DEPARTMENT OF HEALTH AND HUMAN SERVICES
NATIONAL INSTITUTES OF HEALTH
NATIONAL INSTITUTE OF ENVIRONMENTAL HEALTH SCIENCES

MINUTES OF THE NATIONAL ADVISORY ENVIRONMENTAL HEALTH SCIENCES COUNCIL

May 21-22, 2009

The National Advisory Environmental Health Sciences Council was convened for its one hundred twenty-seventh regular meeting on May 21, 2009 at 8:30 a.m. in the Rall Building, Rodbell Auditorium, National Institute of Environmental Health Sciences, Research Triangle Park, NC. Dr. Linda Birnbaum presided as Chair.

The meeting was open to the public on May 21, 2009 from 8:30 a.m. to 5:00 p.m. and on May 22, 2009 from 10:35 a.m. to noon. In accordance with the provisions of Public Law 92–463 the meeting was closed to the public on May 22, 2009 from 8:00 a.m. to 10:15 a.m. for consideration of grant applications. Notice of the meeting was published in the *Federal Register*.

Members Present
Stephen Baylin, MD
Hillary Carpenter, PhD
John Essigmann, PhD
Richard Finnell, PhD
Joseph Graziano, PhD
Stefani Hines, MA, MS
George Leikauf, PhD
Grace LeMasters, PhD
R. Stephen Lloyd, PhD
Sem Phan, MD, PhD
Kenneth Ramos, PhD (May 22 only)
Jerald Schnoor, PhD
Kevin Stephens, MD, JD
Nsedu Obot Witherspoon, MPH

Ex Officio Officer
CPT Michael Macinski

NIEHS Staff
Kathy Ahlmark
Beth Anderson
Ralph (Eddy) Ball, PhD
David Balshaw, PhD
Linda Bass, PhD
Martha Barnes
Sharon Beard
Wanda Boggs
Alma Britton
John Bucher, PhD
Lisa Chadwick, PhD
Jennifer Collins
Gwen Collman, PhD
Helena Davis
Caroline Dilworth. PhD
Christie Drew, PhD
Dorothy Duke
Sally Eckert-Tilotta, PhD
Benigno Encarnacion
Christine Flowers
Mary Gant
Ying Gao
Kimberly Gray, PhD
Vicki Grigston
Astrid Haugen
Tom Hawkins
Heather Henry, PhD
Marc Hollander
Michael Humble, PhD
Ethel Jackson, DDS
Laurie Johnson
Paul Jordan
Annette Kirshner, PhD
Stephen Kleeberger, PhD

Cindy Lawler, PhD
Edith Lee
Michael Loewe
Christopher Long
Robin Mackar
Ellen Moul
Carolyn Mason
J. Patrick Mastin, PhD
Elizabeth Maull, PhD
Michelle Mayo
Kimberly McAllister, PhD
Elizabeth McNair
David Miller
Srikanth Nadadur, PhD
Liam O'Fallon
Michelle Owens
Jerry Phelps
John Pritchard, PhD
Leslie Reinlib, PhD
Donna Roach
Carol Shreffler, PhD
Daniel Shaughnessy, PhD
William Suk, PhD
Hugh Tilson, PhD
Claudia Thompson, PhD
Myra Westmoreland
Michelle Victalino
Craig Wladyka
James Williams
Marva Wood
Leroy Worth, PhD
Darryl Zeldin, MD

Members of the Public Present

David Brown, SRA International
Anne Sassaman, PhD, Consultant
Stacy Torian, Master Key Consulting

OPEN PORTION OF THE MEETING
May 21, 2009 – 8:30 a.m.-5:33 pm

I. CALL TO ORDER AND OPENING REMARKS

Dr. Linda Birnbaum, Director of National Institute of Environmental Health Sciences (NIEHS) and the National Toxicology program (NTP), called the one hundred twenty-seventh regular meeting of the National Advisory Environmental Health Sciences Council to order. She opened the meeting by welcoming those in attendance and inviting everyone to introduce themselves. Dr. Birnbaum informed everyone that, pursuant to the Governments in the Sunshine Act, all aspects of the meeting would be open to the public except for the review, discussion and evaluation of grant applications and related information. She pointed out that the open portion of the meeting was being webcast and instructed people to use their microphones when speaking.

Dr. Birnbaum welcomed Council member Dr. Steve Baylin from the Johns Hopkins School of Medicine and mentioned that this was Dr. Baylin's first Council meeting. She also acknowledged those members not present, Drs. Christopher Bradfield, David Christiani, Palmer Taylor and Ms. Janet McCabe. She noted that Council member Dr. Kenneth Ramos would be joining the Council meeting on May 22, 2009.

Dr. Birnbaum reminded Council members to sign their conflict of interest forms and fill out their expense sheets. She said that most Council votes would be done through a show of hands indicating approvals, disapprovals or abstentions.

II. REVIEW OF CONFIDENTIALITY AND CONFLICT OF INTEREST PROCEDURES

Dr. Birnbaum discussed, with Council, confidentiality and conflict of interest procedures.

III. CONSIDERATION OF MEETING MINUTES

A motion was made by Council member, Dr. Hillary Carpenter, to approve the February 19, 2009 minutes as written. The motion was seconded and approved unanimously by Council.

IV. FUTURE COUNCIL MEETING DATES

Dr. Birnbaum asked Council members to note the following future Council meeting dates.

September 15 –16, 2009	NIEHS	Tuesday – Wednesday
February 17–19, 2010	NIEHS	Wednesday – Thursday
May 19 – 20, 2010	NIEHS	Wednesday – Thursday
September 20–21, 2010	NIEHS	Monday – Tuesday

The February 2010 Council meeting dates include the Council retreat and therefore are three days. Dr. Birnbaum explained that the planned September retreat was postponed to February 2010 due to the work involved with the American Recovery and Reinvestment Act (ARRA).

Following Dr. Birnbaum's introductory remarks, Dr. Gwen Collman indicated that the webcast had been advertised to NIEHS's extramural grantee community and the videocast would be posted on the video archive in the coming weeks.

V. REPORT OF THE DIRECTOR – Dr. Linda Birnbaum

Dr. Birnbaum began her report by discussing NTP's efforts to develop the 12th Report on Carcinogens. An expert panel would be meeting on June 9–10, 2009 to evaluate the status of the carcinogen listing for glass wool fibers. The expert panel will be asked to review the evidence on glass wool and make a recommendation on whether it should be listed as a known carcinogen, as reasonably anticipated to be a carcinogen, or not listed at all.

Dr. Birnbaum informed Council that, on April 27, 2009, the NTP signed a memorandum of cooperation with Canada, Japan and the European Union. The countries agree to work together and further the evaluation of more rapid screening tests for chemical substances.

Dr. Birnbaum also notified Council that a peer review meeting on alternative ocular test methods was taking place on the same day as the NAEHS Council meeting (May 21, 2009). The meeting, hosted by NTP's Interagency Center for the Evaluation of Alternative Toxicological Methods, was being held at the Consumer Product Safety Commission in Washington, DC.

Dr. Birnbaum then discussed the work and funding of NIEHS's Worker Education and Training Program (WETP). She described WETP as one of two components of the Superfund Program and discussed its accomplishments. Dr. Birnbaum mentioned the WETP Awardee Meeting and Workshop that took place in Cincinnati on April 29-May 1, 2009. This meeting and workshop were part of NIEHS activities on partnerships for chemical preparedness.

Following the discussion on Superfund, Dr. Birnbaum indicated some of the recent meetings and publications involving NIEHS staff. She noted NIEHS's increasing involvement in nanomaterials and nanosafety issues, mentioning the weeklong symposium that focused on NIEHS's efforts in nanomedicine. Dr. Sally Tinkle, lead coordinator of nanotoxicology efforts across NIEHS, was a presenter at this symposium, along with Dr. Martin Philbert, a current NIEHS grantee and former member of Council. NIEHS also participated in the annual SOT

meeting that took place in Baltimore in March, 2009. Dr. Birnbaum informed Council that NIEHS researchers had published the first set of findings arising from the Sister Study.

Dr. Birnbaum recognized NIEHS staff recently appointed to senior management positions. She acknowledged Dr. Gwen Collman's role as acting director of NIEHS's Extramural Program and Dr. Steve Kleeberger's role as acting deputy director of NIEHS. Dr. Birnbaum introduced Dr. John Pritchard as acting scientific director of NIEHS's Intramural Program. Dr. Birnbaum acknowledged Dr. Darryl Zeldin's role as acting head of NIEHS's Clinical Research Unit (CRU). She notified Council that the CRU will open formally at the end of July 2009 and invited Council to participate in the opening ceremony. Dr. Birnbaum noted that Dr. Zeldin recently presented the keynote address at the American Academy of Allergy, Asthma, and Immunology Meeting.

Following her introduction of NIEHS administrators, Dr. Birnbaum highlighted recent honors, initiatives and accomplishments involving NIEHS staff. She noted that Dr. Serena Dudek was honored with the A.E. Bennett Research Award in biological psychiatry. Dr. Birnbaum also spoke on NIEHS's participation in the Interagency Autism Coordinating Committee. Dr. Cindy Lawler had been NIEHS's representative on this committee, and Dr. Birnbaum is now serving in that position. The strategic plan developed by this coordinating committee was issued in March.

Dr. Birnbaum noted that Dr. Allen Dearry, an associate director of NIEHS, has taken a leading role in the Annual Policy Forum for Ocean Leadership. She also informed Council that NIEHS scientists, technicians and technical support people recently formed their own association to develop an assembly of laboratory staff. This is the first effort of its kind at any NIH institute, and she expects that this will be a benchmark for other NIH institutes to follow.

Dr. Birnbaum gave Council a brief account of her participation at the Columbia University and WE ACT event on Protecting Children's Health that took place in New York City on March 30, 2009. Both Dr. Birnbaum and Environmental Protection Agency (EPA) administrator, Ms. Lisa Jackson, gave keynote addresses at the event. Ms. Jackson is extremely positive about enhancing interactions between NIEHS and EPA, and a memorandum of understanding to further NIEHS's work with EPA is under development.

Dr. Birnbaum related some key research findings stemming from NIEHS-funded research conducted by extramural grantees and intramural scientists. Dr. Birnbaum also informed Council that NIH has enhanced its peer review policies. Official changes in the external peer review process will be implemented for FY 2010.

Dr. Birnbaum told Council about the Genotype Tissue Expression Project. This new resource will enable the scientific community to study variation in human gene expression and regulation. The project will eventually collect and analyze multiple tissues and assess genetic variations. A Funding Opportunity Announcement (FOA) related to this project is on the Web.

Dr. Birnbaum notified Council that all NIH funding opportunities are now available through Twitter.com and an XML feed that updates nightly. NIH's Twitter sites provide NIH funding news (http://twitter.com/NIHforFunding) and health news (http://twitter.com/NIHforHealth).

Dr. Birnbaum spoke at length about NIH's plans for use of the $10.4 billion allocated to NIH under ARRA. NIEHS has received $187 million in funds thus far, including $20 million to fund SBRP and WETP. The final total will increase due to additional funding that will be provided from the NIH Office of the Director.

Dr. Birnbaum noted that NIEHS signed on to 33 topics under the Challenge Grants Program. NIEHS will also be funding competitive and administrative supplements, as well as a small number of Research and Development (R&D) contracts. These contracts go to the extramural community but support intramural efforts as well. Approximately $1 million will go to the Division of Intramural Research (DIR) for equipment.

Dr. Birnbaum also discussed NIEHS's involvement in the GO Grants program. NIEHS nominated two topics of high priority: 1) environmental health and safety of engineered nanomaterials, and 2) the impacts of Bisphenol A (BPA) exposure on human health. Funds will support large-scale research projects with a high likelihood of enabling future growth and investment in biomedical research, development, and public health.

A total of $21 million has been set aside under the ARRA Summer Supplements Program to fund educational opportunities for students and science educators. NIEHS will support summer research experiences for students working in the laboratories of current NIH grantees.

Dr. Birnbaum then updated Council on the status of the NIEHS budget. The enacted budget from the 2009 Omnibus, signed at the end of March 2009, was $662,820,000. NIEHS also received $168,057,000 in Stimulus funding, not including the Superfund allocation. President Obama has requested that Congress provide $684,257,000 for NIEHS in 2010. If the President's request is approved, it would represent a 3.2% increase over NIEHS's 2009 budget. The President's proposed NIEHS budget includes a requested $5 million for cancer research, $9 million for nanosafety research and $500,000 for autism research. President Obama has committed to doubling funding devoted to cancer research over the next eight years.

The Superfund program budget has increased by approximately $500,000, from $77,546,000 in 2008 to $78,074,000 in 2009. This additional funding was devoted to WETP. President Obama has requested an additional appropriation of $1 million for 2010. Dr. Birnbaum expects that a $10 million pass through from the Department of Energy will be forthcoming.

Dr. Birnbaum noted Ms. Katherine Sebelius's confirmed appointment to the post of Secretary of HHS. NIEHS is waiting for Secretary Sebelius to assign NIH responsibility for implementing the Breast Cancer and the Environment Act signed in October 8, 2008.

Dr. Birnbaum concluded her report by describing some of the bills that are being considered by Congress. Senator Charles Schumer of New York has proposed a BPA-Free Kids Act which would authorize (but not appropriate) $5 million a year for five years for NIEHS to study the health effects of BPA. The Waxman-Markey Bill, related to the 2009 American Clean Energy and Security Act, recently came out of committee. Provisions in the bill require HHS to study and conduct research on the impacts of climate change on human health. Part of the Autoimmune Disease Act, sponsored by Representative Patrick Kennedy of Rhode Island, would authorize (but not appropriate) funds for research into the environmental causes of autoimmunity.

Dr. Birnbaum opened the meeting for comments and discussion from the Council.

VI. DISCUSSION OF DIRECTOR'S REPORT

Ms. Nsedu Witherspoon (Council member) complimented Dr. Birnbaum and the rest of the NIEHS team on their hard work over the past several months.

Dr. Birnbaum thanked Council for their support and remarked that the extramural community has been incredibly helpful and supportive of NIEHS.

Council members posed no questions related to the Director's Report.

VII. REPORT OF THE ACTING DIRECTOR, DIR – Dr. John Pritchard

Dr. Pritchard began his report with an update on DIR's tenure-track searches for a senior investigator in the Biostatistics Branch and an X-ray crystallographer in the Laboratory of Structural Biology. A candidate with experience in embryonic stem cell biology was hired for Dr. Trevor Archer's Laboratory of Molecular Carcinogenesis. A position in the Laboratory of Neurobiology will address developmental neurobiology. A candidate for a developmental biologist position in the Laboratory of Reproductive and Developmental Toxicology has been identified. A candidate for a reproductive epidemiologist in the Epidemiology Branch has not yet been identified. Dr. Pritchard indicated that Dr. Raja Jothi was recently hired as a tenure-track investigator in the Biostatistics Branch. Dr. Jothi's research interests are in the application of statistical methods to large-scale data sets in gene expression.

Dr. Pritchard highlighted some of DIR's recent accomplishments, activities and awards. The Comparative Medicine Program has received full accreditation from the Association for Assessment and Accreditation of Laboratory Animal Care International for the animal care facility. Dr. Pritchard gave Council an account of DIR's Twelfth Annual Biomedical Career Fair held at EPA on May 1, 2009.

Dr. Pritchard concluded his presentation by recognizing four intramural investigators who recently received funding awards. Dr. Lutz Birnbaumer in the Laboratory of Neurobiology received an award from the NIH Director's Challenge Award Program. Two intramural investigators, Dr. Minshub Sim from Dr. Thomas Eling's Laboratory of Molecular Carcinogenesis and Dr. Yuan Liu from Dr. Samuel Wilson's Laboratory of Structural Biology both received NIH Pathway to Independence Awards. Dr. Scott Lujan in Thomas Kunkel's Laboratory of Molecular Genetics received a Ruth L. Kirschtein National Research Service Award for Individual Postdoctoral Fellows.

Council Response and Discussion

Dr. John Essigmann (Council member) remarked that he was heartened to see the list of job openings and to see that some of them had been filled. He asked if there was a clearer way to communicate with university students about the professional opportunities available at NIEHS.

Dr. Pritchard responded that this is one of the objectives for DIR's career days. Job openings are also advertised in *Science* and other national and international venues. While DIR looks very hard for the best people, Dr. Pritchard acknowledged that more could be done and he would think about what steps DIR can take to enhance their recruiting efforts.

Dr. Essigmann (Council member) suggested visiting major cities and universities and coordinating with NIEHS-funded researchers in those areas. He also recommended having job recruitment programming in conjunction with these travels.

Dr. Birnbaum agreed that recruiting is an important effort, but noted that NIEHS staff members already promote NIEHS career opportunities. She went on to list several ways in which NIEHS communicates job and other professional opportunities in various venues and described the

many training activities at NIEHS. She assured Dr. Essigmann that NIEHS will continue to think about ways to enhance recruitment efforts.

Ms. Stefani Hines (Council member) thanked Dr. Pritchard for returning from his retirement. She was curious to know what kind of response he received to the DIR job postings.

Dr. Pritchard replied that the applicants who responded to the DIR posting had wonderful credentials. The challenge for DIR is finding the resources to hire new people.

VIII. REPORT OF THE ACTING CLINICAL DIRECTOR – Dr. Darryl Zeldin

Dr. Zeldin discussed the purpose of the Clinical Research Program as a whole, emphasizing the goals and objectives of the Clinical Research Unit (CRU). He explained his vision of clinical research as a bridge between the basic research conducted at NIEHS and translation to public health impact. He listed several goals for the Clinical Research Program.

He described the CRU's office, patient care and laboratory areas, and listed testing capabilities the CRU will have. When fully staffed, the CRU will be able to handle 10–15 outpatient clinical studies per year. Dr. Zeldin envisions the CRU will be accredited after the first year of operation and plans to do an internal performance and cost-benefit analysis after 3–4 years of operation.

Dr. Zeldin explained that the CRU's clinical studies are prioritized based on quality of science and mission relevance and are subject to a rigorous review process by internal and external participants. The use of all resources will be tracked to the investigators in charge of the studies and will report that usage to the Board of Scientific Counselors (BSC). An external advisory group will provide advice on the direction of the Program and the CRU.

Dr. Zeldin listed several challenges for the CRU, the biggest of which is that it is not in close proximity to a major hospital. Although the CRU will minimize the risk of adverse events and complications, several physician-scientists are employed at NIEHS who are board certified and are capable of handling complications.

Dr. Zeldin then highlighted opportunities open to the CRU. The CRU is fostering collaborations whenever possible and is developing focused areas of excellence in respiratory medicine, reproductive medicine and a few other key areas. It is also integrating many operations with that of the Bethesda Clinical Center at a significant cost savings.

Dr. Zeldin concluded his presentation by describing the CRU grand opening ceremonies and then solicited questions from Council.

Council Response and Discussion

Dr. Joseph Graziano (Council member) thanked Dr. Zeldin for the overview and asked how many physician-scientists NIEHS has. He also inquired about protocols reviewed by the IRB.

Dr. Zeldin replied that NIEHS IRB handles about 55 active clinical protocols. Much of the clinical research has previously taken place at other sites, such as Duke or UNC. NIEHS has about 25 principal investigators with active clinical protocols. He would like to see the program expanded to include a clinical oncologist and a clinical neurologist.

Ms. Stephani Hines (Council member) asked for elaborations regarding the CRU budget.

Dr. Zeldin responded that the CRU's budget falls within DIR and includes separate lines for the OHRC, the CRU and the EAG. Between $1.3 and 1.5 million has been allocated for operations.

Dr. Birnbaum remarked that each NIH institute contributes a significant portion of its budget to fund the clinical research program in Bethesda, and NIEHS was concerned about the return on its investment. Former NIEHS Director Dr. Kenneth Olden successfully negotiated a decrease, with the understanding that the reduction in NIEHS's contribution to the NIH Clinical Program would go toward the construction of NIEHS's CRU.

Dr. Stephen Lloyd (Council member) wanted to know about goals in terms of disease prevention, plans for recruiting patients into the new unit, and coordination with local hospitals.

Dr. Zeldin replied that the CRU has not seen its first patient yet but plans to in the next month. The Bethesda Clinical Center recently did a site visit and made a number of recommendations regarding actions the CRU should take before seeing patients. All recommendations have been implemented.

Dr. Zeldin stressed that he is a strong proponent of prevention research and many of the CRU's studies will focus on prevention efforts. He then described prevention trials being planned.

Dr. Zeldin assured Council that the CRU has strong working relationships with the clinical research program directors at Duke and UNC. The CRU is currently in discussions with both programs, as well as with the EPA inhalation research facility.

Dr. Stephen Baylin (Council member) asked how the CRU's medical needs would be covered during times when the principal investigators are not available.

Dr. Zeldin replied that a NIEHS has developed a campus-wide emergency response system that requires there be a physician-scientist carrying a beeper on the NIEHS campus at all times. Dr. Zeldin stressed that the CRU is especially conscious of this issue, since the CRU is not located near a hospital. The CRU has also coordinated with 911 first responders, campus security and local medical centers to ensure that emergencies are appropriately handled.

Ms. Hines (Council member) was curious as to whether the population in this area was large enough for the CRU's study needs.

Recruitment has not been a problem in Dr. Zeldin's experience. Nearly a million people reside in the area and it has a large population of African and Latino Americans who are interested in participating in clinical research. He added that the CRU is not competing with Duke and UNC for study participants, as it is developing a research focus different from that of Duke or UNC.

Dr. Birnbaum welcomed Council member Dr. George Leikauf to the meeting. After a break, Dr. Birnbaum updated Council on the national searches taking place for Director of DERT, Director of DIR; and Deputy Director, NIEHS. These searches should be advertised by July 2009.

IX. REPORT OF THE ASSOCIATE DIRECTOR, NTP – Dr. John Bucher

Dr. John Bucher reported on NTP findings and publications related to bisphenol-A (BPA). The NTP issued a monograph in September 2008, expressing concern with BPA effects on brain behavior and prostate gland development at current human exposures. Dr. Bucher indicated that this was the first time the federal government acknowledged a significant concern over BPA

exposure at current levels. He also noted that the toxicity of BPA has been a contentious issue in the scientific literature for quite some time.

Dr. Bucher informed Council that NTP made a presentation to the Science Board Subcommittee of the Food and Drug Administration (FDA) in September 2008 regarding BPA. Following that report, the FDA's Science Board made a number of recommendations for changes to testing methodologies. In October 2008, NIEHS issued a Request for Information for ongoing research and research needs on biological effects of exposure to BPA. Twelve responses were received, many of which listed research needs that had already been identified.

The NTP is designing studies with FDA's National Center for Toxicological Research (NCTR) to follow up on recommendations from FDA's Science Board. Dr. Bucher also noted that NTP and NCTR are exploring ways to involve the academic community in the studies. An NIH-FDA-BPA task force was formed to survey ongoing epidemiology studies. He listed several studies under review that could yield useful information about the possible effects of exposures during adulthood. A task force subcommittee is reviewing analytical methodologies, specifically the critical parameters that may make a study suitable or unsuitable for the survey.

Dr. Bucher noted that BPA has been evaluated as part of EPA's ToxCast Phase 1 Program, a high-throughput (HTP) screening activity being done in part in response to the National Research Council report, Toxicology in the 21st Century.

Dr. Bucher continued his report by discussing legislative initiatives related to BPA. He remarked that regulation is ahead of science, and described recent actions taken by Congress and states.

Dr. Bucher ended his presentation by informing Council of postdoctoral training programs in applied toxicology and carcinogenesis, toxicological pathology and laboratory animal medicine.

Council Response and Discussion

Dr. George Leikauf (Council member) commented that NTP could provide highly valuable evaluations of the results of the EPA ToxCast and asked about plans for NTP involvement.

Dr. Bucher replied that BPA and other bisphenol congeners are included in chemical libraries that NTP is submitting to the NIH Chemical Genomics Center. This Center will evaluate the bisphenols for a wider range of endpoints than are being covered by the EPA ToxCast program. NTP will review the data from the ToxCast Program in conjunction with that from the Chemical Genomics Center. Dr. Bucher also noted that NTP will evaluate ToxCast data in light of the animal data NTP has.

Dr. Leikauf (Council member) inquired if NTP might be ready to present their evaluation by this fall. He remarked that Dr. Bucher himself had the best perspective on the validity of the ToxCast results, and his evaluation would help Council provide informed guidance on funding requests.

Dr. Bucher responded that he would be at the September 2009 Council meeting.

Dr. Birnbaum pointed out that the NTP, the National Human Genome Research Institute (NHGRI) and ToxCast are working very closely to develop tests and interpret the results. As the data becomes available, NTP will assess its validity and determine whether the data provides insight into compounds of concern.

Ms. Nsedu Witherspoon (Council member) commented that conflicting public statements, such as those of FDA and their Science Board, confuse the general public. She is pleased to see NIEHS working in a more concerted way with FDA and urged NIEHS to work with FDA to prevent future miscommunications.

Ms. Janice Barlow (Executive Director, Zero Breast Cancer and part of the Bay Area Breast Cancer Environment Research Center) asked if it is unusual for regulation to be ahead of science, as in the case of BPA.

Dr. Bucher answered that regulation usually lags far behind science. BPA is an aberration, partly because some very vocal segments of the scientific and academic communities have been pushing the BPA issue quite strongly.

Both Dr. Birnbaum and Dr. Bucher remarked that it is common for state governments to be ahead of the federal government in terms of regulation.

Dr. Birnbaum then introduced NIEHS's Executive Officer, Mr. Marc Hollander.

X. REPORT OF THE EXECUTIVE OFFICER, NIEHS – Mr. Marc Hollander

Mr. Hollander reported on the master plan for updating NIEHS's facilities and amenities. He began by explaining why a master plan is needed and highlighting the main goals of the plan. Mr. Hollander then presented the NIEHS Master Plan from 1971 and discussed the changes in the landscape, facilities and staffing levels that have occurred over the years.

Mr. Hollander displayed a map illustrating the proposed changes to the NIEHS campus. A permanent clinical facility is planned for 2013. Other proposed changes include a more defined "front" for the main building and four research modules with connecting underground passages.

The renovated campus would include other amenities: a quadrangle area where employees could congregate; easier access to the lake; and a bridge.

Mr. Hollander acknowledged that NIEHS needs more administrative office space. Plans exist to consolidate the offices of the NTP and DERT into a single space on main campus. A dual-level parking lot is also planned. Both Dr. Birnbaum and Mr. Hollander are working with other NIH institutes to identify opportunities for collaborations on the NIEHS campus.

NIEHS is awaiting comments from DHHS on the proposed master plan. Once they are received, NIEHS's Environmental Health and Safety group will do an environmental assessment. The public will then be allowed to review and comment, and a final master plan will be prepared. Mr. Hollander hopes that the master plan will be implemented by late 2009 or early 2010.

Mr. Hollander concluded his presentation by mentioning that a turnpike may be constructed behind the child care center near EPA. The Office of Management is working to minimize any infrastructure problems that may result from this construction.

Mr. Hollander then solicited questions from Council.

Council Response and Discussion

Dr. Birnbaum encouraged Council to take a walk around NIEHS's main campus. She pointed out recent installation of solar panels. NIEHS has also received funding prioritization to build a joint warehouse with EPA, which will result in significant cost savings for NIEHS.

Dr. John Essigmann (Council member) noted that NIEHS has a good opportunity to bring in people for short-term research and teaching interactions, especially since the area seems safe and enclosed. He asked if NIEHS had thought about doing that type of development.

Mr. Hollander replied that NIEHS has considered constructing a housing facility. One potential location is not zoned for housing, but another potential area is slated for public housing. Mr. Hollander is working with the Research Triangle Foundation to obtain a zoning variance.

Ms. Stefani Hines (Council member) asked at what point will NIEHS decide if a permanent CRU is a viable option and what is the process for making that decision?

Mr. Hollander explained that the current CRU is designed to determine viability of an on-campus unit and whether a permanent clinical facility is worth building. NIEHS will monitor the progress of the CRU before Dr. Birnbaum decides if NIEHS should pursue a permanent structure. If a facility is justified, NIEHS will present a business case to NIH's Chief Financial Officer requesting that it be a priority.

Dr. Birnbaum added that, to justify construction of a permanent facility, NIEHS must first demonstrate that the CRU is highly used. She remarked that the current modular buildings will last for at least ten years. No decisions will be made for several years on whether NIEHS should push to have a permanent unit built.

Ms. Hines (Council member) inquired if Council would participate in the analysis of the success of the CRU.

Dr. Birnbaum pointed out that Council provides guidance on all matters related to the NIEHS and assured Council that their feedback would be welcome. There would be many opportunities for Council input when NIEHS updates Council on the progress of the CRU.

Dr. George Leikauf (Council member) wanted to know how much the research space would increase under the proposed expansion. He asked if NIEHS is planning to hire more staff. He also commented about the high cost of research space.

Mr. Hollander replied that research space would more than double and plans exist for more hiring. He did not have the exact hiring figures available but could provide them to Council. Mr. Hollander explained that the high cost is why the master plan allows for the research modules to be added over time. NIEHS may find that not all of the proposed modules are needed.

XI. DIALOG WITH COUNCIL

Before the Dialog with Council began, Dr. Birnbaum introduced Ms. Sandy Lang, former chief of staff for Drs. David Rall, Kenneth Olden, and NTP. Ms. Lang was asked to come out of retirement to serve as special assistant to Dr. Birnbaum.

Dr. Birnbaum mentioned that EHP is now available in Spanish and Chinese. EHP also offers a monthly podcast featuring interviews with well-known scientists. By September Council, she hopes to have more information about the number of articles submitted and accepted by EHP.

Dr. Birnbaum also asked Council to think about potential topics for the Council retreat scheduled for February 2010.

Ms. Stefani Hines (Council member) thanked NIEHS for building so much discussion time into the meeting agenda. She noted that some ideas for retreat topics might emerge during this mid-day discussion period. Dr. Birnbaum replied that discussion time had been added to the agenda in response to Council's request for adequate time for Council to provide comments and suggestions.

Dr. John Essigmann (Council member) commented that the last retreat was amazingly productive. Council had expressed a desire to become better acquainted with the DERT staff, especially given the extramural staff's crucial role in interactions with the community. Several working groups were formed, and these working groups participated in a number of "grey zone" analyses. Dr. Essigmann thought the exercise was successful and suggested that NIEHS find ways to reinforce interactions between Council and DERT staff.

Dr. Birnbaum thanked Dr. Essigmann for his remarks. She then informed Council of recruiting efforts she had not mentioned earlier. NIEHS is currently recruiting for four positions to serve in the Bethesda office. They will function as liaisons between NIEHS and other NIH institutes, other federal agencies, various industry groups and advocacy group stakeholders. These staff would join NIEHS's current legislative liaison, Ms. Mary Gant, and her assistant. Dr. Birnbaum believes that this presence in Bethesda will highlight NIEHS's value and importance to NIH and facilitate networking opportunities.

Ms. Nsedu Witherspoon (Council member) suggested that NIEHS coordinate a strong marketing campaign. She noted that many groups would like to assist with this marketing effort but need guidance on how best to do that. She suggested branching out of the traditional communication venues in the research arena. Ms. Witherspoon also commented that the federal government itself could benefit from education about what the Institute does.

Dr. Birnbaum told Ms. Witherspoon that her suggestion was a valuable one.

Dr. Jerald Schnoor (Council member) noted that in April 2009 EPA Administrator Ms. Lisa Jackson proposed classifying CO_2 as a pollutant that endangers public health and welfare. The finding addresses primarily public welfare rather than the health effects of CO_2. Is NIEHS reaching out to EPA to help them address the health effects and is there anything that Council can do to facilitate that effort?

Dr. Birnbaum responded that the health effect of climate change is a topic of high priority. NIEHS has taken the lead in working with a wide range of federal partners to develop a strategy for studying the area. NIEHS is hoping to have this strategy ready for review by this summer. Meanwhile, other groups at NIEHS are thinking about how to address the climate change issue. Dr. Birnbaum told Council that NIEHS could arrange a short scientific presentation on climate change during the September 2009 or February 2010 Council meeting.

Dr. Essigmann (Council member) commented that the NIEHS strategic plan is very readable and recommends it to those who want to learn more about the workings of NIEHS. He asked Dr. Birnbaum if the strategic plan should be updated now that she is the NIEHS director.

Dr. Birnbaum answered yes, but the existing plan has many strengths. The current plan was completed three years ago, and it is customary for a strategic plan to be in place for at least five years. The NTP strategic plan was completed in 2004, and revising it is high on her priority list.

Ms. Hines (Council member) suggested that Council be included in discussions on how budget prioritization occurs within the Institute. She expressed concern regarding Congressional authorizations (without appropriations) and wondered how they factor into budget prioritization. Can Council educate Congress about how authorizations impact funding in other areas?

Dr. Birnbaum remarked that budget prioritization would be an excellent topic for the upcoming Council retreat. She elaborated on the authorization and appropriation process and cited the example of the Autism Act of 2006. She also discussed NIEHS's efforts related to the Breast Cancer and the Environment Act of 2008. NIEHS will form a congressionally mandated committee and develop a strategy for work related to this Act, with the hope that Congressional appropriations will be forthcoming. She assured Council that NIEHS listens to their feedback as well as that of other advisory boards and key constituents when deciding budget priorities.

Ms. Hines (Council member) suggested more discussion about research centers funded by NIEHS. She listed many questions on how effectiveness of the various center programs is determined, including how they compare with that of the R01 program. She specifically mentioned the Environmental Health Sciences (EHS) Core Centers and wondered how they were affected by the fundamental change to the FOA that took place two years ago.

Dr. Birnbaum responded that these would all be excellent topics for the retreat and invited Dr. Gwen Collman to respond to Ms. Hines's query about the EHS Core Centers.

Dr. Collman explained that NIEHS did a major evaluation of the Core Center program almost five years ago. She detailed the characteristics of the evaluation, the inclusion of both internal and external reviewers, and the discussions that took place with Council, informing them of the changes in the program. Dr. Collman noted that the new program was phased in over time. As soon as the transition is complete, NIEHS will begin evaluating the FOA in relation to science trends and opportunities and the overall NIEHS budget. If the budget is growing and if it is decided during internal discussions with NIEHS leadership that the Core Centers provide a valuable function, the program can continue. If the budget is not growing, NIEHS will have to determine what changes will be made. NIEHS has not yet made a decision on whether to do another evaluation of the type that took place five years ago. NIEHS is aware, however, of the need to develop a strategy for re-evaluating the program and determining future priorities.

Dr. Schnoor (Council member) referenced the master plan and recommended that one of the retreat discussion topics be the direction of NIEHS research five to ten years into the future.

Dr. Stephen Lloyd (Council member) asked if Dr. Collman's plan involved evaluating the overall content of the P30 grant portfolio. Such an evaluation may help NIEHS ensure the Centers are balanced across relevant science areas.

Dr. Collman noted that the P30 centers program is one part of the NIEHS Centers budget. When changes to the program were considered, it was with the idea of developing centers that were research-topic specific. That plan is in a holding pattern. When evaluating the P30 portfolio, NIEHS will examine the distribution of the science of the core facilities in the context of the overall NIEHS budget. She noted that NIH has new requirements regarding what constitutes a center. Consequently, NIEHS's decisions regarding the funding of center programs will be subject to a different level of scrutiny moving forward than in the past.

After Dr. Collman's response the Council adjourned for lunch.

LUNCH

XII. REPORT OF THE INTERIM DIRECTOR, DERT – Dr. Gwen W. Collman

After lunch Dr. Collman reported on the activities of the Division of Extramural Research and Training (DERT). Dr. Collman described how ARRA funds would be distributed across various NIH programs. She mentioned that there would be significant co-funding opportunities with NIH's Office of the Director in certain topic areas.

Dr. Collman indicated that NIEHS has developed plans for distributing its funds, including soliciting new grant applications (Challenge Grants, GO Grants, Trans-NIH FOAs and R&D contracts) and revisiting applications that were peer reviewed but not paid over the last two fiscal years. Administrative supplement funding opportunities have also been advertised. She then described plans for distribution of ARRA funds by SBRP and WETP.

Dr. Collman listed the number of applications received for each solicitation and remarked that all of the applications will go through the appropriate peer review process. Each grant has a different review locus depending on where the parent grant was reviewed. Dr. Collman detailed the process that the Center for Scientific Review (CSR) will use to review the extraordinarily large number of applications received for the Challenge Grants. NIEHS is responsible for peer reviews of the GO Grants proposals. NIMH will organize peer reviews of the applications to the autism FOAs. The competitive revisions will be peer reviewed during study sections at CSR or NIEHS, depending on where the parent grant was reviewed. Administrative supplement applications will undergo an administrative review by NIEHS staff rather than a peer review.

The impact and success of NIH's ARRA funding initiatives will be measured through NIH's Signature Program. This program focuses on scientific areas of high priority or programs that meet specific needs and goals of ARRA. The success of the signature projects will be communicated to the public through stories of how the Stimulus funding has benefited the scientific or biomedical community.

NIEHS has chosen two Signature Program topics. One topic is the evaluation of the safety of engineered nanomaterials. NIEHS has committed $5 million to this topic and has requested an additional $5 million from NIH's Office of the Director. The other topic, climate change, is a joint project between NIEHS and the John E. Fogarty International Center. This program will require $5 million of funding from NIH's Office of the Director.

Following a description of NIEHS's budget planning process for ARRA, Dr. Collman presented a number of charts detailing current NIEHS plans to award ARRA funds. She noted that these amounts could change depending on outcomes of scoring and negotiations and if NIEHS decides to devote more funding to the Challenge Grants Program.

Dr. Collman invited Council's input regarding priorities for distributing ARRA funds. Topics she asked Council to consider were the following: 1) How do we identify areas for high and low priority funding decisions? 2) Should we work towards a consistent success rate across programs, or is it more important to have a high success rate in one program versus another? 3) How do we best balance science, economic stimulus and geography? Dr. Collman emphasized that the awards be distributed across geographic areas and academic institutions.

Dr. Collman discussed the process for reviewing ARRA administrative supplement applications. The normal process for reviewing administrative supplements had to be modified due to the

large number received. As a result, a new computer system was developed to handle the supplements, called the Supplement Operations System (SOS). Dr. Collman noted that DERT staff member Mr. Paul Jordan was instrumental in the development of the SOS system.

NIEHS is making every effort to document all decisions and procedures related to ARRA funding and to identify and manage any conflict of interest issues that may arise. NIEHS is working to develop metrics to measure scientific impact of the grants and is collecting information from grantees about the success of the program. NIEHS has a website that includes information on all ARRA solicitations, guidelines and rules. The ARRA reporting will be made available online as well.

Dr. Collman emphasized that Electronic Council Concurrence (ECC) will take place on a rolling basis so that awards are not delayed. Applications will come under review weekly or biweekly depending on how quickly peer review results become available.

Under the current ECC system, three members of Council review the applications online and give their approval. Dr. Collman proposed another process for ARRA given the number of applications and Council's previously expressed concerns about only three Council members being involved in the ECC process. Under the new process more than one group of three would be formed. These groups could be designed to address different scientific areas. This revised procedure would facilitate the participation of more Council members in the ECC process.

Dr. Collman wanted to discuss raising the limit for Council delegated authorities to $300,000 or $500,000 for the administrative supplements being funded under ARRA in order to expedite awarding of the funds. NIEHS staff members are currently permitted to make supplement awards up to $150,000 without Council concurrence. The proposed change in delegated authorities would allow NIEHS to provide supplemental funds not to exceed $ 300,000/$500,000 direct costs to grants for ARRA requests. Dr. Collman emphasized that this change would only apply to ARRA funding. All other funding would be subject to standard delegated authorities.

Dr. Collman concluded her presentation by noting that any funding decisions not made by the end of the summer would be discussed at the September 2009 Council meeting. She assured Council that they would receive a full report of the ARRA funding plan in September. About $17 million may be left over from the 2009 ARRA funds to fund 2010 grants. Discussions on how best to use this $17 million will also take place at the September 2009 Council meeting.

Council Response and Discussion

Dr. George Leikauf (Council member) suggested that the council delegated authorities limit be raised to $300,000. Dr. Collman invited more discussion.

Dr. Sem Phan (Council member) asked how the distribution of the awards was determined.

Dr. Collman explained that a table was created to keep track of the ARRA programs. NIEHS examined the categories, the amount of NIEHS's regular appropriation, and the trans-NIH programs NIEHS was committed to joining. The process for creating the initial distribution chart was a fairly arbitrary one due to the severe time constraints under which the chart had to be produced. As NIEHS staff learned more about the number and nature of the applications received, they were able to make adjustments to the chart.

Dr. Birnbaum interceded and welcomed recently arrived Council members Drs. Sem Phan and Kevin Stephens to the meeting. She remarked that when discussions about the ARRA funds

first began, every institute's ideas about how its funds should be distributed were different. At the time these projections were made, NIH was not anticipating the overwhelming response to the Challenge Grant solicitations. She noted that NIEHS's projections are still a work in progress. The final distribution of funds won't be known until all of the applications are reviewed.

Ms. Stefani Hines (Council member) noted that the immense response to the Challenge Grant solicitations may have been due to the fact that the topic areas were beyond the realm of what NIEHS usually funds. She asked about the plans for targeting funding priorities.

Dr. Collman responded that all of the Challenge Grant topic areas designated by NIEHS are considered high priorities, but NIEHS was asked to identify the five highest priority topics. She would prefer to look at all of the applications across the topic areas and assess the scientific contribution by the best grants in each topic area rather than determining in advance what the priority areas should be.

Dr. Jerald Schnoor (Council member) remarked that Dr. Collman's chart illustrating how NIEHS ARRA funds would be budgeted only covered $99 million out of the $168 million ARRA budget.

Dr. Collman explained that the chart was only for purposes of illustration and did not include all possibilities. There will be opportunities to trade applications with other institutes and NIEHS may be asked to contribute to any of the research topic areas designated by NIH's Office of the Director. She also commented that the area of small business research is still being developed across NIH. NIH may want to develop a more integrated response in this area, and that could require a greater contribution to SBIR than the projected one of $5 million.

Dr. Liekauf (Council member) expressed concerns about the short timeframe to set up awards. He also commented that universities, like NIEHS, are concerned about tracking the use of ARRA funds and do not have an ARRA tracking system in place.

Dr. Collman pointed out that NIEHS often makes end-of-year awards. She also assured Dr. Leikauf that NIEHS would be reviewing the ARRA grant applications as quickly as possible. Administrative supplement applications will be reviewed internally. Challenge Grant applications will be reviewed in early July 2009 and decisions will be made in early August 2009.

Dr. Birnbaum assured Council that they would receive information as quickly as it is available. She said that NIEHS is receiving ARRA updates on a weekly and sometimes daily basis. Dr. Birnbaum acknowledged that the tracking requirements are extensive, but NIEHS is experienced in tracking funds separately and with transparency and accountability. Universities may find the tracking process challenging, but they are aware of them.

Dr. Stephen Lloyd (Council member) called NIEHS management of the ARRA workload "extraordinarily organized." He asked how much effort Council should put toward reviewing extend-the-pay-line grants that are secondary assignments.

Dr. Collman noted that the figures she had presented only referred to ES primary grants. There are a number of secondary grants, some of which are already paid by other institutes. NIEHS did not do a careful enumeration of what was left over after the other institutes' regular pay line and does not yet know how far beyond the pay line the other institutes are planning to go. Dr. Collman commented the other institutes' funding plans may change at any time.

Dr. Kevin Stephens (Council member) commented that funding quality programs should be the top priority. Topic distribution is also important. He also suggested that NIEHS advertise future

ARRA funding solicitations as early as possible, especially if a 10% carryover for the next year is anticipated, so that potential grantees will have time to put together a quality grant application. He also moved that the limit for Council delegated authorities be increased to $300,000.

Dr. Leikauf pointed out that he had already proposed that this limit be raised. Dr. Kevin Stephens seconded the motion. The motion was approved unanimously by Council.

Dr. Joseph Graziano (Council member) referred to a previous Council meeting during which a presentation was made on how EHS grants fared in study sections. The analysis illustrated that when the number of EHS grants is small in sections with large numbers of other grants, EHS grants tend not to do as well. Dr. Graziano was concerned about Challenge grants being reviewed by a set of reviewers for whom EHS is not the highest priority.

Dr. Collman acknowledged that Dr. Graziano's concern was an important one and welcomed other Council members to inform her of any similar concerns so she could mention them to the CSR deputy director. The applications will be grouped by science area, and CSR is committed to having at least one subject matter expert for each application at the editorial review stage.

Dr. Leikauf (Council member) remarked that he would have expected projected ARRA funding of administrative supplements to be roughly equal to that of competitive revisions, since administrative supplements fund existing projects with the capacity to hire new people.

Dr. Collman pointed out that competitive revisions are tied to existing grants as well. She explained that, originally, NIEHS allotted a very small amount of ARRA funding to competitive revisions, as the Institute had not expected to receive many applications in that category. That allotment increased after 50 applications were received. The number of competitive revisions funded will depend on the priority scores.

Dr. Leikauf (Council member) wanted to confirm how much ARRA funding NIEHS was planning to allot to WETP and asked if the proportion allotted to Worker Training was customary.

Dr. Collman confirmed that $7 million of the $19 million in ARRA funding for the Superfund Program would be allotted to WETP.

Dr. Birnbaum indicated that this is the usual proportion allotted for worker training. She pointed out that next year's Superfund budget of $50 million includes $30 million for worker training.

Dr. John Essigmann (Council member) inquired if funding originally allotted to one category could be moved to another if there are more meritorious applications in that category, and would Council have any say in the process?

Dr. Collman answered that budgeting would be evaluated on an ongoing basis. NIEHS has not yet developed a communication channel for bringing Council into these budget evaluations.

Dr. Essigmann (Council member) noted the differences between the review process for the Challenge grant applications and the normal Council review process and asked whether Council can provide guidance on how to allocate money to different grants.

Dr. Collman replied that NIEHS will present Council with a program plan that includes NIEHS's assessments of the Challenge Grant applications. NIEHS will also inform Council how much funding the NIH's Office of the Director plans to commit to the Challenge Grants, if that information is available. Discussion about how to divide the budget is ordinarily separate from

discussion about the content of the applications, as NIEHS decides up front how much money should be allocated to each program.

Dr. Stephen Baylin (Council member) mentioned that some of the NIH institutes instructed applicants to interpret topics broadly. Some applicants may present excellent science that is off-topic. Their applications will have to be weighed against those reviewed for extending pay lines.

Dr. Collman responded that NIEHS was direct about designating particular topics.

Ms. Stefani Hines (Council member) mentioned the extensive tracking NIEHS did through the SOS system. She suggested that this tracking be used throughout the decision-making process to capture and provide information about budgeting prioritization and the distribution of funds.

Dr. Collman pointed out that ARRA funding decisions are being documented in much the same way as previous NIEHS grant funding decisions. New standard operating procedures were not created for ARRA, but some adjustments had to be made to the existing procedures due to the intensity of the ARRA workload.

Dr. Stephen Lloyd (Council member) asked what criteria would be used for funding decisions about the administrative supplements in cases where scientific merit is indistinguishable. Would priority be given to investigators for whom these grants are the only source of funding?

Dr. Collman responded that NIEHS would not be making new awards to new investigators through these actions. NIEHS has had to balance giving a new investigator a two-year award against the possibility that the investigator may well be eligible for a five-year award during the next Council round. NIEHS will review all of the applications to determine which grantees have the best package and where the best scientific impacts could be made.

Dr. Birnbaum commented that investigators who do not receive funding through the ARRA program will have the opportunity to rewrite their applications and resubmit them through regular NIEHS funding mechanisms for a four- or five-year grant.

Dr. George Leikauf (Council member) complimented Dr. Collman on doing a remarkable job in gathering and sharing information about ARRA. He also commended her for her leadership and direction of DERT over the past several months. Dr. Collman thanked Dr. Leikauf and remarked that she was not the only one responsible.

Ms. Stefani Hines (Council member) asked if Council had responded to all of Dr. Collman's questions, and Dr. Collman answered that they had.

Dr. Birnbaum commented that, in the future, she would make sure that information presented at Council is made available to Council members in advance. She added, however, that in the case of ARRA, if the information had been provided two weeks earlier, it would not have been accurate. She encouraged Council to provide feedback via email if they had additional ideas.

After a five-minute break, Council reconvened for presentations on the Breast Cancer and the Environment Research Centers (BCERC) Program.

XIII. PROGRESS REVIEW OF THE BREAST CANCER AND THE ENVIRONMENT RESEARCH CENTERS PROGRAM

Drs. Elizabeth Maull, Frank Biro, Sandra Haslam and Ms. Janice Barlow

Dr. Collman introduced the Breast Cancer and the Environment Research Centers (BCERC) and introduced the presentation speakers: Dr. Elizabeth Maull (NIEHS), Dr. Frank Biro (Children's Hospital in Cincinnati, BCERC Epidemiology Project), Dr. Sandra Haslam (Michigan State University, BCERC Biology Project) and Ms. Janice Barlow (Zero Breast Cancer and Bay Area BCERC Community Outreach and Translation Core). She named the members of the NIEHS BCERC Team: herself, Drs. Leslie Reinlib, Elizabeth Maull and Caroline Dilworth. She then acknowledged BCERC's partners at the National Cancer Institute (NCI): Dr. Deborah Winn, Ms. Shannon Lynch, Dr. Gary Ellison and Dr. Neeraja Sathyamoorthy.

Dr. Elizabeth Maull

Dr. Maull began her presentation by noting that NIEHS and NCI have worked together for over 15 years to support and develop programs to find the causes of breast cancer and acknowledging the contributions of several collaborators.

She then outlined how breast cancer research has evolved to include scientists and advocates. While scientists recognized that only 10% of breast cancers could be explained solely by genetic factors, negative results from epidemiologic studies were interpreted to mean that environmental exposures were not involved in breast cancer risk. Throughout this time, breast cancer advocates strongly voiced their opinions that scientists should continue to study environmental exposures. They also took their concerns to Capitol Hill to focus attention on the need for more work and more funding. NIEHS, in collaboration with the NBCC, held a workshop in 2002 that brought together biologists, geneticists, toxicologists, clinical and population scientists and breast cancer advocates to brainstorm about scientific opportunities that could move this field forward.

The BCERC program was created to bring scientists and advocates together to examine breast cancer from different angles. Each center is composed of a basic science project, a longitudinal study of puberty and a community outreach core. New hypotheses have emerged, scientific dogma has been challenged and the work has stayed relevant to breast cancer survivors and their families. BCERC has been successful in raising the awareness in the breast cancer community about the methodologies used in research, the importance of focusing on early life exposures and the value of active community engagement to recruit and retain a cohort of girls.

Dr. Maull concluded her presentation by acknowledging the support of the Avon Foundation, the Breast Cancer and the Environment Working Group of the NAEHSC, NCI and her colleagues at NIEHS. She then turned the program over to Dr. Frank Biro of the Epidemiology Projects.

Dr. Frank Biro

Dr. Biro began his presentation by identifying key reasons for studying puberty in relation to breast cancer and discussing the many factors on which the onset of puberty is dependent. The aim of the BCERC epidemiology projects is to examine the determinants of puberty in girls, integrating how genetic, biologic, environmental, lifestyle and socioeconomic factors act together and independently.

Dr. Biro informed Council that 1300 girls are enrolled in the study. He detailed the broad representation of race and ethnicity in the cohort, and discussed the characteristics of the follow-up group. Data collected include demographics, socioeconomic status, physical activity, diet, product usage, residential histories, psychosocial assessment and family environment. A

clinical examination is performed where maturation stage is assessed. Dr. Biro went on to describe the rich depository of 3,300 urine and 2,500 serum specimens that has been created.

Results from the epidemiology projects have found associations between phthalate levels and the use of personal products and vinyl flooring. Researchers have found higher levels of BPA in girls who consume canned foods. An unexpected finding was that nearly every girl in one of the communities was over the 95th percentile for perfluorooctanoic acid (PFOA). This chemical is associated with lower body mass index and elevated maturation. Subsequently, projects within the biology projects were initiated to understand the mechanisms involved.

Dr. Biro went on to describe results linking dietary intake and pubertal status. He also discussed maturation rates and the expected maturation outcomes. Nearly all the girls will have attained maturation status and menarche by 2015 and the investigators will be able to establish maturation tempo for 90% of the girls by that date.

Dr. Biro concluded his presentation that the epidemiology projects worked closely with the biology projects and COTC to direct the science and to achieve excellent recruitment and retention of study participants.

Dr. Sandra Haslam

Dr. Sandra Haslam presented the research accomplishments of the biology projects at all four of the BCERC sites (Fox Chase Cancer Center, Michigan State University, San Francisco Bay Area and University of Cincinnati). She highlighted the interactions between the epidemiology and biology projects across the centers and within each center.

After discussing the goals of the biology projects, Dr. Haslam presented examples of research results. She described the investigation of endocrine disruptors and their link with increased susceptibility to mammary carcinogenesis and with pubertal development in girls. The biology projects have also demonstrated that high levels of PFOA are associated with early pubertal maturation and a lower LDL cholesterol level. The results of these and epidemiological studies have led to a unified hypothesis that PFOA may produce liver-mediated effects that disrupt the normal hormone profile. This effect may explain early pubertal maturation in girls as well as the stimulatory effects on mammary gland and uterine development in mice.

Dr Haslam also described several study results, suggestive of effects between high-fat diets and mammary gland development and mammary tumor susceptibility.

The development of bioinformatic tools for cross center data analysis has revealed inflammation signatures resulting from exposures to endocrine disruptors, dietary fat and progesterone. Inflammation may play an important role in determining susceptibility to breast cancer and raises the possibility that different exposures that increase susceptibility may converge on a common pathway.

Dr. Haslam concluded her presentation by noting that the results of the biology studies have opened many new avenues of investigation and may lead to the identification of potential biomarkers relevant to human breast cancer risk. These investigations may also provide information about other important public health concerns such as adolescent obesity and type II diabetes. After concluding her presentation, Dr. Haslam introduced Ms. Janice Barlow of the BCERC Community Outreach and Translation Cores (COTC).

Ms. Janice Barlow

Ms. Barlow's presentation focused on the activities and accomplishments that reflect the COTC's integration with the epidemiology and biology projects. The COTC includes breast cancer advocates, survivors, professionals and representatives from communities who are potentially most affected by breast cancer. From the beginning, the COTC has been an integral part of the centers and actively involved in setting the research agenda.

The COTC developed fact sheets on the effects of environmental exposures under investigation on the development of the mammary gland and the onset of puberty. Ms Barlow described an educational tool kit called "Of Mice and Women: Modeling Breast Cancer and the Environment." This tool kit explains why and how rodent models are used to study breast cancer. It has also engaged in formative dissemination research.

Ms. Barlow described activities organized by the various Centers for recruiting and retaining study participants: a coloring book, biannual newsletters, community workshops, as well as tea talks during which research results are shared with study participants and their families.

In addition, the COTC played an important role in evaluating the implications of communicating individual-level biomonitoring results back to families in the community with high PFOA rates. The protocol developed for providing those results is a model that can be used in other communities with high levels of environmental exposures.

Moving forward, the COTC will continue to serve as a model for community involvement in research. Ms. Barlow noted that the COTC assists in the planning of BCERC's annual conference on early environmental exposures and participates in the sessions. She invited Council to attend the next conference scheduled for September 18–19, 2009 in Sausalito, CA.

Dr. Birnbaum thanked and commended all three BCERC presenters on their work. She remarked that BCERC, with its integration of various scientific disciplines and the inclusion of a community outreach component, is a model for activities that NIEHS can and should be doing.

Council Response and Discussion

Dr. Kevin Stephens (Council member) complimented the presenters and posed several questions on the inflammation signatures referred to in Dr. Biro's presentation. He also wanted to know whether the effects of anti-prostaglandins, Gardisil, or contraceptive use were being considered with regard to impact on inflammation, obesity, and breast cancer risk.

Dr. Frank Biro described plans for additional studies proposed by the epidemiology projects to examine the interrelationship between the development of metabolic syndrome and other factors in risk of developing breast cancer and potentially heart and peripheral vascular diseases. He also remarked that during every visit, the investigators assess the use of medications. Dr. Biro said that vaccination practices among the girls are not being studied, but they could be considered in the future.

Dr. Birnbaum noted that Dr. Stephens's question about dysmenorrhea and endometriosis was very important because the investigators will be collecting a large amount of data about different exposures and physiological changes. This information will be an important source of data for other researchers to correlate back to and draw associations.

Ms. Stefani Hines (Council member) referenced the slide which noted a positive correlation between pubertal status and animal protein. She asked if the investigators had examined the contributions of hormones present in meats and milk.

Dr. Biro responded that it would be very difficult to parse out different sources of estrogen and determine which estrogen came from exogenous sources. He remarked that most communities have measurable levels of estrogen in their drinking water, probably in much higher concentrations than would be found in animal products.

Ms. Barlow responded that Ms. Hines's question comes up often among mothers of daughters who participate in the studies. It is really difficult to tell which dairy products have hormones in them and what the levels are. Ms. Barlow noted that, because of breast cancer advocacy, Yoplait agreed to take all of the hormones out of their yogurt.

Dr. Grace LeMasters (Council member) called the compilation of the epidemiology data an "incredible undertaking." She asked if there was a protocol for pooling the data for analysis.

Dr. Biro answered that there is a common protocol for how the data is collected and shared among the three sites. However, each study site has its own special area of interest in which they may have collected more data. Every week the investigators also have conference call discussions to share data about a specific area of interest.

Dr. Joseph Graziano (Council member) commended the speakers on their presentations. He remarked that the three epidemiology projects were independent projects born at the same time that now share some common goals. On what health outcome was the sample size based? Going forward, would there be a common approach to this issue?

Dr. Biro responded that there were quite a few commonalities across the epidemiology projects, and the investigators met and developed a common protocol. Common training was also developed, and trainers were sent to the sites. The sample sizes at each center were predicated upon a specific aim within each of the sites.

Dr. Graziano (Council member) wanted to know if an IRB reviewed the material that was presented to the families of the girls who had the elevated level of PFOA.

Dr. Biro replied that the information about the elevated levels of PFOA was shared at one of the BCERC interim meetings attended by the project officers and the BCERC steering committee. After extended discussions between the investigators and the COTC, it was decided that the information should be disclosed to the families. A slide presentation, along with accompanying information packets, was developed and submitted to the IRB for approval. Prior to giving the presentation in the study participants' community, Dr. Biro personally phoned the families and encouraged them to attend. Dr. Biro remarked that the families were grateful for the information and encouraged the investigators to try to determine the source of the chemical.

Dr. Collman added that this type of information dissemination is an emerging issue. When the BCERC program was developed, most studies were not giving out individual results, and the bioethics literature didn't say much about the subject. With scientists and community advocates working together, sharing of individual biomonitoring results has emerged as an issue. When goals, protocols or instruments change in a project, those changes all go back to IRB for approval. Ms. Julia Brody of the BCERC Working Group has developed a schema for disseminating information. The topic of information dissemination has also been discussed at

local forums and at the annual BCERC meeting. Best practices are being developed that could be applied to these situations as a result of this project.

Dr. Leikauf (Council member) cautioned Dr. Biro about measuring factors for which he will not have statistical power to detect a difference. His concern was rooted in the fact that the study involves several different ethnic groups. One of the ethnic groups may need to be dropped from the study to increase the statistical power of the data.

Dr. Biro agreed with Dr. Leikauf that the issue of statistical power must be addressed, but even an underpowered analysis could provide answers to some important questions. Dr. Biro also replied that he does not plan to drop any of the ethnic groups because the information being compiled in this project will probably never be collected again in any project.

Dr. Stephens (Council member) suggested that the investigators examine how hormonal changes in the time period between menarche and ovulation might correlate with breast development. He indicated that it might be interesting to examine genetic components, such as BRCA1 and 2, and family history.

Dr. Biro responded that the investigators are not analyzing for BRCA1 or BRCA2 and did not actively recruit girls with family history of the genes. The sample size might not be large enough to carry out the analysis, although the investigators in Cincinnati had managed to enrich their sample by recruiting from the Breast Cancer Registry of Greater Cincinnati. He went on to discuss discoveries by BCERC researchers in relation to family history.

Ms. Stefani Hines (Council member) commended the integration between the COTC and the scientists. She asked if child psychologists were on the COTC.

Dr. Biro and Ms Barlow described the participation of child psychologists within the epidemiology projects and the COTC, respectively. Ms. Barlow also noted that research assistants working with the girls have developed ways to make the research study experience less invasive and threatening. Evaluations with the families reveal that the girls feel they are participating in something very important and feel very special.

Dr. Birnbaum remarked that the discussions and the presentations had been wonderful and expressed her appreciation for the work of the BCERC team.

BREAK

XIV. CONCEPT CLEARANCE – VIRTUAL TISSUES – Dr. David Balshaw

Dr. Balshaw began his presentation by acknowledging those who participated in the development of the concept: Drs. Jerry Heindel, Leslie Reinlib, Daniel Shaughnessy, Srikanth Nadadur, and Leroy Worth (all of DERT); Drs. Ray Tice and John Bucher of NTP; Dr. Rosemarie Hunziker of the National Institute of Biomedical Imaging and Bioengineering (NIBIB); Dr. Imran Shah of EPA; and Mr. Patrick Kolar of EUROPA.

Dr. Balshaw proposes using a modeling approach to develop a rapid, cost-effective way of assessing or predicting risks associated with environmental exposures. The current *in vitro* and *in vivo* methods are effective but have shortcomings. Two- (2-D) and three-dimensional (3-D) engineered tissues are alternatives that combine aspects of both *in vitro* and *in vivo* assays. At the same time, the integration of systems biology and computational modeling make it possible to both replicate biology programmed into the system and generate new hypotheses.

Engineered tissue systems used in tandem with computational models could serve as a testing method to bridge the gap between mathematical modeling and biological assays. He envisions these models both as research tools for replicating *in vivo* conditions and responses and as high-throughput (HTP), automated screening tools.

Dr. Balshaw presented a program concept that would develop new models, refine and apply existing ones, and integrate developed models into multi-organ systems. The development of new models would be facilitated through a combination of the R21 and the R33 mechanisms. Grantees would receive a short grant with a relatively modest amount of funding to develop proof of principle. If successful, the grantees could then transition to a three-year validation period during which their funding would double. Dr. Balshaw proposed separate funding solicitations for wet and computational models. He anticipates making five awards for each.

Work on existing models would be funded through an R01/U01 award modeled on the Bioengineering Research Partnerships. Each award would be for $750,000/year for five years. An interdisciplinary effort involving bioengineers, toxicologists and computational biologists will be required.

The third component of the concept focuses on the ability to link models, add new dimensions, and integrate into multi-organ systems. It would be funded through an administrative supplement program open to all grantees within the Virtual Tissues Program. This supplement would be a $1 million/year set aside for years 2 through 5.

In addition to being trans-NIH and trans-NIEHS, the partnership also includes EPA and the National Center for Computational Toxicology (NCCT). Potential international partners include EUROPA and the European Centre for the Validation of Alternative Methods (ECVAM).

Dr. Balshaw concluded his presentation by noting that the long-range goal of the program is to assemble a virtual human. He also solicited feedback from Council: 1) Is it better to focus on a small set of well-developed models or to progress on multiple systems of interest to the EHS community? 2) Is a cooperative mechanism valuable? 3) Should implementation be phased? 4) Should we reach out to other entities for participation, or does this dilute our focus?

Council Response and Discussion

The Concept was reviewed by Council members Drs. John Essigmann and Richard Finnell. Dr. Richard Finnell's opinion was that the project seemed more suited to the goals of NTP. With NIEHS already making a considerable investment in epigenomic research and other large initiatives, he thought it advisable that NIEHS focus on smaller, R01 based activities.

Dr. John Essigmann (Council member) was supportive of the concept, but was concerned that biology might not be far enough along for a full virtual human model to be successful at this point. He recommended that Dr. Balshaw and his colleagues move forward on the liver and the lung models, and possibly the immune and vasculature components. A suite of organ models may be created that would facilitate the creation of a virtual human. Dr. Essigmann was pleased to know that chemical engineers would be involved in the project, referencing the vital role that they played years ago in the examination of the health effects of fossil fuel utilization.

Dr. Kevin Stephens (Council member) expressed support for the concept.

Dr. Baylin (Council member) asked if there were any preliminary data comparing responses of a good animal model system with those of a more developed model system?

Dr. Balshaw said that this type of validation had been done in the pharmaceutical arena and some models work fairly well. He agreed that validation will need to be explored more fully.

Dr. Baylin remarked that the concept was a valuable direction because of the disciplines it brings together, the need for the technology and the potential for less expensive screening.

Dr. Stephen Lloyd (Council member) asked if Dr. Balshaw had considered including SBIR funding in some of the funding mechanisms. SBIR funding might give companies like Mattek an incentive to further develop their existing models. He also inquired if there would be funding available to validate the results of a virtual tissues model against an animal model system.

Dr. Balshaw responded that he and his colleagues do want small business participation in the project. The R21/R33 mechanism is open to small businesses, and the grant period is longer than that of an SBIR grant. An administrative review is required before the conversion to the validation phase. During that validation phase, NIEHS would require validation tests comparing the responses of an engineered tissue model to those of an *in vivo* model.

Dr. Leikauf (Council member) remarked that virtual tissues systems face many challenges. Chronic diseases develop over a period of years, which would not be captured in an experiment involving cell cultures. Secondly, oxygen can only diffuse about 50 microns. The tissue quickly becomes hypoxic, making a successful virtual tissue system difficult to build. He suggested a more directed announcement to address these challenges.

Dr. Balshaw answered that some efforts have been made to integrate capillary beds into the tissues so that some of the hypoxic effects could be avoided. Additionally, some virtual tissue systems have supported studies taking place over several months and even up to a year. He sees the project as a means of addressing some of the challenges.

Dr. Joseph Graziano (Council member) asked why the modeling should be partnered at such an early stage with the development of the tissue systems.

Dr. Balshaw mentioned that the dialogue between the computational modelers and the wet tissue modelers is very valuable in ensuring that the tissue systems are designed in such a way that they will be amenable to computational modeling.

Dr. Birnbaum remarked that the Virtual Tissues concept is an excellent example of a trans-NIEHS effort. There are already some modeling efforts underway in DIR.

Dr. Birnbaum requested that Council make a motion in regard to the concept clearance. Dr. Essigmann moved that the concept be allowed to move forward with Council concurrence. Dr. Baylin seconded the motion. Dr. Birnbaum then invited Council to discuss the motion.

Ms. Stefani Hines (Council member) expressed mixed feelings about the concept and remarked that others seemed to have mixed feelings about it as well. She suggested that Council have more discussion about how the concept might be refined.

Dr. Leikauf (Council member) suggested that the motion be amended to require an FOA with more specific targets.

Dr. Collman responded that Dr. Balshaw presented a broad concept, not an FOA. The concept describes a range of different activities. Do you want to turn the concept into a single FOA or amend the proposed areas?

Dr. Essigmann (Council member) suggested that perhaps Dr. Leikauf was recommending that NIEHS structure the FOA as a series of questions to which investigators could respond.

Dr. Birnbaum pointed out that the FOA itself would contain specific questions, but that Dr. Balshaw was proposing a whole new direction of NIEHS research rather than a specific FOA.

Dr. Hillary Carpenter (Council member) remarked that the real question is whether this is a research direction which warrants NIEHS's long-term investment.

Dr. Jerald Schnoor (Council member) agreed. He also commented that Dr. Balshaw's proposal did address some specific goals.

Dr. Baylin (Council member) mentioned that the scope of the proposal could be modified somewhat. For example, during the initial period, investigators could be required to deal with feasibility issues and solve certain problems before moving to the five-year stage.

Dr. Birnbaum responded that specific questions would be determined when an FOA was written.

Dr. Sem Phan (Council member) expressed concern about taking resources away from other directions. A more complicated system would likely not be as productive as a HTP screening approach. The molecular and transgenic models are developing so rapidly. Those models may ultimately yield more results than the mathematical models that have not been very productive.

Dr. Birnbaum asked Council to vote on whether NIEHS should pursue this area of research. Five members of Council were in favor, four were opposed. Three members abstained.

CLOSED PORTION OF THE MEETING
May 22, 2009 – 8:00-10:15 am

XV. Consideration of Grant Applications

This portion of the 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 FACA, as amended (5 U.S.C. Appendix 2).

The regulations concerning conflict of interest were reviewed. 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, of which they are an employee, consultant, officer, director or trustee, or in which they have a financial interest. Institutions or organizations which have multi-campus institution waivers, or are specifically designated as separate organizations under 18 U.S.C. 208(a), are exempt from this provision.

The May 2009 Council considered 450 applications requesting $186,817,192 in total cost and recommended 213 applications with the total cost of $83,853,358.

OPEN PORTION OF THE MEETING
May 22, 2009 – 10:35 a.m.-noon

XVI. CONCEPT CLEARANCE
BREAST CANCER AND THE ENVIRONMENT RESEARCH CENTERS PROGRAM
Drs. Leslie Reinlib and Elizabeth Maull

Dr. Reinlib began his presentation for the next phase of the BCERC Program with a description of the goals and then highlighted the revised program plan. Competitive epidemiology projects would continue, along with their respective Community Outreach and Translation Cores. New applications would be allowed to support basic and/or epidemiology studies focusing on a window of susceptibility. The projects would be required to have community partners.

The second change involves the Coordinating Center. Under the revised plan, this Center would be a separately funded entity. It would oversee the collection of BCERC's epidemiology data and the coordinating of national meetings. The Center will also have a pilot project opportunity fund to encourage cooperation and integration among the BCERC program components.

Three new FOAs have been developed. Competition for the first FOA, *Early Environmental Exposures: Continuing Studies of Human Female Puberty*, would be open only to the existing three epidemiology project sites. Each site would include a COTC component and would be required to have an External Advisory Board. The second FOA, *Environmental Influence During Windows of Susceptibility in Breast Cancer Risk,* would support novel environmental health laboratory and epidemiological studies. The third FOA would support the storage, management and distribution of data and bio-specimens collected at the three epidemiological study sites, and the coordination of national meetings.

Dr. Reinlib informed Council that the current BCERC program is scheduled to end July 31, 2010. The new FOAs will be announced in the fall of 2009. The FY2010 cost of the program would be $6.7M and the six-year cost would be $37.7 million. NCI is a partner in this program. NIEHS usually pays 60% of the costs while NCI usually pays 40%.

Dr. Maull presented a concept for a companion contract to facilitate the translation of key BCERC findings to messages appropriate for lay audiences, identify appropriate target audiences within the advocate community, identify appropriate outreach media needs for those audiences, and disseminate those messages to audiences nationwide.

Funding for the companion contract would come from ARRA and NIEHS. BCERC is also exploring the possibility of funding some of the contract by the NIH Evaluation Set-Aside Program. This program would support a needs assessment for outreach media as well as a final evaluation of the impact of the key messages.

Dr. Maull noted that this effort is intended to be complimentary to rather than duplicative of existing COTC efforts. She noted that the COTC has done a commendable job in their outreach efforts to their individual communities, but that the synthesis of integrated, national messages will require a much more focused method.

BCERC intends to issue a request for proposals by the end of FY2009 and award a contract by March 2010. Dr. Maull noted that $300,000 in ARRA funding is available for this effort. She estimated that NIEHS funds for option years FY2012 and FY2013 would be $100,000.

Council Response and Discussion

The Concept was reviewed by Council members Drs. John Essigmann and Joseph Graziano. Dr. Essigmann supported the concept, but expressed concern regarding the restricted competition in the first FOA. He suggested that NIEHS make it clear to the epidemiology community that the second FOA will be an open competition.

Dr. Graziano approved of the concept.

In response to Dr. Essigmann's concerns, Dr. Reinlib noted that each of the epidemiology projects will have to submit a competitive application for peer review. He also mentioned that some community advocates, working group members and Congressional liaisons have expressed a desire to see the projects continue.

Dr. Essigmann commended BCERC, NIEHS and NCI for being responsive to the critical comments that were made by reviewers in an interim review the Program had undergone.

Dr. Stephen Lloyd (Council member) wanted to know if there would be any integration with epigenomics projects related to metastatic breast cancer.

Dr. Reinlib responded that this was an excellent suggestion. Dr. Collman added that the epigenetics direction could be mentioned in the second FOA.

Dr. Richard Finnell (Council member) was concerned that the epidemiology projects FOA will be a closed competition. There is a public perception that many FOAs are "wired" and when NIEHS releases one that is wired, that perception is reinforced. While he understood the need to preserve the unique cohort in the breast cancer study, he suggested that another funding mechanism be used for that purpose.

Dr. Graziano (Council member) asked why the solicitations could not be competitive renewals.

Dr. Collman responded that NIH has guided NIEHS to use the limited FOA mechanism to facilitate the completion of the study. If the applications were to come in as competitive renewals, they would not be linked as a coordinated activity through the review process.

Dr. Leikauf (Council member) remarked that the animal and cell culture components of the epidemiology study had been put into another FOA. He asked if the size of the epidemiology project awards had been decreased.

Dr. Reinlib answered that the overall cost of the program has actually increased. BCERC examined what the cost averages were for the various components of the program. The budget figures he shared with Council were based on those averages.

Dr. Kenneth Ramos (Council member) commented that the girls would not be followed long enough to find out it if they actually develop breast cancer. What is the plan for moving the project forward to the point where actual breast cancer outcomes can be determined?

Dr. Collman answered that the BCERC study was never designed to link to the cancer susceptibility question. The purpose of the study is to determine whether pubertal endpoints differ based on environmental, genetic and lifestyle characteristics.

Dr. Ramos (Council member) suggested that the developmental elements of breast cancer susceptibility be emphasized more in the concept clearance document. He also wanted to know what level of input the COTC would have in the national outreach efforts.

Dr. Maull replied that the COTC members will be part of an advisory committee that will help review the national outreach materials that are produced by the contractor. The COTC will be involved at every level of the process.

Dr. Grace LeMasters (Council member) suggested that the investigators examine utogenic markers in blood and recommended that the investigators be required to examine hormone levels. Dr. LeMasters added that a younger sister study might also yield useful information. She recommended that dissemination be targeted to adolescents, young children and their parents, rather than the advocacy community.

Dr. Maull responded that one of the goals of the research dissemination contract is to evaluate who the best target audiences are within the advocacy community in general. Both mothers and children could be targeted audiences.

Dr. LeMasters (Council member) recommended that elementary school teachers be one of the target groups as well. She added that, in the case of the epidemiology projects FOA, the projects should be required to give their data to the Coordinating Center.

Dr. Reinlib replied that this would be a requirement in the future.

Ms. Stefani Hines (Council member) recommended that the justification for the closed competition be stated in the epidemiology projects FOA upfront. She applauded the level of attention being paid to community outreach. Ms. Hines also wanted to know if it was required that the Coordinating Center be independent and separate from where the data is collected.

Dr. Reinlib replied that the BCERC epidemiologists had multiple meetings about the ownership of data sets. The plan is for the Coordinating Center to be independent.

Dr. Joe Graziano moved that NIEHS move forward with the concept. Dr. John Essigmann seconded the motion. The motion was approved unanimously by the Council.

A motion to move forward with the BCERC companion contract concept was made and approved by Council.

XVII. SBIR CONTRACTS **Dr. Gwen W. Collman**

Dr. Collman presented a concept clearance for the SBIR Contracts Program, a program that is administered by Dr. Jerrold Heindel. Every federal agency must allocate 2.5% of their research and development funds to small businesses. NIH does this through NIH's Omnibus grant solicitation, special solicitations; and contracts. Each year, the NIH Assembly of Scientists has a call for topic areas, during which time the NTP and DIR staff put forth ideas for contracts. The contract topic areas proposed for this year's solicitation are 1) a computer-assisted sperm analysis system, 2) quantitative HTP screens for environmental toxicants that induce DNA damage, 3) mid- to high-throughput toxicologic tests using model organisms, 4) a PC- or Mac-based integrated prediction system to support environmental toxicology assessments, 5) incorporation of metabolism into quantitative HTP screening to support HTP assays that incorporate animal or human hepatic metabolic capacity, 6) quantitative HTP screening for the

detection of chemicals that modulate gap junctional intracellular communication, 7) monitoring *in vivo* gene expression changes after exposure to toxicants in *C. elegans* and 8) the development of biomarkers for the assessment of environmental exposure to mold in damp housing and water-damaged buildings.

Council Response and Discussion

Drs. Sem Phan and George Leikauf reviewed the concept. Dr. Phan thought the contract topic areas were fully justified. He commented that the gene expression studies are highly useful but the endpoint of the gap junction study is somewhat nebulous.

Dr. Ray Tice responded that a number of *in vivo* and *in vitro* assays have shown that some carcinogenic compounds interfere with cell-to-cell communication through gap junctions. The goal of the gap junction study is to develop key assays that would provide information on the ability of compounds to up-regulate, stabilize, or interfere with cell-to-cell communication.

Dr. Leikauf (Council member) was supportive of the concept, but expressed some concern about the emphasis on HTP screening given that so much work is being done in that area now.

Dr. Tice acknowledged that a number of assays already exist, but NIEHS is continuing to move in that direction. He also commented on the importance of encouraging the pharmaceutical industry to move more in the direction of environmental toxicology.

Motions to move forward with the SBIR concept were made and approved by Council.

XVIII. ADJOURNMENT OF THE NAEHS COUNCIL

The meeting was adjourned at noon on May 22, 2009.

CERTIFICATION

I hereby certify that, to the best of my knowledge, the foregoing minutes and attachments are accurate and complete.

Linda S. Birnbaum, PhD, DABT, ATS Chairperson National Advisory Environmental Health Sciences Council	Gwen W. Collman, PhD Interim Executive Secretary National Advisory Environmental Health Sciences Council

Attachment:
Council Roster