

**DEPARTMENT OF HEALTH AND HUMAN SERVICES  
PUBLIC HEALTH SERVICE  
NATIONAL INSTITUTES OF HEALTH  
NATIONAL ADVISORY COUNCIL FOR  
BIOMEDICAL IMAGING AND BIOENGINEERING**

**Summary of Meeting<sup>1</sup>  
September 11, 2003**

The National Advisory Council for Biomedical Imaging and Bioengineering (NACBIB) was convened for its third meeting on September 11, 2003 in Building 31, Room 6, National Institutes of Health, Bethesda, Maryland. Dr. Roderic I. Pettigrew, Director of the National Institute of Biomedical Imaging and Bioengineering (NIBIB), served as Chairperson.

In accordance with Public Law 92-463, the meeting was open on September 11, 2003 from 10:00 A.M. until 1:15 P.M. for the review and discussion of program development, needs and policy, and closed to the public from 1:15 P.M. until 4:30 P.M. for discussion and consideration of individual grant applications. Two Council subcommittees, the Strategic Plan Development Subcommittee and the Training and Career Development Subcommittee met in open session from 8:00 A.M. until 9:45 A.M. in rooms 6 and 7 respectively.

**Council members present:**

Dr. Carlo De Luca	Dr. Barbara McNeil
Dr. Janie Fouke	Dr. Rebecca Richards-Kortum
Dr. Linda Lucas	Dr. Stephen Williams
Dr. Charles Maynard	Dr. James Zagzebski
Dr. Norbert Pelc	

**Council member absent:**

Dr. Shirley Jackson  
Dr. R. Brent Harrison

**Ex officio members present:**

Dr. Arden Bement	Dr. James Smirniotopoulos
Dr. Esin Gulari	Dr. Michael Weiner
Dr. John Livengood	

**Members of the public present for portions of the open meeting:**

Dr. Elaine Young, University of Maryland Baltimore Campus  
Mr. Edward Nagy, Academy of Radiology Research  
Mr. David Leslie, Schmitt and Leslie, Inc.  
Ms. Renee Cruea, Academy of Radiology Research  
Mr. Farshid Guilak, Duke University  
Ms. Melissa Murray, American Society of Mechanical Engineering  
Ms. Joanne Hawana, The Blue Sheet  
Mr. Kevin O'Connor  
Ms. Michelle Rodrigues, SRI International

<sup>1</sup>For the record, it is noted that members absent themselves from the meeting when the Council is discussing applications (a) from their respective institutions or (b) in which a real or apparent conflict of interest might occur.

NIBIB employees present for portions of the meeting:

Ms. Yinka Abu	Dr. Alan McLaughlin
Ms. Lillian Ashley	Mr. Todd Merchak
Ms. Nancy Curling	Ms. Brenda Mitchell
Dr. Donna Dean	Dr. Peter Moy
Dr. Bonnie Dunn	Dr. Robert Nerem
Ms. Kina Forrest	Dr. Mary Pastel
Dr. David George	Ms. Donna Pearman
Mr. Stephen Green	Dr. Grace Peng
Ms. Colleen Guay-Broder	Dr. Roderic Pettigrew
Dr. John Haller	Ms. Anna Retzke
Ms. Annette Hanopole	Dr. Pat Sokolove
Dr. Joan Harmon	Ms. Mollie Sourwine
Dr. Bill Heetderks	Dr. Edward Staab
Ms. Christine Hollingsworth	Dr. Richard Swaja
Dr. Christine Kelley	Ms. Sandra Talley
Ms. Mary Beth Kester	Ms. Yvonne Talley
Dr. Peter Kirchner	Dr. Meredith Temple-O'Connor
Dr. Brenda Korte	Ms. Stacy Wallick
Ms. Danielle Lewis	
Dr. Peter Lyster	

Other Federal employees present for portions of the meeting:

- Dr. Prabha Atreya, Center for Scientific Review
- Dr. James Ellis, NIH Office of Research Services
- Dr. Alexander Gubin, Center for Scientific Review
- Dr. Richard Panniers, Center for Scientific Review
- Dr. Richard Rodewald, Center for Scientific Review
- Dr. Lee Rosen, Center for Scientific Review
- Dr. Jean Sipe, Center for Scientific Review
- Dr. Paul Wagner, Center for Scientific Review

## **I. Call to Order and Opening Remarks – Dr. Roderic I. Pettigrew**

Dr. Pettigrew welcomed Council members, guests, and staff to the third Council meeting, extending a special welcome to those who share the mission of the NIBIB. He noted the historic importance of the National Advisory Council for Biomedical Imaging and Bioengineering (NACBIB) completing its first year of operation covering three grant review rounds. He expressed appreciation for the Council's attendance on the anniversary of the tragic events of September 11, 2001. Dr. Pettigrew announced that Drs. R. Brent Harrison and Shirley Jackson would not attend. He offered condolences to Dr. Harrison on the recent loss of his mother and expressed appreciation for his active service during his term on the Council that ended with this Council meeting. A replacement is currently under review. Dr. Pettigrew also announced the establishment of a NACBIB working group on the development of an Intramural Division that includes: NACBIB members Dr. Arden Bement and Dr. Carlo De Luca; current NIBIB staff member Dr. Edward Staab, soon to be professor of radiology at the Wake Forest School of Medicine; and Dr. Gary Glover, a prominent imaging scientist and colleague of Dr. Norbert Pelc of Stanford.

There was a discussion of future meeting dates. Council requested a change in the May 2004 meeting date to avoid conflicting with an international meeting on biomaterials scheduled for the week of May 17<sup>th</sup>. Dr. Pettigrew suggested moving the September meeting that may coincide with the annual Director's retreat. It was agreed that staff would poll members by e-mail to set a date for the May meeting and to confirm availability on September 9<sup>th</sup> and 10<sup>th</sup>. Council also put forth the suggestion that NACBIB meet in other areas of the country. Staff agreed to explore this possibility.

Council accepted the minutes of the May 2003 meeting without modification. Dr. Pettigrew drew attention to updated operating procedures for the NACBIB that included all changes requested at the May 2003 meeting. Dr. Pettigrew outlined the agenda, noting that an abbreviated Director's report would permit onset of the closed session immediately after lunch.

## **II. Review of Regulations – Dr. Joan T. Harmon**

Dr. Harmon summarized the requirements under the Government in the Sunshine Act and the Federal Advisory Committee Act. These Acts require the Department of Health and Human Services (DHHS) to open to public observation as many advisory committee meetings as possible, including the meetings of the National Advisory Councils. The Council meeting, therefore, would be open to public observation except during grant application review, scheduled to begin at 12:00 P.M. and concluding by the end of the day. Notice of the Council meeting was published in the *Federal Register* thirty days prior to the meeting.

Dr. Harmon also reviewed regulations concerning conflict of interest, and Council members were reminded that materials furnished for review purposes and discussion during the closed portions of the meeting are considered privileged information. All Council members present signed a statement certifying that they did not participate in the discussion of, or vote on, an application from any organization, institution, or any part of a university system, except for those which have multi-campus institution waivers or are specifically designated as separate organizations under 18 U.S.C. 208(a), of which they are an employee, consultant, officer, director or trustee, or in which they have a financial interest.

## **III. Director's Report – Dr. Roderic Pettigrew**

Dr. Pettigrew introduced his report by noting the tremendous support that the Institute has received from the extramural community during the fiscal year that concluded in September, as evidenced by the overwhelming response of the community to the ten requests for applications issued by the Institute.

He announced transitions for several staff members and staff additions. Dr. Edward Staab, Acting Director, Division of Applied Science and Technology will join the Wake Forest Medical School as professor of Radiology. The search initiated by Dr. Staab for a permanent replacement Director for this Division will continue. Ms. Annette Hanopole and Ms. Lisa Moeller leave for an opportunity to work in the Grants Management office of the National Institute of Child Health and Human Development. Ms. Ruby Akomeah, Senior Administrative Office will move to a similar position within the Intramural Division of the National Institute of Allergy and Infections

Diseases. A search for replacements for these staff members is also underway. In the Program area, Dr. Peter Lyster has officially joined NIBIB and brings strong expertise in bioinformatics. Dr. Pat Sokolove, Associate Dean, University of Maryland came to the NIBIB through the joint American Association for the Advancement of Science-NIH fellowship program. Dr. Sokolove's strong background in training will enable her to support the NIBIB in developing initiatives for the NIBIB Interdisciplinary Training Division. Dr. Gary Glover of Stanford University has accepted an appointment as a Special Advisor to the Director, NIBIB in the area of medical physics.

Dr. Pettigrew provided an update on the fiscal year 2004 budget. The July appropriations bill from the House of Representatives allocates \$27.7 billion for the NIH and \$282 million for the NIBIB, both amounts equal to the President's budget. The Senate has under consideration a subcommittee proposal of \$27.9 billion for the NIH and \$289 million for the NIBIB.

The NIBIB continues to sponsor workshops to bring together NIBIB grantees and to solicit feedback from the extramural community. In June, investigators with grants under the Biomedical Research Partnerships initiative gathered in Bethesda. A similar meeting of P41 grantees was also held in June. As these grants were transferred to the NIBIB from the National Center for Research Resources, (NCRR) staff from NCRR collaborated in this effort.

The NIBIB coordinated the annual NIH Bioengineering Consortium (BECON) symposium, "Catalyzing Team Science" that focused on the forces that support or hinder the development of interdisciplinary research and training. Council member Dr. Janie Fouke was one of the co-chairs for this event. Preliminary recommendations from this meeting are posted on the NIBIB website and a detailed report will be forthcoming. The NIBIB is the administrative home for BECON, a trans-NIH consortium on bioengineering research.

In August and September, the NIBIB sponsored several additional workshops. A meeting on biomedical entrepreneurial science explored ways to facilitate the translation of technology to practical medical applications.

The NIBIB joined with four professional radiology organizations to examine training infrastructure in radiology departments and barriers to the development of research training programs. A white paper on this meeting is under development and will be published in the journals of several of the societies.

The NIBIB, in conjunction with the National Heart, Lung, and Blood Institute, the National Institute of Diabetes and Digestive and Kidney Disorders, and the National Center on Minority Health and Health Disparities sponsored a meeting in collaboration with the Association of Black Cardiologists to determine what initiatives the Institutes could undertake to reduce the disparity in the death rates between African Americans and whites from cardiovascular disease. The keynote for this one and a half day meeting was an address by former Surgeon General, Dr. David Satcher, who instructed the participants to consider his five-point plan for eliminating cardiovascular disparities in their discussions. A report on this meeting is expected in the coming months.

The NIBIB also co-sponsored a meeting with the National Cancer Institute on computer-aided diagnosis and bioinformatics. Led by the NCI, the meeting focused on cancer, but also examined application of this technology to other disease processes. The report is under development.

As mentioned at previous Council meetings, the NIBIB remains involved with the Department of Health and Human Services' efforts to develop a Department initiative on tissue engineering. NIH is leading this work with several other government agencies, including the National Science Foundation, the National Institute of Standards and Technology, the Defence Advanced Research Projects Agency, the Department of Energy, the National Aeronautics and Space Administration, and the Federal Drug Administration. Drs. Donna Dean, Christine Kelley, and Robert Nerem have represented the NIBIB. The group has held three meetings. Under the leadership of Dr. Howard Zucker, Assistant to Secretary Thompson, the group will prepare a report, "Federal Initiative in Regenerative Medicine," that will describe research opportunities in tissue engineering, reimbursement issues, and the challenges of developing products in this area for public health benefits.

Turning to the NIBIB's current portfolio, Dr. Pettigrew presented a listing of nineteen research areas in which the NIBIB supports ten or more grants. He emphasized that there is tremendous interest in the extramural community in these areas of research as evidenced by the 250% increase in investigator-initiated applications from fiscal year 2002 to 2003 and projected a doubling of investigator-initiated applications in fiscal year 2004 over the amount received in 2003. This projection is based on: (1) the number of applications received for the September Council review round, (2) the increase in investigator-initiated grant applications from fiscal year 2002 to 2003, and (3) the large number of applications received in response to the ten requests for application (RFAs) issued by the NIBIB, many of these applications will be revised and resubmitted as investigator-initiated applications in fiscal year 2004.

In conjunction with this data, Dr. Pettigrew requested that Council examine the Institute's funding. From fiscal year 2002 to 2003, the NIBIB received a significant increase in funding. The proposed NIBIB budget for fiscal year 2004 provides for a \$2 million dollar increase in the House version and a \$9 million increase in the current Senate version.

Drawing attention to the large number of applications received in response to fiscal year 2003 RFAs, Dr. Pettigrew noted again, the high level of interest in the mission of the Institute in the extramural community and underscored how this response validated the concepts that led to the establishment of the Institute. The NIBIB is fulfilling a previously unmet need, by offering support to a significant number of investigators interested in conducting technology-based research that is medically directed.

Based on advice received from the extramural community, Dr. Pettigrew explained that the NIBIB had used a \$50 million allocation of uncommitted funds in fiscal year 2003 to target the research areas outlined in the ten RFAs reviewed at previous meetings. The Institute received over 1100 applications in response to these RFAs, approximately twice the number received on average by the NIH for an equal number of initiatives. Over half of the applicants identified themselves as being new to the NIH process, once again illustrating the reach of the NIBIB into

a previously untapped pool of researchers. Despite the acknowledged lack of experience of many of these applicants with the NIH process, the quality of the applications was consistent with others received by the NIH. Considering all the data that point to continued growth in NIBIB applications, the Institute does not plan to issue any new initiatives in fiscal year 2004. Dr. Pettigrew expressed appreciation to the staff for the tremendous work involved in developing, issuing and reviewing these RFAs, the major support received from the NIH Center for Scientific Review in the review process, as well as the work of the extramural community in preparing responses.

Dr. Pettigrew then provided brief summaries of some the research being supported by the NIBIB. He highlighted work from the following projects:

- Shape Memory Polymer Devices for Treating Stroke (*Duncan Maitland, PhD, Lawrence Livermore National Laboratories*)
- Active Hand-held Tremor-canceling Microsurgical Instrument, (*Cameron Riviere, PhD, Carnegie-Mellon University*)
- Nano Arrays for Real-time Probing Within Living Cells, (*Timothy McKnight, PhD, Oak Ridge National Laboratories*)
- Human Brain Atlas, (*John Mazziotta, PhD and Art Toga, PhD, International Consortium for Brain Mapping, David Geffen School of Medicine, UCLA*)
- Spatiotemporal Brain Imaging: *Microscopic & System Level*, (*Anders Dale, PhD, Massachusetts General Hospital, NMR*)

Dr. Pettigrew concluded by outlining some future directions for the Institute and the NIH. Acknowledging the work of Drs. Peter Kirchner, Edward Staab, and Robert Nerem, Dr. Pettigrew announced the anticipated start-up of the previously mentioned NIBIB Intramural Division in fiscal year 2004. Included as an item in the Presidents's budget for fiscal year 2004, the Intramural Division would begin operations through the transfer of two PET research groups from the NIH Clinical Center to the NIBIB. Preparation of a final agreement to complete this transfer is underway. A similar memorandum of understanding is in process to gain use of space at NIST facilities and to outline terms for joint use of other NIST resources. Dr Pettigrew also noted that Drs. Kirchner and Nerem recently led a meeting to plan the tissue engineering focus within the Division. Discussions have also continued with the FDA and the Department of Energy's Oak Ridge National Laboratories on potential areas of collaboration. A relationship with Oak Ridge National Laboratories will offer NIBIB Intramural Division investigators an opportunity to take advantage of a \$1.4 billion cold neutron source that will be utilized for imaging studies through neutron scattering.

Dr. Pettigrew revisited with Council, the quantum grant concept discussed at the previous meeting. Through this potential mechanism, the NIBIB hopes to support high impact interdisciplinary research that would achieve a significant improvement in health care. The time frame for the projects would be six to ten years. Dr. Richard Swaja is leading the effort to develop a process for managing such a funding mechanism. Potential projects could be tissue engineered blood, an improved hemodialysis unit, nerve regeneration, a reliable technique for the early detection of prostate cancer, or blood chemistry without the use of needles. It is anticipated that during fiscal year 2004, the Institute will finalize the concept, announce the

program, and solicit the initial round of applications. It is hoped that the first awards under this program will be made in fiscal year 2005.

Dr. Pettigrew brought Council up to date on the NIH Roadmap process that is planning trans-NIH initiatives in three broad areas: New Pathways to Discovery; Research Teams of the Future; and Regenerating the Clinical Research Enterprise. Dr. Pettigrew, Dr. Frances Collins, Director National Human Genome Research Institute, and Dr. Thomas Insel, Director, National Institute of Mental Health serve as co-chairs of one of nine implementation groups focusing on initiatives in molecular libraries and molecular imaging. All implementation groups recently submitted reports to the Director, NIH detailing plans and potential programs. The NIBIB anticipates involvement in several of these programs. The Office of the Director, NIH will fund these initiatives in fiscal year 2004.

Dr. Pettigrew outlined some of the initiatives planned by his implementation group. The molecular libraries program has a goal of developing a library of small molecules that will support the creation of therapeutic agents at the molecular level. These libraries will also undergo screening to identify specific targets for which the molecules have an affinity for therapeutic purposes, for example the protein expressed on the surface of a cell. There is a point of synergy with molecular imaging in that these can serve also as ligands or a vector to carry in an imaging agent and then subsequently after demonstrating their localization through imaging to use them to carry therapeutic agents, specifically, for example, a gene that targets the specific endothelium, induces apoptosis and could thereby kill the vasculature that supplies cancer, contributing potentially to an effective treatment for cancer.

The molecular imaging portion will address as one priority the low sensitivity of currently available molecular probes relative to the need to image singular molecular events, an area that the group identified as the major barrier to future development of this technology. An example is the need to image enzymes in real time. The group has therefore proposed initiatives to encourage improvements in the specificity and sensitivity of probes in a range that is one hundred to one thousand times greater than those that currently exist.

Dr. Pettigrew concluded his report by reiterating his appreciation for the services of Dr. R. Brent Harrison.

In response to questions from Council regarding the budget for new grants, Dr. Pettigrew explained that, because a large portion of the NIBIB portfolio came to the Institute from transfers, monies for new grants in fiscal year 2004 would flow from an expected 18-20% turnover, providing about \$50 million for new grants. As the Institute matures, he anticipates a portfolio turnover rate of about 25%. Council suggested that staff review the existing portfolio to better understand what the turnover would be within the next three years. Dr. Pettigrew also clarified that while the announcement for the new quantum grants would be issued in fiscal year 2004, grant applications would be supported through fiscal year 2005 funding.

#### **IV. Training and Career Development Subcommittee Report – Dr. Douglas Maynard**

Dr. Maynard thanked the staff for their work in soliciting information from the extramural

community and bringing an assessment of this information to the Subcommittee. Summarizing the first meeting of the Subcommittee, held in May 2003, Dr. Maynard stated that the Subcommittee decided to meet in conjunction with each Council, generally the night before. The Subcommittee planned to examine the existing portfolio, potential new training programs, and proposals for the Intramural training programs. Today's meeting had been devoted to a review of current NIBIB training programs and three potential new programs. NIBIB solicits applications through many of the existing NIH training mechanism. He presented information that showed the number of applications received by the NIBIB through various training mechanisms and the number of grants in each category. He noted that the eleven T32 grants support 70 trainees.

Dr. Maynard described a medical residency research program as one of the new initiatives discussed by the Subcommittee. Members discussed the options of using two traditional NIH funding mechanisms to support this program, a T32 training grant or a grant supplement. Recommending the latter, the Subcommittee proposes offering one to two years of support to NIH grantees to support medical residents who would like to gain exposure to research as a possible career path. Funding for continued training would have to flow from another source. During the training, participants would devote 75% effort to research and 25% to clinical work. Council raised a question about peer review for research projects supported under such a program. Staff responded that generally these projects would be tied to the parent grant that had already undergone peer review. However, several options for this would be examined.

A second program discussed by the Subcommittee was a mechanism to support the transition of postdoctoral fellows into faculty positions. Similar to the young investigator award offered by the Whitaker Institute, the program would use the NIH K22 individual career award to support postdoctoral fellows in the latter stages of their work and in making a move, preferably to a new institution, to a faculty position. This program exists at several other Institutes at the NIH, bringing in postdoctoral fellows to the Intramural Division for eventual transition to faculties of extramural institutions. Council raised questions about the cost associated with moving to a new institution as a faculty member and underscored the need for significant support beyond salary needs to establish a new research program. Council also emphasized the need for both of these initiatives to offer support for the mentoring that would be critical to the success of both of these programs.

Dr. Maynard offered that the third program addresses the need to provide support for mentoring and other administrative needs in institutional training programs. The staff of the NIBIB is exploring a mechanism to supplement the T32 and further information will be provided at a future meeting.

The staff is also involved in other activities, visiting T32 sites, and examining ways of addressing curriculum development and the need for short-term training opportunities at the national level. Dr. Maynard stated that staff had significant involvement in the meeting on research training in radiology previously mentioned by Dr. Pettigrew. The meeting was convened to discuss infrastructure for research in radiology departments and how to improve training opportunities for clinical researchers. A draft report has been completed. Recommendations from the workshop include the following:



- Recruit more MDs and MD/PhDs into radiology research programs
- Develop a national resource for mentoring
- Encourage the Resident Review Committees and American Boards of Radiology to start asking more questions related to research
- Develop a grant program for medical residents like the one discussed above
- Emphasize multidisciplinary research and training, particularly in the clinical arenas
- Create a model curriculum for research training
- Develop masters degree programs for radiological sciences

Dr. Maynard concluded that these current efforts seem very responsive to needs expressed by the extramural community to train more clinical investigators and support young PhDs in making the transition to faculty positions. The next meeting will focus on training in the Intramural Division.

## **V. Strategic Plan Development Subcommittee Report – Dr. Frank Yin**

Dr. Yin reported that this Subcommittee had met twice. At the first meeting, the members selected a chair, who will serve a one year term, decided on a maximum four-year term for committee membership, and agreed to meet three times per year in conjunction with Council, reporting to the full Council at these meetings. The Subcommittee also decided that its role in the development of the Institute’s strategic plan would be to review and critique drafts prepared by the staff.

Today’s meeting began with a discussion of the NIBIB portfolio, including a specific focus on Small Business Innovative Research (SBIR) grants. NIBIB has the highest percentage of SBIR applications of all the Institutes at the NIH. Given the 2.5% mandated budget allocation for support of these grants, the NIBIB may need to consider other sources of funding to support more of the many meritorious applications received. The Subcommittee also heard information on the planned Intramural Division as presented in Dr. Pettigrew’s report.

A large portion of the meeting was devoted to a presentation by NIBIB staff on the process for developing a strategic plan. Through the plan, the Institute hopes to: address critical research needs; emphasize areas in which progress is attainable; focus on innovative ideas; promote coordination and collaboration; and complement existing plans. The results of the process should be a plan that: achieves the mission of the NIBIB; identifies broad opportunities; encompasses a shared vision that unites programs across agencies; promotes collaboration; facilitates measurement of results; and incorporates changes as needed. Through extensive involvement with the community, the process will identify goals achievable within a two to three year time frame.

The staff presented a seven-phase process to be accomplished over a year:

- Get organized – Set up a staff working group with the support of Schmitt and Leslie      Sept. 2003 – Dec. 2003
- Gather data – from past and future workshops and through a web page      Jan 2004 – April 2004

- Write plan – Staff with analyze data and develop that reflects community input. May 2004 – September 2004
- Solicit feedback – though letters, web page, Federal Register and Council. Oct. 2004 – Dec. 2004
- Refine the plan – based on stakeholder feedback Oct. 2004 – Dec. 2004
- Second period of public comment Oct. 2004 – Dec. 2004
- Publish and Implement Jan. 2005

Dr. Yin noted that this timeline provides a completion date one year later than that originally proposed by the Subcommittee. He emphasized that the Subcommittee endorsed the additional time to support the development of a well-conceived, defining document that would reflect significant input from the community. The Council will play a significant role in identifying stakeholders to participate in the process and in critiquing the document.

Council suggested that staff consider performance measures as goals and objectives be developed, taking into consideration that the Office of Management and Budget policy and budget goals may differ from goals set forth by program administrators and the extramural community. Staff indicated that documents prepared for the Government Performance Results Act and other plans would be considered. Dr. Maynard also requested that a formal liaison be established between the two Council Subcommittees to ensure that efforts to plan for training initiatives are not duplicated.

**VI. Closing Remarks – Dr. Roderic Pettigrew**

Dr. Pettigrew thanked everyone for attending the open session and noted that the closed session would begin at 1:15 P.M.

**VII. Closed Session – Review of Applications**

This portion of the meeting, involving specific grant review, was closed to the public in accordance with the provisions set forth in Section 552b (c) (4) and 552b (c) (6) Title 5, U.S. Code and 10(d) of the Federal Advisory Committee Act, as amended (5 U.S.C. appendix 2).

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

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/s/  
Joan T. Harmon, Ph.D.

Executive Secretary  
National Advisory Council for Biomedical  
Imaging and Bioengineering  
Director, Office of Extramural Policy  
Office of Science Administration  
National Institute of Biomedical Imaging  
and Bioengineering

/s/

Roderic I. Pettigrew, Ph. D., M.D.  
Chairperson,  
National Advisory Council for Biomedical  
Imaging and Bioengineering  
Director  
National Institute of Biomedical Imaging  
and Bioengineering

The Council will consider these minutes at its next meeting. Corrections or notations will be incorporated in the minutes of that meeting.