

**NATIONAL INSTITUTES OF HEALTH
NATIONAL LIBRARY OF MEDICINE®**

**ENVIRONMENTAL HEALTH
INFORMATION PARTNERSHIP**

PROCEEDINGS

National Library of Medicine
Bethesda, Maryland
April 23-24, 2014

NLM IN ACTION

Prepared for
Division of Specialized Information Services
National Library of Medicine

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**NATIONAL LIBRARY OF MEDICINE
ENVIRONMENTAL HEALTH INFORMATION PARTNERSHIP**

Theme: NLM in Action

**Board of Regents Room
Mezzanine, Bldg. 38
April 23-24, 2014
Ann Barbre, PhD, Presiding**

AGENDA

WEDNESDAY, APRIL 23, 2014

- | | |
|-------------------------|--|
| 8:30 a.m. – 9:00 a.m. | Registration and Continental Breakfast |
| 9:00 a.m. – 9:05 a.m. | Meeting Opening and Welcome
Ann Barbre, PhD
Chairman, EnHIP |
| 9:05 a.m. – 9:20 a.m. | Welcome and Remarks
Donald A.B. Lindberg, M.D.
Director, NLM |
| 9:20 a.m. – 9:30 a.m. | Introductions
Ann Barbre, PhD |
| 9:30 a.m. – 9:50 a.m. | TOXNET: Data Update and New Interface
Shannon Jordan, MPH
Division of Specialized Information Services, NLM |
| 9:50 a.m. – 10:00 a.m. | Discussion and Q&A
Facilitated by Ann Barbre, PhD, and Robert Copeland, Jr., PhD |
| 10:00 a.m. – 10:15 a.m. | BREAK |
| 10:15 a.m. – 10:45 a.m. | Science Response: How NLM Supports Preparedness and Emergency Operations
John Koerner, MPH, CIH
Chief, CBRNE Branch
Tactical Program Division, Office of Emergency Management, HHS |
| 10:45 a.m. – 11:00 a.m. | Discussion and Q&A
Facilitated by Ann Barbre, PhD, and Doris Withers, PhD |

**NATIONAL LIBRARY OF MEDICINE
ENVIRONMENTAL HEALTH INFORMATION PARTNERSHIP
Board of Regents Room
Mezzanine, Bldg. 38**

AGENDA

- 11:00 a.m. – 11:30 a.m. **The NIH Big Data to Knowledge Initiative**
Michael F. Huerta, PhD
Associate Director, Health Information Development
National Library of Medicine
- 11:30 a.m. – 11:45 a.m. **Discussion and Q&A**
Facilitated by Ann Barbre, PhD, and EnHIP members
- 12:00 p.m. – 1:20 p.m. **LUNCH**
Native Voices Traveling Exhibit to North Dakota Video
Led by Donald A.B. Lindberg, MD
Director, NLM
- 1:30 p.m. – 2:15 p.m. **Keynote Address: The Human Microbiome: What It Is
and How It Affects Your Health**
Lita Proctor, PhD
Project Coordinator, NIH Human Microbiome Project
National Human Genome Research Institute, NIH
- 2:15 p.m. – 2:25 p.m. **Discussion and Q&A**
Facilitated by Bailus Walker, Jr., PhD, and
Ann Barbre, PhD
- 2:25 a.m. – 2:45 p.m. **EnHIP Group Picture**
Bill Branson, Photographer, NIH
Lobby of Bldg. 38 (or outside near totem pole)
National Library of Medicine
- 2:45 p.m. – 3:15p.m. **NIH and NLM Grant Programs**
Valerie Florance, PhD
Associate Director for Extramural Program
National Library of Medicine, NIH
- 3:15 p.m. – 3:30 p.m. **Discussion and Q&A**
Facilitated by Ann Barbre, PhD
- 3:30 p.m. – 3:45 p.m. BREAK
- 3:45 p.m. – 4:45 p.m. **EnHIP in the Next 10 years**
Led by Janice Kelly, MS, Ann Barbre, PhD, and EnHIP
members
- 4:45 p.m.-5:00 p.m. **Wrap-up and Day 2 Overview**
Ann Barbre, PhD

**NATIONAL LIBRARY OF MEDICINE
ENVIRONMENTAL HEALTH INFORMATION PARTNERSHIP
Board of Regents Room
Mezzanine, Bldg. 38**

AGENDA

THURSDAY, APRIL 24, 2014

- 8:45 a.m. – 9:00 a.m. Registration
- 9:00 a.m. – 9:05 a.m. **Welcome and Introductions**
Ann Barbre, PhD
Chairman, EnHIP
- 9:05 a.m. – 9:30 a.m. **Overview of Office of Clinical Toxicology, SIS**
Pertti (Bert) J. Hakkinen, PhD
Acting Head, Office of Clinical Toxicology Specialized
Information Services, National Library of Medicine
- 9:30 a.m. – 9:40 a.m. **Discussion and Q&A**
Facilitated by Ann Barbre, PhD, and EnHIP members
- 9:40 a.m. – 10:00 a.m. **Encouraging EnHIP Schools to Apply for Outreach
Awards**
Janice Kelly, MLS
Chief, Outreach and Special Populations Branch
National Library of Medicine, SIS
- 10:00 a.m. – 10:30 a.m. **Pill Images: Current Status and Upcoming Informatics
Research Challenge**
Michael Ackerman, PhD
Office of High Performance Computing and
Communications National of Medicine
- 10:30 a.m. – 10:45 a.m. BREAK
- 10:45 a.m. – 11:15 a.m. **EnHIP Outreach Awards Presentations**
Paul Tchounwou, PhD, Jackson State University
João Ferreira-Pinto, PhD, University of Texas at El Paso
- 11:15 a.m. – 11:50 a.m. **Summary of Plans for EnHIP**
Discussion and Q&A
Led by Ann Barbre, PhD
- 11:50 a.m. – 12:00 p.m. **Closing Remarks**
Ann Barbre, PhD

**DEPARTMENT OF HEALTH & HUMAN SERVICES
NATIONAL INSTITUTES OF HEALTH
NATIONAL LIBRARY OF MEDICINE**

**PROCEEDINGS OF THE ENVIRONMENTAL HEALTH
INFORMATON PARTNERSHIP MEETING**

April 23-24, 2014

The Environmental Health Information Partnership (EnHIP) convened on April 23, 2014, at 8:30 a.m. in the National Library of Medicine (NLM) Board of Regents Room, Building 38, National Institutes of Health, Bethesda, Maryland. EnHIP Chairman Dr. Ann Barbre, Professor and Associate Dean of Pharmacy, Xavier University of Louisiana, and EnHIP Chairman, presided. The theme of the meeting was “NLM in Action”. Representatives convened again April 24, 2014, at 8:45 a.m. in the NLM Board of Regents Room until adjournment at 12:00 p.m.

ATTENDEES

Representatives from Participating Institutions

Dr. Ann Barbre, Xavier University of Louisiana
Ms. Marnie Carroll, Colorado Mountain College
Dr. Robert Copeland, Jr., Howard University
Dr. Arlene Montgomery, Hampton University
Dr. Doris Withers, Medgar Evers College, City University of New York
Dr. Diógenes Herreño-Sáenz, PhD, University of Puerto Rico
Dr. Doris Holeman, Tuskegee University
Dr. Judith Mazique, Texas Southern University
Dr. Cheryl Taylor, Southern University Baton Rouge
Dr. Paul Tchounwou, Jackson State University

Alternate Representatives

Dr. Stephanie Bauer, University of Alaska Anchorage
Dr. Melissa Littlefield, Morgan State University
Mr. Joe Swanson, Jr., Morehouse School of Medicine
Ms. Linda De Long, Oglala Lakota College
Dr. João Ferreira-Pinto, The University of Texas at El Paso
Ms. Dolores Caffy-Fleming, Charles Drew University of Medicine & Science
Dr. Otis Kirksey, Florida A&M University

Consultants to the EnHIP

Dr. Bailus Walker, Jr., Howard University College of Medicine (Senior Scientific Advisor)

Speakers

Dr. Donald A.B. Lindberg, Director, NLM
Dr. Michael Ackerman, NLM
Dr. Valerie Florance, NLM
Dr. Pertti (Bert) J. Hakkinen, NLM
Dr. Michael Huerta, NLM
Ms. Shannon Jordan, NLM
Mr. John F. Koerner, HHS
Dr. Lita M. Proctor, National Human Genome Research Institute, NIH

NLM Staff

Dr. Donald A.B. Lindberg, Director, NLM
Ms. Betsy Humphreys, Deputy Director, NLM
Ms. Gale Dutcher, Division of Specialized Information Services, NLM
Ms. Cynthia Gaines, Division of Specialized Information Services, NLM
Dr. Michael Huerta, Office of Health Information Programs Development, NLM
Ms. Janice Kelly, Division of Specialized Information Services, NLM
Ms. Laura Bartlett, Division of Specialized Information Services, NLM
Ms. Nicole Scott, Division of Specialized Information Services, NLM
Mr. Dylan Rain Tree, Division of Specialized Information Services, NLM
Dr. Robert Logan, Office of the Director, NLM
Dr. Frederick Wood, Office of the Director, NLM
Dr. Barbara Rapp, NLM
Ms. Mitzi-Ann Allen, NLM
Ms. Benaz Rashid, NLM
Ms. Rose White, Division of Specialized Information Services, NLM
Mr. James Charuhas, Division of Specialized Information Services, NLM

ORISE Staff

Ms. Wilma Templin-Branner

ICF Staff

Ms. Brooke Sales

I. Meeting Opening and Welcome

EnHIP Chairman Dr. Ann Barbre, Professor and Associate Dean of Pharmacy, Xavier University of Louisiana, opened the meeting on April 23, 2014, at 8:30 a.m. in the Board of Regents Room, Building 38, National Library of Medicine (NLM), Bethesda, Maryland. She welcomed representatives and guests and asked all attendees to introduce themselves. She recognized Dr. Donald A.B. Lindberg, Director, NLM, for his vision and leadership. Also, she thanked the EnHIP Executive Committee for selecting outstanding program speakers. The theme “NLM in Action” has been regarded as a very relevant topic in connection with NLM and EnHIP missions.

II. Welcome and Remarks

Dr. Donald A.B. Lindberg, Director, NLM, welcomed the representatives and invited guests to the meeting. He explained that the National Institutes of Health (NIH) has developed an idea called Medical Mysteries, a program focused on the study of genomics. He encouraged anyone given the opportunity to participate in this type of study to do so.

Dr. Lindberg engaged in a discussion with EnHIP representative Marnie Carroll, who stated she had cancer but is now in remission. He congratulated her on winning the battle with the disease and emphasized the importance of research and early detection of diseases.

Dr. Lindberg thanked the participants for their many contributions to EnHIP, their professions, and communities. He previewed the *Native Voices: Native Peoples' Concepts of Health and Illness* video, to be shown during the lunch hour.

III. TOXNET®: Data Update and New Interface

Ms. Shannon Jordan, Chemist, works as part of the chemical information team in the Biomedical Information Services Branch, SIS, NLM. Ms. Jordan started her presentation by describing TOXNET®, a resource for searching databases on toxicology, hazardous chemicals, environmental health and toxic releases. She reviewed the updated TOXNET interface which was put in place after extensive usability testing. In addition to a new look and functionality, improved navigation and access to search features have enhanced the user experience. She demonstrated various functions, such as downloading records, searching details, obtaining history, and saving records. Additional enhancements to TOXNET include categorized databases, updated frequently asked questions, and support pages.

Ms. Jordan discussed the most-visited databases by TOXNET users. She highlighted various topic areas including breastfeeding and drugs, developmental toxicology literature, and chemical releases and mapping.

Ms. Jordan provided data updates on the Hazardous Substance Data Bank (HSDB) with regard to nanomaterials records, links from chemical ingredients to consumer products, consumer-level chemical overviews, and Globally Harmonized System of Classification and Labelling of Chemicals (GHS) data.

IV. Discussion and Q&A with Ms. Shannon Jordan

Ms. Jordan's presentation was well received and led to an informative question-and-answer session facilitated by Dr. Barbre and Dr. Robert Copeland, Jr., Howard College of Medicine. Representatives asked about training programs. Ms. Jordan stated that TOXNET's training program is administered by the National Library of Medicine Training Center (nmlm.gov/ntc). Recently completed beta testing of an online training course went well. A calendar showing upcoming online and in-person trainings will be displayed on the TOXNET Web page in the future. EnHIP representatives expressed positive comments about the new TOXNET interface. Ms. Jordan stated that the goal is to have it available in May.

V. Science Response: How NLM Supports Preparedness and Emergency Operations

John F. Koerner, Chief, Chemical, Biological, Radiological, Nuclear, and Explosives Branch Tactical Program Division, Office of Emergency Management, HHS provided a presentation on how NLM supports preparedness and emergency operations.

During Mr. Koerner's presentation, he discussed the U.S. Department of Health and Human Services (HHS)/Office of the Assistant Secretary of Preparedness and Response (ASPR) roles and structure, and the ASPR linkage to NLM. He shared goals of the National Health Security Strategy: to build community resilience and to strengthen and sustain health and emergency response systems. He discussed its ten strategic objectives and operational capabilities.

Mr. Koerner introduced the representatives to ASPR, the office that coordinates and directs the HHS public health and medical emergency preparedness and response programs. The mission of ASPR is to prevent, prepare for, respond to, and recover from the adverse health effects of public health emergencies and medical disasters. It is the vision of ASPR that the nation's health and response systems and communities will be prepared, responsive, and resilient to limit the adverse health impact of emergencies and disasters.

Mr. Koerner discussed the role of HHS, saying it serves as the primary agency for Emergency Support Function #8, or ESF #8. HHS coordinates with its Federal partners to provide assistance to state, local, tribal, and territorial governments in identifying and meeting public health and medical requirements resulting from incidents of national significance. He went on to discuss ESF #8 in more detail and highlighted the HHS Secretary's Operations Center in Washington, D.C., and the U.S. Centers for Disease Control and Prevention (CDC) Operations Center in Atlanta, Georgia.

Additionally, he provided examples of resources, such as Chemical Hazards Emergency Medical Management (CHEMM) and Radiation Emergency Medical Management (REMM). These might be especially useful to EnHIP representatives. CHEMM was developed for training, planning, and response in times of emergency. The audiences for CHEMM include responders, pre-hospital personnel, hospital-based personnel, health care providers, planners, and trainers.

Mr. Koerner discussed an analysis of the Media Decision Model and provided the following examples of application in recent responses: Hurricane Sandy, Haiti earthquake, North Dakota floods, and the presidential inauguration.

ASPR links with NLM through REMM Web-based research. It was produced by HHS, ASPR, Office of Planning and Emergency Operations, in cooperation with NLM/SIS and with subject matter experts from the National Cancer Institute, CDC, and many U.S. and international organizations. The goals of the Web site are as follows:

- provide guidance for health care providers (primarily physicians) about clinical diagnosis and treatment of radiation injury during radiological and nuclear emergencies;
- provide just-in-time, evidence-based, usable information with sufficient background and context to make complex issues understandable to those without formal radiation medicine expertise; and
- provide Web-based information that is downloadable in advance so that it would be available during an emergency if the Internet is not accessible.

VI. Discussion and Q&A with Mr. John F. Koerner

Dr. Barbre and Dr. Doris Withers, Medgar Evers College, City University of New York, facilitated a question-and-answer session following Mr. Koerner's presentation. Dr. Cheryl Taylor, Southern University Baton Rouge, asked if librarians are part of preparedness and planning. She stated it is known that librarians are called to respond to emergencies. Mr. Koerner stated that at the Federal level, the head of the National Library of Medicine is the Office of Planning and Emergency Operations informatics research and analysis specialist. Questions that arise during disasters can be addressed by librarians. As the conveyers of knowledge, librarians are often called upon in emergency and disaster situations.

Mr. Joe Swanson, Jr., Morehouse School of Medicine, asked about the average response time of ASPR for a typical issue. Mr. Koerner stated that response time varies. A disaster recognized before it happens is called a "notice disaster." An example is a hurricane, a natural disaster tracked by weather officials as it develops and grows in strength. In such cases, ASPR pre-deploys the medical, public health, communications, and assessment teams so that they can move quickly and begin negotiations with the health departments. For a "no-notice event," response can be within 12-24 hours for delivery of materials for medical response teams.

In response to a question, Mr. Koerner answered that the Federal Emergency Management Agency (FEMA) operates the national response framework, making it the overall coordinator of response. ASPR is responsible for Emergency Support Function #8.

Dr. Melissa Littlefield, Morgan State University, asked if any of the agencies under HHS have a mandate or initiatives to prepare communities to be resilient. Mr. Koerner indicated a number of initiatives focused on community resilience. Public health preparedness grants offered by the CDC encourage engagement by leadership at the local level.

VII. The NIH Big Data to Knowledge Initiative

Dr. Michael Huerta, Associate Director, Health Information Development, NLM, explained the NIH Big Data to Knowledge Initiative, better known as BD2K. He remarked that the initiative has a large presence of NLM leadership, and it is supported jointly by all NIH Institutes and Centers.

Dr. Huerta stated the biomedical research enterprise of today is not data-centric. Although there are many labs, the research community does not have access to much data. More data will be available in the future through the adoption of standards that will bring data into the research ecosystem. Data science and tools will enable scientific innovation.

The NIH Big Data to Knowledge Initiative is a significant, unique, and transformative initiative. It will allow NIH to fund research, development, and training. The BD2K Initiative has three major thrusts: advance the science and technology of big data, enhance and develop the workforce in biomedical big data, and facilitate broad use of biomedical data. The impact of the BD2K Initiative will increase data sharing, promote standards, and make data more usable.

To facilitate broad use of biomedical data, changes to policy, practice, and culture are required. His recommendations for achieving these changes are data management and sharing plans for all research projects; peer review of management and plans; information from investigators about data for cataloging; and use of existing standards and repositories. According to Dr. Huerta, the impact of the BD2K Initiative will achieve its four main objectives. They are as follows:

- Increased data sharing will make data available.
- Promotion of standards will make data usable.
- Data will be brought into the research ecosystem.
- Data science and tools will enable scientific innovation.

In closing, Dr. Huerta stated that the BD2K Initiative will fulfill the vision of the data of tomorrow by making the biomedical research enterprise more data-centric.

VIII. Discussion and Q&A with Dr. Michael H. Huerta

In the discussion that followed the presentation, Dr. Huerta was asked by Dr. Doris Withers to share some examples of data categories that are part of this initiative. Dr. Huerta responded that all data conducted with NIH funding is included.

Dr. Taylor asked who owns and controls the data; she expressed concern about data misuse. Dr. Huerta stated that the sharing of data will be heavily influenced by peer review; these individuals understand the science and the community. If there is a reason to not share the data, then the reviewers will block publication.

Dr. Withers shared concerns about the security of the data. Dr. Huerta explained that the data will not include personally identifiable information. The creators have developed a system where the principal investigator has personal information about the research participant, but the information is never shared. Information is exchanged with a global unique identifier for the purpose of the study.

IX. Native Voices Traveling Exhibit to North Dakota Video

During a working lunch, Dr. Donald A.B. Lindberg, Director, NLM, introduced a video related to the exhibit *Native Voices: Native Peoples' Concepts of Health and Illness*. The video displayed how health, illness, and cultural life form a unique and interconnected relationship in the lives of Native Americans, Alaskan Natives, and Native Hawaiians. Native peoples are far from a single, homogeneous group; they have varying beliefs and practices. However, their shared values and experiences have helped reinforce the importance of community, spirit, and the land for countless generations.

After lunch, many of the representatives viewed the exhibit on view in the NLM rotunda.

X. The Human Microbiome: What It Is and How It Affects Your Health

Dr. Barbre and Dr. Bailus Walker, Jr., EnHIP Senior Scientific Advisor of Environmental Health, introduced the keynote speaker, Dr. Lita M. Proctor, Program Director, National Human Genome Research Institute. Dr. Proctor is a member of the Division of Genomic Sciences in the Extramural Research Program.

Dr. Proctor began her presentation by defining the human microbiome. Microbes live in and on the human body and have genetic capabilities.

She shared information about the Human Microbiome Project, which started in 2008 and will continue until 2016. To date, \$194 million has been spent on the project which involves more than 400 scientists and more than 80 institutions. Phase one of the project is to survey the microbiome in humans, and phase two is to understand the key functions of the microbiome and the host.

Dr. Proctor led representatives through a brief natural history of the human microbiome. It is acquired at birth and it matures over the first few years of life. She discussed how the human body is a matrix of microbiomes; each microbiome is unique to each part of the body.

To explain population differences in the microbiome, she portrayed a comparison of gut microbiomes in populations of East Asian ancestry with those in populations of European ancestry. Microbial community composition differs in all populations that were studied, proving that there are external factors which affect the microbiomes.

Dr. Proctor emphasized the relationship of microbiomes and human health. The immune system cannot develop properly without the microbiome. Microbiota and host interact to regulate human health. The composition of the microbiome changes over our lifetimes; it is impacted by diet and environment; it differs in health and disease.

In closing, Dr. Proctor revealed a growing list of potential microbiome-associated diseases. Diseases include irritable bowel disease, ulcerative colitis, Crohn's disease, gastroesophageal reflux disease, psoriasis, cardiovascular diseases, nonalcoholic liver disease, alcoholic steatosis, asthma, cystic fibrosis, some cancers, and some mental health disorders.

XI. Discussion and Q&A with Dr. Lita M. Proctor

Dr. Walker and Dr. Barbre facilitated a discussion about the human microbiome following Dr. Proctor's presentation. Representatives were interested to learn if there is an individualized fingerprint for each person. Dr. Proctor stated that each person is a carrier of unique microbes.

XII. NIH and NLM Grant Programs

Dr. Valerie Florance, Associate Director for Extramural Programs, NLM, presented an overview of the NIH grant programs. Grants are offered by 24 of the 27 NIH Institutes and Centers. Grants are made available through program announcements, requests for applications, and requests for proposals. Multiple exploratory steps help applicants find grants. They can read sample grant research plans and summary sheets, look at funded grants by searching the NIH RePORTER, or use the "Get Grant Writing Tips" from the NIH web site. To submit an application via Web site grants.gov, individuals must register at three different Web pages.

Applications for support from NIH are evaluated initially by peer review groups composed of

scientists from the extramural research community. The objective of the peer review is to evaluate and rate the specific and technical merit of the proposed research or research training project. NIH policy requires that a peer review be carried out in a manner that ensures objectivity, fairness, and maximum competition. When NIH is considering what to fund, they take into account portfolio balance, availability of funds, program priority, relevance of the program to the mission of the institute/center, and the technical merit of the application as assessed by the peer review.

Last year, which was a sequestration year, NLM awarded 27 new grants and continued with 96 existing grants. Dr. Florance discussed NLM resource grants to reduce health disparities and administrative supplements for information services. These grants will provide \$50K per year plus indirect costs for two years to add in-context information specialists to existing NIH-funded research grants.

Dr. Florance explained that if individuals need help with proposals they can contact the program officer assigned to the topic areas of Clinical and Public Health Informatics, Bioinformatics and Translational Informatics, or Consumer Health Informatics.

XIII. Discussion and Q&A with Dr. Valerie Florance

Representatives asked Dr. Florance to describe the steps for searching NIH RePORTER for the “circles” graphic. The circles visualization shows a limited number of projects. Wedges can be clicked to show more information. Dots represent projects; dots will darken as they relate to the search terms. Dr. Florance demonstrated the steps and stated that she will distribute instructions after the meeting.

XIV. EnHIP in the Next 10 Years

Ms. Janice Kelly, Chief, Outreach and Special Populations Branch, SIS, NLM, encouraged representatives to discuss how best to focus membership, leadership, and engagement of EnHIP so the Partnership continues the successes of the past and gains strength for future challenges. She framed the discussion by stating the continuing challenges of budgetary limitations, changing technologies, and the new strategic initiatives of NLM and partnering institutions.

Representatives extolled the value of EnHIP to partnering institutions and of the EnHIP Outreach Awards. Marnie Carroll, Colorado Mountain College, spoke positively about the ease of obtaining the awards. Dr. Doris Withers said EnHIP information resources benefited students and provided opportunities for them. She partnered with the Brooklyn Public Library to share NLM and NIH resources with the community.

Judith Mazique, Texas Southern University, explained that she has used many NLM resources in various areas in her work and shared them with students.

Dr. Cheryl Taylor shared three thoughts about EnHIP. Firstly, EnHIP began as part of a core mission and value coming from different disciplines working together which was a great opportunity to educate each other about the different areas around a core mission. Secondly, Partnership meetings have allowed representatives to reduce the distance between their organizations and NIH as a whole. She also noted that the Partnership still meets face-to-face and has not abandoned the benefits from in-person meetings because of technology. And lastly, she believes NLM benefited through EnHIP after Hurricane Katrina by already having a group in place. She also expressed her appreciation for the fact that NLM offers feedback for their programs which they use to provide their students with the experience of a health curriculum. There are specific examples in which feedback was taken and models were updated based on the feedback of students.

Dr. João Ferreira-Pinto, The University of Texas at El Paso, stated that he has shared the resources of NLM with students and faculty based on his participation in EnHIP. He also discussed institutional knowledge and partnerships that exist because of health literacy. EnHIP Outreach Awards may be small, but they have a large impact.

Dr. Doris Holeman, Tuskegee University, discussed the opportunity to look at issues that help redefine different subject areas. She discussed the impact of awards on rural communities by stating that awareness of resources has grown. EnHIP has fostered collaborations among Partnership institutions that likely would not have come about if it were not for EnHIP.

Dr. Barbre shared that when she first began to participate in the Partnership, her institution did not have a way to train students in many experimental training topic areas. It changed the curriculum entirely and updated the way she and others on the faculty trained students. Now students use NLM databases to make presentations on health for the community.

Melissa Littlefield, Morgan State University, explained that EnHIP Outreach Award funds helped update the library at the Morgan State University. NLM resources were incorporated into the information literacy curriculum for students across all disciplines. Awareness and utilization has increased.

Next, representatives discussed how EnHIP can be strengthened over the next 10 years. Representatives came to a consensus that the size of the group is appropriate and the Partnership may not be as successful if it were larger or smaller. However, several representatives indicated productive opportunities exist to engage more people in EnHIP initiatives. Representatives suggested hosting a webinar to share their experiences and maximize the flow of information beyond EnHIP representatives. Gale Dutcher, Deputy Associate Director, SIS, NLM, stated EnHIP is a premier program of NLM and there is no plan to remove or reduce it. The goal is to keep the Partnership relevant and worthwhile for everyone. Representatives said they do not know how many people have been reached among all of the member institutions and requested a determination of EnHIP's reach.

Dr. Barbre concluded the discussion by stating that representatives need to spend time contemplating topics related to EnHIP's path for the future; she suggested having a webinar to continue the discussion.

XV. Wrap-up of Day 1 and Day 2 Overview

Dr. Barbre thanked the guest speakers for their insightful, stimulating presentations. She acknowledged the NIH and NLM senior staff in attendance. She gave an overview of the next day's events and closed the meeting to give attendees the opportunity to network with each other. The meeting was adjourned at 5 p.m.

Day 2

XVI. Welcome and Introductions

EnHIP reconvened April 24, 2014, at 8:45 a.m. in the NLM Board of Regents Room, Building 38, National Library of Medicine, Bethesda, Maryland. EnHIP Chairman Dr. Ann Barbre, Professor and Associate Dean of Pharmacy, Xavier University of Louisiana, presided. She welcomed representatives and invited guests and asked new attendees to introduce themselves for the benefit of those that were unable to attend the previous session. She thanked everyone for their participation and enthusiasm about the keynote speaker's address on Day 1. She was pleased with the productive networking occurring among EnHIP representatives. She indicated that the presentations of Day 2 would be of high interest and chart a new direction for EnHIP.

XVII. Overview of Office of Clinical Toxicology, SIS

Dr. Barbre introduced Dr. Pertti (Bert) J. Hakkinen, Acting Head, Office of Clinical Toxicology, and Senior Toxicologist, and Toxicology and Environmental Health Science Advisor, NLM, SIS. Dr. Hakkinen said the objective of his presentation was to provide representatives with an understanding of the Office of Clinical Toxicology (OCT). It identifies toxicology-related needs of users and helps to develop new resources or identify enhancements to existing resources. The identification and compilation of authoritative and trustworthy information are everyday challenges because users have specific access needs, particularly during emergencies.

In 2012, OCT introduced a new Especially for Toxicologists Web page which serves as a guide to NLM resources on environmental health, toxicology, and chemicals. Dr. Hakkinen explained how to find different resources within the database. He drew attention to the Haz-Map[®], a resource for health and safety professionals, and consumers seeking information about the health effects of exposure to chemicals and biologicals at work.

Dr. Hakkinen discussed the Enviro-Health Links Web page for tobacco, smoking, and health research. It was updated in March and continues to receive new materials as issues emerge.

The Comparative Toxicogenomics Database (CTD) was added in 2011 to advance the understanding of the effects of chemicals on human health. It includes extensive information describing relationships between chemicals, genes, proteins, and human diseases. Users can access CTD through TOXNET, search CTD's chemicals by name or CAS registry number, and learn about related genes and diseases. Users can progress via the TOXNET's CTD results to the complete CTD site for further details. Enhancements to the content will deliver manually curated exposure-related information to the other types of CTD content.

Dr. Hakkinen reviewed the Chemical Hazards Emergency Medical Management (CHEMM) project, a joint initiative of NLM and ASPR. CHEMM is a comprehensive, user-friendly resource that enables first responders, first receivers, other health care providers, and planners to prepare for, respond to, recover from, and mitigate the effects of mass casualty chemical incidents. He discussed examples of advanced resources, such as the mobile-optimized Web interface which provides TOXNET resources.

Dr. Hakkinen elaborated on the collaboration with organizations, such as the U.S. Department of Homeland Security, U.S. Department of Environmental Protection, U.S. Product Safety Commission, U.S. Centers for Disease Control and Prevention, CDC National Institute for Occupational Safety and Health, and the Agency for Toxic Substances and Disease Registry.

XVIII. Discussion and Q&A with Dr. Pertti (Bert) J. Hakkinen

Dr. Barbre facilitated a discussion following Dr. Hakkinen's presentation. Representatives asked about information delivery using the enhanced TOXNET databases and applications for CHEMM resources.

XIX. Encouraging EnHIP Schools to Apply for Outreach Awards

Ms. Janice Kelly, Chief, Outreach and Special Population Branch, SIS, NLM, highlighted the importance of EnHIP Outreach Awards. The awards support the mission and goals of EnHIP and NLM Long-Range Plan by improving access to biomedical data, medical knowledge and health information; promoting health literacy and reducing health disparities; integrating biomedical, clinical, and public health information systems that promote scientific discovery and speed the translation of research into practice; and developing and supporting a diverse workforce for biomedical informatics research, systems development, and innovative service delivery. EnHIP Outreach Awards also increase the awareness of NLM resources at EnHIP institutions, support partner institutional goals of education and research, and encourage collaborations and partnerships on campuses and in communities.

In the past three years, the number of award applications has declined. Ms. Kelly is aware that the \$5,000 award amount is an issue for some institutions, and issues exist with past-due invoices. She urged the group to submit timely invoices because unspent funds return to the U.S. Treasury and are not available to NLM for reuse. If the unspent funds across NLM are substantial, future budget cuts may occur.

To encourage representatives to apply, Ms. Kelly presented a range of projects: training classes on campus or in the community, research symposium classes, health information literacy, student research projects using NLM resources, disaster preparedness with community/faith groups, genomic education in the community, and environmental/social justice. She explained that the request for quotation (RFQ) will be released this summer. All project proposals should reinforce the EnHIP Strategic Plan and include use of NLM resources.

XX. Discussion and Q&A with Ms. Janice Kelly

Several representatives referenced the issue of past-due invoices. Ms. Kelly asked them to follow up with her via e-mail. A representative asked if an institution could receive more than one EnHIP Outreach Award in a year. Ms. Kelly stated more than one award is unlikely; however, there could be circumstances in which an ongoing initiative would require special consideration.

XXI. Pill Images: Current Status and Upcoming Informatics Research Challenge

Dr. Michael Ackerman, Assistant Director for High Performance Computing and Communications, NLM, provided an overview of “The Pill Identification Challenge (C3PI).” He discussed a scenario in which a person is uninformed about medicine they need or have been taking, leading to a potentially disastrous situation. Identification of unknown medications is a great need. The solution is to use a smartphone equipped with an NLM mobile app to take a picture of the unknown pill. In less than 15 seconds, the app sends the picture to NLM for pill identification and support information. The app delivers pill identification, an NLM database pill image, and essential supporting information.

To create this app efficiently and cost-effectively, Dr. Ackerman engaged and challenged the representatives to develop the algorithms that NLM will use to match the unknown product picture to the Library picture. This spring during Phase 1, NLM will provide a series of test pill images and Challenge specifications and invite the community to provide a matching program embedded in a virtual computer. NLM will test the proposed Challenge test environment and Challenge specifications. In the summer, NLM staff will make necessary adjustments, and in the fall NLM staff will provide a series of test pills and final Challenge specifications. NLM will invite the community to submit a matching program again. NLM will then test the submitted matching programs against a sample from the provided images and a series of not previously provided images. By the end of this year, the program with the most correct matches will be determined.

XXII. EnHIP Outreach Awards Presentations

The mission of EnHIP is to enhance the capacity of minority-serving academic institutions to reduce health disparities through the access, use, and delivery of environmental health information on their campuses and in their communities. To further this aim, NLM provides funding to support partner institutions for training and other outreach activities. Five institutions were awarded the EnHIP Outreach Awards. For summaries of all of the 2013-2014 awards, see Appendix G.

Jackson State University, Jackson, Mississippi

NLM Web-Based Resources: A Catalyst for Biomedical and Environmental Health Research and Education

Presented by Dr. Paul Tchounwou

The strategic approach used by Dr. Tchounwou was to organize a pre-symposium workshop series in conjunction with the Jackson State University's *International Symposium Series on Recent Advances in Environmental Health Research*, and use this activity as a catalyst to familiarize workshop participants with the contents and search strategies of NLM medical, environmental health, and toxicology information resources; highlight information on environmental health issues as they relate to health disparities; and facilitate access to other national and international environmental health research resources. Strategic goals are to enhance environmental health and biomedical sciences research and education at Jackson State University and around the world; to meet the needs of environmental and biomedical scientists, researchers and policy makers; to increase awareness and accessibility; and to train participants on the use of NLMs online health and medical resources.

Learning objectives were to identify the content of each NLM database covered in the course, access the database covered in the course, select which database(s) to search for particular information, explore other relevant Internet resources, and identify aspects of a quality health-related Web sites. The focus was to learn how to retrieve scientific literature in the fields of medicine, nursing, dentistry, veterinary medicine, health care systems, and preclinical and biomedical sciences.

Some of the topics covered during the workshops included human health effects, emergency medical treatment, animal toxicity studies, metabolism/pharmacokinetics, pharmacology, and environmental fate and exposure.

Dr. Tchounwou gave an overview of the databases and tools that they used, including MedlinePlus[®], ChemIDplus, TOXNET, Hazardous Substances Data Bank, Haz-Map, and Tox Town[®]. He shared photos from various workshops and results from a pretest and posttest summary of results. Additionally, he shared testimonial comments from the class participants indicating the value of their instruction.

The University of Texas at El Paso, El Paso, Texas

A Survey of Musculoskeletal Pain and Discomfort in Hispanic Construction Workers from the El Paso del Norte Region

Presented by Dr. João Ferreira-Pinto

Dr. Ferreira-Pinto said the goal of the project was to examine the level of understanding of health topics among UTEP students and to elicit from them the best strategies to develop a targeted outreach

program. Ultimately this information would be used to connect students to NLMs environmental health resources and increase awareness of health-related careers focused on mitigating health disparities in minority communities.

The study's first phase was designed to improve researchers' understanding of the UTEP students' knowledge about health and health disparities. The second phase focused on the development of a framework for an annual interdisciplinary symposium focused on 21st century developments in health-promoting fields. In order to adequately elicit information about UTEP students for phase one, focus groups were convened to obtain information about students' perceptions.

Topics for the focus group discussions involved two areas. First, participants discussed students' perception of health disparities among minorities and their perception of health risks. Second, participants discussed students' preferences toward more acceptable outreach and dissemination formats and messages. This testing led to several findings: minorities are not aware of services; language barriers create obstacles; cost prohibits many minorities from accessing services; and the fear of deportation prevents illegal immigrants from accessing services. The findings from the second focus group declared that students preferred outreach messages delivered through human interaction or social media (Facebook, twitter) and student e-mail or bulletin boards.

Based on these findings, phase two of this project was the development of a framework for an annual interdisciplinary symposium focused on 21st century developments in health-promoting fields. The symposium provided students with the requested information by including an overview of EnHIP and NLM resources. Also, the symposium gave UTEP students access to 21st century innovations in environmental health, biomedical research and health care; it gave an opportunity to learn about health disparities and health-related careers that can help promote healthy living. The symposium occurred in October 2013.

Dr. Ferreira-Pinto shared the results from the symposium, which revealed the following: 82% of the attendees were knowledgeable or very knowledgeable of health disparities after the symposium as compared to 36% prior to the symposium; almost two thirds of attendees (60%) were knowledgeable or very knowledgeable of NLM resources after the symposium; and more than two thirds (72%) stated they would utilize NLM resources in the future.

Dr. Ferreira-Pinto concluded his presentation by discussing the next steps for this initiative. The UTEP College of Health Sciences (CHS) has institutionalized the annual Interdisciplinary Symposium: 21st Century Developments in Health Promoting Fields. The CHS Center for Interdisciplinary Health Research and Evaluation (CIHRE) will sponsor the November 2014 Symposium, and a paper is being completed about the development and importance of the symposium for attracting new students to health-related careers. Representatives asked to continue to be informed about this project in the future.

XXIII. Summary of Plans for EnHIP

Dr. Barbre led the discussion on plans for EnHIP. Dr. Stephanie Bauer, University of Alaska Anchorage, suggested an EnHIP meeting in Alaska. She stated that the University of Alaska Anchorage would welcome the representatives, and that she would be interested in working on the meeting plan. Dr. Bauer shared that the visit would allow representatives to consider different types of groups that might be of interest to them because there are magnitudes of issues in Alaska that may apply, including diversity, geography, and community outreach.

Other representatives spoke favorably about this proposed meeting and volunteered to assist. Dr. Bauer will develop a list of topics and issues, and she will indicate why Alaska is the best place for those topics to be discussed there.

Dr. Barbre concluded the discussion by inviting all representatives to submit topics of interest and benefit to their specific communities. Several representatives expressed interest in environmental justice as a topic.

XXIV. Closing Remarks

Dr. Barbre thanked everyone for their participation and attendance at the EnHIP meeting. She thanked Dr. Lindberg for his warm welcome and video presentation on the exhibition “Native Voices.” Dr. Proctor set the tone for the meeting with her impassioned presentation on the human microbiome. The topic was of great interest to EnHIP representatives. Dr. Barbre praised the presentation by Ms. Jordan about TOXNET and the Hazardous Substance Data Bank. Dr. Barbre thanked Mr. Koerner for his review of the complexity of the decision model, the multiplicity of agencies involved, and the role of the NLM in preparedness and emergency operations. Dr. Florance’s review of NLM and NIH grant programs reminded everyone about resources available from NLM and NIH. Dr. Huerta provided information on the Big Data to Knowledge Initiative and its emphasis on enhanced data sharing. Dr. Hakkinen provided an overview of the SIS Office of Clinical Toxicology and its provision of easy-to-understand information in an emergency situation. Dr. Ackerman explained a project on pill image identification under development by the Office of High Performance Computing and Communications.

Dr. Barbre thanked all representatives for their enthusiasm for these topics. She emphasized the importance of the Partnership and urged representatives to assist in the selection of meeting themes and to engage in discussions about the new direction of EnHIP in the next 10 years. She noted the many opportunities where the Partnership can make meaningful contributions.

Dr. Barbre wished everyone a safe and pleasant journey home. The meeting was adjourned at 12:00 p.m.

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National Library of Medicine
Division of Specialized Information Services
Environmental Health Information Partnership
Charting a Course for the 21st Century
Environmental Health Information Partnership Strategic Plan

INTRODUCTION

Environmental Health Information Partnership

The Environmental Health Information Partnership (EnHIP) was established by the National Library of Medicine (NLM) in 1991 as the Toxicology Information Outreach Panel (TIOP). This group was started at a time in which the issue of racial and ethnic health disparities in a myriad of conditions had been elevated into sharp visibility. There was also concern about disparities in potential and real exposure to environmental toxicants and their contribution to disparities in morbidity and mortality. At the same time there was an increase in the complex literature of toxicological science. The Panel then evolved into the Environmental Health Information Outreach Program and subsequently refined into the current state, the Environmental Information Outreach Partnership. This Partnership reflects a broader focus on the multiple dimensions of environmental health, the environmental health sciences, and health disparities. The objective is to assist in addressing disparities among academic institutions in access to information technology and related pedagogical and research resources.

In this context, it was increasingly recognized that modern instruction, research, and service to communities, students, and professions—the core mission of academic institutions—were nearly impossible without computers and related technologies. Indeed, evidence abounds that the addition of computer science and bioinformatics to the arsenal of environmental health, biomedical, social, behavioral, and clinical research holds enormous promise and continues to stir considerable excitement among researchers, academicians, practitioners, and the entire health services community.

These were among the developments that prompted the NLM to initiate a series of programs and services specifically designed to expand and strengthen its partnership with Minority-Serving Institutions (MSIs) and, in the process, enhance the efforts of these schools to increase the number of racial and ethnic minorities in the environmental health, biomedical research, and health care workforce. The NLM was also interested in ensuring that, through planned outreach efforts, both lay and professional groups were aware of, had ready access to, and utilized the NLM rapidly expanding collections of medical and health information.

Working together, the NLM and the participating colleges and universities continue to apply themselves to these efforts as the 21st century becomes the digital era, creating a better and a more innovative and collaborative future.

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Rationale and Process

The Environmental Health Information Partnership has made substantial progress during the past decade in achieving its initial objectives. A prominent feature of this progress has been information sharing, including regular NLM staff reports on the continuous expansion of the Library databases and programs, as well as presentations from other National Institutes of Health (NIH) Institutes and Centers on development in other areas of the NIH, which supports research and discovery that ultimately improves the methods and outcomes of public health services and personal health care. These discussions have added to the substrate of information which academicians need to bring to full fruition the core functions of academic institutions.

The challenge for the Partnership is not only to maintain its role as a progressive component of NLM outreach efforts, but to advance to even higher levels of productivity consistent with the NLM Long Range Plan (2006–2016) (*Charting a Course for the 21st Century: NLMs Long Range Plan 2006–2016*; http://www.nlm.nih.gov/pubs/plan/lrp06/NLM_LRP2006_WEB.pdf). That plan includes four overall objectives that serve as the reference frame for the Partnership strategic planning process.

The process began with a number of discussions within the Executive Committee, the administrative arm of the Partnership. These discussions, by teleconference as well as face-to-face interactions at the Library on the NIH campus, culminated in a comprehensive review of the NLM Board of Regents-endorsed new 10-year Long Range Plan.

Later, in meetings at the Library, the Partnership organized into four working group, consistent with the NLM plan's four goals. Each group was charged with sorting from the 66-page Library plan challenges and strategies for the partnership—all within the context of the overarching mission of the Library.

The outcome was a report of each working group's deliberations. As with any broad-ranging discussion among multidisciplinary academicians with differing perspectives, numerous important and relevant topics were discussed, a number of which were beyond the boundaries of NLM statutory responsibilities. The Executive Committee attempted to capture the key themes of all of the working group reports. The results of that effort are reflected in the plan that follows.

Henry Lewis, III, Professor and Dean
College of Pharmacy and Pharmaceutical Sciences
Florida A&M University, Tallahassee, Florida
Chairman, National Library of Medicine Environmental Health Information Partnership
(2004 – 2011)

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VISION

EnHIP will be a strong, stable, and effective partner of NLM as the Library becomes even more central to scientific discovery and treatment and prevention of disease. Through this partnership, NLM programs and services, adapted to 21st century health and health sciences developments, will further strengthen the capacity of MSIs to perform three important and fundamental functions within the public health and health care system. These are: (1) educate and train health professionals; (2) conduct basic and applied research in disciplines pertinent to biomedicine, health services, health care, and health disparities; and (3) engage in community, public, and professional services.

MISSION

The mission of the Environmental Health Information Partnership is to enhance the capacity of minority serving academic institutions to reduce health disparities through the access, use and delivery of environmental health information on their campuses and in their communities.

Assumptions: Environmental health refers to the impact of chemical, microbial, physical, and radiological agents on the health of living organisms.

Minority serving educational institutions are those served by programs funded under Title III Historically Black Colleges and Universities, American Indian Tribally Controlled Colleges and Universities, Alaska Native and Native Hawaiian Serving Institutions, and Title V Hispanic Serving Institutions. (Reference: U.S. Department of Education, <http://www.ed.gov/about/offices/list/ope/index.html>).

STRATEGIC GOALS

Goal 1. Seamless, Uninterrupted Access to Expanding Collections of Biomedical Data, Medical Knowledge, and Health Information

Objectives of the Partnership for Achieving Goal 1

- Assess the current capacity of MSIs to access NLM databases and related Library resources that can enhance efforts of these colleges and universities to carry out their fundamental mission.
- Use the above-cited assessment to develop a program that will address the deficiencies revealed in the survey.
- Expand and intensify efforts to ensure that MSI faculty and students are thoroughly knowledgeable of detailed aspects of NLM collections of health and biomedical information.
- Provide technical assistance and related resources to aid MSIs in increasing knowledge and use of NLM programs and services by lay and professional groups within their surrounding communities.

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- Initiate appropriate action to include selected MSI libraries in the National Network of Libraries of Medicine (NN/LM).
- Initiate the necessary administrative and logistical procedures to ensure that future NLM exhibits are available for display in MSI communities.
- Convene a seminar, first at NLM and then at MSIs, on the “hows and whys” of disaster management information.
- Determine the extent of instruction in disaster management at MSIs and potential interest in disaster management information research consistent with the research agenda that may emerge from the NLM Disaster Information Management Research Center (DIMRC).

Goal 2. Trusted Information Services That Promote Health Literacy and the Reduction of Health Disparities

Objectives of the Partnership for Achieving Goal 2

- Structure a program (i.e., internships) to provide opportunities for interested students from MSIs to gain “field experience” in the operational aspects of NLM, including the management of the expansive databases and related activities.
- Initiate discussions with consumer advocacy groups in MSI communities to plan an intensive consumer awareness campaign designed to increase the number of consumers who are aware of and use NLM free high quality consumer information resources.
- Develop specific recommendations for increasing the number of underrepresented minorities in the library sciences workforce.
- Convene a symposium on research advances in environmental health, climate change effects, and the animal-human connection as it relates to disease, designed to enhance the understanding of librarians of the multiple dimensions of the confederations of disciplines that comprise the environmental health sciences and the implications of these advances for both NLM programs and services and for those of local library services.
- Emphasize and promote the importance of MSI community high school teachers’ and students’ understanding of environmental health, climate change, and the animal-human connection as it relates to disease, as well as knowledge and use of NLM environmental health databases.

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Goal 3. Integrated Biomedical, Clinical, and Public Health Information Systems That Promote Scientific Discovery and Speed the Translation of Research into Practice

Objectives of the Partnership for Achieving Goal 3

- Determine the extent of electronic medical records use by physicians, hospitals, and clinics in MSI communities.
- Use data from the preceding objective as [a] basis for a seminar/discussion on the development of electronic health records, including presentations of case studies in which health records were [an] essential source of data.
- Increase MSI faculty members' awareness of the value of electronic health records in environmental health and related research.
- Enhance MSI faculty involvement in translation of public health research findings and knowledge to evidence-based practice.
- Expand Partnership understanding of the NLM online resources and their relevance to the mission of MSIs. Increase MSI students' and communities' knowledge of [the] hows and whys of the NLM online resources and their relevance to consumer and academic services.
- Attract new students to the field of environmental health research, including the study of climate change effects, comparative medicine, and vector-borne diseases.
- Play a leadership role in encouraging community engagement in research activities of MSIs.
- Increase research productivity and, in the process, increase contributions of MSI faculty members to professional journals.

Goal 4. A Strong and Diverse Workforce for Biomedical Informatics Research, Systems Development, and Innovative Service Delivery

Objectives of the Partnership for Achieving Goal 4

- Increase NLM/Partnership visibility in MSI communities.
- Increase Partnership knowledge of NLM programs and services designed to shape biomedical informatics education and training.
- Play a leadership role in initiating discussions of career opportunities in biomedical informatics and library science, including the promotion of interest in these careers.

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- Ensure a prominent role for the NLM/Partnership in “career day” or similar programs at MSIs.
- Attract new MSI students to health sciences librarianship through NLM postgraduate Associate Fellowship Program.

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ENVIRONMENTAL HEALTH INFORMATION PARTNERSHIP MEETING

April 23–24, 2014

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ENVIRONMENTAL HEALTH INFORMATION PARTNERSHIP MEETING

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BIOGRAPHIES

Donald A.B. Lindberg, MD

National Library of Medicine

Dr. Lindberg a distinguished professor of pathology and the founding father of the discipline now known as medical informatics, pioneered in applying computer technology to medicine at the University of Missouri, nurtured the discipline to its present eminence, and in 1984 translated his professional and organizational skills to a national level in leading the National Library of Medicine and opening its vast information resources to all via the World Wide Web. He has a strong commitment to extending the benefits of health information technology to all sectors of society, especially in rural, remote, minority, and underserved communities. Dr. Lindberg has received awards from many professional organizations, including the Presidential Senior Executive Rank Award, the American Medical Association's Outstanding Member of the Executive Branch, and the U.S. Surgeons General's Medallions. He is the author of three books and numerous chapters and journal articles.

Michael J. Ackerman, PhD

National Library of Medicine

Dr. Ackerman received a PhD from the University of North Carolina at Chapel Hill in Biomedical Engineering. He is currently Assistant Director for High Performance Computing and Communications at NLM, responsible for programs in medical imaging, telemedicine, and next generation networking. He originated the Visible Human Project. He holds academic appointments as an Associate Professor of Computer Medicine at the George Washington University and as an Associate Professor of Medical Informatics at the Uniformed Services University of the Health Sciences (USUHS).

Dr. Ackerman was elected a Founding Fellow of the American Institute of Medical and Biological Engineering in 1992, a Fellow of the American College of Medical Informatics (ACMI) in 1985, and a Senior Member of the Institute of Electrical and Electronic Engineers in 2007. He serves on the editorial boards of TeleMedicine and e-Health, and the Journal of the American Medical Informatics Association. He has published a book and more than 225 papers and book chapters.

Valerie Florance, PhD

National Library of Medicine

Dr. Florance is Associate Director for Extramural Programs at NLM. She has overall responsibility for extramural research and resource grant programs in biomedical informatics and information sciences, and she serves as Program Officer for NLM's university-based informatics training program. Before coming to NLM in February 2001, she spent three years as Project Director for better_health @ here.now, a visioning project undertaken at the Association of American Medical

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Colleges to help the Association's members understand the power of computers and networks for managing health information. Previously, she held faculty and administrative positions at three academic medical centers. She has graduate degrees in Medical Anthropology and Information Sciences, and she is a Fellow of ACMI.

Pertti (Bert) J. Hakkinen, PhD

National Library of Medicine

Dr. Hakkinen is Acting Head, Office of Clinical Toxicology, Senior Toxicologist and Toxicology and Environmental Health Science Advisor (to the Director) with NLM/SIS. Also, he is adjunct Associate Professor in Biomedical Informatics at USUHS.

He provides leadership on the development of new resources in toxicology, exposure science, risk assessment, and enhancements to NLM resources in these fields. Dr. Hakkinen is the Project Leader for the Chemical Hazards Emergency Medical Management tools, represents NLM on various committees, and provides leadership for NLM participation in national and international efforts in toxicology-, exposure-, and risk assessment-related information. Also, he is an Associate Professor in Biomedical Informatics and the Codirector of a public health informatics course offered since 2009 at USUHS. He is an adjunct Associate Professor in Preventive Medicine and Biometrics at USUHS. During his career, Dr. Hakkinen has held numerous leadership positions in the field of toxicology and risk assessment. Before joining NLM in 2008, Dr. Hakkinen served for several years on the auxiliary staff of the European Commission (EC) at the EC's Institute for Health and Consumer Protection, Joint Research Centre, in Italy. He has held positions with Toxicology Excellence for Risk Assessment, Gradient Corporation in the United States and Procter and Gamble Company in the United States and Japan. In addition, he was the Vice-chair of the Scientific Advisory Panel for the Mickey Leland National Urban Air Toxics Research Center in Houston, Texas, from 2003 until 2011.

Dr. Hakkinen earned a Bachelor of Arts degree in Biochemistry and Molecular Biology from the University of California, Santa Barbara, and he received a PhD in Comparative Pharmacology and Toxicology from the University of California, San Francisco. Dr. Hakkinen is a member of the Society of Toxicology, and he is a charter member of the Society for Risk Analysis and the International Society of Exposure Science. He is a coeditor and coauthor of an edition of the Encyclopedia of Toxicology and of the last two editions of the Information Resources in Toxicology book. Dr. Hakkinen has authored and coauthored numerous other publications.

Michael F. Huerta, PhD

National Library of Medicine

Dr. Huerta is NLM Associate Director and Director of the NLM Office of Health Information Programs Development. The office works across NLM to help make the Library's considerable resources known to librarians, researchers, health care providers, and the general public. The office helps coordinate the Library's international efforts as well as its evaluation and strategic planning activities. Over his 23 years at NIH, he has led many informatics and data-intensive research initiatives. Recently, he developed, implemented, and led the NIH Human Connectome Project and directed the NIH National Database for Autism Research. He is helping to lead the NIH Big

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Data to Knowledge initiative and is involved with a number of trans-NIH and trans-government groups and initiatives regarding standards, technologies, practices, and policies to more widely, efficiently, and meaningfully share data generated in biomedical research. His research background is in systems neuroscience; his undergraduate and doctoral work was completed at the University of Wisconsin-Madison. He was a postdoctoral Fellow at Vanderbilt University. He served on the faculty of the University of Connecticut Health Center before joining NIH.

Shannon M. Jordan, MPH

National Library of Medicine

Ms. Jordan is a Chemist at NLM/SIS. Ms. Jordan works as part of the chemical information team in the Biomedical Information Services Branch. Her area of focus is developing and maintaining chemical data for the Hazardous Substances Data Bank and ChemIDplus databases as a part of the environmental health and toxicology program. Also, Ms. Jordan provides training in searching NLMs environmental health and toxicology databases. She participates in outreach activities to increase knowledge and access to NLM biomedical and consumer health resources. Ms. Jordan received a Bachelor of Science degree in Chemistry and Master of Public Health degree from Howard University.

John F. Koerner, MPH, CIH

Office of Preparedness and Emergency Operations, HHS/ASPR

Mr. Koerner is the Chemical, Biological, Radiological, Nuclear, and Explosives (CBRNE) Branch Chief in the Office of Preparedness and Emergency Operations for the Assistant Secretary for Preparedness and Response, DHHS. The Branch provides CBRNE subject matter expertise and leads the development of innovative, evidence-based interventions to support the national medical and public health emergency response. Previously, he was principle of an industrial hygiene firm specializing in health care, environmental microbiology, biodefense, and emergency response. He holds a Master of Public Health degree from the Johns Hopkins Bloomberg School of Public Health and has 21 years of experience in the field.

Lita M. Proctor, PhD

National Human Genome Research Institute, NIH

Dr. Proctor is Program Director of the Human Microbiome Project (HMP). The HMP is an eight-year, trans-NIH Common Fund Initiative to create a toolbox of resources for this emerging field.

During the first phase of HMP (2008-2012), resources that were developed included bacterial, viral, and fungal strains and their genome sequences and phylogenetic and metagenomic sequence data from the microbiomes of healthy adults and from a collection of cohort studies of patients with specific gut, skin, or urogenital diseases. Computational tools for phylogenetic and metagenomic data analysis and single cell genomics and novel cultivation approaches, as well as ELSI studies in human microbiome research, rounded out the resources for this phase.

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For the second phase of HMP (2014-2016), an integrated dataset of biological properties will be developed as a community resource. These datasets will include transcripts, proteins, and metabolites from the microbiome and host. These datasets are being developed from three different systems (IBD, diabetes, and pre-term birth) as exemplar models of microbiome-associated conditions or diseases. Computational tools to analyze these complex datasets will be developed as a resource.

Dr. Proctor joined the Division of Genomic Sciences in the Extramural Research Program in 2010. Previously she served as Program Director at the National Science Foundation (NSF) in the Geosciences and the Biosciences Directorates, where she managed microbiological, bioinformatics, and research resources programs. She is formally trained in microbial ecology, was a NSF Postdoctoral Fellow in molecular microbial genetics at the University of California, Los Angeles, and has held appointments at Florida State University and the University of California, Santa Cruz.

APPENDIX D

Environmental Health Information Partnership Meeting—April 23–24, 2014

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ENVIRONMENTAL HEALTH INFORMATION PARTNERSHIP 2013–2014

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Environmental Health Information Partnership Meeting—April 23–24, 2014

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APPENDIX G

Environmental Health Information Partnership Meeting—April 23–24, 2014

ENVIRONMENTAL HEALTH INFORMATION PARTNERSHIP

EnHIP PROJECTS 2013–2014

Benedict College, Columbia, South Carolina

Improving Minority-Serving Institutions' Knowledge of National Library of Medicine Resources Through Competitive Student Presentations

This project continues the extension of the widely acclaimed, previously funded program requiring teams or individuals to research and present their findings about a topic within the category of topics that are focuses of the Environmental Health Information Partnership and the larger organization, the National Library of Medicine (NLM). Students will conduct intense research using NLM databases to make presentations on their findings. The students have multidisciplinary majors, but all are members of the College's Student Environmental Health Association.

Colorado Mountain College, Glenwood Springs, Colorado

First Engagement: First Generation Parents in HIT Careers

The project will place a first-generation parent, minority intern at the local hospital in the Health Records office in order to gain experience and training in Health Information Technology and to complete a medical translation certification.

Jackson State University, Jackson, Mississippi

NLM Web-Based Resources: A Catalyst for Biomedical and Environmental Health Research and Education

The goal of this project is to continue to enhance environmental health and biomedical sciences research and education at Jackson State University and around the world by organizing and implementing a pre-symposium workshop in conjunction with the *International Symposium on Recent Advances in Environmental Health Research*. The workshop will cover NLM toxicology and environmental resources as well as other related health information databases.

Medgar Evers College, City University of New York, New York, New York

Genomics Education and Outreach Program: Human DNA Variation, Health, and the Environment

The goal of GenEOP is to inform and to educate science majors and nonmajors, the College, and community about the human genome project, the science of genomics, and the impact on science and society. Education of students involves enhancing their knowledge about genomics, including the human genome, the research, related technological applications, emerging careers, advances in medicine and health, and the impact on and implications for society. The primary genomic information resources on the Internet are emphasized in the education of undergraduate students.

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The focus of community activities is on increasing genetic literacy by providing education about genetics, understanding the impact of genomics on many areas of human endeavor, especially health, and providing sources of useful, reliable information.

The University of Texas at El Paso, El Paso, Texas

A survey of Musculoskeletal Pain and Discomfort in Hispanic Construction Workers from the El Paso del Norte Region

The purpose of this project is to explore the characteristics of a sample of the Hispanic construction worker population from the El Paso del Norte region in order to identify the needs for occupational health and safety, and wellness intervention programs. Using an observational, cross-sectional study design, a questionnaire will be developed to collect demographic, socioeconomic, and occupational information. It will also document the history of diseases, self-perceived level of health, and level of knowledge of chronic work-related musculoskeletal disorders. Furthermore, the questionnaire will collect information on the perception and knowledge of safety training and identify safety-training and knowledge barriers. It will ask about self-reported frequency and intensity of musculoskeletal pain and discomfort symptoms. A sample of 120 Hispanic construction workers will receive the questionnaire. This twelve-month study includes an evaluation phase focused on the completion of all proposed aims and the proper dissemination of information to practitioners, researchers, and stakeholders.