

**National Institute of Diabetes and Digestive and Kidney Diseases
National Institutes of Health**

**Network of Minority Research Investigators
Midwest Regional Workshop**

**November 3-4, 2011
Harper Center, Omaha, NE**

Summary Report

THURSDAY, NOVEMBER 3, 2011

WELCOME REMARKS AND MEMBERSHIP INTRODUCTIONS

Dr. Shirley Blanchard, Associate Professor, Creighton University, Omaha, NE

Dr. Lawrence Agodoa, Director, Office of Minority Health Research Coordination (OMHRC), National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK), National Institutes of Health (NIH), Bethesda, MD

Dr. Blanchard welcomed the attendees to Omaha and Creighton University for the Network of Minority Research Investigators (NMRI) Midwest Regional Workshop. She said she was proud to be the Chair of the Oversight Committee of the NMRI and to have been chosen as Chair of the 2011 NMRI Midwest Regional Workshop. Dr. Blanchard introduced Dr. Gail Jensen, Dean of the Graduate School, Dean of the University College, and Associate Vice President of Faculty Development and Research at Creighton University.

Dr. Jensen welcomed the NMRI to Creighton University and explained that Creighton is a Jesuit school that is a good venue for the NMRI because of the emphasis on academic leadership in all areas. She said that she has worked with Dr. Blanchard for more than 17 years and that her work in the field of physical therapy and the influence of biological determinants has added important knowledge to the field. The connection between the Jesuit academic mission and the NMRI mission is found in the emphasis in both institutions on the inquiry process for understanding all aspects of disease and promotion of health. Returning to the work of Dr. Blanchard, Dr. Jensen said that no one better embodies the concept of translation of clinical practice, community practice, academic excellence, and research than Dr. Blanchard.

Dr. Blanchard also recognized Dr. Richard O'Brien, former Vice President of Health Sciences and Dean of Medicine, and Dr. John Stone from the Center for Health Policy and Ethics.

The NMRI Midwest Regional Workshop Planning Committee members were recognized. They are:

Mario Ascoli, Ph.D., Professor, Department of Pharmacology, College of Medicine, The University of Iowa, Iowa City, IA

Joyce Balls-Berry, Ph.D., Director, CTSA Office for Community Engaged Research, Mayo Clinic, Rochester, MN

Luis Cubano, Ph.D., Associate Professor, Department of Anatomy and Cell Biology, Universidad Central del Caribe, Bayamon, PR
Trudy Gaillard, Ph.D., Assistant Professor of Medicine, Division of Endocrinology, Diabetes and Metabolism, The Ohio State University, Columbus, OH
Eddie L. Greene, M.D., Associate Professor of Medicine, Division of Nephrology and Hypertension, Mayo Clinic, Rochester, MN
Neali Hendrix Lucas, Ph.D., Postdoctoral Fellow, Department of Urology, University of Michigan, Ann Arbor, MI
Judith McElhiney, M.D., Internal Medicine Resident, Department of Internal Medicine, Gundersen Lutheran Medical Center, La Crosse, WI
Charmaine Stewart, M.D., Associate Professor, Program Director, Transplant Hepatology Fellowship Program, University of Minnesota, Minneapolis, MN
Monique Williams, M.D., Assistant Professor, Department of Medicine, Washington University in St. Louis, MO

Ad-Hoc members include **Ira Combs, R.N.**, Community Liaison Nurse Coordinator, Center for Reducing Health Disparities, University of Nebraska Medical Center, Omaha, NE; **Bennie Upchurch, M.D.**, Associate Professor of Medicine, Creighton University School of Medicine, Omaha, NE; and **Winnie Martinez**, Program Analyst, OMHRC, NIDDK, NIH, Bethesda, MD.

Dr. Agodoa began his presentation by asking attendees to stand, introduce themselves, and give a short statement about their research interests. After introductions, Dr. Agodoa reviewed the origins of the NMRI, beginning with talks between Dr. Agodoa and Dr. Allen Spiegel, former Director of the NIDDK. In approximately 1999, Dr. Spiegel invited Dr. Agodoa to his office and said that there was a problem attracting minorities to research. The U.S. Department of Health and Human Services had developed an initiative for each of the NIH Institutes to establish programs to address this problem. Dr. Spiegel asked Dr. Agodoa to head this initiative for the NIDDK, and he was given only two staff members, Winnie Martinez and Rose Pruitt, an alumnus of Creighton University. From this initiative, the NMRI became one of the programs developed to address health disparities. At that time, most of the researchers who focused on diseases of interest to the NIDDK were not minorities, although those diseases disproportionately affected minorities.

The coming year, 2012, will represent the 10th Anniversary of the NMRI. The success of the NMRI depends on senior investigators mentoring and being role models for junior investigators. The primary mission of the NMRI is to assist in encouraging minority investigators to be researchers in fields of interest to the NIDDK. The NMRI has approximately 100 members, and it is hoped that the network will be expanded in the future by exporting the NMRI concept to other NIH Institutes.

A recently published article stated that minority investigators have less than one-half the chance of having an NIH grant application approved as majority researchers do. This is an ongoing problem that must be addressed by the NIH in the future. Also, NMRI will examine whether NMRI members have fared better in having grants approved than non-NMRI minority researchers.

NMRI Mentorship Program

Dr. Virginia Sarapura, Associate Professor, University of Colorado Denver, Denver, CO

Dr. Sarapura, who manages the NMRI Mentor Database Program as a member of the NMRI Oversight Committee, provided background on the mentor program. The mission is to assist junior investigators to achieve success through mentoring by NMRI senior investigators. The goals of the NMRI Mentor Program are to provide learning activities on how to be an effective mentor and mentee; help match mentors and mentees; and create a framework for continued communication between mentors and mentees. Learning activities include breakout sessions at the regional and national workshops. Dr. Sarapura explained how the NMRI facilitates mentor/mentee partnerships.

There are three ways to request a mentor or mentee: (1) self-identify a mentor from the workshops or from the NMRI Directory and contact him/her directly; (2) visit the NMRI website at <http://nmri.niddk.nih.gov/> and click on the “NMRI Mentor/Mentee Program” link on the right panel, complete the form, and fax it to Winnie Martinez at martinezw@mail.nih.gov; or (3) complete the NMRI Questionnaire (<http://www.scgcorp.com/NMRIQuestionnaire/>) and answer the four questions in the survey related to becoming a mentor or mentee (questions 10-13). During the April 2012 NMRI Annual Workshop, there will be time for mentors and mentees to talk and establish a relationship. This relationship will be formalized by a written and signed contract expressing the acceptance of the requirements of the NMRI Mentor Program. The Mentorship Agreement Form includes timelines for mentor/mentee pairs and a schedule for contacts (at least four times per year), the listing of educational objectives that the mentor/mentee pair will work on during the year, and a place to assess contacts made during the year and how successful the mentor/mentee pair was in meeting the educational objectives.

In the past year, 23 mentor-mentee pairs have been matched; however, there are many more members who want mentors than there are mentors who need mentees. To increase the number of senior investigators willing to accept mentees, the Oversight Committee is considering ways to address this problem. This includes expanding the NMRI Mentor Program beyond NMRI membership. Further discussions are ongoing. Dr. Sarapura concluded by asking attendees to consider becoming involved in the program.

Discussion

Participants gave examples of mentor/mentee relationships that have been successful and not successful, both within the NMRI Mentor Program and general mentorship outside NMRI. A problem that minority students and faculty members have is progressing through the tenure system; acquiring a senior mentor possibly is the most important step a junior investigator can take to learn how to navigate the academic tenure system.

Another important role for mentors is bringing junior investigators into the publication process. Having an investigator’s name appear on publications increases the individual’s visibility at his/her academic institution and helps younger members gain national recognition.

It also is important to remember that individuals need different mentors at different career stages.

For young investigators, it is preferable that they first acquire mentors within their institution and later find mentors outside their institution.

RESEARCH OPPORTUNITIES AT NIH—FACING THE CHALLENGES OF A CHANGING RESEARCH SYSTEM

Dr. Frank Hamilton, Program Director, Division of Digestive Diseases and Nutrition, NIDDK, NIH, Bethesda, MD

Dr. Hamilton thanked the organizers of the workshop and especially Dr. Agodoa and Ms. Martinez for continuing to support the NMRI. He said that the NMRI has provided an opportunity for him to focus on health disparities that disproportionately impact minority communities. He said those at the NIDDK and NIH want everyone to succeed, but an investigator first must know how to access the resources through successful grant writing. He described the NIH as an institution that: is transforming medicine; has a mission of uncovering new knowledge that leads to better health for everyone by supporting peer-reviewed scientific research at universities, medical schools, hospitals, and research institutions throughout the United States and overseas; conducts research in its own laboratories; trains research investigators; and develops and disseminates credible health information based on scientific discovery. Dr. Hamilton provided a history of the NIH and an overview of the 27 Institutes and Centers that make up the NIH. Funding for the NIH was \$31 billion in 2010, with more than \$24 billion of that being distributed outside of the NIH for investigator-initiated research through grants and contracts.

One of the most important people in the NIH funding process is the Scientific Review Administrator (SRA), who is responsible for the administrative and technical review of applications, selecting reviewers, managing study sections, preparing summary statements, and providing requested information about study section recommendations to NIH Institutes and National Advisory Councils or Boards. Dr. Hamilton strongly recommended that if an individual gets a call from an SRA requesting placement on a study section, that they accept. This is a good first step toward becoming familiar with the funding process. Study sections are peers that one needs to get to know so those peers are familiar with those who submit applications.

The Program Director or officer is another important person for those submitting NIH applications to get to know. This is the person who will be with an applicant from the review process through the years of funding. Program Directors/officers are a resource to help applicants make their way through the biomedical maze, and they develop research initiatives with input from the community.

Dr. Hamilton recommended that anyone thinking of submitting an application to NIH first review the information on the NIH Listserv at <http://www.nih.gov>, where detailed information is available on Program Announcements (PAs), Requests for Applications (RFAs), or other funding mechanisms. PAs are important because they indicate areas of interest at NIH in specific topics. For example, recent activity indicates that NIDDK is interested in determining researchers' level of interest in the topics of the use of antidepressants, obesity, and diabetes. RFAs indicate that money is available for an activity and that the NIH wants researchers to

apply; this is a good mechanism because it targets specific topics, and the number of researchers who will apply is not known in advance. Dr. Hamilton emphasized that grants are awarded not to an individual researcher but to an institution; it is important that researchers understand that an institution may or may not allow moving a grant to another institution should a researcher change locations.

It is important to understand the fundamentals of grants. NIDDK funds grants based on scientific merit. Applications are reviewed by scientific peers and judged using NIH standards, which have changed during the past few years. It is important that researchers recognize their strengths and weaknesses before applying for an NIH grant. Being honest about credibility and standing in the field is critical. Answers to these questions can help determine the type of grant for which a researcher will apply. As a new investigator or early stage investigator, individuals must sell themselves harder than established investigators and must plan ahead, be organized, and produce a thoughtful, well-written application.

Dr. Hamilton presented information on how to prepare an application, the expected review process, and common problems in preparing applications (Note: Always read and follow the directions). Above all, applications should include a clear statement of why the research is important and how it will improve public health.

The Center for Scientific Review (CSR) is the NIH entity that receives grant applications and assigns them to appropriate Institutes and study sections. Applications are assigned based on the overall mission of the Institute, its specific programmatic mandates, and its interests. The specific scientific review group assigned is based on each review group's specific review guidelines. The five review criteria include significance, approach, innovation, investigator, and environment.

Dr. Hamilton summarized the scoring of NIH grants by reviewers, which is based on a nine-point scale. The following list indicates what the reviewers thought about an application as they applied the nine-point scale. It is unlikely that an application will be funded if it scores a 5 or below. The higher an application's score, the more likely that it will be funded.

- 1 Exceptionally Strong—no weaknesses
- 2 Outstanding—Strong, negligible weaknesses
- 3 Excellent—Very strong, with minor weaknesses
- 4 Very good—Strong, with numerous minor weaknesses
- 5 Good—Strong, but with at least one moderate weakness
- 6 Satisfactory—Some strengths, but also some moderate weaknesses
- 7 Fair—Some strengths, but at least one major weakness
- 8 Marginal—Few strengths and few major weaknesses
- 9 Poor—Numerous major weaknesses and few strengths

Dr. Hamilton provided suggestions on specific items related to applications, and what reviewers may be looking for in an application. He then reviewed small grants that may be more appropriate for young investigators, including R03, R21 (innovation), T32 (training), F32 (individual training), and a special NMRI R03 that is available for minority investigators, which

is a mechanism for investigators who do not have an R01 but who need data to complete preliminary studies that could lead to an R01. These are grants for feasibility/new technology/innovative ideas and usually are short term (up to 3 years), with a cap of \$125,000 per year.

There also are K-awards available for investigators for career development. These include the K01 (mentored research scientist development award), K08 (mentored clinical scientist development award), K23 (mentored patient-oriented research career development award), and K99/R00 (Pathways to Independence Award).

The final NIH program described that should be of interest to young investigators is the NIH Loan Repayment Program (LRP). The LRP provides up to \$35,000 per year for 2 years toward repayment of educational loans. The NIH pays the taxes on this amount directly to the Internal Revenue Service (i.e., up to \$15,000). Institutes make decisions on funding. Applicants may re-compete and obtain funding for 4 to 6 years.

Dr. Hamilton ended by restating the belief that NIH is here to help young investigators. He asked that they look at the NIH/NIDDK websites for more information and make use of the tutorials available to improve grant-writing skills. In addition, NIH/NIDDK staff is available to answer questions by email or telephone.

“STANDING ON THE SHOULDERS OF GIANTS: HOW MENTORING CAN TAKE YOU TO NEW HEIGHTS”

Dr. Phyllis A. Nsiah-Kumi, Assistant Professor, University of Nebraska Medical Center, Omaha, NE

Dr. Nsiah-Kumi shared her journey in the pursuit of a career in academic research. The four basic tenets of advice for new investigators beginning the journey include deciding where to go in life; finding someone who is already there; asking them to teach the new investigator how they got there; and teaching others. Mentoring is the critical component for success, both for those who mentor investigators along the journey, and for those investigators mentor once they reach a career stage at which others can benefit from their experience. The allusion to “standing on the shoulders of giants” describes how Dr. Nsiah-Kumi reflects on those who helped her progress to her current status.

Dr. Nsiah-Kumi provided an overview of her journey, beginning as a high school student in Prince Georges County, MD, where she had the opportunity to take a research practicum in agriculture studying Red Delicious apples; she did not like research at that point. Other steps along the way included undergraduate and graduate work, ending in her position at the University of Nebraska Medical Center. At each step of the way, she had the honor of having outstanding mentors; she provided a list and short description of how each person encouraged her and helped her maintain her career track. Dr. Nsiah-Kumi currently serves as a clinical researcher in internal medicine and pediatrics and as a researcher in health disparities, type 2 diabetes prevention in children, health literacy, breast cancer prevention and obesity, public health, and community-based participatory research (CBPR); and she still maintains her roles as

a teacher and mentor.

Mentoring may be formal or informal, or may just be one-on-one with a colleague. Peer mentoring, which can serve as a critical benefit in academia, is mentoring between individuals who essentially are equal in age, experience, and rank. Having different mentors at different stages of one's career path is important. Dr. Nsiah-Kumi provided a list of things that a mentor can do, including:

- Share knowledge
- Encourage competence
- Promote character growth
- Show how to get it done
- Teach by example
- Critique work (grants, papers, etc.)
- Invite the mentee to collaborate
- Open doors

Before looking for a mentor or mentors, it is important for an investigator to understand what he or she wants the mentor for and the path the individual wants to travel. Once there is a clear understanding of career goals, it is possible to look for mentors; a potential mentee needs to think "outside the box," look around, prepare to be mentored, and ask as many people as possible in seeking a mentor. After finding a mentor(s), the investigator should be enthusiastic, reliable, prompt and prepared, and appreciative. Asking questions of a mentor can open many doors. One aspect of the mentor/mentee relationship that many people do not know is that it is important periodically to re-evaluate the relationship to determine if still is working for both mentor and mentee. There is no harm in adding or changing mentors multiple times during one's career because no one mentor is likely to offer everything a mentee needs at different career stages. However, individuals should remember their past mentors and credit them for the role(s) they have played in assisting their careers.

Mentors are people, not superhuman beings. They also have careers, and mentees should recognize that they have much to attend to in addition to their mentoring responsibilities. Mentors also should be seen as "eyes in the forest" that can help a mentee to see the forest instead of just the trees in the forest. Dr. Nsiah-Kumi concluded her presentation with a quote from Marianne Williamson from *A Return To Love: Reflections on the Principles of A Course in Miracles*:

"Who am I to be brilliant, gorgeous, talented, fabulous? Actually, who are you *not* to be? You are a child of God. Your playing small does not serve the world. There is nothing enlightened about shrinking so that other people won't feel insecure around you."

Dr. Nsiah-Kumi encouraged attendees to take part in a culture of mentoring: to make good use of their mentors, and to become a valuable mentor for future researchers. She noted that no one knows what impact they can have without making the effort.

Discussion

Dr. Blanchard asked how Dr. Nsiah-Kumi, as a woman of color, meets challenges that confront her in her academic career and on a day-to-day basis. Dr. Nsiah-Kumi responded that she has learned to pause more before reacting. By pausing, it is possible to think about her response so that it is appropriate to the situation and is thoughtful. It also is important to stay accountable for commitments made; this is especially challenging for people of color who are in situations in which they are sorely underrepresented because an institution wants to be inclusive and minority individuals sometimes are one of only a few people representing minorities. It is important to learn to say “no” occasionally. One lesson she has learned is that it is best to defer a decision rather than always saying “yes” on the spot. Individuals need to assess whether they have the time and will to make a commitment, and what impact the commitment will on their employment and research goals. It always is best for individuals to be “up front” about what they can do and to know their capabilities.

LUNCH SESSION

A Mentor/Mentee Session: “Looking for a Mentee” was scheduled during lunch. Each table at lunch was theme-based, and participants chose to sit at a table based on scientific interest. An NMRI senior investigator staffed each table and facilitated discussions. The topics and topic leaders were:

Diabetes: *Dr. Trudy Gaillard, Assistant Professor, Ohio State University*

Grants Management: *Dr. Luis Cubano, Associate Professor, Universidad Central del Caribe*

Networking: *Dr. Orhan Öz, Associate Professor, University of Texas Southwestern Medical Center*

Obesity: *Dr. Shirley Blanchard, Associate Professor, Creighton University*

Endocrine: *Dr. Carlos Isales, Professor, Medical College of Georgia*

SCIENTIFIC PRESENTATIONS BY JUNIOR INVESTIGATORS

Histomorphometric Analysis of Bone in Healthy, Young Patients With Type 1 Diabetes Mellitus

Dr. Laura A.G. Armas, Assistant Professor, Osteoporosis Research Center, Creighton University, Omaha, NE

Fracture is a common complication of type 1 diabetes (T1D), but little is known about the cause. There is some thought that people with T1D lose bone because of the diabetes, although a few studies have indicated that bone microarchitecture or remodeling abnormalities may account for skeletal fragility in people with T1D.

A study published in 1995 on bone mass density (BMD) among adults with T1D indicated that they were not building bone and had reduced numbers of osteoblasts. Dr. Armas discussed methods of a cross-sectional study she conducted that examined activation frequency (the balance of old and new bone during bone remodeling). The study included 18 healthy age- and sex-matched participants in each of two arms (T1D and control). Laboratory values at baseline were equivalent for each arm, except for lower levels of IGF-1 and higher levels of A1c among those with diabetes. Dual-Energy X-Ray Absorptiometry (DEXA) tests found no differences among the T1D arm and controls. All participants received a bone biopsy in the iliac spine to determine structural histomorphology and micro-computed tomography (CT) with tetracycline labeling. Measurements were made of bone tissue volume (divided by total bone volume) and trabecular volume; results indicated no differences between the T1D arm and control arm. Assessments of bone formation rate (BFR) also were the same in each arm.

Remodeling results were assessed using a tetracycline-labeling regimen (3 days on, 2 weeks off, 3 days on). By taking the BFR and dividing it by bone wall thickness, an assessment of activation frequency was determined that tells the probability that a specific site of the bone is undergoing remodeling. Activation frequency did not differ between those with diabetes and controls. However, looking only at those with diabetes, five members of that arm had past nontraumatic fractures. Dr. Armas presented data showing that the skeletal microarchitecture in these five participants was different from that of those with diabetes and no history of fracture. Results indicated that they had lower glycemic control, lower bone volume, and thinner and fewer trabeculae. In addition, they had less osteoid, osteoblast, and mineralization surfaces, indicating that they were making less bone than those without a history of fracture. In addition, activation frequency and BFR were diminished in this group.

Future studies will be considered to look at people with diabetes complications and those with a history of fracture. Preliminary studies are exploring measurements of bone quality and osteocyte apoptosis.

Discussion

Dr. Armas clarified that the people with diabetes in this study were taking only insulin and no other diabetic drugs such as metformin; therefore, differences in bone remodeling are not likely to be drug effects. In addition, slight differences in body fat were seen between participants with diabetes and controls (diabetics had slightly higher levels of body fat).

No differences were seen in bone mineral density by DEXA between those with diabetes, although nano-indentation tests have been scheduled to determine the strength of the bone. It was noted that past fractures among the five participants occurred at different sites, although the sites all were weight-bearing bones.

Biomarkers were not assessed because it does not appear that this would be helpful in the investigation at this point. One issue is that an assumption was made that bone is relatively heterogeneous but remodeling is the same in all types of bone; therefore, heterogeneity should not have been a factor.

A question on differences in upper torso weight-bearing bones and lower torso weight-bearing bones was discussed. Remodeling may occur at a different rate (faster) in lower torso bone due to the fact that weight-bearing in that area, such as the leg, would need to be faster than bones in the upper torso, such as the arm.

It was noted that all participants in this study were Caucasian, because most T1D patients are Caucasian. Also, there were more women in the study, although no significant difference in fracture was observed between men and women.

Future study will include nerve conduction studies to determine the effect of peripheral neuropathy among those with diabetes and the risk of fracture.

Lysophosphatidic Acid Receptors, Periodontal Disease, and Type 2 Diabetes

Dr. D. Roselyn Cerutis, Associate Professor of Oral Biology and Pharmacology, Department of Oral Biology, Creighton University, Omaha, NE

Dr. Cerutis presented research on periodontal disease (PD) and type 2 diabetes (T2D). She provided an overview of PD and its importance as the incidence of T2D increases. Approximately one-third of people with T2D are diagnosed with PD, which is caused by infection and is worrisome because it occurs in young people with T2D. PD has a genetic component, but also involves the host-inflammatory immune response that occurs in systemic inflammation, which is associated with many other chronic diseases. In addition, bone loss occurs concomitant with PD, which also is a concern. Dr. Cerutis proposed that PD be designated as the sixth complication of diabetes to focus research attention in this area.

Cortisol that is produced during an infection raises glucose levels. This is a significant issue for dentists because they do not want to treat PD until the infection is alleviated. The normal course of pretreatment is to give an antibiotic to eliminate the infection before scaling and root planing to address PD. The administration of antibiotics also can reduce A1c levels.

Lipid mediators (e.g., cytokines) have been the focus of research for a few decades with regard to regulating inflammation. Dr. Cerutis described the stages of inflammation, from neutrophil infiltration through macrophage arrival. A class of neutrophils, polymorphonuclear neutrophils (PMNs), is the first line of defense in oral infection. PMNs elaborate a class of lipids known as resolvins. A lipid mediator, lysophosphatidic acid (LPA), is involved in wound healing and inflammation. Targets of LPA include peroxisome proliferator-activated receptor gamma (PPAR γ) and lysophosphatidic acid receptor (LPA R). Dr. Cerutis described a study in her laboratory exploring the role of LPA on gingival (GF) and periodontal ligament (PDLF) fibroblasts. Human GF and PDLF express LPA1-5 and regulate healing and inflammatory responses. In addition, LPA is present in high levels in the saliva and GF fluid of patients with moderate to severe PD.

An *in vitro* examination of GF and PDLF and the effect of the interaction of insulin and glucose was designed to determine if LPA regulates glucose metabolism and/or diabetes-associated genes in human oral fibroblasts. Methods were described. After 9 days, there was a 2.5-fold

increase in LPA1 for GF. Mitogen-activated protein kinase (MAPK) signaling was inhibited by high insulin concentration, and it was determined that LPA regulated six genes known to be associated with glucose metabolism and inflammation in T2D. These genes were glycerol kinase (GK), UDP-glucose ceramide glucosyltransferase (UCGC), pre-B-cell colony enhancing factor 1/visfatin (PBEF1), PPAR γ , co-activator 1 alpha (PPARGC1), suppressor of cytokine signaling 2 (SOCS2), and SOCS3. Further studies using microarray analyses of serum from nine T2D patients indicated that LPA strongly induced transcription of IL-8, IL-11, and COX2. Because IL-8 generally is pro-inflammatory and IL-11 is anti-inflammatory, this implies that LPA may play a positive or negative role in inflammation, depending on its concentration.

In conclusion, it is important that research on LPA continue, in the context of LPA1 and LPA3, to determine the impact of regulating/inducing the genes in PD.

Discussion

Future research will address the role of specific stem cell populations in the PDLF.

An advantage of working with LPA is that it is stable and maintains its integrity through freezing and boiling. This makes it easy to work with in an array of situations.

SCIENTIFIC PRESENTATIONS BY SENIOR INVESTIGATORS

Immunobiology: A Common Underlying Basis of Human Diseases

Dr. Devendra K. Agrawal, Dean of Translational Research, Creighton University, Omaha, NE

Dr. Agrawal described the primary host defense systems: innate and adaptive immunity. He provided detailed descriptions of the basic events that occur in immune response and how these responses are intertwined with human disease. For examples, he used airway diseases (asthma and chronic obstructive pulmonary disease, COPD) to show the commonality of immune diseases and how inflammation can be reduced by the administration of glucocorticoids.

Dr. Agrawal described the Hygiene Theory of disease that supports the concept that observations of children, all of whom are born with T helper cell-2 (Th2) immunity, differ by number of siblings in developing T helper cell-1 (Th1) immunity. Multi-sibling children tend to have more childhood infections than “only” children; however, only children have more allergies later in life than multi-sibling children because the only children do not develop the Th1 immunity. It is thought that increased exposure to allergens and infectious agents among multi-sibling children strengthens the Th1 immune system. Developing a polarized Th1/Th2 immunity is dependent on timing and dose, environmental co-factors, and genetic factors. A goal of research is to find an immunomodulator that can balance the Th1/Th2 immune response. Potential targets for immunomodulation include cytokine agonists, PPAR γ agonists, probiotics, mycobacterial antigens, vitamin D, and many others.

Immunobiology is an area of research that can impact cardiovascular disease (CVD), which is known to be influenced by inflammation through the buildup of atheromatous plaque in arteries.

Studies have shown that the critical disease sequelae in CVD occurs when plaque breaks off and travels through the arteries and veins, where it blocks the flow of blood and causes myocardial ischemia or stroke. The question is why does some plaque break off and others do not, and how to keep the plaque from breaking off.

Dr. Agrawal described his work in carotid artery stenosis. He has observed plaques removed from CVD patients that show that a key mechanism is the instability of the plaque due to increased inflammation and apoptosis of cells. The importance of understanding plaque buildup is to determine if any interventions can keep arteries grafted during Coronary Artery Bypass Graft (CABG) surgery from becoming blocked. Approximately 20 percent of saphenous vein (from the leg) grafts renarrow within the first year after CABG surgery, but only 1 to 2 percent of grafted internal mammary arteries renarrow during the same time. Renarrowing also occurs in arteries after undergoing balloon angioplasty or insertion of a nondrug-eluting stent. Less renarrowing occurs when drug-eluting stents are inserted. Another approach is to try gene therapy on the new or intervened artery, which has shown limited success to date.

Dr. Agrawal described his research on vitamin D as an immune modulator. Vitamin D enhances the actions of T-regulatory cells, and vitamin D receptors exist in almost all human cells and are found in the cell nucleus. He presented information showing that vitamin D participates in both innate and adaptive immunity, which means it may play a role in most human diseases. For example, vitamin D is involved in immunity in the lung and esophagus (Barrett's esophagus). In addition, vitamin D receptors in the intestine and colon are associated with inflammatory bowel disease and possibly with the sequelae for colon cancer.

Discussion

Dr. Isales asked about the role of vitamin D in aging. Dr. Agrawal indicated that the role of vitamin D in regulating processes related to aging has not been clarified, but this is an area of research that should be pursued.

A challenge in changing levels of immunomodulators is the impact of changing one on many others. For example, if there are five immunomodulators in a specific system, increasing activity of one may decrease the activity of others. A lot of this information still needs to be found through current research.

Vitamin D: The Iceberg Nutrient

Dr. Robert Heaney, Professor, Creighton University, Omaha, NE

Dr. Heaney provided background on vitamin D, which exists in two chemically distinct forms—Vitamin D₂ (ergocalciferol) and vitamin D₃ (cholecalciferol), the natural form found in animals that is produced in skin on exposure to ultraviolet-B light. The canonical scheme details that 25(OH)D₃ is the functional indicator of vitamin D status, and the principal storage form of the vitamin. 25(OH)D₃ is hydroxylated primarily in the kidney to produce 1,25(OH)₂D₃, which is a hormone that circulates in the blood and is responsible for calcium absorption. Varying recommendations exist for the intake and serum levels of vitamin D to maintain health; a recent Institute of Medicine (IOM) recommendation of 50 nmol/L is considered adequate minimal

maintenance, but higher amounts are recommended by other organizations for specific conditions or populations.

The concept of vitamin D as an “iceberg” nutrient is expressed by the common knowledge (for almost a century) that vitamin D is required for calcium homeostasis and for associations with diseases such as osteoporosis (the visible iceberg, the endocrine pathway). However, it now is known that most of the iceberg is below the surface in the form of vitamin D’s ability to control genes and regulate cell cycles (autocrine pathway). The autocrine effect (locally made $1,25(\text{OH})_2\text{D}_3$ that has a local effect) is the area that was discussed in this session.

Although the canonical scheme attributed hydroxylation of $25(\text{OH})\text{D}_3$ to $1,25(\text{OH})_2\text{D}_3$ to the kidney, it now is known that only 15 percent of the hydroxylation takes place in the kidney as part of the endocrine pathway. Upwards of 85 percent takes place in various tissues around the body when cell-specific needs arise as part of the autocrine pathway. The critical nature of the need for the autocrine pathway is that circulating $1,25(\text{OH})_2\text{D}_3$ made in the kidney is not available to peripheral tissues; they have to make it themselves. Dr. Heaney showed examples of this process.

Until a decade ago, science thought that DNA in somatic cells functioned mainly to make faithful copies for tissue repair or replacement. We now know that DNA functions constantly in the synthesis of needed cellular components and processes. Likewise, our understanding of the cell model was that cell/tissue differentiation meant that each cell type contained a different cytoplasmic apparatus; we now know that cell/tissue differentiation means that only certain genes can be accessed in each tissue. $1,25(\text{OH})_2\text{D}$ is the key that unlocks the DNA library to allow cell/tissue differentiation and is synthesized in the cell itself when it is needed.

Vitamin D enables, but does not cause, cellular processes. An example may be shown from calcium absorption. Looking at a graph of vitamin D intake and calcium absorption, it is clear that once enough vitamin D is present (~ 80 nmol/L), calcium absorption stops, regardless of the amount of vitamin D added after that point. This is a good point to remember about the difference between drugs and nutrients: once enough of a nutrient is present, the effect stops, unlike continued effects at increasing doses of a drug. Key points to remember about vitamin D and calcium absorption include the following:

- Vitamin D does not itself cause calcium absorption.
- A high $25(\text{OH})\text{D}$ level, or a high vitamin D intake, does not mean that calcium absorption will be high, only that high calcium absorption will be possible.
- In this action, as in all of its other actions, vitamin D enables physiological response.

Population studies in Nebraska of vitamin D exposure show that most women do not get adequate amounts of vitamin D. Data from the National Health and Nutrition Examination Survey (NHANES) show that most girls (ages 1-21) also receive inadequate amounts of vitamin D per day. Reasons for lack of adequate vitamin D exposure among African Americans may include that the migration from the rural South to northern cities decreased sun exposure; in addition, most people of all races now work indoors during the light part of the day. This has resulted in an increase of vitamin D-related disease in the general population. Evidence of a

causal relationship between low vitamin D levels and disease indicates the breadth of the negative consequences of low vitamin D exposure.

Dr. Heaney presented results from studies on fall risk, fracture risk, blood pressure, tuberculosis, influenza, and colorectal and other cancers clearly showing the breadth of the vitamin D-disease continuum.

The new perspective on vitamin D is that it is an integral component of the mechanism whereby cells control gene transcription in response to a variety of extracellular stimuli; adequate vitamin D status enables optimal response to a broad variety of signals; and deficiency will manifest itself differently, depending upon the tissue being stressed, thus explaining the diversity of responses. In summary, Dr. Heaney presented the following points:

- For several body systems, the preponderance of the level 1 evidence indicates that ≥ 32 ng/mL is necessary to realize the benefits of vitamin D repletion.
- Observational studies support this conclusion and strengthen the level 1 evidence by insuring the generalizability of the randomized controlled trials (RCTs).
- For some endpoints (e.g., cancer), the data suggest that 40 ng/mL per day of vitamin D is needed.
- Levels of 40 ng/mL and above are physiological levels.
- Given the manifest safety of such levels, we should strive to achieve at least 30 and preferably >40 ng/mL per day in all of our patients.
- When other medical problems coexist with vitamin D deficiency, their treatment will be impeded unless the vitamin D status of the patient is restored to normal.

Dr. Heaney concluded by showing a table comparing vitamin D exposure recommendations from the IOM and Endocrine Society.

Discussion

It is not possible from the data presented to show which cancers would be responsive to vitamin D intervention, although there is considerable evidence for pancreas, colon, brain, and other cancers. It is likely that all cancers have some degree of vitamin D sensitivity. The important issue is ensuring that patients maintain a daily intake level of 40 ng/mL.

Magnesium has not been adequately studied with regard to the uptake of calcium, although many calcium supplements contain magnesium. One issue is that magnesium does not have reliable isotopes that can allow tracing in human studies. It seems prudent to believe that there is some reason to ensure that magnesium intake is adequate.

As a clinician, it is not practical to screen everyone for vitamin D; the assumption is that most people will have low levels of vitamin D. Dr. Heaney indicated that for his studies, he prescribed 1,000 IU for everyone in the study and measured levels after 3 months. If levels were adequate, he maintained that regimen; if levels were not adequate, an additional supplement was added.

In the past decade, 25(OH)D has become the most common endocrine assay prescribed by

physicians in North America. Because third-party payers have recognized this, they are beginning to tighten up the reimbursement standards; in Canada, they will not reimburse for this unless there has been a previous diagnosis of deficiency. This is curious, somewhat like not allowing a glucose test unless the physician knows the patient has diabetes.

Differences among recommendations need to be put in context. For example, the IOM recommendations were based on the level (600 IU) that prevents clinical osteomyelasia, even though more than 600 IU is required to prevent histological osteomyelasia. The Endocrine Society recommendations (600-2,000 IU) were based on other criteria.

A question consumers and patients always have is whether all vitamin D supplements are the same. Vitamin D₂ is from plant sterols and is a synthetic product that does not exist in nature; vitamin D₃ is the form made in the skin of animals and has a better pharmacologic profile than vitamin D₂. However, both work, and it is important to remember that the body cannot convert vitamin D₂ to vitamin D₃. There also is a degradation product of 25(OH)D known as D-24 that does not appear to have physiological properties.

Pre-Clinical Imaging: A Tool for Understanding Pathophysiology and Screening Diagnostics and Therapeutics

Dr. Orhan Öz, Associate Professor, University of Texas Southwestern Medical Center, Dallas, TX

Dr. Öz provided an overview of imaging technologies and commented that during the past decade, the quality and usefulness of imaging has made great strides. He also provided an aside that his association with the NMRI has been valuable in his career and on a professional level.

Preclinical imaging is defined as imaging applied to animal models of disease to understand the pathophysiology of the disease and evaluate the efficacy of new imaging diagnostics and therapies; it is multimodal by necessity. Preclinical imaging is the bridge from basic research to clinical medicine. The modalities of preclinical imaging include structural-based techniques such as radiography, CT, magnetic resonance imaging (MRI), and ultrasound (US); and functional imaging such as radionuclide-based imaging (e.g., single photon emission computed tomography [SPECT] and positron emission tomography [PET]), MRI, and optical imaging.

Dr. Öz discussed the electromagnetic spectrum and where each type of imaging falls along the spectrum. A review of the features for each type of imaging indicates that differences in resolution, time for the test, cost, and type of organ or tissue imaged with each are determined by the needs of the procedure. Different types of imaging technologies are used to elucidate a specific anatomic, physiologic, metabolic, or molecular feature. Technologies that have moved the imaging field forward include computer speed and data-storage features; without the incredible improvements in the ability of computers to store the large amounts of data required for images, preclinical imaging would not have advanced so significantly.

Dr. Öz provided overviews of each type of imaging technology to show the application of preclinical imaging. As an example, he used the 50kD glycoprotein aromatase, a member of the P450 superfamily and product of the *CYP19* gene, to illustrate the power of imaging. Aromatase

is expressed in the ovary; testes; placenta; adipose mesenchymal cells; osteoblasts; osteocytes; chondrocytes; and some osteoclasts of bone, vascular smooth muscle, and endothelium; and numerous sites in the brain. He showed various imaging techniques to explain how structural and functional imaging can add to the knowledge of aromatase expression in an animal model and in humans for bone distribution using the knowledge that aromatase converts C₁₉ androgens to C₁₈ estrogens. Dr. Öz also illustrated imaging for investigations of cell activation in tumor growth, for which an imaging assay has been developed. The assay can be used to screen pharmaceuticals or biologics that activate or suppress natural killer cells; in the future, the assay will be moved into a dedicated small animal SPECT-CT platform for better image quality.

Enhancement of molecular imaging for gene therapy allows imaging of protein expression and function and promoter activity. There is interest in gene therapy for cancer treatment, generally with viral vectors such as adenovirus. The Coxsackie and Adenovirus Receptor (CAR) is the primary receptor for recombinant adenovirus, inhibits tumor growth, and is differentially expressed among various tumors. Dr. Öz showed examples of how imaging can distinguish between CAR+ and CAR- tumors; CAR expression can be an indicator of tissue receptivity for adenoviral gene therapy.

Dr. Öz quickly reviewed the use of multimodal imaging used to target β cell activity by testing for ligand-binding activity of the GLP-1 receptor. He showed images in this early investigation that used PET and CT imaging to determine insulin excretion by β cells in the pancreas. A pig model was being developed to induce diabetes in pigs and investigate various interventions that could be imaged to determine their effectiveness.

Dr. Öz concluded by summarizing the various imaging techniques. He said there now was very high resolution and specificity in imaging, especially with SPECT, and the simultaneous imaging of multiple physiological processes. For example, in the future, researchers will be able to observe β cell mass and function under ideal conditions.

Discussion

Dr. Öz said that he would have a functional MRI soon, although it would not be appropriate for structural imaging because field strength may not be high enough.

To date, no imaging can yet determine bone strength (i.e., the potential for fractures). However, a micro-CT may be used if coupled with engineering models for bone strength.

A recommendation for imaging in obesity cardiovascular models, SPECT, can tell the ejection fraction that would be useful. For cardiac perfusion, a different tracer would have to be used for different imaging techniques. For a patient who comes to the clinic with chest pain, a pharmacologic challenge coupled with an imaging technique could provide the physician with adequate knowledge for treatment options. Most likely, radiographic or CT would be used for anatomical imaging, but this does not always predict physiology.

For specificity, antibodies can be imaged by glucose-labeled radionuclides, although it is case-specific. Another technique described by Dr. Öz includes peptoids for targeting the vascular

endothelial growth factor (VEGF) receptor. The peptoid was developed for a different purpose but upon its use, activity was noticed in an unexpected location. Because there was access to various imaging technologies, he was able to determine that the activity was related to binding to the VEGF receptor. They now can label the receptor or lipids.

DINNER ADDRESS: ACHIEVING SUCCESS AS A LEADER: MY PERSPECTIVE

Dr. Sade Kosoko-Lasaki, Associate Vice President for Health Sciences, Multicultural and Community Affairs, Creighton University, Omaha, NE

Dr. Kosoko-Lasaki described her experience and perspective about successfully taking a leadership role. She is a black woman who came from a foreign county, more than 40 years of age, and has had many experiences and been able to achieve a great deal.

A key element in attaining success is the need to determine where to spend one's time. Dr. Kosoko-Lasaki said that Creighton University's emphasis on ethics, service, and excellence drew her to the university. This is described in its mission statement: "We live our mission and are guided by our identity. We approach education with a passion for learning and a zeal for making a difference in our world ... we celebrate our diversity"

It is important to define oneself in the context of leadership. A person cannot be a "wimp" and a leader; leadership requires courage to make decisions and the vision to lead. Dr. Kosoko-Lasaki commented about her experience at Creighton University. Her job was defined vaguely to increase the diversity among student and staff, which provided her with the opportunity to grow, including applying for more than \$10 million in grants, and bringing in more than \$8 million for diversity efforts. Part of building diversity is helping the community. Another component of being a leader is to be consistent with what one says, and not to say different things to different individuals.

Another important idea is to set goals. Dr. Kosoko-Lasaki's department holds a retreat once a year to review achievements and tweak the goals for the next year. If a student misses the deadline for NIH student grants, then the goal might be to partner with someone who has a grant. She encouraged all minority researchers to set goals, be curious, be smart, and have a dream. When Dr. Kosoko-Lasaki came to Creighton University, only one minority student was in medical school there: now there are 16—that is success.

She encouraged all minority students to achieve, anticipate, and celebrate success. Passing on success, such as through mentoring, takes humility and takes a team. One example of mentoring is Creighton University's program to mentor those who could not matriculate into the health sciences. Minority students and researchers should make it a goal to build confidence in themselves and in their ability to learn to work as a team.

To sustain one's success, one must be a positive influence and form good health habits. Also, it is important to plan for the next job and for retirement. In short, one should develop the job and develop oneself.

On any given day, Dr. Kosoko-Lasaki prioritizes the day's tasks. Her family comes first. She surrounds herself with knowledgeable people and maintains her level of confidence in herself and in the people around her; she does not micromanage them. Time management is crucial, as time must be available to address issues at work and also for at home. She also prays frequently. Her family motivates her—she said that whoever motivates you must be acknowledged.

Dr. Kosoko-Lasaki described Creighton University's local community outreach efforts, as well as her national and international contributions. Glaucoma is her passion. It is the most common cause of blindness among African Americans, but African Americans often do not trust physicians. She began an outreach program to screen 14,000 people in Omaha, NE. She has served as a board member of the Educational Commission for Foreign Medical Graduates (ECFMG®), among other organizations.

A student at Creighton University mentioned to her that children in the Dominican Republic had night blindness. Efforts in Africa sponsored by UNICEF, the U.S. Agency for International Development (USAID), and other organizations linked night blindness with vitamin A deficiency in children. Dr. Kosoko-Lasaki went to the Dominican Republic to screen and administer Vitamin A to children. While there, she also worked with the local community, teaching Dominican Republic health workers to identify vitamin A deficiency. She also helped adults with glaucoma, particularly by teaching local ophthalmologists about glaucoma screening and treatment and training grassroots people to recognize glaucoma symptoms; the program is flourishing. She later received a telephone call from the U.S. Congressional Glaucoma Caucus to extend her glaucoma work to the U.S. Virgin Islands, which she did, particularly by teaching those locals who screen for glaucoma.

In closing, Dr. Kosoko-Lasaki quoted Oliver Wendell Holmes: "The joy of life is to put out one's power in some natural and useful or harmless way." She finished with the writings of Dawna Markova: "I will not die an un-lived life. I will not live in fear of falling or catching fire. I choose to inhabit my days, to allow my living to open me, to make me less afraid, more accessible; to loosen my heart until it becomes a wing, a torch, a promise. I choose to risk my significance, to live so that which came to me as seed goes to the next as blossom, and that which came to me as blossom, goes on as fruit."

Discussion

An attendee asked about Dr. Kosoko-Lasaki's clinical practice, particularly how she gets the administration to protect her time. Dr. Kosoko-Lasaki replied that Creighton University would prefer that she do more clinical work. Many people do not have a sense of the value of research. It is hard to be a part-time physician, but she has passion for treating people. A leader must know how to decide what can be done and who is the best person for a job. Dr. Kosoko-Lasaki limits her practice to what she does: glaucoma. She does not treat diabetic retinopathy or other eye conditions, except when she goes to Africa, where she becomes a physician for all conditions.

FRIDAY, NOVEMBER 4, 2011

To begin the morning, a pre-session activity was held for one-on-one meetings of mentors and mentees, or those wishing to develop a mentor/mentee relationship. The purpose of the pre-session was to have junior investigators meet with senior investigators to receive feedback on draft grant proposals.

WELCOME REMARKS

Dr. Blanchard

Dr. Blanchard thanked everyone for a successful workshop the previous day and said she was looking forward to as successful a workshop that day. She welcomed Dr. Chris Bradberry, Dean, School of Pharmacy and Health Professions, and Dr. Kimberly Galt, Professor, Associate Dean for Research and Director of the Health Services Research Program, both of Creighton University. Dr. Blanchard noted that Dr. Galt had offered to participate in the NMRI mentor/mentee program and work with Dr. Luis Cubano, an NMRI member from Universidad Central del Caribe in Puerto Rico.

Dr. Bradberry welcomed the NMRI to Creighton University and said it was an honor to hold the workshop at Creighton. The work that the NMRI does is central to the mission of the university, and he wished the NMRI every success in meeting that mission.

Dr. Galt observed that the NMRI has an opportunity to change the research community because NMRI members have the knowledge and talents that have emerged from others to allow them to do this work. Investigators have a mission to report their findings to the world, which can provide guidance to the larger society for meeting social and health needs. She said she hoped that NMRI members understand the opportunity they have and will not become so focused on the “trees” that they fail to see the entire forest and the impact they have.

Dr. Galt spoke kind words regarding Dr. Blanchard and said how much she values her work as a role model. Dr. Galt said she works diligently in her research, but brings that back to her community and to her teaching. She commented that Dr. Blanchard also has gained a lot through her participation in the NMRI, and how much she has brought back to the university.

Dr. Blanchard thanked Drs. Bradberry and Galt and introduced the agenda for the day, which began with a report from the NMRI Oversight Committee.

REPORT OF THE NMRI OVERSIGHT COMMITTEE

Dr. Blanchard

Dr. Blanchard reviewed the membership and procedures of the Oversight Committee and the NMRI Annual Report presented at the April 2011 NMRI Annual Workshop. Dr. Blanchard was past-Chair of the Oversight Committee; Dr. Charmaine Stewart, University of Minnesota, was the current Chair, and Jose Romero from Harvard University was slated to become Chair at the

April 2012 NMRI Annual Workshop. Dr. Blanchard explained that the Committee consists of 10 members from various constituencies of the NMRI, and members serve a 3-year term. The Committee convenes by conference call every 3 months, with the fourth meeting coinciding with the NMRI Annual Workshop.

The Committee's primary responsibility is to facilitate the development of active mentoring between senior and junior members, facilitate outreach, establish groupings of Network members based on interests and goals, and match mentors and mentees. The Committee coordinates with professional societies that support NMRI regional and annual meetings, evaluates NMRI effectiveness, pursues the retention of NMRI members, and ensures that members fall within the specific programmatic areas of the NIDDK.

Dr. Blanchard said that in consultation with Dr. Agodoa, the NMRI was considering broadening the scope of topics beyond those that are central to the NIDDK's mission to be able to recruit investigators into the NMRI from outside of that scope. This could strengthen the NMRI in the future and would create a variety of opportunities to expand NMRI membership.

Committee goals for the past year were met and included monitoring the formalized mentoring program for member career development and identifying specific learning activities. An NMRI DVD, in production at the time of the meeting, was to be posted on the NIDDK NMRI website to show what the NMRI does and provide short vignettes of member statements.

Dr. Blanchard reviewed and compared results from the 2009 and 2010 NMRI evaluation questionnaires. She reported that the information on the questionnaire is critical for the NMRI Planning Committee and Oversight Committee in developing activities and workshop agenda items. Selected examples of questionnaire results from 2010 included the following:

- **Academic Status:** Of the 111 respondents in 2010, approximately 46 percent were Assistant Professors, 21 percent were Associate Professors, and 5 percent were Professors. Approximately one-third were tenured; two-thirds were not.
- **Meeting Attendance:** Ten percent of respondents reported that they had attended all NMRI meetings; approximately 74 percent had attended more than one meeting.
- **Reasons for Attending:** The five most common answers for why members attended the NMRI meetings included professional mentorship (73%); research opportunities (69%); to enhance grant-writing skills (65%); assistance in developing management skills (51%); and continuing education (37%).
- **Career Development:** Of those responding to the question on how the NMRI had helped them in their career, multiple members answered that the NMRI allowed them to interact with administrators and stay current in NIH policies; supported them in mentoring undergraduate researchers; taught best practices to succeed as a minority investigator; and provided knowledge regarding how to submit a focused grant application. Above all, mentoring was cited most often as the benefit most valued by NMRI members. On a scale of 1 to 10, NMRI members rated career development at the NMRI as an 8.

- **Assisting in the Tenure Process:** The NMRI has built a track record of scholarship and service for assisting in the progression of members toward tenure. This has been accomplished through letters from the NMRI to faculty institutions, mentoring, ensuring that research remains the focus of NMRI members, and giving assistance in understanding the tenure process.
- **Mentorship:** More than 70 percent of NMRI members would like to be a mentor, and more than 60 percent would like to have a mentor.
- **Grants:** Of those responding regarding the number of grants they had submitted this year, 41 members had submitted 61 grants, with 16 grants having been funded. This was impressive given the difficult economic times that made grant seeking more competitive.

Dr. Blanchard concluded her review by asking four members to stand and tell what they planned to do in the next 12 months to support the NMRI. Drs. Cubano, Balls-Berry, Greene, and Cerutis made commitments to accomplish specific activities to promote the NMRI. Dr. Agodoa added that the NIDDK had issued a Request for Proposals for professional societies to establish training programs for minority investigators who are members of the society. Four awards were planned at \$150,000 each. After hearing from members, Dr. Blanchard welcomed Dr. Virginia Sarapura to present information on the NMRI Mentor/Mentee Program.

CONCURRENT SESSIONS

Four concurrent sessions were held; participants were able to attend two of them during the session. Below is a compilation of the two sessions presented by session leaders.

Tenure and Promotion: Transition From Postdoctoral Associates to Assistant Professor (“...and you thought the science was challenging”)

Dr. Victor Padron, Associate Professor, Creighton University

Dr. Padron said that he had experienced rank and tenure at four universities, two private and two public; served on academic tenure committees; and been involved with academic shared governance. Tenure is usually conferred on senior academicians and is a contractual entitlement to keep one’s position without termination except for just cause. Case law provides that tenure is a property right. For the institution, tenure is a long-term investment in academicians’ continued productivity. Tenure is a very structured process for most institutions to ensure that personnel have and maintain a good track record. Many people currently being hired do not have tenure written into their contractual arrangement; and many “contingent” faculty members are hired annually with no benefits. Presumably, tenure arises from a strong record of research, teaching, and service. There usually is a review process for attaining tenure.

The purpose of tenure is to protect and ensure “academic freedom.” It is the prerogative of faculty to teach and conduct research in areas that might be controversial and to dissent from prevailing ideas (social, administrative, or in a given discipline). In the absence of tenure,

academicians may find themselves conducting research wanted by their chair, mentor, or school. There may be “safe” or “third rail” topics that an individual cannot address. Also, caution may be needed regarding some topics; Dr. Padron noted that because he signed on at a Catholic Jesuit school, he has to be cautious about certain moral topics (e.g., homosexuality, abortion), none of which directly involved his specialty.

In the absence of tenure, there is the possibility of no intellectual independence or autonomy and, hence, the formation of “group thinking.” There also is the possibility of the squelching of novel or original ideas. If an individual’s ideas are distinct from the institution, then the institution has little incentive to retain that person.

Tenure is not unlimited and can be lost because of: serious misconduct; violation of institutional rules and statutes; bringing of shame, repudiation, or embarrassment to the university; criminal behavior; and research misconduct. Other circumstances include that an institution can declare that it is financially unable to continue a program or department.

The loss of tenure can be contested because it is a property right. The university accreditation process requires that rules and procedures be established to handle faculty grievances, dismissals, and the like. Dr. Padron said that the person who knows the rules knows best when to use and when to bend them.

Benefits of tenure include: strong incentive for junior faculty to work—they have a target to achieve; namely produce or find another job. Tenure should help create an academic environment of excellence. Senior faculty members who realize that their institution will be their home for a long time have a greater interest in the best interests of the university. Tenure also means that senior faculty members have a greater tendency to want to mentor others because they do not see them as rivals for their own jobs.

Most academicians with advanced degrees are looking for full-time teaching and research faculty positions. They usually are looking for a tenure-track and expect the standard titles associated with those positions (assistant, associate, full professor). However, 60 percent of full-time teaching faculty at 4-year college campuses and universities are contingent faculty. They work on an annual contract to teach courses or perform specific research activities. Some contingent faculty are able to negotiate some benefits.

There are economic tradeoffs to consider. Tenure track faculty require a long-term commitment, are difficult to get rid of, and tend to be more expensive. Dr. Padron said that his mentor had said that working in an area of research in which one is the only expert is one way to get to the top. Another idea is to immerse oneself in a critical area in which there is a shortage of personnel. Nontenured faculty are a short-term commitment and receive few or no benefits as well as lower salaries.

The typical tenure process, which varies by institution, is a probation period of 7 years with a tenure review during the fifth or sixth year and possibly earlier. Early review of tenure can be negotiated into the contract during the hiring process. A person who does not make tenure usually is let go, but this is not always the case. In some instances, a Dean might make that

person contingent faculty. The reason that the tenure review process occurs approximately a year before the end of the probationary period is to allow faculty who do not attain tenure 1 year to find another job.

Tenure candidates should prepare a dossier or portfolio that illustrates their accomplishments. A panel review and usually an external review occur. Letters are solicited from former students and graduate students regarding whether a professor should be tenured.

There are many criticisms of the tenure process. Public perception is that once a professor is tenured, he/she becomes unproductive or less relevant in their field. University administrators also must deal with professors who are active mavericks; such professors may present issues for the administration, but they also may be change-leaders in their fields. Senior faculty control hiring and favor cronies, sycophants, and those who think like themselves (perpetuating “group think”); this also hones political correctness. Opportunities to obtain tenure have grown more slowly than nontenured track positions, leading to an academic underclass.

Tenure does not necessarily extend special privileges. Offices can be small, and parking spots far away. Administration has ways to be unpleasant if they think an individual is unpleasant.

There is a perception that “publish or perish” diminishes teaching, particularly in junior faculty. Few graduate programs train their students to be good teachers. Most junior faculty teach how they were taught, but there have been many shifts during the past decades, such as the advent and widespread adoption of electronic learning systems.

There are approximately 300,000 junior faculty in the United States. Fewer than 200 have been removed for cause per year. It would appear that the majority are performing satisfactory work.

There can be a disconnect between policy and reality. At some institutions, a professor will not receive tenure without sufficient publications, regardless of the amount and quality of teaching or service. In addition, personal agendas can be inserted into the tenure process.

Dr. Padron said that he is a member of the American Association of University Professors, an organization that he believes stands against the movement to destroy tenure, long-term commitments to faculty, and academic freedom.

He described a number of challenges facing tenure as an established practice. Tenure is under attack from the corporatization of the university environment. In the name of workforce flexibility, many corporate-type CEOs who are in academia would like to eliminate tenure. Personnel comprise the greatest cost of any institution. These CEOs bring an attitude that human beings are interchangeable and disposable. Corporatization of the university results in less collegiality and less personal interaction. There is another perception that tenured faculty become unproductive; however, nearly all are quite productive. Also, corporate people do not have to prepare academic impact statements. They can request and make changes arbitrarily without consideration of the impact on an individual’s ability to conduct research or teach. The corporate mentality centers on promotion, not on a university’s purpose of education and research. Junior faculty are fired for unpopular or political opinions; however, a university should be a place for

many diverse ideas. The desire for public accountability also presents challenges for tenure. Another thought is that junior faculty must concur with others' ideas for the initial 7 years in a school to attain tenure. Some also believe that the "publish or perish" environment produces junk science and junk scholarship; the desperation to be productive means that work is produced without regard to quality. The number of top-notch journals in a given field is small. The recruitment of administrators from business brings a corporate, top-down mentality in contrast to the traditional academic concept of shared governance, in which management, faculty, and staff come together to resolve problems.

Specific recommendations for those seeking tenure include:

- Visit the school's website and examine newsletters, journals, and meeting minutes to see what is going on.
- Determine if there is a functioning faculty senate as well as student, staff, and faculty leadership.
- Review the school's statutes, handbook, and bylaws.
- Identify the chair of the promotion and tenure committee.
- Ask the university to share its promotion and tenure guidelines with you.

Dr. Padron said that in many universities, one can switch between the tenure and nontenure tracks; because this is becoming increasingly frequent, many schools now limit this to a one-time switch. He suggested that new graduates talk with junior faculty and determine if they are being mentored and are knowledgeable about what is needed to achieve tenure and promotion. These expectations can be quite clear at times and obscure in other instances. Dr. Padron said that his Dean had specific requirements of junior faculty: two publications a year and a grant proposal submission every other year; acceptable teaching evaluation forms; and appropriate service.

Dr. Padron encouraged participants to learn all they can and to get along with colleagues. Other advice is to: see whether the experience of senior faculty is in tandem with the written guidelines; determine whether there a "honeymoon period," such as no committee assignments for the first year; and use finesse to ascertain unspoken intradepartmental policies.

Choosing an institution is not dissimilar to choosing a spouse. With a spouse, one also gets the spouse's family and friends. When one becomes a professor, he/she also gets the department, college, university, and everything connected with them. An individual entering a culture must learn to adapt within the culture to succeed.

Discussion

Participants shared anecdotes about their experiences with tenure and promotion guidelines. One participant noted that she was told she had a honeymoon period but was still required to perform work that she was not expecting.

Dr. Padron said that the timelines for tenure and for promotion vary by institution.

A participant asked how the scholarship component of one's portfolio could be refined. Dr. Padron suggested that one's Department chair, a ranking senior committee member, or

school Dean might provide the best guidance. Some people lack this support and find themselves in inhospitable or even hostile situations. Dr. Padron said that at one point in his career he decided he would not pursue full professorship after he looked at the costs and gains.

Community-based Research (3 speakers)

A. Community Engagement, Research, and Research Scientists

Dr. Beth Furlong, Associate Professor, Creighton University, Omaha, NE

Dr. Furlong related a story of her early days in research in Arkansas when she recognized with others that outside researchers are “helicopters”— they swoop into a community, conduct their research, and leave. She said that this taught her early on that researchers need to engage with the community, not just use the community for their research. She provided the following definition of community research:

“Community engagement in research is a process of inclusive participation that supports mutual respect of values, strategies, and actions for authentic partnership of people affiliated with or self-identified by geographic proximity, special interest, or similar situations to address issues affecting the well-being of the community of focus.” (Ahmed and Palermo, 2010, p. e4).

The rationale for including community engagement as a tenet in research is that research is tax-funded and the society should demand accountability and respect for those who are the object of the research; individuals who participate in research want feedback on results of the research; community engagement enhances research by improving the need, design, execution, and analysis of the research; and the NIH has specified that translation CBPR is a high priority. In addition, engaging the community can be viewed as a common good and is likely to attract more participants for future research.

Barriers exist against calling for more community engagement. Dr. Furlong provided an argument and a counter-argument for each of the points in her rationale for more community engagement (listed in the previous paragraph). For example, funding is not an issue if it is not tax supported, although scientists may be accountable in other ways in privately funded research. With regard to the issue of respect for research participants, researchers often think that having participants sign a consent form is the same as giving them input and respect, although participants often do not understand what they are signing. A significant barrier is that researchers generally do not have experience or understanding of community engagement; this challenge can be met by designing training programs for researchers to assist them in truly engaging communities. The argument that research is for the common good has no counter argument.

Dr. Furlong concluded by asking participants to consider the following questions:

1. For the research you do, how would you engage participants?
2. What are the barriers and opportunities you envision?

B. Black Family Health and Wellness: How to Organize an Annual Community-based Wellness Program

Dr. Wayne Houston, University of Nebraska Medical Center, and Dr. Ira Combs, Community

Liaison Nurse Coordinator, University of Nebraska Medical Center

Dr. Houston spoke about the origins of the Black Family Health and Wellness program. The idea of the program came to him in 1998 when a first-year medical student asked if Dr. Houston could help him develop a cancer presentation for the African American community. After many discussions, they decided on a health fair and began organizing at the community level.

Dr. Houston explained some of the principles of community organizing, which included the following:

- Organizing with community leaders requires that all participants leave their personal agendas at the door and concentrate on the planned activity.
- Identify sponsors to support activities early in the process, especially if a large community event is planned. This also will help with publicity.
- Create a theme for the event. The brand for the community health fair cited above was “A Healthy Family is the Heart of the Community.”
- If the activity will be a recurring one, develop a name for the organizing group. Dr. Houston’s group became known as the “Black Family Health and Wellness Association (BFHWA),” because the group wanted to have activities throughout the year.
- Being consistent builds confidence; do not stretch resources too thin. The BFHWA focused on health fairs that included health screenings and education, which gave it staying power.

Dr. Houston reported on the 2011 Health Fair Summary Report, which is a summary of self-reporting medical questionnaires completed by participants. Areas assessed include medical history, doctor and dental visits, return visits to the BFHWA health fair, lifestyle issues (e.g., smoking, physical activity, etc.), and results of screenings for blood pressure, cholesterol, triglycerides, body mass index, and glucose.

C. The Community Nurse Perspective

Ira Combs, B.S.N., Community Liaison Nurse Coordinator, College of Public Health, University of Nebraska Medical Center, Omaha, NE

Mr. Combs provided a perspective on community nursing and highlighted a unique program he designed as an educational tool for the African American community in Omaha. He began by describing an event that happened when we was discussing why African American men did not get prostate digital-rectal exams. Although conventional wisdom implied that the physical discomfort of the exam was the main barrier, Mr. Combs was able to show that cost was the real issue. This discussion with physicians led to Mr. Combs being offered a job on the SELECT study, a prostate cancer study that sought to recruit large numbers of African American men. Mr. Combs helped design a brochure and community project to communicate with men to overcome barriers to accrual in the African American community.

A significant part of the education program was a series of public service announcements using a character known as “Dr. Jesse,” who talked about the importance of research for the African American community with “Prevention Man (seen on YouTube).” This campaign has been successful in helping men to get screened and in encouraging young people to find out more about research.

In conclusion, Mr. Combs said that CBPR is critical for building research in communities. He said that one serious problem with the research agenda is that researchers tend to pursue the grant money without necessarily finding out what the community needs or wants.

Discussion

Dr. Houston explained that his group did not gather information on age in the question for physical activity. He said he is concerned that African American men (and men in general) have not been participating in physical activities. The investigators will look at this more closely in the future.

Dr. Furlong addressed the issue of cultural humility (having people not of color appreciating the culture of people of color). There are many strategies, such as role playing. She said that much cultural insensitivity could be unintentional, although that does not make it less hurtful. Public health nurses should always be respectful and positive about interactions with the community. Mr. Combs said it is important to remember that a researcher is a partner, not an authoritarian figure. This is especially important in interactions between the medical establishment and the community.

Education/Faculty Development and Student Assessment

Dr. Eddie Greene, Associate Professor, Mayo Medical School, Rochester, MN

Dr. Greene discussed students, teaching, and mentoring as part of an academic portfolio. When an aspiring academician becomes a professor and finds his/her academic career dreams met, he/she actually has three roles: scientist, educator, and clinician. It is hard to be highly effective in all three simultaneously. Important choices need to be made: it is challenging to be outstanding as a scientist, in clinical medicine, and as a medical educator. Navigating a career in academic medicine and science is not too dissimilar from mountain climbing; at times, it can be discouraging without the right environment, optimal mentorship, and adequate level of funding. Once obstacles are overcome, however, and career dreams become reality, it is a rewarding experience. Find the areas that one is passionate about is key to the process.

New professors generally have 6-7 years to attain tenure. During this time, they should complete various activities, such as networking and building a reputation. Initial activities should include: publish in peer-reviewed, high-quality journals; join appropriate national organizations and societies; make presentations at local, regional, national, and international meetings; and become a mentor. Subsequent activities could involve leadership roles on institutional committees and greater involvement in professional society committees.

When a person is a successful researcher, mentor, and professor, it creates a “win-win” situation for all involved: patients, students, taxpayers, and the researcher’s institution. In addition, the scientific literature is improved.

In Mayo’s CTSA, Dr. Greene asks students and mentees how an area of interest could be tied in with a current disparity or to explore areas of health equity that have not yet been examined. His

students prepare a three-page document containing specific ways to incorporate health disparities into their activities.

Mentors should help students build a portfolio of pathways to success. Initially, students face uncertainty and may even feel that they are in a maze. It is important that they realize that time is important and work with their mentor to navigate the maze successfully. Professors should help students climb the ladder of academic success and, in the process, measure how to be most effective in helping them get there. The process starts with the student developing the initial idea; the professor should help the student develop a thorough understanding of the idea and present it as effectively as possible.

Dr. Greene said that mentors could promote scientific excellence and success among younger students as well. Important elements of the teaching and mentoring process include: encouraging students' creativity and innovation; recognizing that the teaching/mentoring portfolio is becoming increasingly important in assessing a professor's academic success; and realizing that strong investments in successful teaching and mentoring have benefits over time. Discipline, teamwork, eventual scientific independence, and innovative science also are important. A mentor could challenge his/her mentees regarding their level of knowledge and encourage deeper and lifelong learning.

Faculty competencies include establishing a climate for learning, providing feedback to students, communicating goals, demonstrating professionalism, optimizing understanding and retention, and evaluation. There are many evaluation and other reports to be completed to help determine a professor's efficacy. Other important faculty capabilities are the encouragement of self-directed learning and promotion of scholarship. Dr. Greene described types of evaluation data, such as program-level and rotation-level data, as well as student comments, evaluator statistics, and faculty evaluator comments.

The faculty development committee and faculty evaluation committee will report faculty development outcomes to the Program Director and Department Chairs. Based on review of the previous year's data, they will suggest faculty development initiatives and outcome metrics for the coming year.

Discussion

One participant asked how to balance her role as a junior researcher with the expectation that she should take a leadership role in a professional society based on her extensive experience with that organization. Dr. Greene commented that her leadership role should help her as a researcher; her historical knowledge of this part of her field means that she will not struggle in as many areas as many other junior investigators and that she likely will have more opportunities for potential research collaborations and for others to read her grant applications before submission.

One participant asked whether Dr. Greene's students show resistance to taking health disparity courses. Dr. Greene answered that they do not as the broad biomedical research and clinical community now addresses issues regarding health disparities. Dr. Greene also said that his time is divided among three areas: clinical, 40 percent; CTSA 10 percent; and director of diversity for

medicine as well as other administrative activities, 30 percent.

A participant noted that the R15 application requires information about how the investigator will incorporate mentoring and asked for advice. Dr. Greene suggested that she look at successful training grants at her institution. The ideas should be crafted within the proposal narrative to demonstrate how students would be mentored in a specific context and not provided simply as a generic bulleted list or attached as an appendix that might not be read. Applications could include effective graphics as well.

Online courses can present challenges if they do not incorporate some in-person interactions and sharing of ideas. It is important for students to interact with professors. Dr. Greene said that in some courses students' grades are based partly on how well their small-group colleagues comprehend the same material; this is a way to instill sharing of knowledge among colleagues later in their careers.

Participants noted the shift in expectations within the classroom in the past decades: in the past, the professor taught the course and students learned; now, there is a heightened sensitivity to keeping students happy as they have paid a significant amount for the class and, in a general sense, students bring a consumer approach to having their needs met. Dr. Greene commented on the broad ranges of students, from the unmotivated to the highly motivated, that professors must teach.

A participant commented that institutions vary in their development of additional support systems for minority and female students. Dr. Greene acknowledged the importance of the support systems and said that many institutions actively consider ways to provide and improve this assistance.

Managing a Research Lab/How to Write Your First Grant

Dr. Carlos Isales, Professor, Department of Orthopaedic Surgery, Medical College of Georgia, Athens, GA

Dr. Isales began his session by asking participants to tell about their past experience with grant submissions and to offer advice on why a grant was successful or not successful. The following are selected examples of participant experiences and advice, as well as comments from Dr. Isales regarding the efforts:

- A participant related the details of a progression of grants from a successful K-award in 2005 and an R03 a few years later. The participant is beginning the process of developing an R01 application on tropical parasites but cannot determine which NIH Institutes and Centers (ICs) to apply to for this topic. Dr. Isales responded that the NIH website may provide information that will enable the participant to determine the best Institute to apply to, especially because each Institute has different funding levels for projects that may cross ICs. This strategy may increase an investigator's opportunities for success.
- A participant related an experience of becoming part of an NIH study section, and how this enhanced the individual's understanding of the application process. However, an application submitted to another study section garnered only a 4 on the scoring standard (medium).

Dr. Isales said that this may indicate that the study section was not excited about the project, although it may have been scientifically sound and included solid procedures. Currently, innovation is a priority for the NIH, and both a topic and its packaging are important. The application must convey excitement and show how the project can directly benefit public health. One suggestion by Dr. Isales was to choose a co-Principal Investigator (PI) who could bring different skills and knowledge to the project and to resubmit the application to a different study section. The NIH likes multiple PIs on projects and may look favorably on the expanded topic areas. Dr. Hamilton added that another suggestion is to make sure that any application relates to a disease process, even if the project is basic science. Dr. Isales agreed with Dr. Hamilton and also said that the new PI should be someone with many publications who is well-known in a field related to the application. Another option would be to seek funding from outside organizations outside of the NIH, such as the Gates Foundation.

- Dr. Isales interviewed a participant to try to instruct him on ways to enhance his ability to produce a winning proposal. After hearing the experiences of this individual, who wanted to apply for an R21 or K-award, Dr. Isales indicated that one reason the application scored low may have been the lack of a translation component. Dr. Isales also warned the participant that a K-award must be applied for within 5 years of completing a post-doctoral program; Dr. Isales encouraged the participant to not miss this deadline. Dr. Isales also encouraged the individual to acquire more and diverse mentors, although at least one of the mentors should be local and available to meet with regularly. Ideally, a mentor would be someone who was successful in winning a K-award.

In concluding the session, Dr. Isales made the point that junior investigators should have more than one mentor, with at least one with strong subject matter credentials in the investigator's field and one with clinical experience. He also stressed the importance of publishing during early years, and letting the mentors review and strengthen manuscripts. In addition, there are many outside programs, such as the Robert Wood Johnson Foundation, that can assist young investigators in progressing from junior to senior investigator. Dr. Hamilton added that faculty programs at the national and local professional organization levels also have networks that could be accessed to assist in training efforts.

MARCO CABRERA POSTER AND NETWORKING SESSION AND ORAL PRESENTATION AWARDS

Dr. Blanchard

Dr. Blanchard announced the results of the judging of the oral presentations by junior investigators and posters submitted for the Marco Cabrera Poster and Networking Session. The presenter awards included a plaque and certificate. Winners of the poster award received a plaque, and each person who presented a poster also received a certificate from the NMRI. The following awards were presented:

Poster: First Place Award:

Detrice Green Barry, Ph.D., M.S.N., R.N., Assistant Professor, Miami Valley College of Nursing and Health, Wright State University, Dayton, OH

Using Technology for Bleeding-Disorder Education: High-Fidelity Human Patient Simulators and the Remote Presence Robot

Poster: First Runner-up Award:

Danese Joiner, Ph.D., Postdoctoral Fellow, Orthopaedic Cell and Tissue Mechanics Laboratory, Van Andel Research Institute, Grand Rapids, MI

Global Disruption of Murine Mitogen Inducible Gene 6 (Mig6) Accelerates Surgically Induced Osteoarthritis and Downregulates Wnt/B-Catenin Signaling

Presentation by a Junior Investigator: Basic Science

Dr. D. Roselyn Cerutis, Associate Professor of Oral Biology and Pharmacology, Department of Oral Biology, Creighton University, Omaha, NE

Lysophosphatidic Acid Receptors, Periodontal Disease, and Type 2 Diabetes

Presentation by a Junior Investigator: Clinical Science

Dr. Laura A.G. Armas, Assistant Professor, Osteoporosis Research Center, Creighton University, Omaha, NE

Histomorphometric Analysis of Bone in Healthy, Young Patients With Type 1 Diabetes Mellitus

CLOSING REMARKS

Dr. Blanchard and Dr. Agodoa

Dr. Blanchard thanked the group for attending and participating in the NMRI Mid-West Regional Workshop and said it was an exciting time for her. She thanked Dr. Agodoa for coming to Omaha and Creighton University. She said that she learns so much from her NMRI colleagues and feels like she regards them not just as colleagues, but as friends. She recognized the NMRI Planning Committee for its efforts in planning the regional workshop and for recruiting attendees.

Dr. Agodoa thanked Dr. Blanchard for chairing the workshop and presented her with a plaque in appreciation. He reiterated how excited NIDDK staff are about holding a session for high school and undergraduate students after the adjournment of the regional workshop.

Dr. Agodoa said it always is a pleasure to see the members of the NMRI and the new people who are attending for the first time. He explained that the network belongs to NMRI members and he hopes that they take full advantage of it. The NIDDK bears the cost of the NMRI, and once we get people hooked, the hope is that they will become involved and make the network stronger. The NMRI depends on its members, and it has continued to grow during the past decade. Dr. Agodoa announced that the 10th anniversary of the NMRI will be celebrated at the April 19-20, 2012, meeting in Bethesda, MD. He encouraged NMRI members, and especially new members, to plan on attending. In closing, he also encouraged senior members to become mentors for the junior members who have requested mentors.

Dr. Agodoa again thanked Dr. Blanchard and Creighton University for hosting the NMRI Mid-West Regional Workshop, and he adjourned the workshop.

RESEARCH TRAINING OPPORTUNITIES FOR HIGH SCHOOL AND UNDERGRADUATE STUDENTS

Dr. Lawrence Agodoa, Director, Office of Minority Health Research Coordination, NIDDK

Dr. Luis Cubano, Associate Dean for Research and Graduate Studies, Universidad Central del Caribe

The NMRI hosted approximately 30 Omaha Public Schools Honors Program students and local undergraduate students for an afternoon session to learn about summer research opportunities at the NIH, such as the NIDDK OMHRC's Short-term Education Program for Underrepresented Persons (STEP-UP) and Summer Internship Program (SIP) for Underrepresented Minorities. In addition, information on the Alaska Native Summer Internship Program (AN SIP) and Gateways to the Laboratory/NIDDK Honors Research Program also was presented.