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

SEPTEMBER 15–16, 2009

The National Advisory Environmental Health Sciences Council was convened for its one hundred twenty-eighth regular meeting on September 15, 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 September 15, 2009 from 8:30 a.m. to 5:00 p.m. and on September 16, 2009 from 8:30 a.m. to 10:30 a.m. In accordance with the provisions of Public Law 92—463 the meeting was closed to the public on September 16, 2009 from 10:30 a.m. to 11:30 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
David Christiani, PhD
John Essigmann, 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 (by telephone)
Jerald Schnoor, PhD
Kevin Stephens, MD, JD
Palmer Taylor, PhD
Nsedu Obot Witherspoon, MPH

Ex Officio Officer
CPT Michael Macinski

NIEHS Staff
Janice Allen, PhD
Beth Anderson
Ralph (Eddy) Ball, PhD
David Balshaw, PhD
Linda Bass, PhD
Martha Barnes
John Bucher, 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
Kimberly Gray, PhD
Rachel Gross
Astrid Haugen
Tom Hawkins
Jerry Heindel, PhD
Heather Henry, PhD
Marc Hollander
Michael Humble, PhD
Ethel Jackson, DDS
Laurie Johnson
Annette Kirshner, PhD
Stephen Kleeberger, PhD
Diane Klotz, PhD
Sandy Lang
Christopher Long
Robin Mackar
Ellen Moul
Carolyn Mason
J. Patrick Mastin, PhD

Michelle Mayo
Kimberly McAllister, PhD
RoseAnne McGee
Elizabeth McNair
Srikanth Nadadur, PhD
Teresa Nesbitt, DVM, PhD
Sheila Newton, PhD
Heather Nicholas
Liam O'Fallon
Ted Outwater
Michelle Owens
Jerry Phelps
John Pritchard, PhD
Margarita Roque
Barbara Shane, PhD
John Schelp
Carol Shreffler, PhD
Daniel Shaughnessy, PhD
William Suk, PhD
Claudia Thompson, PhD
Mary Wolfe, PhD
Leroy Worth, PhD
Darryl Zeldin, MD

Members of the Public Present

David Brown, SRA International
Bill Farland, PhD, Colorado State University
Richard Callan, MPH, EPA
Nigel Fields, MSPH, EPA

OPEN PORTION OF THE MEETING
September 15, 2009 – 8:30 a.m. - 5:00 p.m.

I. CALL TO ORDER AND OPENING REMARKS

Dr. Linda Birnbaum called to order the one hundred twenty-eighth regular meeting of the National Advisory Environmental Health Sciences Council. She opened the meeting by welcoming those in attendance and 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. Dr. Birnbaum acknowledged Council members who were not present: Drs. Christopher Bradfield, Richard Finnell, and Kenneth Ramos, and Ms. Janet McCabe. She noted that Council member Dr. Kenneth Ramos would be joining the Council meeting by telephone.

She then invited everyone in the room to introduce themselves. Dr. Birnbaum pointed out that the open portion of the Council meeting was being webcast and instructed people to use their microphones when speaking.

II. REVIEW OF CONFIDENTIALITY AND CONFLICT OF INTEREST PROCEDURES

Dr. Collman reminded Council to sign conflict of interest forms, to speak into the microphones, and to state their name for the record when making comments.

III. CONSIDERATION OF MEETING MINUTES

A motion was made by Council member, Dr. Jerald Schnoor, to approve the May 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.

February 17–19, 2010	NIEHS	Wednesday – Thursday
May 19 – 20, 2010	NIEHS	Wednesday – Thursday
September 20–21, 2010	NIEHS	Monday – Tuesday
February 16–17, 2011	NIEHS	Wednesday – Thursday

She emphasized the importance for Council members to attend Council meetings.

V. REPORT OF THE DIRECTOR — Dr. Linda Birnbaum

Dr. Birnbaum began her report by briefly updating Council on events regarding the Stimulus Bill. NIEHS has received $168 million in funds directly for general ES (environmental science) awards, plus $19.3 million for Superfund, and an additional $8 million from the Office of the Director (NIH OD). As of September 8, 86% of the available funds had been allocated to 290 grants. The intent has been to spend, but spend wisely. NIEHS has also awarded $25 million to contracts for research and development.

Out of 598 proposals assigned to NIEHS for the Challenge Grant program, 38 awards have been made. Dr. Birnbaum described the rigorous requirements for applications to be accepted for review. For grants in the Signature Areas, NIEHS expects to award $14.9 million on 10 grants on the health effects of Bisphenol A (BPA), and $10.5 million on 10 grants for nanomaterials safety. These figures include contributions from the NIH OD. She went on to describe supplements to the Superfund P42s and summer supplements.

Dr. Birnbaum then updated Council on the status of bills in Congress. All three appropriation bills funding NIEHS have been passed by the House. Senate has only passed the bill supporting the Worker Education and Training Program. For the first time, the potential increase in appropriated funds for NIEHS is the largest, proportionally, of all the NIH Institutes in the Labor/HHS bill. The House and Senate bills propose 3.1% and 4.9% increases, respectively. Overall increase for NIH is anticipated to be 1.7%, but may be 3%. Budget bills recognized priorities in nanotechnology research, alternatives to animal testing, translational research, and endocrine disruptor research.

Dr. Birnbaum displayed a slide showing specific amounts for each of the bills. She pointed out that funding for Superfund has been flat the past few years. NIEHS is meeting with committee members who are interested in increasing the appropriation for that program.

Priorities in the President's budget include cancer, autism, and the health and safety of exposure to nanomaterials. President Obama is interested in climate change as well. NIEHS is leading a cross-agency effort to develop a white paper on health effects of climate change research needs. Dr. Birnbaum expects a draft to be available shortly.

Dr. Birnbaum described interests of the new NIH Director, Dr. Francis Collins, that coincide with NIEHS interests. Dr. Collins was involved in developing the Genes and Environment Initiative (GEI) with NIEHS previously, and further overlapping interests are anticipated. His current priorities include high-throughput approaches, translational research, health care reform, global health research, health disparities, empowering the biomedical research community, the microbiome, small molecule screening, stem cell research, and personalized medicine.

Dr. Birnbaum went on to describe priorities of the Office of Management and Budget and the Office of Science and Technology, which influence NIEHS areas of emphasis. These include job creation and economic recovery, innovative energy technology, biomedical science technology, and transportation.

Several searches are underway for open staff and leadership positions at NIEHS. A Supervisory Ethics Program Specialist position was created. When that person is on board, NIEHS can regain its ethics authority. The Scientific Education and Diversity position has taken awhile to initiate because it's essentially a new position.

Dr. Birnbaum highlighted several events that occurred since last Council meeting. She was honored at a reception by the Society for Toxicology (SOT). Pioneer Awards were made to grantees Dr. Leona Samson, MIT, and Dr. Sarah Tishkoff, University of Pennsylvania. An NIEHS workshop on epigenetic mechanisms took place at the National Academy of Science in Washington DC. NIEHS, SOT, NCI and other organizations will sponsor PPTOXII: Role of Environmental Stressors in the Developmental Origins of Disease, December 7–10. NIEHS joins others in launching the Early Autism Risk Longitudinal Investigation to discover biological markers and environmental risk factors for autism. Dr. Birnbaum was one of four panelists at the 13th Annual Green Chemistry and Engineering Conference, June 24. NIEHS sponsored a town hall meeting on Environment and Child Health in New Jersey, June 17.

Dr. Birnbaum noted a number of scientific publications authored by NIEHS intramural researchers or NIEHS grantees.

She went on to describe several bills being drafted or under consideration by Congress. In addition to priorities described in the budget discussion earlier, an increase (from 2.5% to 3.5%) is proposed in the SBIR/STTR set-aside.

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

VI. DISCUSSION OF DIRECTOR'S REPORT

Ms Stefani Hines asked how a person could find out what bills are going through Congress and their effects on NIEHS. Is there an organization that will know the status, stage, meaning, and open comment periods for these bills, and can facilitate public input?

Ms Mary Gant (NIEHS) explained that various non-profit organizations (NPOs) have representatives in DC, but their success varies in informing their stakeholders and the public. However, there is no one effective environmental health group in Washington. She would be happy to help if anyone has specific questions on the bills before Congress. NIEHS could list bills under consideration on its website.

Dr. Birnbaum thought that NIEHS could consider listing on its website bills that may impact on the environmental health sciences.

Ms Hines suggested that a list that summarizes the meaning, what phase the bill is in, and other information would be helpful to distill the information for the busy person. People would be more likely to provide input if they didn't have to wade through the entire bill. She suggested that definitions be provided for those who are not familiar with the legislative process.

Ms Gant indicated that anyone can contact their member of Congress at any time on a bill, and changes can be made at any time. There are rules about grantees and lobbying, but appropriate ways exist for grantees to interact with Congress and provide input into bills.

Dr. Birnbaum suggested that Mary Gant give a discussion in a future Council meeting on the legislative process.

Dr. Joseph Graziano asked about the advocates and push-back for the climate and health bill.

Ms Gant explained that the public health subtitle is in the bill that has passed the House. It was written by the American Public Health Association (APHA) staff and introduced as an amendment to the Waxman Markey Bill. The bill provides a list of activities for the Center for Disease Control and Prevention (CDC), most of which are appropriate for the CDC. However, it provides that the director of CDC work with other agencies on the research component. NIEHS worked with DHHS to change the language to charge the secretary directly with selecting the appropriate agency to support research. NIH would be the natural agency to choose. The bill also included language supporting "centers of excellence," which would limit the support mechanisms NIH would be able to use. NIH would like to change this language, and the APHA supports the change. Hopefully, the Senate bill will give what the agencies want. NIH doesn't need this legislation; underlying language gives authorization to support climate change research, but having the language will assist in moving forward.

Dr. Birnbaum pointed out that the bill also includes $50 million for climate health effects research so additional funds could be available.

Ms Gant hopes that the bill will inspire the appropriators to come up with actual funding.

Dr. Jerold Schnoor referenced the approximate 3% success rate for the Challenge Grant Program and asked Dr. Birnbaum to comment on how well the review process worked.

Dr. Birnbaum answered that she thought the process went well. The success rate for NIEHS was rather high, given what was expected with the large number of applications submitted and compared with other institutes. The number funded by NIH OD was high. Center for Scientific Review folks are exhausted, but this experience may introduce a new way to conduct reviews.

Ms Nsedu Obot Witherspoon wanted to go back to the discussion about the NPOs and their limited resources. She said that NPOs would be very appreciative of anything that NIEHS can do to assist in tracking bills and providing information on them.

Dr. Birnbaum reiterated that NIEHS would work on providing that information on its website.

Dr. Hilary Carpenter asked for details on bills supporting research on endocrine disruptors.

Dr. Birnbaum listed several of the bills in the House and Senate, but she is not convinced that they will make it through Congress this year. NIEHS will spend $30 million on BPA this year alone, so NIEHS is not enthusiastic about bills, like the Schumer bill, that focus on this specific area. The Schumer bill also authorizes spending without appropriating additional funds.

Dr. Stephen Lloyd asked about new topics anticipated for future areas of emphasis.

Dr. Birnbaum listed climate change, which didn't get many applications under the Challenge Program; early life exposures; epigenomic screens (similar to the genome-wide screens); air

pollution; water quality and the lack of drinkable water in the future; complex mixtures of contaminants; and nutrition. She stated that NIEHS needs to spend more time thinking about chronic diseases and their environmental causes.

Dr. Kenneth Ramos asked a question by email. He would like to know about NIEHS plans to advance Dr. Collins' new agenda and what Council's role is in those plans.

Dr. Birnbaum welcomes Council input into how NIEHS could address the new agenda. Dr. Collins' comments to NIH staff are available on the NIH website, so Council can read them. NIEHS should meet with Council and strategize about the best way to advance his agenda. She believes that Dr. Collins' agenda is still forming. He comes from a strong genetic and medical background. She periodically reminds him that we can't change our genetics, but we can change our environment, which would then have a strong impact on health.

Dr. John Essigmann suggested that Dr. Collins' agenda should be a topic of discussion at the upcoming Council retreat, and Dr. Birnbaum agreed.

VII. REPORT OF THE ACTING DEPUTY DIRECTOR — Dr. Stephen Kleeberger

Dr. Kleeberger focused his report on the reorganization of the Office of the Deputy Director. When Dr. Kleeberger took over the position, his office was composed of three subunits: the Office of Science Policy, the Office of Policy, Planning, and Evaluation, and the Library and Information Services Branch (LISB). The first two units have been combined under the Office of Policy, Planning, and Evaluation (OPPE). The LISB remains. Two senior advisor positions now report to the Deputy Director. The journal Environmental Health Perspectives (EHP) is under this office, as is the new position in Science Education and Diversity.

Additional responsibilities of the Deputy Director include serving as chair of several NIEHS committees, as well as NIEHS representative for the National Cancer Advisory Board.

Dr. Kleeberger then described the responsibilities, recent accomplishments, and activities of each of the units in his office. The OPPE, headed by Dr. Sheila Newton, coordinates NIEHS research and training, planning activities, and program analysis. It has tracking and reporting responsibilities, serves as interagency liaison, and develops protocols, working documents and agency statements on policy, legislation, the Freedom of Information Act and public outreach to NIH, the Congress, and public stakeholders. He listed recent activities, one of which was the NIEHS contribution to the NIH Biennial Report.

Dr. Hugh Tilson, EHP Editor, has continued to strengthen the journal by enhancing its editorial and advisory boards. It has shown a significant increase in the impact factor to 6.123, second highest ranking of all journals in public, environmental and occupational health.

Dr. Alan Dearry is the Senior Advisor for Public Health, and has assumed responsibility for NIEHS' participation in the National Children's Study, and represents NIH/DHHS on the Joint Subcommittee on Ocean Science and Technology.

Dr. Sally Tinkle is the Senior Advisor for International Activities. She continues to head NIEHS activities on health effects of nanomaterial exposures, represents NIEHS in interactions with the Fogarty Center, and works with other NIEHS staff in strengthening collaboration with World Health Organization (WHO).

Dr. Kleeberger ended his presentation by discussing a memorandum of understanding (MOU) under development with EPA. The intent of the MOU is to formalize the desire to collaborate in scientific areas of mutual interest to complement expertise and share resources. Two interagency agreements (IGAs) are being negotiated which allow collaboration between EPA and NIEHS on cell and animal experiments, epidemiological investigations, and clinical studies.

Dr. Kleeberger asked if there were any questions.

Council Response and Discussion

Ms Nsedu Obot Witherspoon stated that the NIH Biennial Report is a key document to get the word out on activities and asked if there were plans to distribute it.

Dr. Sheila Newton (NIEHS) responded that the report referred to is the second report. The first one is available on the NIH website, and linked on NIEHS website. Anyone can go and find that report. There is no specific chapter on EHS, but the Institute is strongly represented in each of the chapters. She is not aware of plans to distribute it further.

Ms Witherspoon asked if there were any specific plans for the communication office to send it, and any other report, out to stakeholders. People are not going to the website.

Dr. Kleeberger said he thought it was a great idea for the communication and outreach offices.

Dr. John Essigmann asked how NIEHS could best position itself to take advantage in the event that the budget for cancer research doubles.

Dr. Kleeberger explained that an NIH-level strategic planning group worked on this. He and Dr. Newton were points of contact and were asked to determine what NIEHS is currently spending on cancer research, and report to NIH how they would spend double that amount on cancer research. They solicited ideas from the divisions for potential initiatives and programs. Those ideas were forwarded to the NIH central committee, who collected and condensed them into overarching themes. NIEHS is well represented on that list, so the Institute is well positioned if funding were to come through.

Dr. Essigmann observed that the Institute mission includes a number of diseases, both a strength and a weakness. Still, it has been successful at linking airway disease and cancer through fundamental mechanisms and has some bragging rights in that arena. NIEHS should have a leadership position in taking on complex diseases.

Dr. Kleeberger thanked Dr. Essigmann for his comments and said NIEHS is very proud of having made those linkages between diseases.

Dr. Newton said the NIEHS had a big presence at the table. In the amount of funds devoted to cancer, the Institute was number two, behind NCI, and ahead of the third Institute by far.

Ms Stefani Hines requested more details about the Science Education and Diversity position. She followed up with questions on the search and clarification on the meaning of diversity in the position title.

Dr. Kleeberger responded that the position description is currently being defined. It would be an outreach position, and it would definitely involve training.

Dr. Birnbaum stated that the recruiting announcement went out today and will close September 25. She said that the recruiting period should probably be extended to 30 days. The opening is listed in USAJOBS. The search is open to public as well as federal employees.

Dr. Kleeberger explained that the position would deal with all aspects of diversity at NIEHS: within training, programs, career development, and outreach efforts.

Dr. Birnbaum expressed her vision of the Institute as an integrated whole. Familiarity and coordination is needed between the diversity, education, and outreach activities in all the divisions.

Dr. George Leikauf wanted to speak about the cancer initiative. Lung cancer truly involves a gene-environment interaction and where NIEHS should take the lead, but other cancers not well represented in the NIEHS portfolio also have strong environmental factors. While cancer funding may be controlled by political processes, NIEHS needs to figure out where environmental health scientists can contribute to research on other cancers.

Dr. Kleeberger thought it was a good point and should be part of a discussion on strategic planning.

Dr. Stephen Lloyd wanted to know about plans for NIEHS to be more involved in ocean biology and the environment.

Dr. Birnbaum stated that the centers program in oceans and the environment is winding down. NIEHS will look at the best way to continue support for this work. The President has included oceans health in his list of priorities, and NIEHS is the DHHS representative on the cross-agency task force on that issue. The task force is working on a policy statement which will be issued from the President's office on oceans health, including human health impacts related to oceans. Dr. Alan Dearry has stepped into the lead. Dr. Sharon Hrynkow was previously the representative, but she is going on detail to the OSTP. There are town hall meetings on oceans health across the country, and NIEHS will continue to consider how we can continue to support work in human health impacts related to oceans.

Dr. John Essigmann commented that he enthusiastically supported work on the oceans, global warming, and the potential impact on human health.

CPT Michael Macinski stated that the military has strong interest in environmental exposures affecting deployed troops and wondered whether NIEHS could be of assistance or could engage in that area.

Dr. Birnbaum replied that there could be real opportunities with the Worker Training Program under Superfund. They support training for workers exposed during emergency response and clean up of hazardous materials, and there may be opportunities to extend that training to the military. If specific chemicals are of concern, there are opportunities with the National Toxicology Program (NTP) to use animal or in vitro model systems to determine the potential toxicity of those chemicals.

Dr. Kleeberger described the extramural COUNTERACT program in which a number of centers have funding to investigate measures to counter the effects of exposure to chemical used as weapons. They are also prioritizing research in that area.

Dr. Palmer Taylor asked who was the lead on chemicals in the COUNTERACT program.

Dr. Gwen Collman responded that NIAID is the NIH umbrella organization for biologicals, radiation, and chemicals. NINDS and NIEHS collaborate to run the COUNTERACT program. NIEHS has a large portfolio on projects that focus on the counter measures to pulmonary toxicants.

Ms. Stefani Hines asked how the Office of the Deputy Director fit into the larger organizational structure.

Dr. Kleeberger replied that the Office hasn't changed with regards to how it fit into the NIEHS structure. Dr. Birnbaum went on to explain that the changes streamlined the Office and returned it to a structure similar to that of the past. The intent is to improve coordination among the entities under the Office of the Deputy Director.

VIII. REPORT OF THE ASSOCIATE DIRECTOR, NTP — Dr. John Bucher

Dr. John Bucher reminded Council that NTP is interested in improving its community outreach and finding ways to articulate the meaning of findings that NTP generates. He focused his presentation on a talk he recently gave to the National Research Council on bringing toxicology in the 21st century (Tox21) into the regulatory arena and what would be required for its acceptance. In that talk he compared/contrasted the use of toxicity pathways with the more traditional mode of action as tools for evaluating risks to humans for regulatory purposes.

Dr. Bucher went on to describe the concepts of mode of action and toxicity pathways. In traditional mode of action, the steps between an exposure and an outcome are postulated and key events are identified. The steps are not precisely known. The concept of toxicity pathways focuses on the steps.

To use toxicity pathways to assess risk to human health, several questions need to be answered. Do they provide the true key events that are part of the mode of action? Do they underlie the various pathologies and altered physiology that reflect mode of action? Do they allow or enhance cross-species extrapolation of risk?

Dr. Bucher contrasted mode of action and toxicity pathways. Mode of action requires considerable human judgment as to its applicability, while toxicity pathways may provide more means for unbiased discovery. Toxicity pathways may provide integrated dose-response information and a spectrum of responses. However, the complexity of toxicity pathways raises difficulties.

He went on to describe the challenges to acceptance of each concepts, which involves validation of the method used for regulatory action. Dr. Bucher described several examples where a mode of action was accepted and then, under closer examination, was found to be inappropriate. He also described several issues with toxicity pathways. As an example, he briefly described the requirements for acceptance of a mode of action for the association of 2u-globulin with chemically induced renal toxicity and neoplasia in the male rat. He pointed out that there was no validation requirement at the time.

The Interagency Coordinating Committee on the Validation of Alternative Methods (ICCVAM) is required by law to ensure that new and revised test methods are validated to meet the needs of federal agencies. Mode of action was not validated, and toxicity pathways haven't been validated either. The question is what to do next.

Dr. Bucher displayed a slide describing the conceptual validation of toxicity pathway information. Toxicologists may want to use of scale of concern in which information from many sources is compiled and examined by an expert panel. The panel would express a "gut feeling" on the level of concern they have over the outcome represented by the data. Subsequent activities would depend on their level of concern.

Dr. Bucher described the intentions for utilization of data from toxicity testing as indicated by several agencies. They range from prioritizing agents and testing in the case of NTP and EPA ToxCast, to prioritizing for risk assessment, in EPA's strategic plan.

In his concluding comments, Dr. Bucher stated he believes Tox21 is a different game. The question is if we should bend toxicology rules to fit the regulatory rules or bend the regulatory rules to fit toxicology.

Council Response and Discussion

Dr. Palmer Taylor indicated that he thought NTP has some common interests with Food and Drug Association (FDA) in assessment of toxicity. He wanted to know if stem cells have been considered as a means of looking at potential gene toxicity.

Dr. Bucher said that stems cells had been part of the Tox21 discussion and NTP will look at them very closely. FDA has provided some leads into collaborations with industry, which have provided chemicals that have failed in various stages of clinical trials, so they now have a direct human counterpart and do not have to go through animal studies.

Dr. David Christiani stated that it is troubling to see the insufficient data category placed at the bottom of the scale, where the color on a warning scale is green. Insufficient data could mean that there could be bad effects, and more research is needed. It could also be its own category.

Dr. Bucher indicated that the insufficient data category generates candidates for the NTP testing program.

Dr. Kevin Stephens asked about the closeness of collaborations between NIEHS, FDA, and EPA, whether it could be closer, and if so, how to accomplish it.

Dr. Birnbaum indicated that the agencies are working on the relationships. CDC is another partner. Different parts of NIEHS more naturally collaborate with different agencies, and she went on to mention much collaboration between NIEHS and other agencies. She is working with the leadership of other agencies to increase interactions. If Council has recommendations where the Institute could increase interactions, she would be interested to hear them.

Dr. Stephens responded to ask where Council could assist in improving interactions.

Dr. Birnbaum said she welcomed Council assistance, but perhaps this was another topic to add to the retreat.

Dr. George Leikauf asked Dr. Bucher where NTP will go with regards to in vitro testing. It's a huge investment in money and effort, and without bioinformatic support, it will result in a big collection of data that no one can interpret. He thought that NTP is standing on the sidelines and allowing others to take the risk. That may be wise, but at some point, NTP will need to take a leadership role or get out of the business.

Dr. Birnbaum believes Tox21 is not the whole story for the future of toxicology. The bioinformatic support is working, and a lot of data has been generated. A lot of information will be generated, but she is not sure answers will be. NIEHS (NTP) is not a regulatory agency, and she does not think it is the purview of NIEHS to talk about Tox21 with respect to a regulatory approach. In addition, there is no one regulatory approach. Dr. Birnbaum indicated that she is talking to the National Academy of Science about convening a panel to examine what NTP should be doing for the rest of the 21st century in addition to the rapid screening approaches.

Dr. John Essigmann commented that he and other directors of training programs would be looking to Dr. Bucher for direction on what to include in their training programs: whether they should be training individuals in bioinformatics or classical toxicology. He also thought that the role of NIEHS with regards to regulatory agencies is a key issue. He referred to an article in EHP discussing exposure biology, where everyone has a role. FDA and industry have roles, but NIEHS should be the thought leader to make exposure biology real.

Dr. Birnbaum thought he made an important point. She referred to the large exposure biology component under the GEI and the continuing discussions on expanding it. She went on to mention a need for focusing on exposure pathways. NIEHS, EPA, and other agencies are co-funding a National Academy panel on exposure biology.

Dr. Stephen Lloyd asked for comments on the roles, benefit, and detractions of using genetically modified rodent models in terms of overall goals of NTP. He followed up by asking if NTP would be a repository for genetically modified animals.

Dr. Bucher said that NTP had looked at a number of genetically modified organisms in cancer screening programs and found they were not that useful. NTP has an ongoing activity to try to understand the linkage between environmental and genetic influences on phenotype. Dr. Bucher thought that NIH already had repositories for genetically modified animals.

Dr. Gwen Collman explained about the knockout mouse program at NIH and offered to provide information to Dr. Lloyd on the program and the animals that are available.

Dr. Palmer Taylor wondered if NIEHS could play a research role with respect to the FDA and other agencies.

Dr. Birnbaum responded that the question didn't have an easy answer. What Dr. Taylor was suggesting could fall under the mission of NTP, although not necessarily under the mission of NIEHS. NIEHS mission is to focus on environmentally relevant exposures, and when interests coincide, the Institute prioritizes those studies and conducts them.

Dr. Birnbaum thanked Dr. Bucher for his report and indicated that Mr. Marc Hollander, the Executive Officer, would not give a report this meeting. The next report would be from Dr. Darryl Zeldin, Acting Clinical Director.

IX. REPORT OF THE ACTING CLINICAL DIRECTOR, DIR — Dr. Darryl Zeldin

Dr. Zeldin started his presentation describing changes in the Clinical Research Program since he last spoke with Council. The contract with Digital Infusions has been phased out and the responsibilities for compliance on human subjects protections has been taken over by NIEHS staff. He enumerated several new staff hired for the Clinical Research Unit (CRU). Dr. Fred Miller's group in Bethesda was reviewed by the Board of Scientific Counselors. Dr. Zeldin indicated that Dr. Miller did an outstanding job and a clinical staff scientist will be recruited.

A number of groups in DIR were asked to join as affiliated members of the CRU. These groups conduct mechanistic research and including them in the clinical program would enhance integration of basic and translational research.

Dr. Zeldin went on to describe the grand opening of the CRU on July 27. Mr. Joe Graedon of The People's Pharmacy was Master of Ceremonies, and many political and scientific leaders attended. A clinical research symposium was held in the afternoon where researchers described their projects in translational research.

Two clinical research protocols are currently active in the CRU, and Dr. Zeldin expects the list of protocols to grow over the next several months. The CRU received approval as the southern recruitment location for projects conducted in Bethesda. For one study, the use of telemedicine has been implemented. Dr. Miller conducts a virtual exam for each patient recruited.

The External Clinical Advisory Council met for the first time. The advisory group provides guidance on the overall direction of the clinical program, how best to interact with intramural and extramural researchers, and strategies for future growth. Dr. Zeldin listed several recommendations from the group. These include creation of one or two signature programs, collaboration with NTP and other agencies for optimal impact, use of existing databases and cohorts, and establishing a research program on health disparities. The advisory group had several recommendations on activities, such as establishing training, visiting scholar, and seminar programs; providing clinical funding mechanisms; and providing incentives for translational research during the tenure process. Key recommendations for future growth include distinguishing the CRU from other clinical research units by emphasizing its environmental focus; beginning with small, achievable projects and developing larger, more complex studies over time; and assuming leadership role in the development of a new model for conducting environmentally relevant, translational research studies

Dr. Zeldin concluded his presentation by describing activities in the regulatory compliance group for protections of human subjects during research. Staff has been consolidated in the CRU. New Internal Review Board (IRB) members have been appointed, two audits of local sites were conducted; and a SharePoint site was launched to create a one-stop shop for forms and tracking through the compliance program.

Dr. Zeldin then asked for questions and comments from Council.

Council Response and Discussion

Dr. Joseph Graziano asked about the metrics for success for the program.

Dr. Zeldin responded that the advisory council discussed potential metrics, including number of publications, use of the CRU by investigators, number of active protocols or new research questions, success in promoting mission relevance of research, and a number of other things. Ideally, he plans to meet regularly with the advisory council, review progress, and in 3-4 years have an external review by another group.

Dr. Graziano asked if there was a specific 5-year plan with milestones.

Dr. Zeldin said there were plans, but much will depend on the resources that were available. His personal goals were to double the number of active protocols, involve a significant portion of the intramural researchers with research in the CRU, increase the awareness of clinical research with intramural staff, and increase the collaboration with other agencies.

Dr. Graziano asked Dr. Birnbaum where she saw the growth in resources would come from.

Dr. Birnbaum replied that the optimistic answer is that the budget would grow, but realistically, the Institute would have to see how it fit within the budget the Institute has. As more intramural researchers conduct projects in the CRU, their funds will go to support the clinical program. Extramural collaborations could bring funds from the outside. She indicated that she was highly committed to the CRU. Dr. Birnbaum added that her metric for success is if the program shows that it makes a difference. The program is well positioned for that to happen.

Dr. Palmer Taylor asked if the strategic plan will drive the recruitment or vice versa.

Dr. Zeldin responded that they would recruit people within a focus of general environmental health and allow the best people to come forward and create their programs.

Dr. Birnbaum invited Council to tour the CRU before going to lunch. Council would re-convene at 1:45 pm.

X. REPORT OF THE ACTING DIRECTOR, DIR — Dr. John Pritchard

Dr. Pritchard began his report by describing the open positions in DIR, starting with the search for the Director. He asked Council's assistance in identifying top candidates and advertising the position in the extramural community. Dr. Birnbaum joined him in encouraging their assistance. She emphasized the breadth of the search and the fact that the Institute is looking for exciting candidates. Several other positions are open, and Dr. Pritchard described the scientific areas and status for each of them.

He went on to discuss newly hired tenure-track investigators: Dr. Patricia Jenson, a neurotoxicologist; Dr. Guang Hu, whose area is molecular carcinogenesis; and Dr. Scott Williams, a crystallographer in structural biology.

Dr. Pritchard described the Summers of Discovery Program. There were 46 students participating, the bulk of whom were undergraduates. He emphasized the desire to give a taste of research to young people who have not decided on a career path. Dr. Pritchard announced that 20 post-doctoral fellows received travel awards from NIH. The Institute had more applications into this NIH-wide program than any other Institute except NCI.

Dr. Pritchard then provided a brief snapshot of research underway in the intramural program. He emphasized the breadth of research being conducted, from epidemiology to mechanistic studies. He mentioned that enrollment is completed in the Sisters Study, and went on to list several accomplishments in mechanistic research investigations.

Dr. Pritchard asked for questions before proceeding with the scientific seminar.

Council Response and Discussion

Ms. Stefani Hines was impressed with the number of students included in Summers of Discovery. She asked how they were distributed among the laboratories.

Dr. Pritchard replied that it was rare that multiple students were assigned to a laboratory. The Summers of Discovery is a long-standing program and there is considerable enthusiasm for participation among the investigators.

Dr. Palmer Taylor asked if the program for graduate students is in collaboration with the universities where they are enrolled.

Dr. Pritchard said that sometimes there is collaboration, but often the students are early in their graduate training and are local and looking to sample research in a different scientific area. NIEHS has active ongoing interactions with universities to increase the number of graduate students in the intramural program in general.

Dr. Pritchard introduced Dr. Paul Wade.

XI. SCIENTIFIC SEMINAR, AN EPIGENETIC PATHWAY SPECIES PHENOTYPE IN BREAST CANCER — Dr. Paul Wade

Dr. Wade introduced himself as a molecular biologist, interested in how chromosome structure influences gene expression and how that impacts cell behavior. He focuses on a nuclear enzyme, NuRD or MI-2 complex, with subunits that modulate epigenetic information and affect chromatin structure. His talk will describe studies that use breast cancer and B-cell development to probe the function of the enzyme complex.

The NuRD complex is thought to be involved with transcriptional repression. Dr. Wade's lab has been focusing on a single subunit encoded by three genes named the metastasis associated (MTA) proteins. The genes encode protein products that are thought to be involved with transcriptional repression. There is biochemical evidence that NURD complexes contain proteins encoded by this gene family.

Dr. Wade went on to describe a survey of response of breast cancer cell lines to MTA family members to sort out potential downstream genetic targets. What they found was that every cell that expressed MTA3 was also positive for estrogen receptor alpha (ER-α). This estrogen receptor is a key regulatory molecule in mammary epithelial cell development and a critical prognostic indicator in breast cancer.

Additional experiments on the regulation of Snail by MTA complex reinforced the transcriptional repressor hypothesis. Snail is an important transcriptional repressor in Drosophila and mammals whose direct targets are genes that are involved with the establishment of the epithelial phenotype. The changes in morphology in cells with Snail turned on or off had implications in phenotypic characteristics of breast cancer tumor cells.

In summary, Dr. Wade's laboratory has defined a molecular pathway downstream of ER that regulates important aspects of breast cancer cell physiology, shape and behavior. The ER-α directs the synthesis of a regulatory component of a chromatin remodeling enzyme, the Mi-2/NuRD complex, which in turn participates in regulation of a variety of genes. This pathway ties action of ER to growth properties and phenotypic characteristics of breast cancer cells. Further, elucidation of this epigenetic pathway has provided insights into how the local environment of breast cancer cells can influence their epigenome.

Dr. Wade opened his presentation for questions.

Council Response and Discussion

Dr. Stephen Baylin thought it was interesting when the acute manipulation was made to get silencing, the H3K9 methylation was not seen. He wanted to know what processes went on in between, and asked if Dr. Wade had cloned the cells.

Dr. Wade answered that his lab has attempted to make clonal lines with over-expressed Snail, and in 40 – 50 individual clones isolated, all have the individual resistance marker and all lose expression of the trans-gene. Expression of Snail has been deleterious, but the experiments have been crude.

Dr. Birnbaum asked if Dr. Wade had tried hypoxic challenge in other ER-α+ cell lines.

Dr. Wade responded that he had done it in two of the three ER-α+ breast cancer cell lines and seen a similar response in both.

Dr. John Essigmann and Dr. Wade briefly discussed an article published in *Science* on the interaction of estrogen and ER in breast cancer cells.

Dr. Sem Phan and Dr. Wade discussed the binding of MTA complex to the promoter for Snail, status of array studies looking for potential target genes, and activation of TGfβ signaling.

Dr. Stephen Lloyd asked if the timing of DNA replication changes when Snail is introduced.

Dr. Wade responded that they had not looked, so he didn't know.

Dr. Birnbaum asked if he or others had looked at the developmental expression profile for either NuRD or MTA.

Dr. Wade said that they had conducted the developmental time course, and the tissues have been cut. A post-doctoral fellow is on the way to do those studies. He would have some answers in six months.

Dr. Birnbaum expressed the hope that Council enjoys the scientific presentations at Council meetings and indicated that they would continue in future meetings.

XII. SUPERFUND RESEARCH PROGRAM EXTERNAL ADVISORY PANEL — Dr. William Farland, Ms Nsedu Obot Witherspoon, Dr. Bill Suk

Dr. Bill Suk, Director of the Superfund Research Program (SRP), explained that an External Advisory Panel was convened and charged with providing guidance in shaping future activities in the SRP. It was asked to identify current and emerging scientific issues fundamental to the program's Congressional mandates and provide recommendations for approaches to enhance the efficacy of the program. Dr. Farland, Senior Vice President for Research and Engagement at Colorado State University, chaired the panel, and Ms Witherspoon was the Council representative on the panel. Both would comment on the report, and Dr. Suk would return and give the NIEHS response.

Dr. Farland began his report by describing the expertise of the External Advisory Panel. It encompassed the broad range of scientific disciplines involved with the SRP and included experience in state and federal government, academia, and the private sector.

He stated the report represents analyses of information presented to the panel and collected from stakeholders as well as recommendations from the panel. The report is draft at this point

and with the concurrence of the Council, it will be finalized. The panel was pleased with the cooperation it received from the NIEHS staff and other partners.

Dr. Farland discussed the panel's findings. The panel concluded that the program has a strong history of assembling multidisciplinary teams to address emerging issues regarding contaminations found at Superfund sites. The panel felt that quality of research from this program has increased knowledge, reduced uncertainty in risk assessment, and helped incorporate scientific evidence into policy and decision-making at Superfund sites and in the Superfund program in general. The program provides an opportunity to connect emerging issues with prevention of exposure at hazardous waste sites. Overall, the program fills an important niche in the science needs for site assessment and remediation, has had a positive impact on public health, and it is worthy of continuation.

The panel recognized the unique nature of the program in integrating basic and applied research, and acknowledged the tension that exists when crossing multiple disciplines. Dr. Farland described one of the findings of the panel as encouraging more interactions between the various partners (i.e., NIEHS, EPA, CDC, state organizations) to increase impact of the program.

Dr. Farland said that future resources are likely to be scrutinized and accountability emphasized, and the panel thought that the program should focus on the critical questions of the day. It's important that the program demonstrate wise and efficient use of resources, and program administrators should significantly advance efforts to identify and prioritize current and ongoing areas of investigation.

Dr. Farland said that the program has been responsive to recommendations from previous evaluations and went on to describe seven panel recommendations. The panel recommended high-level strategic planning to promote research on emerging scientific issues. The program should increase interaction and promote integration among grantees to promote synergy. The panel recommended an increased focus on translation of research to remediation activities and effective and sensitive community outreach, particularly to communities affected by Superfund sites. Another recommendation is for critical review of ongoing programs to ensure that investment is in the best science. Finally, recommendations were made to develop metrics to assess progress of grantees and the program as a whole, and to assess impact of the program.

Several questions were generated by the panel for the program to use to inform the strategic planning process. Dr. Farland stated the goal is to provide for clear program goals and priorities and look at the balanced portfolio to address a clear vision of the program's future directions. He listed scientific areas the panel recommended to include, and enumerated metrics for measuring progress. The panel thought that the single-investigator mechanism should continue, but be evaluated, and the incorporation of the P20 mechanism should be examined. Augmenting the program with K awards and training mechanisms should be considered. Data dissemination and repositories should be considered. Effective translation is the ultimate goal of the program.

Ms Nsedu Obot Witherspoon commented on her positive experience on the advisory panel. She emphasized the panel's recommendations regarding community outreach, data dissemination, and collaboration with other agencies. Under training, Ms Witherspoon spelled out the panel's recommendation to continue to train multi-disciplinary scientists.

Dr. Suk presented the NIEHS response to the report. He thought the report was comprehensive and important to the program as it moves forward. All programs need to evolve. SRP is in the

process of developing a strategic plan and will make every effort to have a draft to present to Council in May. The program has worked previously to enhance collaboration among grantees and with other agencies, and the Stimulus Bill provided another opportunity to do this. The ARRA awards will provide a model to further enhance collaboration and translation. Community engagement is also important, as are interactions with other agencies.

SRP will continue to use the annual peer review process. The program will work more closely with the NIEHS Program Analysis Branch to develop ways to understand the metrics, impact, and opportunities within the program. Dr. Suk stated that they intend to establish expert panels. The program has always been an enterprise that should be held accountable to the taxpayers. Based on the report, the program will continue to support multidisciplinary research, training and translation. The program will use available mechanisms to support its overall mandates.

Dr. Suk ended his presentation by stating that this report was one of the best evaluations he had seen for the program, and SRP will work to address all of the panel's recommendations possible under the resources made available to it.

Council Response and Discussion

Dr. Joseph Graziano commented that he is one of the long-term Principal Investigators (PIs) in the program referred to in the report. The opportunity for biomedical and non-biomedical investigators to work together is what makes the SRP a unique program. He stated that he is not a fan of strategic planning but in this case, it is appropriate. In particular, input from the partners is needed on identifying the emerging issues. The theme of the annual SRP meeting in New York is emerging issues, and in hind sight, he wished they could have devoted the entire meeting to it. He hopes that the interactions at the meeting will be a start to the process of strategic planning in this arena. One bullet point in the presentation was that greater emphasis should be placed on improving public health. He would argue that this is a very difficult outcome to assess and perhaps it should be re-phrased to reducing exposures. To do health assessments is beyond the budget of the program.

Dr. Farland agreed on the final comment and pointed out that the panel included indirect measures of public health, like reduced exposures at Superfund sites. Previous attempts at health assessments have had limited success.

Dr. Birnbaum informed Council that she and Dr. Gwen Collman are meeting with the head of EPA's grants program next week and, after hearing the comments, she believes there are opportunities to collaborate to address some of the Superfund needs.

Ms Stefani Hines referred to the action area of increasing investigations into the potential effects of emerging toxicants, novel compounds, agents, and activities. She wanted to know what toxicants the panel was referring to, since Superfund focuses on a particular set of chemicals.

Dr. Farland responded that the panel included the natural experiments ongoing with the use of zero-valent iron in remediation, but an additional concern is the aging sites. While the program started with a set of chemicals, those chemicals are aging and novel compounds are developing. A third area is the development of new remediation technologies that will place other compounds into the environment. We need to see how they impact the environment.

Ms Hines followed up with a request for comments on the panel review process.

Ms Witherspoon said this was her second review panel and found the experience very positive.

Dr. Jerold Schnoor stated that he was a Core Director on a Superfund grant, and he thanked the panel for their report. He went on to describe his experience with the community outreach component. As a researcher, it is heart-wrenching to interact with community members who want you to fix the problem. Community interest is strong, and opportunities may exist for the SRP to reach out to the communities impacted by Superfund sites.

Dr. Farland noted that many times the researchers are working on the cutting edge and they don't have the answers to the issues. There is a role for the investigators to be communicators and resources for the program, since they have background in the problems they investigate.

Dr. Hilary Carpenter commented that critical evaluation has its place, but it shouldn't detract from the success of the program. It's an outstanding program.

Dr. Birnbaum responded that the objective of the evaluation is not negative. The panelists agree that the program is great and unique, and the question is how it can be improved. It's hard to grow the program under current funding. She is optimistic that funding may improve in the next few years. It's important that people realize that SRP has always partnered with other agencies, but there may be opportunities to do more.

Dr. Palmer Taylor asked if trainees can be tracked to see if they go into areas related to the SRP. Is there a way for trainees to interact with the program once they graduate?

Drs. Suk and Heather Henry (NIEHS SRP) described the tracking of trainees that was initiated in the late 1990's. There are listserves and newsletters for current trainees and alumni. NIH has some ongoing career-tracking activities and SRP will be included in those in the future.

Dr. Christy Drew (NIEHS) stated that career-tracking is an NIH-wide goal. At the moment, there is no easy means to determine how successful trainees have been at receiving grant funding, but software is being developed to assist NIH in that activity.

Dr. Kevin Stephens asked if Council was being asked to vote on acceptance of the report.

Drs. Birnbaum and Collman responded that the purpose of the presentation was to have a discussion with Council and request comments. Otherwise, the draft report will go forward and comments will be noted. If changes are recommended, those would be considered.

Dr. Stephen Lloyd wanted to know if there were examples where Superfund activities have gone from bench to bedside, namely basic research has affected change in policy or practice, and where these could be used as success stories.

Dr. Farland said one example is that of arsenic contamination and some of the approaches for remediation and water treatment. Research has translated into practical work funded by EPA, which has gone on to be used in the field. The point is a good one and the panel believed that it was going to take more than this program to move research into practice.

Dr. Lloyd referred to earlier comments on the flat budget for the SRP. These success stories would be helpful in any attempt to persuade Congress to increase funding.

Dr. Birnbaum indicated that SRP has many success stories that could be cited, and NIEHS hasn't done a great job of communicating them. Having a list of them will be helpful while communicating with the public.

Dr. Graziano commented that Dr. Ken Olden, former NIEHS Director, always took stories to the hill and he thought that was why the funding increased in the past.

Dr. Birnbaum stated that SRP funding had grown very slowly compared to NIH budgets. She went on to say that NIEHS has communicated successes in the past and would continue to do so. She would be pleased to have Council's help in that endeavor.

Dr. Stephen Lloyd referred to the R01 program and asked how it was integrated with the P42 program. He wondered if there were ways to specifically link them together; perhaps in the review criteria for the competing renewals in a way similar to that of pilot projects in the P30s.

Dr. Suk responded that R01 grantees had always been incorporated into the annual meeting to provide a free flow of information between the programs. The ARRA funds were used specifically to encourage R01 grantees to work with P42 grantees. As for considering R01s as pilot projects for the P42s, he pointed out that the P42 mechanism is not a center mechanism and doesn't allow for pilot projects. Dr. Suk said that SRP would look into a way to spin R01s off of P42 programs.

Dr. Birnbaum reminded Council of the concept clearance for the VICTER program discussed in a previous meeting. The virtual center concept may be one way to integrate R01s and P42s.

Dr. Birnbaum then asked Council if they would prefer to keep to the agenda and have more discussion or to move into the Interim DERT Director's report after a short break. Council members indicated they would prefer the latter.

XIII. REPORT OF THE INTERIM DIRECTOR, DERT — Dr. Gwen W. Collman

Dr. Gwen Collman began her presentation by informing Council of staff changes in DERT. Dr. Ethel Jackson retired in July after 37 years of federal service. Dr. Christy Drew has been appointed Chief of the Program Analysis Branch. Dr. Claudia Thompson is the Acting Chief of the Susceptibility and Population Health Branch, and as of October 11, Dr. Jerry Heindel will be the Acting Chief of the Cellular, Organ Systems, and Pathobiology Branch. She went on to list retired staff who returned to assist with ARRA grants: Dwight Dolby and Carolyn Winters. Natasha Horowitz and Barbara Gittelman were hired to assist the Grants Management Branch, and Rachel Gross was hired as a Management Analyst, under the Administrative Fellows program. Wesley Brinson is the new supervisor of the Extramural Administrative Support Staff.

Dr. Collman went on to detail the status of the awards for ARRA funds. As of September 13, NIEHS had obligated $161 million to ARRA awards, and $19.1 million for the Superfund programs. Funds to DIR include $840,000 for equipment, $23 million for research and development contracts, one of which would support an extramural award to support dissemination of research results from the Breast Cancer Centers.

Dr. Collman reminded Council of the many mechanisms that DERT chose to distribute ARRA funds and went on to detail the number of applications received, number of awards made, and total dollars spent for each mechanism. Using pie charts, Dr. Collman demonstrated the distribution of the awards by number of awards and dollars allocated, pointing out that the extend-the-payline awards constituted the majority of the funds allocated, while the greatest number of awards were made in the administrative supplements.

The approach for decision-making was that of flexibility, looking for the best science, and identifying opportunities to fulfill the intent of the Stimulus Bill as directed by Congress. Dr. Collman described the iterative approach in making funding plans. Turning to the administrative supplements, Dr. Collman detailed the internal review process. A grand total of 140 supplements were funded, with 81 R01/P01 grants, 11 Centers, 6 Career, 18 for Worker Education and Training Program, and 24 for the SRP.

Dr. Collman continued her presentation with various stories about recipients of ARRA awards, describing the impact of ARRA funds. These included administrative supplements that allowed for increased hypothesis testing, furthered careers of young investigators, created jobs for researchers and assistants, and expanded opportunities for students. She went on to report an estimated 403 jobs were created, 98 jobs were retained, and 100 jobs were expanded.

Moving on to the Challenge Grant Program, Dr. Collman reported that of 598 applications assigned to NIEHS, 38 awards were made, a 6% success rate. NIEHS worked hard to maximize the success rate for this program. Stories about awards included testing and validating high-throughput methods, generation of engineered tissue models, environmental education, and community outreach to Alaskan native populations.

Dr. Collman described the awards to the autism initiatives. NIEHS participated in 3 of the 4 initiatives and funded 4 applications. She briefly described the outcomes of the Grand Opportunity (GO) grant program in nanomaterial safety and BPA exposure.

Dr. Collman ended her discussion by displaying slides on the recent and near-future solicitations for ARRA funds, weekly workload distribution during the processing of the ARRA applications, and the geographical distribution of ARRA grants. She thanked the many people involved in the process.

Council Response and Discussion

Ms Stefani Hines asked how the job numbers were calculated.

Dr. Collman explained that applicants were asked to provide that information when they applied for ARRA grants. Those figures were collected and collated.

Ms Hines commented that the numbers could be higher than estimated when the contributions from indirect costs are included.

Dr. Collman responded that there is also the economic benefit of the supplies and equipment purchased. NIH is creating an algorithm to extract the economic benefit from grantee expenditure reports. This will allow modeling, rather than manual, collection of that data.

Dr. Birnbaum commented that she was surprised not to see ARRA funds going to some states where NIEHS has considerable investment.

Dr. Collman responded that DERT screened to find the best projects to fund. Not all ARRA funds have been obligated and as they look to find appropriate projects to fund, they can go back and look at other applications received to look for good opportunities.

Dr. Birnbaum thought that, overall, the Institute did a wonderful job distributing awards across the country.

Dr. John Essigmann mentioned that NASA ensures that every state participates in their programs, and NIEHS may want to speak with them for advice.

Dr. Collman responded that various programs dipped deep in their piles of applications to make sure geographical and technical areas were covered.

Dr. Essigmann asked if the process had been as immune to political pressure as the usual NIH process.

Dr. Birnbaum stated that NIEHS had received expressions of support from Congress regarding particular applications. She said her standard response is to thank them for their interest, and refer them to the NIH peer review process.

Dr. Collman stated that most communications of that kind were for regular ES programs, rather than for applications to ARRA solicitations. She also said she received many calls from researchers who do not normally seek funding from NIH, to determine if their areas would be appropriate for the programs. Those involved with SBIR programs received calls from small businesses with the same questions.

Dr. Birnbaum asked if Dr. Collman knew how many non-traditional grantees received an award.

Dr. Collman responded that DERT can analyze how many awards are from first-time NIH grantees. A number of applicants to the challenge grants were submitting to NIH for the first time. It was tough to apply to NIH for the first time through grants.gov, and NIH is concerned about those who were frustrated by the process.

Ms Hines asked if NIH is thinking about what the large number of challenge grant applications and awards will mean for the future.

Dr. Collman said that NIH is very concerned about the increase in number of applications and the effects on budgets, workload and success rates. NIH has released guidance on resubmitting unsuccessful applications.

Dr. Palmer Taylor asked a question regarding the process for sharing grantee stories with the White House.

Dr. Collman indicated the Office of Communication is sharing these stories with many audiences, including the public and the White House.

Dr. George Leikauf asked how the number of jobs created from ARRA funds compared with the number created with regular funding. He indicated that, because the intent of the ARRA program was to create jobs, and comparative statistics would be good to report.

Dr. Collman responded that she didn't know how many jobs are created with regular funds.

Dr. Leikauf also wanted to know about the decision-making process for the ARRA grants, since the priority scores were broadly ranged. Some of the projects were originally scored in the 300s and fell in the 50th percentile.

Dr. Collman explained that the challenge grants were scored using the new scoring system of enhanced peer review. NIH staff is still trying to understand how the old system mindset fits into the new scoring system. The challenge grants were percentiled to give some overall

perspective. Program administrators looked at the applications, picking out those with the highest merit. Dr. Collman believes that the majority of the choices fall below the 12th percentile, with a few falling no more than the 16th percentile. In some cases the priority scores are higher than those normally paid under regular appropriations. Over the next few Council rounds, staff will work to understand what the new scores mean and how funding decisions compare to what have been seen in the past.

Dr. Collman went on to explain that decisions were not made on priority scores alone. For the higher scoring applications, the staff looked at the comments and discussed the merits of the applications extensively to make sure they were comfortable with their decisions. It should be understood that some of the higher-scoring applications funded under ARRA were from payline extensions from previous Council rounds. These had been peer reviewed as 5-year projects with a lot of science, and investigators were asked to reduce them to 2 years. Staff looked at the revised scope and considered it along with the intent for ARRA funding when making decisions. There were some unique opportunities in the conversion grants generated by focusing on the strongest parts of the applications.

Dr. Essigmann commented that this was a Herculean task and decisions were obviously thoughtfully made. He wondered if other Institutes were as thoughtful.

Dr. Collman responded that each Institute had its approach and made its decisions in its own way according to its culture and budget. She thought each Institute had a reasoned approach. NIEHS was guided by the need to be accountable and transparent.

Dr. Birnbaum adjourned the meeting for the day at 5:00 pm.

OPEN PORTION OF THE MEETING
SEPTEMBER 16, 2009 – 8:30 – 10:30 am

Dr. Birnbaum opened the meeting and welcomed everyone back. She asked Dr. Collman to remind Council members of the requirements for confidentiality and conflict of interest. Dr. Collman read the procedures to Council and reminded Council to sign their forms.

Dr. Collman explained that NIEHS has not received the new slate for Council, so memberships for those whose terms are up will be extended for 120 days. Dr. Collman asked that they put the next Council dates on their calendars.

Dr. Birnbaum explained the next two presentations would be on the two signature projects for the ARRA Grand Opportunity Program.

XIV. STAFF REPORT, BISPHENOL A: RESEARCH TO IMPACT HUMAN HEALTH – Dr. Jerold Heindel

Dr. Heindel started his presentation by explaining some background on the solicitation. He said that grants under this program have the opportunity to not only impact human health but also public health, policy, and regulation. He went on to describe the use of BPA as a monomer that, when polymerized, is used in plastics, packaging materials and sealants. Human exposure occurs when the monomer leaches out of polymerized materials. The monomer has estrogenic properties in animal model systems, even at low environmental concentrations.

Dr. Heindel described the intent of the solicitation was to assist the FDA in collecting data adequate to support regulatory decisions on the use of BPA. After analyzing data available on

BPA toxicity, the FDA had written a draft report which would indicate BPA was safe. A subcommittee of the FDA Science Board reviewed the draft report and issued the opinion that the report was not based on science, and the FDA should re-examine their conclusions. FDA asked the NTP and NIH for assistance in obtaining data to support regulations regarding BPA.

ARRA funds were an opportunity to support studies focused on the needs of the FDA for targeted studies. The announcement was written to direct investigators on the rigorous requirements for the studies to generate data usable by the FDA. Selected grantees would serve as a consortium focused on the animal and human health effects of BPA exposure.

Dr. Heindel stated that 42 applications were received and 41 were reviewed. Of the 24 applications discussed, 10 were funded, and project titles and investigators were listed. He ended his presentation on the plans for grantees to meet in October, along with other BPA researchers, to maximize impact of the research.

Council Response and Discussion

Dr. David Christiani commented that he was impressed with the coordination of the program and the focus on standardized measurements.

XV. STAFF REPORT, NANOMATERIALS ENVIRONMENTAL HEALTH AND SAFETY – Dr. Sri Nadadur

Dr. Nadadur began by explaining that environmental health and safety of engineered nanomaterials (ENMs) is a priority area for NIEHS, and the ARRA funding provided an opportunity for the Institute to further the agenda. He went on to describe previous NIEHS activities in nanosafety and collaborations with other federal and international partnerships in the field. Research on nanomaterials is supported in regular NIEHS appropriations, as well as the SRP and NTP.

Dr. Nadadur then described the physical characteristics of ENMs that make them of interest: their small size, high surface area, and high reactivity. The use of ENMs is increasing rapidly, but toxicity and human exposure data on them are limited and sometimes contradictory.

The goals of the solicitation were to develop reliable and reproducible methods to assess exposure and biological response/toxicological endpoints for ENMs; develop guidelines for ENMs environmental health effects and safety; and use a consortium approach to accomplish coordinated and integrated research efforts.

Dr. Nadadur stated that 42 applications were received. Of the 27 applications discussed, 10 received awards. He went on to list the project titles and investigators of the successful applications, and summarized the materials investigated, models and methods used, biological responses and exposure metrics measured. He ended his presentation with a discussion of plans for a grantee meeting in October where investigators would coordinate their research activities.

Council Response and Discussion

Ms Stefani Hines remarked that both the BPA and nanosafety programs will use initial grantee meetings to coordinate future research activities. Usually, grantee meetings are used to share research results. She wanted to know if this way was a new approach.

Drs. Nadadur and Collman explained that these programs have particular goals for the program and particular needs of NIEHS partners. Given the short timeline of 2-year grants, the programs are trying to jumpstart the coordination of activities.

Ms Hines went on to say it has the potential for ensuring high productivity.

Dr. Jerold Schnoor wanted to reiterate the previous comment in particular with respect to the ENM research. The ways ENMs are introduced into biological systems are highly variable, so it's wise to standardize the approaches.

Dr. Birnbaum thanked the speakers for their reports and discussed with Council whether to proceed into the closed session. Ms Stefani Hines requested open discussion on the items for the retreat. Dr. Birnbaum said to proceed.

XVI. OPEN DIALOGUE

Ms Hines noted that some ideas were discussed the previous day, but some other ideas include processes for input into various areas. One example is the structure, planning, and preparing for Council meetings. Council would like to have thoughtful input into the agenda. A number of ideas are put forth but some prioritization of the ideas would make them more meaningful and functional. For example, better understanding of the budget is needed. Council is enthusiastic about some good ideas, but it's difficult to see how they fit within the research priorities, or into the big picture, since they don't have a good overall view of the budget. She also asked if there a process for follow up on questions and issues that came up in previous Council meetings.

Dr. Collman asked Council to email any suggestions for the retreat in February. If Council has interests in scientific or procedural topic areas, send those to help NIEHS staff formulate plans for the meeting. As soon as there is a framework for the meeting, she would share it with them.

Dr. Schnoor observed that among Council members, two things are popular: greater input into the agenda, and an opportunity for open-ended discussions to brainstorm over future issues and directions for NIEHS.

Dr. Birnbaum agreed that an open-ended discussion would be good to have at the retreat. She indicated she was open to suggestions for agenda items, and to email her with those.

Ms Hines said that there is no process for Council members to view agenda items suggested by other members and prioritize them.

Dr. Birnbaum responded that copying fellow Council members on emails is a good idea. There is a timeliness issue with regards to vetting agenda items through Council. Items brought up early in the process could be discussed by email. She suggested that everyone think more about ideas of how to do this, but there are opportunities for Council to bring items that they would like to discuss.

Dr. Grace LeMasters commented that one idea was to have one person designated as liaison to NIEHS and funnel suggestions through that person.

Dr. Steve Kleeberger said there is precedent for that and NIEHS could look into implementing it. Dr. Birnbaum thought it was an excellent idea and, while she would look into established mechanisms for it, she saw no reason why it couldn't be done if Council would like to do this.

Dr. Joseph Graziano pointed out that sometimes Council is asked to comment on something, but they don't have access to the document until the last minute. Dr. Collman acknowledged that timeliness in getting material to Council has been an ongoing issue.

Dr. Birnbaum asked Council to send comments to her if, upon reflection, they have comments on anything they have heard or seen at Council meeting.

Ms Stefani Hines thanked Dr. Birnbaum for listening to their suggestions. She had been looking over the "sense of Council" presentation that was given to Dr. Sam Wilson when he was Interim Institute Director, and she was happy to see that all of the recommendations from Council had been implemented. She wanted to publicly acknowledge the outstanding efforts to address concerns of Council.

Dr. Birnbaum announced that if there were no more comments, Council would go into closed session.

CLOSED PORTION OF THE MEETING
SEPTEMBER 16, 2009 – 10:30 - 11:30 am

XVII. 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 September 2009 Council considered 293 NIEHS applications requesting $96,832,041 in total cost and recommended 154 applications with a total cost of $48,739,869.

XVIII. ADJOURNMENT OF THE NAEHS COUNCIL

The meeting was adjourned at 11:30 AM on September 16, 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

NATIONAL ADVISORY ENVIRONMENTAL HEALTH SCIENCES COUNCIL

September 15-16, 2009

Stephen B. Baylin, M.D. (11)
Department of Oncology and Medicine
The Bunting Blaustein Cancer Research Bldg.
The Johns Hopkins University School of Medicine
1650 East Orleans Street, Suite 544
Baltimore, Maryland 21231

Christopher A. Bradfield, Ph.D. (11)
McArdle Laboratory for Cancer Research
University of Wisconsin Medical School
1400 University Avenue
Madison, WI 53706

Hillary Carpenter, Ph.D. (10)
Minnesota Department of Health
P.O. Box 64975
St. Paul, Minnesota 55164

David Christiani, MD (09)
Department of Environmental Health
Harvard School of Public Health
665 Huntington Ave
Boston, Massachusetts 02115

John Essigmann, Ph.D. (09)
Professor of Chemistry, Toxicololgy, and Biological Engineering
Department of Chemistry and
Department of Biological Engineering
Room 56-669
Massachusetts Institute of Technology
77 Massachusetts Ave
Cambridge, Massachusetts 02139

Richard H. Finnell, Ph.D. (11)
Executive Director and President
Texas Institute for Genomic Medicine
Margaret M. Alkek Professor of Medical Genetics and Regents Professor Institute of
Biosciences and Technology
The Texas A&M University System Health Science Center
2121 W. Holcombe Blvd
Houston, TX 77030

Joseph H. Graziano, Ph.D. (09)
Associate Dean for Research
Professor of Environmental Health Sciences
And Pharmacology
Mailman School of Public Health
Dept. of Environmental Health Sciences
60 Haven Avenue, Level B-1
New York, New York 10032

Stefani Hines, M.A., M.S. (09)
Assistant Dean for Assessment & Environmental Health Sciences Specialist
UNM College of Pharmacy and
NM Environmental Health Sciences Center
MSC 09 5360
1 University of New Mexico
Albuquerque, New Mexico 87131-0001

George D. Leikauf, Ph.D. (10)
Department of Environmental and Occupational Health
Graduate School of Public Health
University of Pittsburgh
100 Technology Drive, Suite 350
Pittsburgh, PA 15219-3130

Grace LeMasters, Ph.D. (12)
Professor, Epidemiology and
Director, Molecular Epidemiology Training Program
Dept of Environmental Health
UC College of Medicine
PO Box 670056
Cincinnati, Ohio 45267

R. Stephen Lloyd, Ph.D. (12)
Senior Scientist, CROET
Professor, Molecular and Medical Genetics
CROET at Oregon Health and Science University
3181 SW Sam Jackson Park Road, L606
Portland, Oregon 97239-3098

Janet McCabe, J.D. (12)
Improving Kids' Environment
3951 N. Meridian St. #160
Indianapolis, Indiana 46208

NATIONAL ADVISORY ENVIRONMENTAL HEALTH SCIENCES COUNCIL

September 15-16, 2009

Sem H. Phan, M.D., Ph.D. (12)
Department of Pathology
University of Michigan Medical School
109 Zina Pitcher Pl
4058 BSRB
Ann Arbor, Michigan 48109-2200

Kenneth S. Ramos, Ph.D. (10)
Distinguished Professor
Department of Biochemistry and Molecular Biology
and Director Center for Genetics and Molecular
Medicine
University of Louisville
319 Abraham Flexner Way
Louisville, Kentucky 40292

Jerald L. Schnoor, Ph.D. (11)
Allen S. Henry Chair in Engineering
Department of Civil and Environmental Engineering &
Co-Director, Center for Global and Regional
Environmental Research & Editor-in-Chief
Environmental Science and Technology
(American Chemical Society)
The University of Iowa
4119 Seamans Center
Iowa City, IA 52242

Kevin U. Stephens, M.D., J.D. (09)
Department of Health
City of New Orleans
9801 Lake Forest Boulevard
New Orleans, Louisiana 70127

Palmer Taylor, M.D. (12)
Dean
University of California, San Diego
Skaggs School of Pharmacy and Pharmaceutical
Sciences
9500 Gilman Dr. #0657
La Jolla, California 92093-0657

Nsedu Obot Witherspoon, MPH (11)
Executive Director
Children's Environmental Health Network
110 Maryland Avenue, N.E., Suite 505
Washington, D.C. 20002

Ex Officio Members

CPT Michael J. Macinski
Director of Public Health
MSC, USN Navy and Marine Corps Public Health
Center
620 John Paul Jones Circle
Suite 1100
Portsmouth, VA 23708

Chairman
Linda S. Birnbaum, Ph.D, D.A.B.T., A.T.S
Director
National Institute of Environmental Health Sciences
and National Toxicology Program
PO Box 12233
Durham, North Carolina 27709

Executive Secretary
Gwen W. Collman, Ph.D.
Interim Director
Division of Extramural Research and Training
National Institute of Environmental Health Sciences
PO Box 12233
Durham, North Carolina 27709