

B. Meetings and Events

Clinical and Translational Science Awards (CTSA)

Dr. Alving updated the Council on the interactions that are developing among the CTSA sites and other NCRR programs as well as on opportunities across NIH Institutes and Centers (ICs).

In late April, the CTSA Consortium Oversight Committee met in Chicago to discuss a wide range of topics, including ways to foster collaborations and connections between the CTSA institutions and researchers funded by the ICs. The Committee is exploring ways to better promote research opportunities, both through personal connections and searchable database systems. For example, the University of California, San Francisco, has a new feature on its Web site that highlights its research cores and full range of services. It is hoped that this approach will be established across the entire consortium, with a link on the CTSA Web site. CTSA principal investigators at the meeting also

expressed interest in a strategic plan and priority setting, and a June retreat is planned for that purpose.

Dr. Alving highlighted examples of CTSA collaborations:

- CTSAs and National Primate Research Centers (NPRCs): CTSAs are co-located and have begun collaboration with NPRCs at the University of Washington; Oregon Health Sciences University; University of California, Davis; University of Wisconsin; and Emory University.

    - For example, the Washington Institute of Translational Health Sciences and Washington NPRC have co-sponsored the "Ignition Award," a program to support pilot projects for nonhuman primate research, with collaboration among regional partners in Washington, Wyoming, Alaska, Montana, and Idaho. (The acronym for the states involved in this joint research effort is "WWAMI"—the first initial of each state's name.) Current proposals for the pilot project represent a broad array of translational issues such as Alzheimer's disease, pluripotent stem cells, and stroke and spinal cord injury.

    - In another example, the Atlanta Clinical and Translational Science Institute (Atlanta CTSI) at Emory University has built a rich consortium that includes Morehouse School of Medicine, Georgia Institute of Technology, Children's Health Care of Atlanta, the Centers for Disease Control and Prevention, and Kaiser Permanente. Each of these institutions is linked to several others, creating a dynamic web. A collaborative effort there is focused on the development of an MRI-based program on stroke and stroke prevention. It has brought together Emory and Morehouse clinicians and neuroscientists and imaging physicists from the Yerkes NPRC to study a model of stroke in nonhuman primates.

- CTSAs and Institutional Development Awards (IDeA): The University of Washington CTSA is collaborating with IDeA research efforts in the WWAMI states. The group met recently with the IDeA and CTSA program staff and identified IDeA research efforts that could be part of this collaborative effort. In addition, CTSA and IDeA programs are participating in the Upper Midwest Consortium meeting sponsored by Mayo Clinic in June. The meeting entitled, "Building Inter-Institutional Collaborations for Clinical and Translational Education and Research," will include participants from institutions in Kansas, Nebraska, Iowa, Wisconsin, Minnesota, North Dakota, and South Dakota.

Dr. Alving also announced that a news release regarding new CTSA awardees will be issued on May 29, after the Notices of Awards have been released. She noted that the CTSA goes beyond awards and money; it is a philosophy embraced by many institutions.

Women in Biomedical Research

On March 4, 2008, NCRR and the NIH Office of Research on Women's Health, as part of an NIH Working Group on Women in Biomedical Careers, co-sponsored a workshop, "Women in Biomedical Research: Best Practices for Sustaining Career Success." The status of women in science and engineering is a serious concern. The pipeline is balanced in terms of gender from K-12 through the postdoctoral level. In spite of this even start, women are a small portion of the science and engineering faculty members at research universities, and they typically receive fewer resources and less support than their male colleagues. Retention is a problem, and generational and family issues must be considered in devising ways to ensure that women achieve lifetime careers in biomedical research.

Clinical Research Networks

Dr. Alving described the workshop, "Clinical Research Networks: Building the Foundation for Health Care Transformation," which took place on May 8, 2008. Experts presented key accomplishments, and the research community had an opportunity to critically review and discuss how the clinical research networks could be used to advance other research efforts. Seven of the 12 networks will continue as part of the CTSA Consortium. Dr. Alving acknowledged the efforts of Dr. Jody Sachs and invited Council members to visit www.clinicalresearchnetworks.org.

On May 9, 2008, NCRR held a second workshop, "Accelerating the Dissemination and Translation of Clinical Research into Practice." This was the first in a series of workshops to discuss best practices and ways in which researchers can form partnerships with community health care providers to translate clinical research into practice. Outcomes from this series will include written materials and a Web site. Dr. Alving recognized the efforts of Dr. Donna Jo McCluskey, who led the development of the workshop.

C. Budget Update

Dr. Alving reported that NCRR had funded 989 research grants, 80 research and development contracts, and 125 full-time trainee positions in FY 2007. No construction applications were funded. The FY 2008 budget, which was signed into law on December 26, 2007, included an increase of 1.1 percent from the FY 2007 level. The President's budget request for FY 2009, which was released in February, holds the NIH budget at $29.2 billion, equal to the FY 2008 level. Due to the upcoming election, it is unclear when the final budget will be passed. Dr. Alving reminded the Council that the new President will not influence the budget until 2011, except through supplements. She also noted that NIH had met with the House Appropriations Committee, but it was unclear when a meeting with the Senate Appropriations Committee would occur.

D. Chimp Management Working Group Update

The Chimpanzee Sanctuary Working Group has been reconstituted to oversee the federally supported sanctuary, Chimp Haven, which is fully operational and houses 128

animals. The Working Group is charged with developing a strategic and business plan to fulfill fiscal requirements, and developing liaison opportunities with interested stakeholders. A detailed update will be presented to the Council at the September meeting.

E. Personnel Update

NCRR

Mr. James V. Blagaich has joined NCRR as the Director of the Office of Information Technologies. Mr. Blagaich brings 20 years of experience in federal information technology operations and planning. He comes to NCRR from the Center for Scientific Review, where he served as team leader for Planning, Policy, and Budgeting. Mr. Blagaich has also worked at the Department of Defense as a Defense Health Program Manager. As Director of the Office of Information Technologies, he will provide technology vision and leadership in the development and governance of NCRR's information technology program.

Dr. Manuel H. Moro has joined NCRR as a Health Scientist Administrator in the Division of Comparative Medicine, where he will serve as a program official for the Special Career Emphasis Awards. Dr. Moro comes to NCRR from Kansas State University, where he was Assistant Professor in the College of Veterinary Medicine and coordinator of the infectious diseases/zoonoses section of the Master of Public Health Program. His research at Kansas State focused on tick-borne diseases such as Lyme disease and human babesiosis.

Dr. Renée W. Joskow has joined NCRR as a Dental Officer and Program Officer responsible for providing management and support for a portfolio of CTSA awards. She participates in the planning and implementation of new initiatives and ongoing projects for the Division for Clinical Research Resources. Dr. Joskow is a dentist and epidemiologist who has held many federal positions. She has worked with the National Institute of Dental and Craniofacial Research and with the Centers for Disease Control and Prevention's Emerging Environmental Threats Division.

Dr. Mary E. Purucker has joined NCRR as a Medical Officer in the Division for Clinical Research Resources. Dr. Purucker comes to NCRR from the Food and Drug Administration, where she worked for 12 years. Her career at FDA ranged from pre-market safety and efficacy assessment of new drugs and biological therapeutics to post-marketing surveillance activities, and she served as Director of the Division of Counterterrorism in the FDA Center for Drug Evaluation and Research. At NCRR, Dr. Purucker will oversee several CTSA sites, serve as an NIH coordinator for the CTSA Pediatric Oversight Committee, and participate as a team member on the CTSA Public-Private Partnership committee. Dr. Purucker will also participate in trans-NIH efforts on traumatic brain injury and optimal use of emergency care research networks.

Dr. Martha F. Matocha has joined NCRR as a Scientific Review Officer in the Office of Review. She comes to NCRR from the National Institute of Allergy and Infectious

Diseases, where she was Deputy Branch Chief in the Vaccine Clinical Research Branch. Dr. Matocha brings a wealth of scientific and administrative experience, and in the Office of Review she will assist with a variety of special emphasis panels.

F. Future Meeting Date

The next Council meeting will be held on Tuesday, September 16, 2008.

IV. NCRR Strategic Plan 2009-2013: Ms. Lori A. Mulligan, Director, Office of Science Policy and Public Liaison, NCRR

Ms. Mulligan presented an advance copy of the NCRR Strategic Plan 2009-2013: *Translating Research from Basic Discovery to Improved Patient Care.* This plan, developed through input from the research community, industry, foundations, professional organizations, federal partners, and NCRR and NIH staff, will serve as a framework to guide priority setting and program activities over the next 5 years. The strategic plan aims to:

- Build capacity;
- Advance research through animal models;
- Foster research through technologies;
- Develop informatics approaches to support research;
- Strengthen the research workforce; and
- Maximize partnerships.

The process of developing the strategic plan began in August 2007, when NCRR asked broad questions and received more than 500 public comments. This input served as a basis for a forum in December 2007, where more input was received and drafting began. A public comment period on the draft strategic plan was held in April 2008, and NCRR received 47 comments. This input recommended balanced representation of all NCRR programs, provided in-depth analysis of informatics sections, endorsed a multidisciplinary approach, expressed support for including veterinarians in research, and stressed support for continued commitment to science education for students and the public. This input was incorporated into the advance copy of the strategic plan which was presented to the Council. In the plan, NCRR also worked with grantees and staff to highlight NCRR grantees' accomplishment.

Ms. Mulligan reported that the final plan will soon be posted on the NCRR Web site (and made available as a PDF) and that print copies will be available and disseminated to Council. NCRR also will hold an implementation retreat on June 6, 2008, which will include forecasts of initiatives, workshops, and requests for applications, as well as focused discussion on informatics, public-private partnerships, and CTSA governance. Ms. Mulligan acknowledged and thanked the plan production team for its work on the strategic plan and invited meeting attendees to e-mail her with comments.

V. Imaging Dynamic Intravital Motion: Dr. Jay R. Hove, University of Cincinnati

Dr. Hove, a recent recipient of the Presidential Early Career Award for Scientists and Engineers, described his work using intravital microscopy, which can measure the dynamics of internal flows at small scales.

The relationship between intravital flow and the form and function of adjacent cells can be used to distinguish healthy from diseased tissue. Living organisms contain several intravital flows, including gastrointestinal flow, ciliary and flagellar flows, chemosensory and transduction mechanisms, and the muscular contractions of the beating heart. Yet to fully understand the impact of these flows on normal and pathological development, one must measure them. Science has become advanced at measuring external flows (e.g., with wind tunnels, smoke, and particle drops), but measuring flows *inside* living animals is more difficult. Many biomedical imaging techniques, such as magnetic resonance imaging, allow some measurement on a macro scale. However, a large amount of research focused on developmental processes uses small animal models, for which these imaging techniques do not work as well.

Borrowing from engineering principles, Dr. Hove and his colleagues seed fluid flows and follow displacement, with the aim of extracting quantitative information about micro-scale flows. Their work uses the zebrafish, a model organism that has been used in several studies of skin pigmentation, early events in cardiogenesis, regenerative medicine, and pumps without valves. The zebrafish offers several advantages, including genetic tractability, high fecundity, and rapid development. The zebrafish is also transparent, which allows for optical dissection using confocal microscopy. Dr. Hove presented an example in which green fluorescent protein was used to visualize the mechanics of the heart as it pumps. He also noted the increasing use of small, synthetic tracers to facilitate viewing.

With optical dissection, researchers can begin to view cross-sectional profiles of velocities in small channels and derive quantitative information about such concepts as circumferential stretch and wall stress. However, this technique is planar, providing quantitative information about flows in two dimensions over time. Historically, three-dimensional information was derived through serial image slices, which were put back together to generate the whole image. Such a process can provide information about spatial orientation, dimensions, and routes of vessels, but it cannot adequately follow movement. To overcome this problem, Dr. Hove and colleagues have taken advantage of basic photographic concepts: the pinhole and defocusing principles. A prototypical camera has been constructed and combined with computer software to look at all three dimensions simultaneously and to examine hydrodynamic variables of interest. Dr. Hove and his colleagues are now translating this concept to and validating it for the microscopic stage.

VI. Engaging Underserved Communities and Community Engagement in the CTSAs: Ms. Sara L. Young, Montana State University; Dr. Sergio Aguilar-Gaxiola, University of California, Davis; Dr. J. Lloyd Michener, Duke University

Academic Partnerships with Native American Communities: Ms. Sara L. Young

Ms. Young, an enrolled member of the Crow tribe, discussed Native American tribes, tribal colleges, and ways to build partnerships. The majority of the 562 federally recognized Native American tribes have sovereign nation status, with their own elected officials, legislatures, tribal health departments, and other government services, and they conduct government-government relations with federal, state, and local governments. Each tribe has a unique culture, language, set of practices, and economic situation. The Apsáalooke Nation, the Crow Tribe of Indians of Montana, occupies a 2-million-acre reservation in southern Montana. Most tribal members reside on the reservation and receive medical care at Indian Health Service facilities there, which include one hospital-clinic and two stand-alone clinics. Ms. Young noted that because of problems in recruiting providers, the two stand-alone clinics provide only minimal services, which presents a hardship for the many members who live more than 60 miles from the hospital-clinic.

Academic partnerships often begin with tribal colleges, which are tied to the land of the reservations and have cultural significance. These colleges all play a significant role in the education of many natives, similar to the role played by community colleges in urban areas. Academic partnerships also can begin with area offices of the National Indian Health Board. Each office represents tribes within its area or region. Tribal governments, many of which have formed their own institutional review boards to guard against violations of trust, are also potential partners, as are the National Congress of American Indians and urban Native American health care facilities. Ms. Young described several partnerships in her home state of Montana.

Ms. Young concluded her presentation by pointing out that respect, collegiality, trust, equality, communication, commitment, development of a minimal level of understanding about the tribe's history, and a sincere interest in working with the tribe are critical to successful partnerships. Tribes should be given a say in developing the research, because they know what their problems are, what they can tolerate, and which approaches will work best. Ms. Young quoted Reno Charette, the former Coordinator of Indian Affairs for the State of Montana: "The rule is to talk to the tribes before the pencil hits the paper, not when the document is ready to be signed in ink."

Engaging Underserved Communities as Partners: Dr. Sergio Aguilar-Gaxiola

Dr. Aguilar-Gaxiola, Co-Chair of the CTSA Steering Committee, noted the ultimate goal of improving the health of all people, and he emphasized the importance of effectively passing down the evidence-based knowledge generated in CTSAs to the public. Reducing health disparities requires direct input from the communities affected by them. However, these communities are often unaware of the potential benefits of biomedical research, are suspicious or distrustful of health services, and are not ready to participate in research or policy processes. Partnerships should examine a community's needs and recognize its strengths and resources. The CTSA at the University of California, Davis has conducted several meetings to explore such an approach. For example, in July 2007, the CTSA held a meeting titled "Community Perspectives on Reducing Health-Related Disparities: Informing the Research Agenda through Practice and Action." Participants went outside the academic health center to demonstrate the CTSA's seriousness in engaging in two-way interactions, and for the most part, community members drafted the meeting agenda.

The UC-Davis CTSA also began a specific project in collaboration with the California Department of Mental Health, as a component of the California Mental Health Services Act. The project spanned 10 California counties and convened 30 focus groups covering rural and urban areas; specific racial and ethnic groups; the lesbian, gay, bisexual, and transgender community; youth living in foster care; young adults with a juvenile justice history; and older adults. Community-based providers that serve these populations also participated. The focus groups revealed specific mental health problems faced by their communities; problems in accessing mental health care and with the quality of services received; social determinants of health; and social exclusion of these communities, based on current and historical experiences with government agencies. Yet the groups also revealed community assets such as individual and community resiliency, traditional and spiritual healers, religious leaders, informal and formal support networks, community-based organizations, and social service and health programs. This outreach effort has led to two reports, the dissemination of findings and actions to the communities that participated, and ongoing partnerships with community agencies and underserved groups. A copy of the first report was distributed to Council members.

Dr. Aguilar-Gaxiola concluded his presentation by highlighting several examples of community-engaged research conducted by UC-Davis.

Durham and Duke: A Story of Community Engagement: Dr. J. Lloyd Michener

Dr. Michener began by emphasizing the importance of flexibility and sensitivity to the group with which one works and by noting that community engagement takes time and persistence. He also pointed out that community engagement is about relationships and trust. Duke had been trying for decades to reach areas most affected by poverty and health disparities. It formalized its efforts about 10 years ago by pulling disparate projects into an overall unit, but its efforts picked up after Duke started holding meetings in the community at times that were convenient for community members. Duke has engaged multiple partners in Durham County and worked with them to develop approaches and projects that respond to their concerns and build on community strengths.

Dr. Michener reported that the resulting outcomes have been "breathtaking." *Just for Us*, which serves older patients who have doctors but who are not receiving specialized care or mental health services, has resulted in lower ambulance, emergency room, and inpatient costs, as well as lower hemoglobin A1C levels, improved blood pressure, and better medication adherence among the majority of patients. *LATCH*, which provides culturally appropriate outreach toward newly immigrated Latinos who lack knowledge of the health care system and who engage in high-risk behaviors, has resulted in fewer emergency room visits and has had positive effects throughout the health care system. A partnership with several area churches, which assesses barriers to diabetes control in low-income African American populations, has resulted in better self-care among its target population. A patient registry, which is in development, will enable Duke to work with community medical practices and groups in Kannapolis, North Carolina, to identify and track everyone in that community over an extended period. Dr. Michener pointed out that once researchers explain what they are trying to do and what can be accomplished, community groups are enthusiastic about forming partnerships.

All these efforts were in progress before Duke received its CTSA. Now, with that award, Duke is matching researchers and community groups that have not known how to connect. Duke is also requiring researchers to undergo training for community engagement, creating an electronic records system, ensuring that important data are included, disseminating that data back to the community, and conducting demonstration projects to collaborate with community groups and change how care is delivered.

VII. Collaborative Tool Building for Sharing and Visualizing Multimodal, Multi-Scale Data: Dr. Arthur W. Toga, University of California, Los Angeles

The Biomedical Informatics Research Network (BIRN) provides a network infrastructure for collaborative biomedical science. It is a multifaceted effort, with national distribution of several components and participation by many institutions. Dr. Toga described one component, Mouse BIRN, which includes Drexel University; Duke University; University of California, San Diego; University of Texas Health Sciences Center; Cal Tech; and University of California, Los Angeles. Each institution brings a unique expertise and history in terms of data acquisition, and Mouse BIRN integrates those observations to provide ways to measure and collect mouse data. In 2007, Mouse BIRN had produced 18 publications and 13 abstracts, and since September, there have been 74 downloads of the Mouse BIRN Atlasing Toolkit (MBAT). Thus, Mouse BIRN can be used outside a small cadre of BIRN investigators.

The spatial confluence of features, attributes, and activities define unique locations in the brain. MBAT is one of the tools Mouse BIRN is creating to correlate location-specific data. MBAT attempts to integrate the collection of genetic information with historical anatomical and physiological collections. *In situ* hybridization data are mapped onto an atlas space along with other types of data to provide a more complete representation of the functional regions of the brain. Atlases, a collection of maps that name and describe these regions, provide an intuitive visual representation, serve as an organizing framework for mapping disparate data types and information to disparate locations, serve as a pedagogical tool or reference, and provide standards for comparison. MBAT uses a

flexible computational approach that can incorporate several slightly different interpretations of a brain region. Thus, gene expression information can be correlated with physical manifestations of brain function and disease.

Dr. Toga further noted that MBAT can compare data from different sources at different scales; allow access to existing, mature gene expression databases and to PubMed; provide ontology access; and offer mechanisms to examine word relationships. The toolkit has several query systems so that investigators can obtain experimental information for genes, organisms, and anatomic or tissue areas. Map data also are available from arrays. Although this information is not an anatomic map, investigators know the structure from which the array data were derived. Several atlases and developmental studies in gene expression have been loaded into MBAT. An investigator can thus use MBAT to look beyond the brain at the entire animal.

Mouse BIRN has many plans for the future, and in prioritizing them, it seeks input from investigators. Other data will be mapped into the atlas space, and other visualization and estimation components will be added. Dr. Toga expressed the hope that MBAT will become an intuitive and visual interface to a variety of Web resources as well as an alignment and comparison tool and a tool for correlating and measuring multiple types of spatially mapped data.

VIII. Concept Clearance—Data Sharing for Biomedical Research: Dr. Gregory K. Farber, Health Scientist Administrator, Division of Biomedical Technology, NCRR

Dr. Farber reported that two program announcements (PAR-07-425 and PAR-07-426) had been released to allow researchers to add tools or data to the BIRN infrastructure or to develop vocabularies to aid in data deposition. A wide range of NIH ICs added their support to these announcements. However, researchers still need an interface as easy as MBAT, an icon they can click on their desktop to share and analyze data. They also need advice on how to structure their data collection and processing activities to make their data useful to researchers outside their laboratories. In addition, more outreach is needed so that scientific communities know about the value of sharing their data.

To solve these problems, Dr. Farber asked for clearance to develop two funding opportunity announcements. The first will be a Notice of Limited Competition, which will be limited to participants in the BIRN testbed awards. These participants have a significant amount of knowledge about both the BIRN infrastructure and the problems faced by biomedical/clinical researchers when setting up an experiment. The purpose of this notice will be to support a service activity that can offer advice on data collection, data analysis, or data presentation to those who want to use the BIRN infrastructure. It is expected that the limited competition awardee(s) will work with researchers at CTSA sites.

Dr. Farber also requested clearance to develop a Small Business Innovation Research (SBIR) funding opportunity announcement that will support software that acts as an “on ramp” to the national data-sharing infrastructure.

A motion to approve the concept clearance was forwarded and seconded. The motion passed unanimously.

IX. Recognition of Retiring Council Member: Dr. Barbara M. Alving

Dr. Alving recognized Dr. Barbara B. Knowles for her service to the Council.

X. Report—Evaluation of the Comparative Medicine Training Program: Dr. Tilahun D. Yilma, University of California, Davis

Due to the number of grants awarded to projects that use animals, and due to the extensive use of animals in biomedical research, veterinarians can play a substantial role in biomedical research to advance human health. However, veterinarians are underrepresented in biomedical research. The National Academy of Sciences has recommended an increase in the number of veterinarians conducting biomedical research, as well as changes in recruitment and programming. NIH National Research Service Awards (NRSAs) support veterinarians, but they do not allow support for trainees while they are preparing for veterinary residency examinations.

Three NCRR training opportunities are designed to bring veterinarians into biomedical research: professional student short-term summer research training (T35, PA-05-117); one-year, hypothesis-based, animal-oriented research training for veterinary students (T32, PA-06-468 and PA-01-138); and three-year, post-D.V.M. research training, usually leading to a Ph.D., for highly qualified veterinarians (T32, PA-06-468). Dr. Yilma reported on an evaluation of these programs by a working group he had chaired. This Working Group agreed that veterinarians trained in research can play significant roles in government, academic institutions, biomedical research, and industry. The group also noted considerable challenges in identifying, recruiting, training, and retaining veterinarians who can fill these roles, as well as a lack of role models for pre- or post-D.V.M. trainees outside traditional clinical practice.

Although the Working Group agreed that the three NCRR programs are generally well designed and correctly aimed, they recommended an analysis of the predoctoral T32 program to take place in four to five years. They requested that alternatives be considered if the analysis determines that the program is ineffective in promoting research careers. The group also recommended that all NCRR training programs pay more attention to informing students how to choose a research training program and to coordinating information sources on training opportunities for veterinarians. The Working Group further recommended that NCRR use existing NIH mechanisms to encourage including more research information in veterinary curricula. Doing so would allow professors interested in research to enhance the quality and depth of their courses by emphasizing basic mechanisms of disease and biomedical research.

Dr. Yilma reported the Working Group's overall conclusion that the NCRR Division of Comparative Medicine Training Program will attract and select the most promising applicants and provide trainees with tools that will let them remain and succeed in NIH-funded research. A draft of the Working Group's report was available to Council

members, and NCRR invited comments. A final draft will be posted on the NCRR Web site.

XI. Concept Clearance—Visualizing Biomedical Research Characteristics: Dr. Olga D. Brazhnik, Health Scientist Administrator, Division of Biomedical Technology, NCRR

Dr. Brazhnik noted that biomedical research can be characterized in a multitude of ways. Publications, grant applications, progress reports, funding, experimental approach, specific aims, databases, collaborations, scientific networks, and organizations and people with specific expertise can contribute to the complex process of biomedical research. These elements are highly interlinked and are often represented by large volumes of data. For example, thousands of papers are produced weekly. Visualization can help to make sense of these data and complex relationships, to aid in seeing the big picture, and provide other useful information, especially for the process of making decisions. Dr. Brazhnik cited a project mapping the evolution of co-authorship networks (Visvanath and Börner, 2004) as an example of visualization. Dr. Brazhnik requested clearance to develop an SBIR funding opportunity announcement to develop visualization tools that will assist in the assessment of various characteristics of biomedical research, especially those that will aid portfolio analysis.

A motion to approve the concept was forwarded and seconded. The motion passed unanimously.

XII. Concept Clearance—Postdoctoral Fellows on CTSA Training Grants: Dr. Anthony R. Hayward, Director, Division for Clinical Research Resources, NCRR

Dr. Hayward reminded the Council about existing career development opportunities in the CTSAs:

- A U54 curriculum development program;
- Predoctoral support through the TL1 mechanism, which requires trainees to be registered for Ph.D. or M.S. programs. Trainees are primarily medical students; and
- Postdoctoral support through the KL2 mechanism, which requires 75 percent dedicated time and a salary up to the NIH cap.

Trainees would have more opportunities within CTSAs if a postdoctoral component were added to the TL1 mechanism, allowing CTSAs to appoint postdocs and add to short courses. This would increase institutional flexibility for the support of statisticians, informaticists, and trainees with M.D. degrees. The concept was approved by the CTSA Consortium Oversight Committee on April 27.

A motion to approve the concept was forwarded and seconded. The motion passed unanimously. The concept will be proposed to the NIH Office for Extramural Research. If it is accepted, the next CTSA request for applications will be modified, and a notice will be published in the NIH Guide.

CLOSED SESSION

This portion of the Council meeting was closed to the public in accordance with the determination that it was concerned with matters exempt from mandatory disclosure under Sections 552b(c)(4) and 552b(c)(6), Title 5, U.S. Code and Section 10(d) of the Federal Advisory Committee Act, as amended (5 U.S.C. Appendix 2).

Council members discussed procedures and policies regarding voting and confidentiality of application materials, committee discussions, and recommendations. Members absented themselves from the meeting during discussion of and voting on applications from their own institutions, or other applications in which there was a potential conflict of interest, real or apparent.

XIII. Application Review

The Council reviewed 236 applications (with total direct costs of $494,396,365). The Council concurred with the review of all applications.

ADJOURNMENT

The Council adjourned at 2:15 p.m. on May 14, 2008.

CERTIFICATION

We hereby certify that, to the best of our knowledge, the foregoing minutes and supplements are accurate and complete.

Barbara Alving — 7/21/08

Dr. Barbara M. Alving
Chair, National Advisory Research Resources Council
and
Director, National Center for Research Resources, NIH

Date

Louise Ramm — 7/18/08

Dr. Louise E. Ramm
Executive Secretary, National Advisory Research Resources Council
and
Deputy Director, National Center for Research Resources, NIH

Date