

Eunice Kennedy Shriver National Institute of Child Health and Human Development

NICHD

Yvonne Thompson Maddox, Ph.D.

Deputy Director

EDUCATION

Ph.D.: (Physiology and Biophysics) Georgetown University, 1981

B.S.: (Biology) Virginia Union University, 1965

RESEARCH INTERESTS

Delineating how inflammatory mediators injure cells and studying gender differences in the vascular system

PIVOTAL EVENTS

My father became critically ill during my senior year in undergraduate school; this meant, given a stay-at-home mother and two younger brothers, that I had to forgo my dream of becoming a physician and find a job. Right out of undergraduate school, with a B.S. in biology and a great sense of faith in myself, I obtained a position as a blood bank technician at the Medical College of Virginia in Richmond. It is because of that job and the woman who managed the blood bank that I am where I am today. That work experience led me to private industry, a graduate degree, academia, and later to NIH.

MENTORING & WORK/LIFE BALANCE

In my late twenties, married, and a mother, I enrolled in graduate school at Georgetown University. As I struggled to obtain the Ph.D. in physiology, I came to fully appreciate the value of mentoring and its role in career building. I had the great benefit of having two exceptionally bright and caring preceptors. One was a woman, an endocrinologist and full professor, who constantly reminded me that I could achieve whatever I desired. In addition, to make sure that my dreams were realized, she was always there to promote me and to keep me on track. The second mentor was a man, a British scientist, full professor and editor of a noted scientific journal. He was my thesis preceptor and he emphasized that "nothing took the place of good training," and the necessity for obtaining a basic core of knowledge in the sciences in order to be successful as a researcher. He encouraged me to be innovative and to be constructively critical. While he admitted that many female students faced tougher obstacles than male students, he encouraged me to visualize what I wanted in a career and to expect nothing short of that vision. Thus, I found ways to juggle the child, the house work, the business trips, the lectures, the grant writing; and in doing so, was able to instill in my son, now a successful architect, that skill of "keeping all the balls in the air." "Taking hold of and tackling the situation at hand" is also the message that I



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have conveyed to the many budding scientists and administrators whom I have mentored.

INSIGHTS

Serving as the Deputy Director of the *Eunice Kennedy Shriver* National Institute of Child Health and Human Development (NICHD) enables me to fulfill my life-long dream, to help protect and promote the health and well-being of women and children, especially those who may be vulnerable because of the circumstances in which they are born and live. NICHD research focuses on areas that are critical to women and children and to our Nation's health: child development, developmental biology, nutrition, AIDS, intellectual disabilities, population issues, reproductive biology, contraception, pregnancy, and medical rehabilitation. My role is to guide and oversee NICHD organizations and programs and to work with other NIH Institutes and Centers and with outside groups and institutions.

I value the hard work and the many rewards of my research career, but also know that discoveries in the laboratory and insights gained at the bedside cannot help individual women and children unless these discoveries and insights shape the programs and policies that affect the health of populations. In addition, it is critical that partnerships be forged with the many publics that benefit from and impact upon medical research. So, I am fortunate to be able to lead many activities to improve the health of special populations, both domestically and abroad. For example, NICHD supported research that showed that putting infants to sleep on their backs reduces the risk of sudden infant death syndrome (SIDS). Working with the American Academy of Pediatrics, we have translated this science into the national "back to sleep" campaign, and U.S. SIDS rates have dropped by more than 50 percent. I have subsequently drawn upon the strengths of the African American community in a national coalition to bring greater reduction of SIDS rates in African American children.

I have learned from each of my positions at the NIH, including the time I served as Acting Deputy Director, NIH, the value of establishing collaborations and enhancing communications in moving our scientific advances to the populations who are most in need. As Co-Chair of the NIH's Public Trust Initiative, I work with colleagues and NIH's many publics to enhance understanding and trust of medical research. It was an honor to colead the Department of Health and Human Services National Strategy to Prevent Teen Pregnancy and the Department's Race and Health Disparities Initiative, and to help develop the agenda to address the challenges we face in reaching underserved populations in which poverty and cultural barriers interfere with delivering effective, vital health messages.

Jennifer Lippincott-Schwartz, Ph.D.

*Chief, Section on Organelle Biology,
Cell Biology and Metabolism Program,
Division of Intramural Research*

EDUCATION

Ph.D.: (Biochemistry)
The Johns Hopkins
University, 1986

M.S.: (Biology)
Stanford University, 1979

B.A.: (Psychology and
Philosophy) Swarthmore
College, 1974

RESEARCH INTERESTS

Understanding how intracellular organelles are assembled and inherited, and how proteins move within cells; development of quantitative tools and methods for analyzing proteins and organelle dynamics in living cells

PIVOTAL EVENTS

The most pivotal event in my experience as a scientist was recognizing the power of live cell imaging with Green Fluorescent Protein (GFP). This occurred early in my career as an independent investigator when I started using GFP in experiments. At the time, GFP was viewed simply as a new type of reporter molecule. I soon realized that by employing techniques such as photobleaching and photoactivation in living cells, GFP could be used as a quantitative tool to measure intracellular protein diffusion, protein binding/dissociation rates, and transport kinetics in single cells. This, in turn, led me to collaborate with biophysicists and physicists to employ kinetic modeling approaches to address key organizational principles of endomembrane structure and function.

MENTORING & WORK/LIFE BALANCE

As a proud mother of two and with a husband busy negotiating peace agreements at the U.S. State Department, I have always walked a tight rope in balancing family with professional responsibilities. Two approaches have helped in this process. One is having a clear perspective on the relationship of home and work. My family knows that I am committed first to them and then to doing science. This makes them supportive when there are events or periods at work that require more of my time and energy. A second is pacing one's style of doing work. I've discovered that continuous, small steps at work often lead more quickly to real accomplishment in science than large bursts of work that drain all your energy. One needs to know exactly when crunch time is for a project. Then one goes all out.



Regarding mentoring, I have found that it is very important not to prejudice the abilities of your students and postdocs. Time and again I have been amazed by their growth in doing science. Also, I feel it is very important to listen to students and postdocs and to respect their ideas. The students and postdocs in my lab always provide significant input of ideas and direction into the projects they are working on.

INSIGHTS

In being in the forefront in the use of quantitative, live cell imaging with GFP fusion proteins, my lab has been able to discover a variety of new features of organelles and protein transport pathways. These discoveries, however, have not always been met with the most enthusiastic response, especially when they contradict existing paradigms. I've found that extraordinary determination and patience are important for weathering these storms. It is also important to rise above the fray by listening to your critics and then concentrating on doing new experiments to shed additional light on a problem.

Germaine M. Buck Louis, Ph.D., R.N.

Senior Investigator and Chief, Epidemiology Branch, Division of Epidemiology, Statistics, and Prevention Research

EDUCATION

Ph.D.: (Epidemiology)
State University of NY
at Buffalo, 1987

M.S.: (Epidemiology)
State University of NY
at Buffalo, 1980

B.A.: (Sociology)
State University of NY
at Buffalo, 1978

R.N.: Millard Fillmore
School of Nursing, 1975



RESEARCH INTERESTS

Environmental determinants of human fecundity and fertility, development of methodologies for measuring exposures during critical or sensitive windows of human development for the assessment of reproductive toxicity

PIVOTAL EVENTS

My passion for reproductive epidemiology has continually served as a source of my motivation. Upon reflection, two pivotal factors have positively affected my ability to succeed:

1) supportive mentors, and 2) seed money for new investigators. Young investigators need mentors who will listen, encourage, and actually assist them in the transition to independent investigator. Without exception, I am continually reminded how much of my success is attributed to past and current mentors. Secondly, seed money is critical to help young investigators succeed, and I was fortunate to have this resource available to me. Funding allowed me to get started, learn the ropes, and build my confidence. Lastly, being a mother made me a better researcher. I have never designed a protocol asking study participants (or their families) to do something I would not do or ask of my family. I believe this has served me well without losing any scientific integrity.

MENTORING & WORK/LIFE BALANCE

My first mentors were all men who were dedicated to their professions and families, as were my former department chairs. As a mother of four and a long-time provider of elder care, I never have felt guilty when my professional responsibilities were temporarily offset by family responsibilities. This balancing act is dynamic and often changes in an unpredictable way, underscoring the need to be flexible. I was fortunate to have a flexible work environment that empowered me to decide where, when, and how I would work to the extent possible in academe. The tone for a balanced professional and personal life was set from the top down, requiring no one to apologize for wanting to be defined by more than one's profession. As scientists, we are selectively highly motivated. Tapping into this motivation by offering a flexible work environment allows life to define our professional demands rather than the reverse.

INSIGHTS

I can think of three milestones that fostered my professional development, beginning with the completion of the academic requirements for an earned doctorate. As I was completing my degree in 1987, I was very interested in competing for the Abraham Lilienfeld Student Prize Paper Award offered by the Society for Epidemiologic Research in recognition of the best student-authored dissertation paper. Despite being discouraged from competing by my department chair (his advice was that the award normally went to students in the top schools), I was strongly encouraged to apply by my mentor, whose unconditional support was a continual source of motivation for me. He remains my mentor to this day. From this experience, I learned how to make "no" a motivating influence in my life.

The second major milestone was earning tenure at my previous institution despite underrepresentation of women amongst the tenured medical school faculty. Tenure is incredibly liberating and bestows recognition (both internally and externally) about one's ability to conduct original research, train the next cadre of students, and serve one's profession and institution.

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Tenure is achievable even if the timeline requires flexibility to accommodate the responsibilities associated with raising young children or providing elder care, such as in my case. Without question, I believe being a mother and daughter made me a better reproductive epidemiologist.

Another important milestone was being asked to serve The National Academies by working on some of the most pressing problems facing the American people. Serving on panels with experts from various disciplines is challenging, informative, and just plain fun. There is a cost in that time spent may mean fewer papers. However, time spent opens new career avenues such as those involving the synthesis of information with regard to public policy and advocacy. A well-developed professional should open his/her self to such experiences, especially before advising others not to pursue such opportunities. My best advice for junior faculty and young investigators is to consider the word "no" advisory at best, and to follow your passion in the pursuit of new knowledge or professional service opportunities. Do so within the comfort of your timeline.

Lynne Meryl Mofenson, M.D.

Chief, Pediatric, Adolescent & Maternal AIDS Branch, Center for Research for Mothers & Children

EDUCATION

M.D.: Albert Einstein
College of Medicine, 1977

B.A.: (Psychology)
State University of New
York, Stony Brook, 1971

RESEARCH INTERESTS

Clinical and epidemiologic research in issues related to pediatric/perinatal infectious diseases; specifically, HIV infection and HIV-associated coinfections in pregnant women, infants, children, and adolescents



PIVOTAL EVENTS

Coming to the NIH in 1989 was a pivotal experience. The environment provided by my supervisor, colleagues, and the NICHD in general allowed me to recognize my areas of expertise and where I could best make contributions. It also allowed me the flexibility to expand my activities outside of standard NIH work. My greatest rewards are providing consultation domestically and to the World Health Organization on guidelines for care and treatment of HIV-infected women and children,

and seeing the effect of these guidelines on improving global public health. I feel privileged to have been accorded this unique opportunity by the NIH, and grateful to the NICHD leadership for allowing me to expand my work to include not just supporting research, but also assisting in implementing the research findings globally.

MENTORING & WORK/LIFE BALANCE

I have to give my husband full credit for my ability to balance family and career; he worked from home and was primary caregiver for our daughter from age 5 years through high school, and has been (and is) very understanding and patient with the long hours and frequent travel that my job requires. I try to ensure that the work environment in my Branch is flexible enough to allow staff time with their families and not allow work to overwhelm their lives (as I often do). I encourage my extramural staff to not just supervise but actively participate in the research we support. It is rewarding to watch the staff develop individual expertise areas and make contributions to the scientific literature and public health policy. I am very proud of the work our staff has been able to accomplish and the contributions they have made.

INSIGHTS

After medical school, I entered private pediatric and infectious diseases practice, where I saw some of the first HIV-infected patients in the early 1980s. My career then veered toward public health and in 1985, I moved to work in the Division of Infectious Disease Control in the Massachusetts Department of Public Health. There I became involved with HIV in children (along with other infectious diseases) from a public health and policy perspective. This was expanded when I joined the NICHD in 1989 and focused my work specifically on HIV infection and its treatment in women and children. It has been very rewarding to see the major public health effects on the HIV epidemic in women and children, resulting from the work of our Branch and collaborating Institutes. When I joined the NIH, there were thousands of HIV-infected infants being born in the United States each year and HIV infection in children was a death sentence. Now, new pediatric HIV infections have been nearly eliminated domestically and HIV-infected children are becoming adolescents and young adults, thanks to new treatments. The challenge now is to make these domestic achievements become a global reality. In 1994, I was selected by the NIH Director to chair the Public Health Task Force that developed guidelines on prevention of mother-to-child transmission, following the results of Pediatric AIDS Clinical Trials Group protocol 076. This provided me a model for translating research results into guidelines and effective public policy and led to my commitment to this type of translational activity in the pediatric HIV arena. Through my experiences with pediatric HIV research at NIH, I have learned that

collaborations (which are not always easy to achieve) are often the key to achieving positive results. This could be viewed as a more “female” point of view, as opposed to a more traditional “male” competitive research model, but I feel the results we have achieved show the success of this approach.

Catherine Y. Spong, M.D.

Chief, Pregnancy and Perinatology Branch,
Center for Developmental Biology & Perinatal Medicine;
Chief, Unit on Perinatal and Developmental
Neurobiology, Division of Intramural Research

EDUCATION

Senior Staff Fellow:
Laboratory of Developmental
Neurobiology, NICHD,
1997–2000

Fellowship: (Maternal
Fetal Medicine) NICHD
and Georgetown University
Medical Center, 1995–1998

Internship/Residency:
(Obstetrics and Gynecology) Harbor UCLA Medical
Center, 1991–1995

M.D.: (Six-Year Medical Program)
University of Missouri-Kansas City, 1991

B.A.: (Biology and Chemistry)
University of Missouri-Kansas City, 1991



RESEARCH INTERESTS

My research focuses on maternal and child health, emphasizing prematurity and fetal growth restriction. In addition, I am interested in the developing fetus and neuroprotective agents to prevent fetal injury. I am also the Program Scientist for the NICHD Maternal Fetal Medicine Units Network, a network of 14 sites in the United States that performs clinical trials in high-risk pregnancies.

PIVOTAL EVENTS

My parents encouraged me to enter science fairs beginning in kindergarten. They stimulated my curiosity, identifying projects appropriate for my age (growing avocado pits under different conditions, growing crystals in first grade, evaluating magnetic fields in second, and so on). They taught me how to develop a hypothesis and to realize that things did not always work out as expected.

MENTORING & WORK/LIFE BALANCE

In order to balance so many activities, including being an Extramural NICHD Branch Chief, running an intramural lab, remaining clinically active as a maternal fetal medicine specialist, being an associate Editor of *Obstetrics & Gynecology*, an Editor of three textbooks, and a wife and mother, I am fortunate to be surrounded by incredibly supportive, intelligent, and hard-working people. I owe much to those I work with, my family and parents, for it is their support that drives me and facilitates my ability to succeed. I have tried to instill in those I mentor the critical importance of believing in what you do, doing things you enjoy, and the importance of family.

INSIGHTS

I have been interested in a career in medicine as long as I can remember. I have always wanted to help people and to improve the lives of others. My career has been marked by taking advantage of unexpected opportunities and looking beyond what is typical. In medical school, one of my earliest mentors was new to the school and unexpectedly welcomed us to join his lab—an opportunity I readily accepted. I had been involved in research in high school and really enjoyed it. His constant guidance over the subsequent 5 years provided extensive experience and the introduction to national meetings where I have been presenting and attending for many years.

In choosing my specialty, I was drawn to obstetrics with the hope of being able to improve the health of mothers and children, but the clincher was that this was a field where there was the potential for pure joy. Certainly there can be sadness, but being present at the birth of a child is a gift never forgotten. In a visit to the NIH as a resident, I learned of an opportunity to pursue my maternal–fetal medicine fellowship at the NICHD and participate in cutting-edge research. Developing my skills as a basic scientist intramurally, I learned of opportunities for full-time positions at NICHD for obstetricians, something I had not realized existed.

Since joining the NICHD in 1995, and the extramural program in 2000, I have been honored to develop and identify research programs that impact how obstetrical care is given, for example, participating in trials that have identified a therapy to prevent recurrent preterm birth and in ongoing studies on stillbirth. I have learned that improving the health of women in pregnancy feeds into our ultimate goal, to improve life-long health. The ability to optimize the intrauterine environment and hence allowing the baby the best environment for development, not only improves pregnancy outcome, but also improves long-term health for the mother and child and thus the health of all with less heart disease, diabetes, and even cancer. Most importantly, I have learned that the best mechanism for success is to surround yourself with supportive and successful people. I have been blessed with incredibly supportive family

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and friends and I have worked very hard to keep my family as the center of my life. For me, children are the essence of life; their presence resonates in everything I do, thus I have incorporated my children as an integral part of my professional career.

Christine Almy Bachrach, Ph.D.

Chief, Demographic & Behavioral Sciences Branch, Center for Population Research; Acting Associate Director for Behavioral & Social Sciences, NIH; Acting Director, Office of Behavioral and Social Sciences Research, Office of the Director, NIH

EDUCATION

Ph.D.: (Population Dynamics)
The Johns Hopkins University
School of Hygiene and Public
Health, 1979

M.A.: (Sociology [Demography])
Georgetown University, 1974

B.A.: (Social Relations) Harvard
University, 1972

**RESEARCH INTERESTS:**

Social environmental effects on health; health and development over the life course; fertility, family formation, and reproductive behaviors; social demography; dynamic processes of social change

PIVOTAL EVENTS

When I arrived at the NIH as an extramural program officer, I had to learn that I could be a scientist without doing research myself. Learning that lesson allowed me to develop a broad vision of science that discovers opportunities in the ways that scientific fields intersect and challenge one another. Several pivotal experiences facilitated my learning process. I chaired a trans-NIH conference on social and cultural dimensions of health and initiated a second on social and behavioral contributions to health disparities. I chaired the Social Environment Working Group for the National Children's Study; and joined the National Advisory Committee of the Robert Wood Johnson Foundation's (RWJF) Health and Society Scholars Program. The NIH environment has allowed me to learn constantly over the past two decades, and enabled me to contribute to an extraordinarily exciting scientific goal: integrating knowledge from biomedical, behavioral, and social scientists to improve health.

MENTORING & WORK/LIFE BALANCE

Over the years, I have mentored a steady stream of staff, interns, and fellows, maintaining relationships with quite a few. I helped to establish a mentoring program that is now formally adopted by the Population Association of America. I mentored in the NCI's "Knowledge Management" program, and as a member of the National Advisory Board of the RWJF Health and Society Scholars Program.

Having been fortunate in my own professional life, I am especially committed to helping young women negotiate their personal and professional lives. I had children immediately after completing my doctoral training. I combined part-time work (60–75 percent) with parenting for 13 rewarding years, juggling building my publication record with making Halloween costumes for my children. I have never felt I paid a price: NICHD appointed me to lead my current program 1 year after I resumed full-time work and supported me as I developed an endlessly rewarding career.

Maria L. Dufau, M.D., Ph.D.

Chief, Section on Molecular Endocrinology, Endocrinology and Reproduction Research Branch, Program in Developmental Endocrinology and Genetics, Division of Intramural Research

EDUCATION

Ph.D.: (Medical Sciences)
National University of Cuyo,
Mendoza, Argentina, 1968

Research Fellow: (Medicine
and Pediatrics) Massachusetts
General Hospital and Boston
Lying-In Hospital, 1963–1967

Rockefeller Foundation
Fellowship 1962–1966

Rockefeller Foundation

Biochemical Training Program: Tulane University, 1962–1963

M.D.: National University of Cuyo, Mendoza, Argentina, 1962

B.A.: (Education) Normal School, Mendoza Argentina 1955

RESEARCH INTERESTS:

Molecular basis of the hormonal control of gonadal function with emphasis on the structure and regulation of the human luteinizing hormone receptor (repression and de-repression mechanisms, epigenetics, signal transduction); multiple-promoter control of human prolactin receptor gene transcription by steroids and growth factors; elucidation of the function of



inhibitory short forms of the prolactin receptor and their relevance to physiological regulation and breast cancer; the regulatory mechanisms involved in the progress of spermatogenesis and Leydig cell function, including the identification and functional characterization of novel regulatory genes that participate in the progression of testicular gametogenesis, Leydig cell function, and other endocrine processes

PIVOTAL EVENTS

My rigorous medical training gave me a broad base for the understanding of human biology and pathology, and very early on I became interested in endocrinology. I was encouraged by two of my teachers (chairmen of physiology and medicine) to apply for a Rockefeller Foundation Fellowship, which permitted me to obtain training in clinical endocrinology in the United States and to begin a career in biomedical research. I was very fortunate to have excellent mentors throughout my training, which permitted me to rapidly develop an independent field of research. Also, from my earliest days of investigation at the NICHD, my research was well recognized and I received funding that allowed me to pursue my research goals. Furthermore, I must acknowledge the contributions of many talented postdoctoral fellows, my staff scientist, research associates, and visiting scientists who have worked in my laboratory over the years, and my collaborators to the success of my research program.

MENTORING & WORK/LIFE BALANCE

A major component of my activities has been mentoring of the many fellows from the United States and abroad who have trained in my laboratory. I have always emphasized the importance of acquiring a broad knowledge of the field, as well as specialized insights into their specific research topics. I have instilled the need for learning and performing all techniques required for the experiments, as indispensable to facilitate their future independent research. While guiding and nurturing them to perform productively, and to always follow novel approaches, I have fostered their independence. It has been very pleasing to observe them grow as successful investigators in academia, industry, and as high-level administrators of research programs.

I was able to maintain a continuous series of research accomplishments in my laboratory program while raising a son and attending to family responsibilities, with the invaluable support of my husband and other family members.

Lynnette K. Nieman, M.D.

Senior Investigator and Chief, Section on Reproductive Medicine, Program in Reproductive and Adult Endocrinology, Division of Intramural Research; Associate Director, Inter-institute Endocrinology Training Program

EDUCATION

M.D.: SUNY Buffalo, 1978

A.B.: (Molecular and Cellular Biology) Smith College, 1974

RESEARCH INTERESTS

Clinical investigation of cortisol deficiency and excess; effects of gonadal steroids on reproduction

PIVOTAL EVENTS

When I was a chief resident, one of my coworkers and I were talking about success as an academic. He very mysteriously said, "Success is very simple, just follow the three P's..." Of course, I had to know about these magical concepts. After some delaying tactics, he finally told me: Patience, Persistence, and Perseverance. While I did not feel enlightened at the time, I have come to realize the merit in this advice, and the subtle nuances between each of the "P's." Science is not a noninterrupted series of "aha" events, or wonderful discoveries, but rather, a process toward a goal. The process may be tedious and disheartening. Although they do not guarantee it, patience in the moment, long-term persistence toward the goal, and perseverance in times of adversity, all contribute to success.

MENTORING & WORK/LIFE BALANCE

It is hard to balance personal/family and professional responsibilities without worrying about the outcome of each. Apart from choosing a supportive partner, my advice is to first know and prioritize what you want—children, personal pursuits, housework, etc. Next, figure out your resources—money, time, helpers. Then think about all the solutions and buy, negotiate, or reschedule to rebalance your life. Finally, recognize that there may be times when it just isn't fun to juggle.

Sadly, mentoring is not well-rewarded in the academic world and the traits thought to characterize a successful scientist may not overlap those of a good mentor. Despite this, we all need mentoring until we retire. A mentor who is also a good friend is rare and precious. Sometimes mentoring needs can be parsed amongst many colleagues. Self-reflection about needs and creatively considering solutions (e-mail, short interviews, long-term coffee breaks) may help.



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Ida Stephens Owens, Ph.D.

Chief, Section on Genetic Disorders of Drug Metabolism, Heritable Disorders Branch, Program in Developmental Endocrinology and Genetics, Division of Intramural Research

EDUCATION

Ph.D.: (Physiology)
Duke University, 1967

B. S.: (Biology) North Carolina
Central University, 1961

RESEARCH INTEREST

My research focuses on the genetics and modulation of human endoplasmic reticulum-bound detoxifying enzymes, UDP-glucuronosyltransferases (UGT), which rid the body of an unlimited number of endogenously and exogenously derived chemical toxins

**PIVOTAL EVENTS**

Upon completing my undergraduate studies at North Carolina Central University, I unexpectedly gained entry into the Physiology Department at Duke University Medical School by fortuitously meeting the departmental chairman (D.C. Tosteson) and was among the first two African Americans to receive a Ph.D. from that University (J. J. Blum, Ph.D. mentor). Secondly, I joined the NIH with a United States Public Health Service (USPHS) grant and completed postdoctoral work with Y.J. Topper in National Institute of Arthritis, Metabolism, and Digestive Diseases (former) (NIAMDD) followed by postdoctoral training with D.W. Nebert in NICHD with the promise of a tenure-track position. During the second postdoctoral endeavor, I sought and gained approval of my mentor to develop a program concerning the UDP-glucuronosyltransferase system. This system was in the pathway related to the interest of my mentor who focused on cytochrome P₄₅₀-dependent monooxygenases. With the advent of cloning technology, I was able to carry out molecular studies that developed into a cutting-edge research program, which included the first sequencing of the novel 13-gene human *UGT1* complex locus containing the bilirubin-specific UGT gene. This enabled us to describe the first genetic defect in children afflicted with Crigler-Najjar (CN) diseases (Types I and II) and earn the NIH Director's award.

MENTORING & WORK/LIFE BALANCE

I have been a dedicated mentor since gaining tenure at NICHD, training many students starting with sustained support of a bio-aide from Howard University (S. Farquharson) in 1989,

who went onto obtain a Ph.D. from Duke University. There have been more than 80 summer interns, postbaccalaureate trainees, and postdocs trained in my laboratory. Following a 1993 NIH survey that showed women scientists at NIH were treated unfairly, corrective measures were taken, including a surveillance process to prevent reversibility of this action. As NIH mandated, a senior-level female scientist, designated Women Scientists Advisor (WSA), was elected in each institute by her peers to monitor unfair treatment; I was elected WSA by women scientists in NICHD. Although I was supposed to serve for 2 years, I have been in that position since 1997, as a replacement was never identified.

With respect to family life, great support from my husband made my earlier years of balancing family responsibilities manageable. Indeed it was demanding juggling time between science and the multitude of issues surrounding the care of children. As every opportunity counted, it was very much a bonus to add-on family vacations at the end of scientific meetings, making the juggling act and the two competing responsibilities come together with an enjoyable outcome.

Keiko Ozato, Ph.D.

Chief, Section on Molecular Genetics of Immunity and Deputy Chief, Laboratory of Molecular Growth Regulation, Program in Genomics of Differentiation, Division of Intramural Research

EDUCATION

Visiting Associate: NCI, 1987–1981

Research Associate:
Johns Hopkins University,
School of Medicine, 1975–1978

Postdoctoral training:
(Developmental Immunology)
Carnegie Institution
of Washington, 1973–1975

Ph.D.: (Developmental Biology)
Kyoto University, Japan, 1973

M.S.: (Science) Kyoto University, Faculty of Science, 1966

RESEARCH INTERESTS

Gene regulation in the developing immune system

PIVOTAL EVENTS

My mother, who was a traditional Japanese housewife with no scientific education, had unconditionally supported me to pursue a scientific career. This was in the face of opposition



and other obstacles. Her trust in me and in science has been the primal, lasting impetus for me to work in research. Later, I have had close scientific interactions with my husband and received consistent encouragement from him. This has been the most valuable asset I have had throughout my career.

MENTORING & WORK/LIFE BALANCE

Although our daily focus is directed toward the natural world, positive interactions with fellow scientists are important requirements for making progress in our work. Though we are not formally trained in mentoring, it seems that many of us learn to establish nurturing interactions with other laboratory workers during our research career. Early scientific education can incite interest in science in young minds that may lead to a career in science. The Summer Intern and other programs at the Institute allow us to interact with young students and are important opportunities toward this goal.

With respect to the family–career balance, we have witnessed a historical shift in emphasis for women scientists during our own time. Now we are no longer looked upon critically if we choose to work late into the night in the laboratory when we have a family at home.

Tracey A. Rouault, M.D.

Chief, Section on Human Iron Metabolism and Head, Molecular Medicine Program, Division of Intramural Research

EDUCATION

M.D.: Duke University Medical School, 1977

B.S.: (Biology) Yale College, 1973

RESEARCH INTERESTS

I am interested in understanding how humans regulate iron metabolism to ensure that there is sufficient iron to support the function of cellular enzymes, while avoiding problems of toxicity caused by iron overload. Individual cells and tissues regulate uptake and sequestration of iron in the cytosol, and in mitochondria, the main engines of cellular metabolism. Our work has demonstrated that iron regulatory protein 2 is the main regulator of mammalian cytosolic iron homeostasis. Mice that lack iron regulatory protein 2 develop microcytic anemia, erythropoietic protoporphyria, and adult-onset neurodegeneration.



We are studying our mouse model to better understand early mechanisms of neurodegenerative disease. In addition, we are interested in mitochondrial iron homeostasis, and we are studying how disruption of mitochondrial iron-sulfur cluster assembly leads to the human neurodegenerative disease, Friedreich ataxia.

PIVOTAL EVENTS

When I was a student at Duke Medical School, I had the opportunity to work in a medical research laboratory during my third year of studies. I completed a project that involved using electron microscopy to evaluate red cell membrane lesions in patients with a rare type of hemolytic anemia. My work led to writing and publication of an article in the journal, *Blood*. I experienced the satisfaction of answering a research question and summarizing the results of my work in a research article. The success of this small project was important in the development of my career, because I had the opportunity to present my results at a symposium and to write a scientific paper, and I realized that research could be rewarding and exciting.

MENTORING & WORK/LIFE BALANCE

My two children were born before I started my research fellowship at the *Eunice Kennedy Shriver* National Institute of Child Health and Human Development. I found that research was compatible with my responsibilities at home because I could plan experiments and organize my life. Despite the possibility of working regular hours during my early years in research, I frequently had to stay late or work at night to complete experiments. Fortunately, we were able to hire several wonderful women from South America who lived in our house during the week. We sponsored one of these women for U.S. citizenship, and we have remained close with her family for many years. As a result, both of my daughters speak excellent Spanish, a great extra benefit of our child-care arrangements. As a mentor of young scientists, I try to be as flexible as possible, because I think that people work best when they feel that they control their own destinies.

NICHD

Gisela Storz, Ph.D.

Senior Investigator and Chief, Section on Environmental Gene Regulation, Cell Biology, and Metabolism Program, Division of Intramural Research

EDUCATION

Ph.D.: (Biochemistry)
University of California,
Berkeley 1988

B.A.: (Biochemistry)
University of Colorado,
Boulder, 1984

RESEARCH INTERESTS

Cellular defenses against oxidative stress, identification and characterization of noncoding RNAs, identification and characterization of small, unannotated proteins

**PIVOTAL EVENTS**

The continuing support, encouragement, and advice of several individuals, both mentors and colleagues, as well as my husband, have been critical throughout my career.

MENTORING & WORK/LIFE BALANCE

I think mentoring students and postdoctoral fellows is one of the biggest joys in my profession. It is a great pleasure for me to follow the careers of former lab members and to hear of their successes.

For me, having three children has provided a good counterbalance to the rigors of leading a research group and fulfilling other professional responsibilities. It is sometimes a challenge to accommodate the demands of both work and family while retaining time for myself, but I feel fortunate to have a very interesting and fulfilling life.

Marian Willinger, Ph.D.

Special Assistant for Sudden Infant Death Syndrome, Pregnancy & Perinatology Branch, Center for Developmental Biology & Perinatal Medicine

EDUCATION

NRSA Postdoctoral Fellowship:
(Neuropathology), Harvard
Medical School, 1976–1979

Ph.D.: (Microbiology),
University of Pennsylvania, 1976

B.A.: (Biology)
SUNY Binghamton, 1970

RESEARCH INTERESTS

Sudden Infant Death Syndrome (SIDS), stillbirth, adverse pregnancy and infant outcome, health disparities

**PIVOTAL EVENTS**

My graduate and postdoctoral training were of the highest quality and are the foundation for my achievements. When I was junior faculty, I realized I wanted a future as a member of a team to improve public health rather than being a bench scientist. I spent a year interviewing with Federal agencies, think tanks, and science journalists trying to find the right fit. I joined the early years of the NIAID effort to combat AIDS. Quickly, I learned how the government tackles a public health threat. My passion is maternal and child health and an opportunity became available to expand the SIDS program at NICHD. Soon after, the international community was mobilizing with new knowledge to reduce SIDS risk. I forged fruitful collaborations and learned new disciplines. I became part of a powerful team, which was successful in reducing SIDS deaths by half.

MENTORING & WORK/LIFE BALANCE

My thesis advisor taught me to think objectively, critically, and creatively about scientific questions. I try to impart these values when mentoring. Also, I try to support young people in their career search. The willingness of senior professionals to give me their time was vital to my search.

It took vigilance and staying focused on my personal priorities when balancing family and professional responsibilities. I wanted the peace of mind that I was doing the best that I could for my family, so support systems were very important. As a baby, my son had a wonderful daycare provider. My parents also helped and good schools were essential. The NICHD leadership at all levels share my value of family, and value my contributions. Their support has enabled me to achieve a healthy balance and accomplish my personal and professional goals.

Anne D. Willoughby, M.D.

Director, Center for Research for Mothers & Children (Former)

EDUCATION

USPHS Epidemiology Fellowship: NIH, 1984–1986

M.P.H.: (Epidemiology)

University of California – Berkeley, 1983–1984

Robert Wood Johnson General Academic Fellowship: Stanford University, 1981–1983

M.D.: Cornell University Medical College, 1978

A.B.: (Psychology) Bryn Mawr College, 1973

RESEARCH INTERESTS

Maternal and child health, pediatric and maternal HIV/AIDS, global health

PIVOTAL EVENTS

I believe that my work at NIH has been a stimulus to my growth as a scientist. Through talking with scientists all over the United States and abroad, attending professional meetings, making site visits to many excellent medical academic centers, and even the routine process of reading grant applications and attending study sections, I have had an opportunity to see the superb science funded by NIH be initiated and come to fruition. I always say that attending study section is listening to the smartest people in the world talk about the nascent work of the smartest people in the world. The growth made possible by working at NIH is unparalleled in the entire world and I am lucky to be a part of it.

MENTORING & WORK/LIFE BALANCE

One of the finest mentors in the world is Dr. Wendy Baldwin, who was branch chief of the Demographic and Behavioral Sciences Branch in NICHD. Wendy later became the Deputy Director of NICHD and then Deputy Director of the NIH. She was a mentor extraordinaire because she saw every moment with me as a teachable moment. She always wanted me to know more than I already did and would show me the ropes if I would stand still for 15 seconds. She appointed people to committees who were a “reach” for them—and they succeeded, to their surprise but not Wendy’s. She made it all look easy and full of joy and purpose.

I was pregnant with my first child when I interviewed at NIH. He is now a second-year medical student. I guess that means that I somehow balanced life and work well. I think the key (and the only key) is to work incredibly hard and face the fact that you are going to be exhausted much of the time. You can’t complain about the exhaustion because it is the price you pay

for what you have. You know you made a choice and you aren’t entitled to be anything but grateful that you have choices.

Karen K. Winer, M.D.

Medical Officer, Endocrinology, Nutrition & Growth Branch, Center for Research for Mothers & Children

EDUCATION

M.D.: Sackler School of Medicine 1984

B.A.: (Music History and Theory) Boston University, 1974

RESEARCH INTERESTS

Disorders of growth and sexual maturation, osteoporosis prevention, bone growth and accrual in childhood, type 1 diabetes, calcium metabolism, and hypoparathyroidism.

PIVOTAL EVENTS

The training I received during my fellowship years at the NICHD represents a pivotal experience. The unique environment at the NIH helped pave the way for my initiation of several important intramural and extramural projects. First, my study to develop an effective treatment for hypoparathyroidism with the missing hormone, parathyroid hormone, has markedly improved the quality of life of my patients and a new wealth of research spawned from my findings has been enormously gratifying. Second, the multicenter Bone Mineral Density in Childhood Study (BMDCS), a 6-year study of bone growth, provides unique longitudinal bone density measures, bone age, sexual maturation, and anthropometric data for 2,000 children ages 5–18. The study has opened the door for further investigations in disorders of skeletal growth and maturation that often accompany chronic illness in childhood. Third, my involvement with the successful multicenter Diabetes Research in Children’s Network (DirecNet), a group of five centers that are working together to develop and test noninvasive ways to monitor children with type 1 diabetes with the ultimate goal of “closing the loop” between automatic glucose level measurements and appropriate insulin delivery responses.

MENTORING & WORK/LIFE BALANCE

Balancing family with professional responsibilities has been challenging, but the experiences and satisfaction I derive from each has given me tools that have been invaluable in succeeding in the other. The boundless curiosity of my children and their ability each day to see the world new born and their keen eye for the human condition created an important



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model for me as I pursued my research. The nurturing skills I developed as a mother have made me more effective in the way I care for my protocol patients and far more determined to improve their lives.

An essential part of my work as a program administrator is to provide guidance to investigators. I communicate with investigators and speak with them at professional meetings to discuss their research ideas, difficulties with navigating the NIH review system, and funding opportunities at the NICHD. Since 1999, I have been program director for K12–Child Health Career Development Award Program. This program provides training and research funds for young investigators, giving them opportunities to develop their research skills that would, in the absence of this program, be unavailable to them. Over the past 17 years, 550 junior investigators have received training through this program.

National Institute on Deafness and Other Communication Disorders

NIDCD

Judith A. Cooper, Ph.D.

Deputy Director; Director, Division of Scientific Programs

EDUCATION

Ph.D.: (Speech and Hearing Sciences) University of Washington, 1982

M.S.: (Speech and Hearing Sciences) Vanderbilt University, 1972

B.F.A.: (Speech Pathology) Southern Methodist University, 1971



RESEARCH INTERESTS

Language and autism, language disorders in children, adult aphasia, language and deafness

PIVOTAL EVENTS

I strongly believe my success as a scientist is directly related to pivotal “environments” and individuals I encountered at critical points in my career. These include 1) Prior to NIH, several key colleagues and professors who encouraged me to look beyond a career in clinical practice and to pursue a doctoral degree in communication sciences and disorders, 2) Once at NIH, a division director who fostered my independence and supported pursuit of my scientific interests, and 3) The overall NIH environment, and its associated opportunities. In this environment, where I have spent almost my entire professional career, I have been able to develop and facilitate programs in areas such as linguistic-cultural diversity; language and autism; specific-language impairment; and treatment of adult aphasia, providing me with a fulfilling, ever-interesting, and rewarding career. Success for me has always been strongly linked to job satisfaction and believing in the value of what I do.

MENTORING & WORK/LIFE BALANCE

My opportunities for mentoring have primarily involved assisting, advising, and advocating for the research community, and supporting and fostering development of staff within my division. Working with beginning and seasoned investigators, helping them navigate the NIH system and often reach the funding goal, has been very rewarding to me. This interpersonal interaction and providing assistance is extremely important to me regarding job satisfaction and what I have always wanted in my career, i.e., to help make a difference in the lives of individuals with communication disorders.

NIDCD

With two sons and an NIH spouse, I have had experience with balancing family and professional responsibilities. Success for me was largely due to having a spouse who believed in egalitarian sharing of family tasks, and viewed our professional responsibilities equally. In addition, having a supportive work environment that allowed flexibility and self-directing of work/schedule was critical. These supports are critical to success in the balancing act.

While each of us may have a different family “unit,” whether balancing care for parent, child, husband, sibling, or other loved one, the balancing challenges are similar. Working in an environment that recognizes the personal dimensions of its employees has been invaluable in helping me balance my personal and professional responsibilities.

Amy M. Donahue, Ph.D.

*Chief, Hearing and Balance/Vestibular Sciences Branch,
Division of Scientific Programs*

EDUCATION

Ph.D.: (Speech and Hearing Science) University of Tennessee, Knoxville, 1985

M.A.: (Audiology) University of Tennessee, Knoxville, 1979

B.S.: (Speech and Hearing) Middle Tennessee State University, 1978

**RESEARCH INTERESTS**

Normal and disordered bases of hearing, including noise-induced hearing loss, presbycusis and cochlear implants; science administration

PIVOTAL EVENTS

My success as a scientist is the result of a combination of hard work and good fortune. I met individuals who encouraged me to believe in myself and who were willing to provide opportunities to learn and grow. Four individuals (the father of a friend, an academic professor/advisor, a research mentor, and a division chief) were instrumental in helping me envision and create my career in science. Beyond the “people” aspect, my desire to seek a career in science outside the traditional academic career path, provided the basis and setting for numerous experiences, challenges, and opportunities more diverse than I ever imagined and surely different from those of a traditional academic career path.

MENTORING & WORK/LIFE BALANCE

The role and value of mentoring in shaping my career is without question and it is certain that my career would have been different without mentoring. In turn, it is now my responsibility to mentor others. Any professional woman who fully engages her capacity to connect with others will struggle with balancing family and professional responsibilities.

National Institute of Dental and Craniofacial Research

NIDCR

A. Isabel Garcia, D.D.S.

Deputy Director

EDUCATION

Residency: (Dental Public Health) University of Michigan, 1989

M.P.H.: University of Michigan, 1988

D.D.S.: Medical College of Virginia, Virginia Commonwealth University, 1980

B.S.: (Chemistry) University of Mary Washington, 1976



RESEARCH INTERESTS

Health policy and legislation, health disparities, organization and financing of care, oral/pharyngeal cancer outcomes

PIVOTAL EVENTS

My career would have taken a totally different path without the influence of several people who widened my professional outlook and gave me new and unexpected job opportunities. Former Virginia oral health director, Dr. Joe Doherty, gave me my first dental public health job, where I first experienced the satisfaction of providing care to people in great need as well as the frustration of not being able to address their problems more thoroughly. That job helped me realize that public health and science are the means to better health for communities. It also made me appreciate that I needed to return to school for formal public health training. Dr. Brian Burt and colleagues at the University of Michigan taught me the basics of scientific inquiry, epidemiology, and public health, which formed the foundation of my subsequent career in the U.S. Public Health Service (USPHS). Dr. Dushanka Kleinman recruited me to NIDCR and gave me the chance to integrate dentistry and public health in a research environment, and Dr. Larry Tabak challenged me to jump out of my comfort zone and continues to teach me by example many lessons about leadership and professionalism. Of important note is my husband, mentor, and public health colleague, Dr. Ric Bothwell, whose unwavering support has allowed me to take on positions of greater responsibility over the years.

MENTORING & WORK/LIFE BALANCE

I have benefited from the counsel and guidance of many mentors before, during, and after my professional training. My parents set an exceptional example of hard work, integrity, and perseverance in the face of many challenges. After coming to the United States from Cuba in the early 1970s, they were undeterred by the typical barriers faced by new immigrants and made sure that I didn't lose sight of the importance of getting

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an education and setting high career goals. Besides the professional mentors already mentioned, other mentors have been ordinary people without professional degrees or credentials, who learned in unconventional ways and shared selflessly their knowledge and experiences with me. I am fortunate to have worked over the years with supportive colleagues and supervisors, who make the sometimes precarious balancing act between home and work much easier. The support and flexibility of my husband and my family has enabled me to have a fulfilling work life that benefits from the perspective that only spouses and children can offer.

Indu S. Ambudkar, Ph.D.

Chief, Secretary Physiology Section and Chief, Molecular Physiology and Therapeutics Branch, Division of Intramural Research

EDUCATION

Ph.D.: (Biochemistry)
Madurai Kamaraj University, Madurai, India, 1980

M.Sc.: (Biochemistry)
Lucknow University,
Lucknow, India, 1975

B.Sc.: (Biology) Isabella
Thoburn College, Lucknow,
India, 1973

RESEARCH INTERESTS

Molecular composition, function, regulation, and assembly of Ca²⁺ entry channels in epithelial cells; role of calcium signaling in salivary gland function and disease

PIVOTAL EVENTS

I moved to the United States as a postdoctoral fellow after obtaining my Ph.D. in India. Until that point, although I was a good student and enjoyed working in the laboratory, I was not very serious about pursuing a career in science. In fact, I came to the United States because my husband had a position and wanted to move to this country. However, once I got here, I became aware of the vast opportunities that were available to me and realized the only burden on me was to learn as much as I could and work hard. I continued to work on Ca²⁺ signaling, which was also the topic of my Ph.D. thesis, learning different aspects and systems within this field and also adapting newer technologies as they evolved. So, I guess for me 1) realization that I actually enjoyed research, and 2) acceptance of the fact that ultimately what I do will determine my "success," or lack of it, was the turning point in my career as a scientist.

**MENTORING & WORK/LIFE BALANCE**

I enjoy teaching and interacting with young scientists. My basic approach is to treat my fellows and students as colleagues. I remind myself, and them, that the reason they are in my laboratory is so that they can further their careers as scientists. My responsibility is to provide an environment that encourages them to think and be creative and help them ask the right questions and focus on experiments that will lead to answers. Their responsibility is to learn and work toward their goal. I have found that motivation and focus leads to good work and happy colleagues in the laboratory.

I never, ever contemplated on the issue of balancing family life and career. My husband and I always assumed that I would do both and neither of us felt that they were mutually exclusive. I have a son who is 23; he graduated from college and has a career. Things did get quite tough every now and then, especially earlier on, with scheduling time, day care, fevers, earaches, etc. At work, I learned to be focused and goal-oriented, finishing tasks I had planned for each day. My husband, who is very supportive of my work, contributed equally to our son's care and household chores. We organized and planned things in advance and got them done. I think my son has grown up to be a happy, well-adjusted young man and our scientific careers have not suffered. My advice to young women scientists, if you really want a career, be positive about it and focus on what you can do to make it work.

INSIGHTS

An important aspect of being a successful scientist is networking, i.e., getting to know not only your peers, but also the leading scientists in your field. A lot of this "socializing" happens at meetings and conferences. In the absence of a "mentor" to introduce me to everyone, I was left with the option of doing this by myself. This can be intimidating for any young person, but especially so for a woman who grew up outside the United States. I realized in the beginning that 1) there were extremely few women in my field of work, and 2) the "guys" did a lot of socializing during which they discussed science and other important happenings in the field. Initially, I stayed away from this because I was intimidated by them. Also, the few times when I tried to talk to them, I felt they were rather reserved with me. Due to my cultural background, people had a tendency to assume that I would be very conservative and they were not quite sure how to interact with me. So, you see they were a bit nervous, too. Anyway, I soon realized that it was necessary for me to overcome my hesitancy and get to know the people in my field and let them get to know me. So, that's what I did. Perseverance, an open mind, and a sense of humor finally paid off. Now they consider me one of the "guys." I guess I should take that as a compliment!

Lynne M. Angerer, Ph.D.

Senior Scientist, Developmental Mechanisms Unit,
Division of Intramural Research

EDUCATION

Postdoctoral Fellow:
(Chemistry)
California Institute of
Technology, 1973–1977

Ph.D.: (Biology) The Johns
Hopkins University, 1973

M.Sc.: (Zoology and
Entomology)
The Ohio State University,
1967

B.Sc.: (Zoology) The Ohio
State University, 1966



RESEARCH INTERESTS

Mechanisms of cell fate specification in early development; gene regulatory networks controlling specification of neural precursors

PIVOTAL EVENTS

Five people, all men, made entirely different, yet profound contributions to my success as a scientist. These were 1) my father, who told me that I could reach any goal with enough effort, 2) a college professor, who taught me how experimentation solved problems in biology, 3) my husband, who encouraged me not only to go to graduate school but to face all the challenges of a career in science, 4) my graduate advisor, who showed by his actions how not to interact with others in science and forced me to stand up for myself, and 5) my postdoctoral advisor, who taught me how to think quantitatively and dissect a problem cleanly into its essential elements.

MENTORING & WORK/LIFE BALANCE

During the past 30 years, Bob Angerer and I have trained 12 Ph.D. students and 9 postdocs. I have also served on the thesis advisory committees of many other students and organized journal clubs where I trained people in effective presentation methods. Because my positions have allowed me to devote all my time to research, I discussed science and career planning with all these people on a frequent basis. I was able to balance the demands of my career with raising two children because my husband was actively involved with both endeavors.

INSIGHTS

Perhaps my most useful scientific achievement was the work I did to develop *in situ* hybridization methods for detecting mRNAs in cells and tissues in the early 1980s. I was the first to show that labeled RNAs, rather than DNAs, were sufficiently

sensitive to detect even rare mRNAs. This led to my leading workshops and writing review articles and serving on an editorial board dealing with *in situ* hybridization methods. It is gratifying that the riboprobe method developed by me and others in our lab are still universally used for this important technique. More recently, I supervised a lab group that made important discoveries on patterning mechanisms in sea urchin embryos by discovering mutual antagonism between SoxB factors and canonical Wnt signaling, identifying a mechanism that coordinates cell fate specification along different developmental axes, finding new signals required for endoderm specification and developing the first microarrays in the sea urchin for global analysis of gene regulatory relationships.

Pamela Margaret McInnes, D.D.S.

Director, Division of Extramural Research

EDUCATION

M.Sc.: (Dentistry)
University of Witwa-
tersrand, Johannesburg,
South Africa, 1980

D.D.S.: University of
Witwatersrand, Johannes-
burg, South Africa, 1977

RESEARCH INTERESTS

I am actively involved with the NIH extramural research community in the mission of reducing the morbidity and

mortality attributable to infectious diseases. I have a particular interest in vaccine development and clinical evaluation, as well as the prevention of oral and craniofacial diseases.

PIVOTAL EVENTS

As an 18-year-old dental student, I conducted my first research project on dental caries in South African mineworkers under the kind and generous tutelage of Professor Hugo Retief. That first research experience changed my life and moved me toward a career that included both clinical dental practice, research and teaching. I often look back and think how lucky I was to have wandered into the MRC Research Unit at the University of the Witwatersrand and naively ask, "What is research about?"

MENTORING & WORK/LIFE BALANCE

In dental school in South Africa, I was one of three female dental students. Later, I was on faculty at Louisiana State University (LSU) School of Dentistry where there were only four women permanent faculty members at the time. Female mentors *per se* were certainly not plentiful in my early career.



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Instead I was mentored by several wonderful male clinicians and scientists and I think that helped me enormously. I strove to do what they did in terms of productivity and contributions. Admittedly this was stressful at times, but I never considered doing it any other way. When I joined the NIH extramural program in 1989, I had the extraordinary good fortune of working with Dr. Carole Heilman in NIAID. In the work environment she created, I was able to balance family and professional responsibilities, working very hard, but also having fun and keeping my family well-nourished, educated, clean, and happy!

INSIGHTS

A watershed event in my career was being accepted into the NIH Grants Associates Program in 1989. I spent a year learning about the Federal biomedical research enterprise, rotating through a variety of program, review, policy, and budget assignments. Needless to say, I loved the whole NIH experience! I joined NIAID in 1990 and was privileged to work in the extramural program managing an infectious diseases research program for the next 16 years. There, I was afforded extraordinary opportunities to learn infectious diseases, vaccine development, and clinical evaluation, and along with many other scientists and administrators, I share pride in the development and licensure of several pediatric vaccines. In 2006, I returned to my “dental beginnings” and now direct an extramural research program in NIDCR. In my group, I try to provide the same environment I was privileged to experience under Carole Heilman, and to foster scientists from varied backgrounds to be successful both professionally and personally.

Pamela Gehron Robey, Ph.D.

*Chief, Craniofacial and Skeletal Diseases Branch,
Division of Intramural Research*

EDUCATION

Ph.D.: (Cell Biology)
Catholic University
of America, Washington,
DC, 1979

M.S.: (Biochemistry)
Catholic University
of America, Washington,
DC, 1977

B.A.: (Biology) Susque-
hanna University, 1974

RESEARCH INTERESTS

Stem cell biology, skeletal biology, skeletal diseases, tissue engineering

**PIVOTAL EVENTS**

Most likely, moving to NIDCR in 1982 was the pivotal event in my career. I was given the opportunity to establish my own program in bone cell biology. At the time, I did not know much about bone, and followed my intuitions and relied on my graduate and postdoctoral training to establish a method for culturing normal, nontransformed osteogenic cells that faithfully recapitulate stages of maturation that are assessable in vitro. This provided the necessary tool to my collaborators to isolate clones and genes for all of the major structural proteins in bone. In addition, I had the opportunity to recruit Alexander J. Friedenstein, the father of “mesenchymal” stem cell biology for a sabbatical. He opened my eyes to the field of stem cell biology—the focus of my current studies—and the role of stem cells on health and disease, and their utility in regenerative medicine.

MENTORING & WORK/LIFE BALANCE

I was very fortunate to have two great mentors. George R. Martin taught me how to question and think, how to conduct rigorous research, and how to project myself as a scientist. John D. Termine impressed upon me the importance of family, and trusted me to accomplish my goals by working from home or during off hours when necessary. A key part of his mentoring was in helping me to recognize that it is not possible to be everything to everyone all the time, and that setting priorities both at home and at work is essential. He created a family atmosphere in the laboratory that really brought out the best in people. All of these elements are things that I strive to maintain in my laboratory and branch, and I believe that these things have contributed significantly to my branch’s success over the years.

INSIGHTS

The methods that I have developed over the years for not only establishing osteogenic cells and populations containing stem cells, but also for in vivo transplantation, are now used worldwide, and have become the gold standard by which to assess osteogenic processes and multipotency of populations containing stem cells. Based on my expertise in these areas, I have often been invited to contribute chapters to textbooks, and to give oral presentations to groups with a broad array of scientific backgrounds, and to legislators and the lay public. What I learned early on, in fact from my children and in talking to their schoolmates, is the need to speak in simple terms. I am a firm believer that nothing that we do as scientists is so complicated that it cannot be well explained in language that is understandable by all. In fact, I believe that communication is one of our major responsibilities, not only to fellow scientists, but also to the public. The ability to communicate is something that has contributed significantly to success in my career.

Sharon Marie Knudson Wahl, Ph.D.

Chief, Cellular Immunology Section and
Chief, Oral Infection and Immunity Branch,
Division of Intramural Research

EDUCATION

Ph.D.: (Immunology)
University of Washington
School of Medicine

B.S.: (Biology) Pacific
Lutheran University

RESEARCH INTERESTS

Basic mechanisms by which the host mobilizes and modulates cellular inflammatory reactions in defense against foreign antigens and infectious pathogens, innovative ways to define how endogenous mediators that are critical in host defense may become dysregulated to promote disease, and development of strategies for modulating chronic pathogenic inflammatory diseases. In a bench-to-bedside approach, inroads have been made into malignant, infectious, and autoimmune diseases.

PIVOTAL EVENTS

As the first in my family to attend college, I was fascinated by science classes, and labs were so much fun that I kept signing up for more. One of my biology teachers turned me onto scientific exploration, and with the realization that a woman with a B.S. in biology had few career options, he encouraged me to continue my education. While my intention was to finish an M.S., and I had lined up an instructor position, a classmate convinced me to take Ph.D. qualifying exams, reasoning that if I failed, I had lost nothing (except my self-respect) and if I passed, I could continue toward my Ph.D. In retrospect, that was a defining moment, and after completing my Ph.D., a brief postdoc while waiting for my then-to-be-husband to finish his Ph.D. initiated my interest in inflammation. After he secured a postdoc at NIH, we pulled a U-haul across country to Maryland, where we had little money and I had no position until a fellowship opened up with Dr. J. Oppenheim. Following our 2-year fellowships, we began interviewing for junior faculty positions at medical schools. Unexpectedly, my Lab Chief asked me to stay, not something we had considered, as it seemed inconceivable to get paid for doing research full-time. However, as I progressed from being a fellow to staff scientist, then tenured microbiologist, section chief, and branch chief, I realized that it was possible to get paid for doing what you love!



MENTORING & WORK/LIFE BALANCE

Career highlights include the satisfaction in knowing that I have had some small impact on my students' and fellows' professional and personal development. There is incredible satisfaction in observing students become driven by the excitement of their experiments, recognize that completion of one experiment is not an end unto itself, and appreciate the goal of new therapeutic insights. One especially rewarding experience was the surprise celebration of an unnamed birthday, in the planning stages for more than a year unbeknownst to me, in which my former fellows gathered from all over the world for a weekend of science and celebration.

Although having children was never in question, when to have a baby was the more difficult decision, and following our opportunity to stay at NIH, my husband and I decided to start a family. Although reliable day care was difficult in those days, we did our best to develop our own approaches to combining roles of scientist and parent. Since my husband and I did not travel together without our children, we took them to meetings around the world and those experiences inspired a life-long appreciation for travel and other cultures. As teenagers, both worked in my lab and are my published co-authors, instilling a shared love of science, although neither wanted science careers. However, much to our delight, both our son and daughter are recent medical school graduates, and we have been incredibly blessed and enriched by our children.

INSIGHTS

Growing up on a small farm in the Pacific Northwest, where my strict disciplinarian father taught me the meaning of hard work, I never could have imagined, let alone planned, the paths through which my life has taken me. Looking back, I think one of the most important aspects of my career has been the receptiveness to take advantage of unplanned opportunities that appeared in front of me. For example, I would not have gone to graduate school without the prodding of one of my biology professors, nor continued onto get my Ph.D. without arm-twisting by a graduate school colleague. When ready to leave NIH, an unexpected option to stay appeared, and later, when I again knew I was ready for change, the opportunity to be Section Chief was offered, and then, the Branch Chief. Change is important in our careers to prevent complacency and to enable advancement, but change may appear in unexpected ways, and we need to be open to it.

Looking backward, my career has evolved in such a way as to provide professional fulfillment combined with successful parenting, in which I take great pride. The commitment is enormous, compromise is essential, and the inherent difficulties in combining the two roles are clearly not for the faint-hearted. It would be dishonest to say it was always easy, but that is not to say that it was not worth every sacrifice and concession.

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Jane C. Atkinson, D.D.S.

Program Director, Clinical Trials Program, Center for Clinical Research, Division of Extramural Research

EDUCATION

Certificate: (Oral Medicine/Clinical Research)
National Institute of Dental Research, 1988

Residency: (General Practice) University of Maryland Hospital, Baltimore, Maryland, 1981–1982

D.D.S.: University of Missouri-Kansas City, 1981

B.S.: (Medical Technology) University of Kansas, 1975

RESEARCH INTERESTS

Clinical trials, Sjögren's syndrome, oral graft-versus-host disease

PIVOTAL EVENTS

My experience as an Oral Medicine/Clinical Research staff fellow in the Intramural Program of the National Institute of Dental and Craniofacial Research was the most pivotal event in my research career. It exposed me to multidisciplinary, clinical research and gave me an appreciation for translational, bench to bedside clinical investigations. During my training and later in my career in the intramural program at NIH, I had collaborative research projects with experts in rheumatology, infectious diseases, cancer research, and imaging. There are very few places in the world that can provide this type of experience to a clinical investigator, especially one with a dental degree.

MENTORING & WORK/LIFE BALANCE

After 22 years in research, I appreciate how much I owe my previous mentors, especially Bruce J. Baum. I only hope I can provide similar guidance to young investigators in oral health research. One piece of advice I have for any new researcher is to consider their career with a long view and not to let their career compromise their family time. When I started my training at NIH, my son was 2 years old, my daughter was 4 months old, and my husband traveled extensively as a journalist. I limited my professional travel and postdoctoral education when our children were young, choosing research projects that fit my children's daycare schedule and calculating data at home. However, I do not feel these time constraints compromised my career. Now my children are in graduate school, and I have another 10 years to work in a field that still challenges me.

Sangeeta Bhargava, Ph.D.

Program Director, Immunology and Immunotherapy Program, Integrative Biology and Infectious Diseases Branch, Division of Extramural Research (Former); Assistant Director, Division of Receipt and Referral, Center for Scientific Review

EDUCATION

Postdoctoral Fellowship:
(Mucosal Immunology) University
of Pennsylvania, 1994–1999

Ph.D.: (Reproductive Biology)
AIIMS, New Delhi, India, 1994

M.Sc.: (Life Sciences)
Jawahar Lal Nehru University,
New Delhi, India, 1989

B.Sc.: (Zoology) Delhi University,
Delhi, India, 1987

RESEARCH INTERESTS

Mucosal immunology; immunology

PIVOTAL EVENTS

I was raised in a family with a father who was a cardiologist and a stay-at-home mother. My mother wanted me to be a school teacher so that I would have a half-day job and the rest of the day would be devoted to my family, whereas my father wanted me to be a medical doctor. Both my parents assumed that I would follow one of their footsteps. Neither imagined exactly how I would carve my own niche and be the first one to obtain a Ph.D. and be a scientist in my family.

My parents always stressed the importance of education. I was determined to prove to myself and my parents that I could have a profession that excited me rather than doing what I was told to do. I pursued my dream and surprised my parents by informing them that I did not want to do medicine. I joined the top science college in India for zoology, which turned out not to excite me at all. I gave myself another chance and went through a national entrance exam for my master's degree. In my master's program, I was fortunate enough to find a teacher who turned me to the field of immunology and I never let it go. I realized while studying immunology that I needed to understand how metabolic pathways influence the immune system. I did my Ph.D. in reproductive biology in the field of steroid biochemistry. What really fascinated me while doing my Ph.D. was the freedom my advisor gave me to think about what excited me the most at that time, so much that he let me choose my own Ph.D. topic and pursue research in it.



I was fortunate to do my postdoctoral work in mucosal immunology in the laboratory of John Cebra at University of Pennsylvania. His laboratory in many respects was a scientific paradise where one had the freedom to ask questions and pursue them. It was in his laboratory that I designed an oral vaccine for neonates, which can bypass suckled neutralizing antibody that inhibit active immunization and also found that this vaccine can be cross protective for other mucosal sites in neonates. I was able to show the cross priming mechanisms that are associated with viral infection at various mucosal sites. I realized as a postdoctoral fellow that I wanted to pursue the applied and translational aspect of mucosal immunology and thus to my postdoctoral mentor's surprise, I went into the private sector. I worked on many kinds of vaccines as a lab scientist in the private sector, but I missed the challenge of moving a scientific field in a particular direction and interacting with people.

I joined NIDCR at the end of 2003 as Program Director of the Immunology and Immunotherapy Program. My work suits me perfectly because I am always learning new things. I enjoy this job for the variety and the challenges it entails.

MENTORING & WORK/LIFE BALANCE

Both my husband and I are scientists and we have two children (ages 11 and 6). It is demanding to balance family with professional responsibility and I have a lot of support and help from my husband, which has been instrumental in balancing family and career. When I am not at work, I spend time with my family. The key in my opinion for successfully combining a career and family life is compartmentalizing the two. I try not to bring my work home and so my energy is concentrated with the family. I am active with my children in the schools' activities, Parent-Teacher Association (PTA), and their extracurricular activities.

From my experience so far, I would give the same advice to any young person as I give to my kids: to be open-minded and to learn as many things as possible before you decide what you want to do. More importantly, don't let anyone push you into a field that you don't like, as you have to find your own path. I believe that if one has a strong intellectual background, one can do anything.

Kathy Lynn Hayes, D.M.D.

*Acting Director, Office of Science Policy and Analysis,
Office of the Director*

EDUCATION

Residency: (Dental Public Health),
NIDCR, 2003

M.P.H.: (Public Health
Administration)
The Johns Hopkins University,
1999

Residency: (Advanced General
Practice)
University of North Carolina, 1991

D.M.D.: University of Kentucky College of Dentistry, 1986

B. S.: (Biology) University of Kentucky College of Arts and
Sciences, 1982



RESEARCH INTERESTS

Dental public health, including epidemiologic research, health services research, disparities research

PIVOTAL EVENTS

The opportunity to participate in and present results of ongoing research was offered as an elective course in the dental curriculum at my alma mater. The experience helped foster an understanding and abiding respect for the diligence required of scientific investigators of all disciplines. The ability to work in varied assignments across multiple health agencies as a member of the U.S. Public Health Service has had a significant beneficial effect in that it provided an opportunity to develop a broad understanding of the inter-related missions of the agencies and their combined effect on health policy, including health-related basic, translational, and clinical research. Finally, postdoctoral training here at the NIH in 2002/2003 was an incredibly enriching experience that opened up a world of opportunities that might not have been otherwise available.

MENTORING & WORK/LIFE BALANCE

Some of the best mentors were those who offered a supportive environment where one not only received an opportunity to take on new responsibilities, but also felt comfortable enough to take some chances and make some mistakes. It seems clear that we must consciously expand our mentoring efforts to encourage young women's interest in science at much earlier ages. By the time they are thinking about college, the die is cast, and it may be too late.

Maintaining a well-rounded personality and lifestyle to meet professional, family, and personal needs is a challenge for everyone. I feel especially blessed to have a spouse who is a full

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partner in all aspects of family and professional life. Things may be a bit easier for us than they were for our mothers and grandmothers, in that parenting and household duties often are more equitably shared today than in their generations.

Eleni Kousvelari, D.D.S., D.Sc.

*Associate Director for Biotechnology and Innovation,
Office of Extramural Research (Former)*

EDUCATION

D.Sc.: (Oral Biology)
Boston University, School of
Graduate Dentistry, 1977

M.Sc./C.A.G.S.P.: (Prosthodontic)
Boston University School of
Graduate Dentistry, 1976

D.D.S.: Athens University,
Medical and Dental School,
Athens, Greece, 1968

**RESEARCH INTERESTS**

Biotechnology

PIVOTAL EVENTS

The event that had a tremendous impact on my career as a scientist was my decision to join the extramural programs at the NIDCR. This career move allowed me to bridge my expertise in biological and material science. I was fortunate to join the NIDCR at a pivotal time when the NIH was establishing programs in bioengineering, nanotechnology, and biocomputing. The knowledge and expertise acquired through my studies and work in dentistry, material sciences, and biochemistry has been a great asset in building multidisciplinary/interdisciplinary programs in biotechnology for the NIDCR and for actively participating in similar activities across the NIH. The tremendous support from the NIDCR leadership allowed me to create state-of-the-art programs including 1) saliva-based diagnostic technologies, 2) nanotechnology, and 3) biomimetics. Saliva-based technologies, once developed, will replace current disease detection methodologies with miniaturized, automated, inexpensive, and efficient technologies that can yield results in as little as 10 minutes, while nanotechnology and biomimetics will enable the design and development of materials, devices, and drugs that are compatible with the biological environment and at the same time are tailored to combat specific disease in specific tissues and organs.

I would also like to mention the extraordinary relationships/networks I have developed with exceptional colleagues because of my membership in trans-NIH/Roadmap initiatives,

e.g., nanotechnology, nanomedicine, and committees, e.g., Bioengineering Consortium (BECON), Biomedical Information Science and Technology Initiative (BISTI), the NIH Nano Task Force and in multi-Agency Committees such as the Nanoscale Science, Engineering, and Technology.

MENTORING & WORK/LIFE BALANCE

I would have never been able to develop and implement the many different programs in biotechnology without the advice, encouragement, and support of the NIDCR Directors, Drs. Harold Slavkin, and Lawrence Tabak. Their extraordinary vision for the future of biotechnology and its promises has been and continues to be an inspiration for me.

I have also received extremely useful mentoring from many extraordinary scientists in the extramural community and those at the NIH whom I have met throughout my career in extramural programs. Two of my colleagues in particular, Drs. Jeff Schloss (NHGRI) and Catherine Lewis (NIGMS), have been absolutely incredible in sharing with me their vision, experience and knowledge in different scientific and administrative areas. These relationships have been some of my most productive and collegial ever!

I would like to think that as a mentor I have contributed to the development of the careers of individuals who have worked with me as well as of those whom I have mentored in applying for and obtaining NIH grant support. I am particularly happy for the new investigators I have advised who are now advanced to tenured faculty members in their respective academic institution, are among the leaders in biotechnology, have received NIH MERIT Awards, and have become superb teachers and mentors to a new generation of scientists.

Ruth Emilie Nowjack-Raymer, Ph.D.

Director, Health Disparities Research Program, Center for Clinical Research, Division of Extramural Research

EDUCATION

Ph. D.: (Epidemiology) University of London, University College London Medical School, 2000

Clinical Research Fellowship: (Behavioral and Social Sciences, Randomized Clinical Trials) University of Washington, 1997

Internship (Global Public Health): World Health Organization, Geneva, Switzerland, 1984

M.P.H.: University of Michigan, 1984

B.S.: (Dental Hygiene, Health Promotion, Education) Ohio State University, 1972



RESEARCH INTERESTS

Elimination of the disproportionate burden of oral diseases and conditions suffered by vulnerable populations, including racial/ethnic minorities, urban and rural-dwelling poor, those with developmental and acquired disabilities, and elders; cross-cutting research approaches including epidemiology, social and behavioral interventions, clinical trials, community-based studies

PIVOTAL EVENTS

Having seen the sequelae of social disadvantage, I have always had a passion to make a difference in the lives of vulnerable populations—this passion keeps me mission-focused. Rather than a pivotal event, it’s the diversity of my career trajectory that has contributed most to my ability to direct a wide range of research approaches in varied settings. The puzzle pieces of my career as a clinician, dental public health program administrator for a large State, World Health Organization collaborator, officer of domestic and international professional organizations, clinical trialist, and epidemiologist now fit together beautifully to inform my role as Director of the Health Disparities Research Program. The common denominators that have made this possible are educational opportunities and strong mentors. Federal, State, institutional, and organization-based educational grants have been essential; and mentors—both men and women—have encouraged me to take risks and have advocated for novel opportunities.

MENTORING & WORK/LIFE BALANCE

Sixteen years ago, I was in Singapore working on a Global Program on AIDS project and was 7 months pregnant with my

second child. While there, I saw an NIH official who noted that I was “in a happy family way,” but he expressed regret that I’d “obviously chosen to be a mother rather than a scientist.” Fortunately, my mother and other women had demonstrated that having a vibrant career and family were not mutually exclusive. Conducting and monitoring studies and programs have always meant considerable travel. While challenging, it was possible to meet both professional responsibilities and those of a nursing mother, a mother of teenagers, and even as a mother seconded to another country for 2 years. Social support, in my case from a terrific husband, was and remains essential. Excellent environmental supports such as e-mail, teleconferencing, teleworking, and managers who are supportive have enhanced this capacity.

Deborah D. Philp, Ph.D.

Director, Intramural Office of Education and Research Training, Division of Intramural Research

EDUCATION

Ph.D.: (Cell, Molecular and Developmental Biology) The City College and The Graduate School and University Center of the City University of New York (CUNY), 2000

M.Phil.: (Cell, Molecular, and Developmental Biology) The City College and The Graduate School and University Center, CUNY, 1999

B.S.: (Biology) The City College of New York, CUNY, 1989



RESEARCH INTERESTS

My areas of research interest are wound healing, hair growth, and angiogenesis.

PIVOTAL EVENTS

Aside from my ever-supportive parents and family, there are several people and events that have played an instrumental role in the success of my career. The key pivotal event that opened my eyes to a career in research occurred during my senior year at the City College of New York, CUNY. I became a part-time laboratory technician in the newly formed immunology laboratory of Dr. Jerry C. Guyden. Prior to working with Dr. Guyden, I thought that a career in medicine was my only option. In less than 1 year, I realized that my true passion was in biomedical research. Dr. Guyden encouraged me to pursue my master’s and Ph.D. degrees with full financial support from the Division of Minority Opportunities in Research at NIGMS. Dr. Hynda Kleinman, my postdoctoral PI at NIDCR, was also

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very important in my career pursuit. She helped fine-tune my scientific skills and build a network for future positions.

MENTORING & WORK/LIFE BALANCE

Mentoring is something that is very dear to me. My mentors have played an essential role in the pursuit of my career. My parents have been excellent. They taught my siblings and me that knowledge was a very powerful tool and that sharing it with others would help them become empowered. My Ph.D. advisor showed me the importance of being a mentor to students and taught me how to be a mentor by his actions. My postdoctoral PI was also an instrumental mentor for me as a woman in science. She showed me the importance of networking and being open to opportunities. She also taught me the importance of collaborating and sharing with others. Both my Ph.D. advisor and postdoctoral PI showed me that a healthy balance between family life and professional responsibilities does exist. With a strong support network at home and good communication, anything is possible.

Lillian Shum, Ph.D.

Director, Mineralized Tissue and Salivary Gland Physiology Program and Chief, Integrative Biology and Infectious Diseases Branch, Division of Extramural Research

EDUCATION

Postdoctoral Training:
(Growth and Development)
University of California
San Francisco, 1991–1995

Postdoctoral Training:
(Craniofacial Molecular Biology)
University of Southern California,
1989–1991

Ph.D.: (Anatomy, Cell, and
Developmental Biology)
University of North Carolina
at Chapel Hill, 1989

B.Sc.: (Biology and Biochemistry)
The Chinese University of Hong Kong, 1984

**RESEARCH INTERESTS**

Skeletal and dental biology and pathology; salivary gland biology and pathology; genomics, epigenomics, proteomics, and pharmacogenomics; tissue repair and regeneration

PIVOTAL EVENTS

Just 1 month into my postdoctoral training, my advisor called an urgent lab meeting. A newly published paper contained information to reveal the identity of an elusive family of proteins. He declared that we would enter the race. We worked, succeeded in less than 2 years, and published in *Science*. I was enlightened that success mandates the mentality of “us” rather than “me.” The guiding principal is that our collective success is my success. This single project taught me to value the power of team science, to share a common goal, to plan and coordinate, to appreciate complementary expertise, to be independent yet interdependent, to be responsible and accountable, to be diligent, to strive for excellence, to share the credit, and to rise up to the occasion. I practice what I learned from this experience in my responsibilities to accelerate the progress of science for the benefit of public health.

MENTORING & WORK/LIFE BALANCE

Being mentored is a lifetime experience and mentoring others is a lifetime commitment. The relationship between a mentor and mentee is one of trust, respect, responsibility, and nurture, sharing successes and failures. One should seek multiple mentors in different aspects of learning and at different stages of one’s life.

My family as well as my career are top priorities in my life, and these have reciprocal relationships. My family supports my pursuit of a professional career and my accomplishments bring joy and pride to my family. Growing up in Hong Kong, a society epitomizing East meets West, I observed contrasting cultures in which one values the homemaker and the other esteems the breadwinner. Pursuing both is the art of recognizing both roles consistently as “providers.” It works most of the time for me but not always, and I am trying my best.

Marian F. Young, Ph.D.

*Chief, Molecular Biology of Bones and Teeth Section,
Craniofacial and Skeletal Diseases Branch,
Division of Intramural Research*

EDUCATION

Postdoctoral Fellowship:
Lab of Developmental Biology
and Anomalies, National Institute
of Dental Research, 1981–1984

Ph.D.: (Developmental Biology)
University of Connecticut, 1981

B.A.: (Biology) State University
of New York at Oneonta, 1976



RESEARCH INTERESTS

Molecular biology of skeletal tissues, including bones, teeth, cartilage, and tendon

PIVOTAL EVENTS

My success was largely dependent on a series of supportive teachers and mentors. This mentoring started in the State University of NY with my biology and biochemistry professors, who encouraged me down a path to graduate school at the University of Connecticut. My mentor at U Conn taught me the “basics” of biomedical research and the importance of blending basic science with disease applications. Additional mentors during my postdoc at the NIDCR taught me different aspects about research, including management, an important feature that helped prepare me to run my own research program. Each one of these important mentors encouraged me to challenge myself toward higher degrees or in some way helped me get into positions that advanced my career. Some mentors were developed from the larger scientific community developed at scientific meetings where my work was presented and where newer contacts/networks additionally helped me with mentoring my own staff.

MENTORING & WORK/LIFE BALANCE

Several aspects were crucial to balancing family with professional responsibilities. I’ve given lectures on this topic at career development symposiums at professional meetings and I jokingly state that there are three important aspects of managing career and family. They are to have a good 1) spouse, 2) boss, 3) and colleagues. All three must be supportive in the advancement of your career. I’ve been extremely fortunate to have this in place throughout my career here at the NIH. They all “three” were flexible, supportive, and encouraged trying new challenges. They helped in times of need either by sharing their own experiences and provided advice or even chipped in their own time to help out.

National Institute of Diabetes and Digestive and Kidney Diseases

NIDDK

Carolyn Ward Miles, Ph.D.

*Director, Clinical Obesity and Nutrition Program,
Division of Digestive Diseases and Nutrition*

EDUCATION

Ph.D.: (Human Nutrition and Foods) Virginia Polytechnic Institute and State University, 1977

M.S.: (Human Nutrition and Foods) Virginia Polytechnic Institute and State University, 1971

B.S.: (Human Nutrition and Foods) Virginia Polytechnic Institute and State University, 1969



RESEARCH INTERESTS

Nutrition, obesity, and bariatric surgery

PIVOTAL EVENTS

Moving to the Washington, DC, area was a pivotal event in my career. With this move, opportunities opened up for me to teach nutrition and to work in a variety of areas in the Federal Government. I was able to do hands-on research in the area of energy expenditure and through this experience I became very interested in the obesity problem in this country. Working at the Food and Drug Administration in regulation of nutrition-related products and in the areas of food labeling and health claims provided me with opportunities to learn about the development of government policies. Also, my years at the NIH have given me an opportunity to learn about what research is being done in the areas of nutrition and obesity and the opportunity to work with clinical studies that are looking for solutions to the obesity problem.

MENTORING & WORK/LIFE BALANCE

I have had the good fortune to have a number of good mentors starting with my major professor in graduate school. I have also enjoyed good mentoring experiences with many coworkers at my different places of employment during my career.

Balancing family and professional responsibilities has been easier for me than for many women because I have a very supportive husband who is very interested in seeing that I succeed in whatever I want to do.

INSIGHTS

I have had a varied career in academic institutions and government agencies. After graduate school, I became an Instructor in Pediatrics at the Medical College of Virginia, Virginia Commonwealth University and the Nutrition Consultant to the

Virginia State Inborn Errors of Metabolism Program. After moving to the Washington, DC, area, I taught undergraduate and graduate courses in nutrition at the University of Maryland. Most of my professional career has been as an employee of various government agencies. As a principal investigator at the Beltsville Human Nutrition Research Institute of the Department of Agriculture, I conducted research in the field of energy intake and expenditure. I gained experience with government regulatory policies while working in the Center for Food Safety and Applied Nutrition of the Food and Drug Administration. In this position, I was involved in writing regulations for infant formulas and dietary supplements and was also involved with development of food labeling and health claims regulations. I started working at the National Institutes of Health as a Scientific Review Administrator in the Review Branch of the National Institute of Diabetes and Digestive and Kidney Diseases before becoming a Program Director in the Division of Digestive Diseases and Nutrition.

Marva Monique Moxey-Mims, M.D.

Director, Pediatric Nephrology & Renal Centers Programs and Director, Applied Kidney Small Business Innovation Research Program, Division of Kidney, Urologic, and Hematologic Diseases

EDUCATION

M.D.: Howard University, 1983

B.Sc.: (Biology) McGill University, 1979

RESEARCH INTERESTS

Causes and treatment of chronic kidney diseases in children, pediatric transplantation, hypertension



PIVOTAL EVENTS

I think that my decision to become a pediatric nephrologist was pivotal. It was not my original plan, but as an intern, I found the nephrology patients to be the most fascinating. Additionally, the nephrology attendings were the most inspirational teachers. They obviously loved what they were doing and felt that they could make a significant difference in their patients' lives. I would come away from rounds with them feeling that I wanted to do the same. This is what continues to drive me now—a desire to have a positive impact on the lives of children with kidney disease, even though now it won't necessarily be by direct hands-on contact.

MENTORING & WORK/LIFE BALANCE

During my first academic appointment at State University of New York (SUNY) Buffalo, I was mentored by Dr. Bernice Noble, a wonderful pathologist/microbiologist. During my time working in her laboratory, she emphasized that with the appropriate support systems and realistic expectations, a woman could be both a mother and professional. She must determine what compromises she can live with and which things are simply nonnegotiable. It took a while for me to make peace with this reality, but it is what eventually led to my decision to leave my job as a pediatric nephrologist at Children's Hospital. My position at the NIH allows me to balance my family and professional responsibilities in a way that I find personally acceptable. I have an impact on the broader scientific community by developing research initiatives; I can see patients and still be at home with my family in the evenings and on weekends.

INSIGHTS

I obtained my undergraduate degree in biology from McGill University in Montreal, then with a desire to attend a historically black university, obtained my M.D. from Howard University in Washington, DC. I did both my general pediatric training and clinical pediatric nephrology training at Children's Hospital, Washington, DC, followed by a research fellowship at NIAID. I then took a position at SUNY Buffalo and Children's Hospital of Buffalo as an Assistant Professor of Pediatrics and staff pediatric nephrologist. I then returned to Children's Hospital of Washington and The George Washington University School of Medicine, where I was a staff pediatric nephrologist, eventually promoted to Associate Professor of Pediatrics and medical director of the kidney transplant program. This was followed by 2 years at the FDA in the Center for Devices and Radiological Health (my first step toward better balancing family and career). That then led to my current position at the NIH.

NIDDK

Constance Tom Noguchi, Ph.D.

Research Physicist and Chief, Molecular Cell Biology Section, Molecular Medicine Branch, Division of Intramural Research

EDUCATION

Ph.D.: (Physics) George Washington University, 1975

A.B.: (Mathematics and Physics) University of California, Berkeley, 1970

RESEARCH INTERESTS

My research program focuses on the molecular and cell biology of cytokine stimulation to promote progenitor cell survival, proliferation, and differentiation. Specific

applications relate to erythroid differentiation and strategies to treat sickle cell anemia, and to the protective effects of erythropoietin in ischemia/trauma in nonhematopoietic tissue such as brain, heart, and muscle.

PIVOTAL EVENTS

Opportunity Knocks: While a physics graduate student, I met Alan Schechter, an NIDDK intramural scientist at a holiday party. With his encouragement, I obtained an NIGMS post-doctoral fellowship to work at the NIH.

Basic Training: When other NIDDK PIs proposed a conceptual model for sickle hemoglobin polymerization, my experience in numerical analysis from theoretical physics allowed me to adapt their approach to explain our measurements of hemoglobin polymerization in intact red cells from sickle cell patients.

Follow the Data: While working on erythropoietin as a therapeutic strategy for sickle cell anemia, I discovered the embryonic brain expressed a high level of the receptor for this cytokine that is primarily required for red blood cell production. At NIDDK, I was able to further characterize the receptor in nonblood cells, which led to a broader understanding of erythropoietin as a protective agent in endothelium, brain, muscle, and other tissues.

MENTORING & WORK/LIFE BALANCE

Research is a social endeavor and a mentor can be invaluable in guiding you through some of the hurdles that you will encounter along the way. Mentoring can come from numerous individuals, not only your supervisor. Take the opportunity at meetings and seminars to expand your network.

There is never a convenient time to have a family. Once the decision to have children is made, the support from your spouse,



your supervisor, and fellow colleagues is invaluable. Child care is the most difficult problem to solve as a working parent. You must feel secure in your situation so that you can focus on your research when you are at work. Although research is not a 9-to-5 activity, make the time to enjoy the family and to have meals together. If necessary, return to the lab after dinner or after the children have gone to bed.

INSIGHTS

Take the opportunity to mentor and teach at all levels. As research scientists, we have the opportunity to share the excitement of new discovery, to explain the purpose of scientific research, and to communicate the significance of our discoveries. As mentors and teachers, we promote and develop the next generation of investigators, we increase understanding and appreciation for research, and we pay back to the community for their continuing support. As a community service, offer to speak in schools or judge science fairs. In general, volunteering increases your exposure and can lead to unexpected opportunities. While president of the local childcare organization, another parent asked me to become a role model for a book series on scientists. I now have a biography written for elementary school-aged children and have been contacted by students around the country who have done reports based on the book.

Wei Yang, Ph.D.

Chief, Structure and Mechanism Section, Laboratory of Molecular Biology, Division of Intramural Research

EDUCATION

Ph.D.: (Biochemistry & Biophysics) Columbia University, 1991

M.Ph.: (Biochemistry) Columbia University, 1988

M.A.: (Biochemistry) Columbia University, 1986

B.A.: (Biochemistry) SUNY at Stony Brook, 1985

Undergraduate: (Biochemistry) Fudan University, China, 1980–1983

RESEARCH INTERESTS

We study structure and mechanism of DNA repair, recombination and replication, and implications for cancer and developmental biology.



PIVOTAL EVENTS

The decision to join NIH was a pivotal point for my success. The intramural research funding and supportive colleagues, who provide a vibrant and nurturing research environment at NIDDK and the Laboratory of Molecular Biology in particular, have made my research career pleasurable, successful, and rewarding.

MENTORING & WORK/LIFE BALANCE

Throughout my training and independent research career, I have been very fortunate to be surrounded by encouraging and nurturing mentors and colleagues, who have never regarded me differently because I am a woman and have always been proud of what I do. The reduced pressure on time management as an intramural research scientist allows me to think more, work at bench, and have a relatively easy balance of family and professional responsibilities.

INSIGHTS

Being in a nurturing and first-class scientific environment is the key to my own success in science. As a graduate student at Columbia University, I determined the first protein structure using a selenomethionine-substituted protein and the novel Multiwavelength Anomalous Dispersion (MAD) method, developed by my thesis advisor, Professor Wayne Hendrickson. Dr. Hendrickson showed me the joy of research and the way to success by devotion to excellence. As a postdoctoral fellow at Yale University, I determined the crystal structure of a DNA recombinase complexed with a 34 bp DNA substrate, which was the longest DNA crystallized at the time. There I was inspired by my advisor, Professor Thomas Steitz, who exemplifies how to ask relevant questions in science and how to design experiments to most effectively get an answer. At the Laboratory of Molecular Biology (LMB), NIDDK, I am blessed to have enormously supportive senior colleagues, Drs. David Davies, Gary Felsenfeld, Martin Gellert, and Kiyoshi Mizuuchi. The environment of LMB is open, stimulating, rigorous, and caring. In this environment, I have been able to have an impact on our understanding of DNA mismatch repair and translesion DNA synthesis.

I highly recommend young women scientists to find places that receive them with open arms. Outside of my immediate working environment and among people who don't know me well, I often find that I have to be outspoken and firm. Our society has given women equal opportunities, but old habits of patronizing women are slow to disappear. Outstanding mentors and the excellent environment at NIH have given me the courage and support to speak up and stand by my views, which in the long run will allow us all to be scientists and not 'women' scientists.

Carole A. Bewley, Ph.D.

Senior Investigator and Chief, Natural Products Chemistry Section, Laboratory of Bioorganic Chemistry, Division of Intramural Research

EDUCATION

Cancer Research Institute
Postdoctoral Fellow: (Protein NMR and Structural Biology)
Laboratory of Chemical Physics,
NIDDK, 1996–1999

Ph.D.: (Oceanography and
Natural Products Chemistry)
Scripps Institution of Oceanography,
University of California,
San Diego, 1995

B.S.: (Chemistry) San Diego State University, 1985

**RESEARCH INTERESTS**

Natural products chemistry, protein–carbohydrate interactions, nuclear magnetic resonance spectroscopy, HIV, tuberculosis

PIVOTAL EVENTS

It is probably fair to say that my path to NIH is not well-traveled. A fascination with marine organisms and organic chemistry, and hundreds of hours spent underwater led me to the graduate program at Scripps Institution of Oceanography. There, an appreciation of the diversity of chemical structures and biological activities of natural products produced by marine organisms led to the obvious—a desire to determine the structural basis for their mechanism(s) of action. Selecting the best possible mentors and institutes for carrying out research in these areas (SIO and NIH, respectively) contributed greatly to my growth and success as a scientist.

MENTORING & WORK/LIFE BALANCE

Undoubtedly, one of the most gratifying aspects of directing a research program at the NIH is the opportunity for one-on-one interactions with and mentoring of the talented high school, undergraduate, and graduate students training at NIH, and the dedicated postdoctoral fellows who deserve the credit for making each project come alive. Striking a balance between family, research, and all that each entails, is challenging. But the rewards taken and lessons learned from each, combined with the talented members of my research group, make this possible and pleasurable.

NIDDK

Orna Cohen-Fix, Ph.D.

Senior Investigator and Chief, Cell Cycle Regulation and Nuclear Structure Section, Laboratory of Molecular and Cellular Biology, Division of Intramural Research

EDUCATION

Postdoctoral Fellow: The Carnegie Institution of Washington, Baltimore, 1994–1998

Ph.D.: (Biochemistry)
The Weizmann Institute of Science, Israel, 1994

B.Sc.: (Biology) Tel-Aviv University, Israel, 1986

**RESEARCH INTERESTS**

Cell cycle regulation: The mechanisms that govern timely chromosome segregation, regulation of chromosome movement during mitosis, pathways involved in the response to intracellular damage. Nuclear architecture: The connection between nuclear structure and nuclear function, proteins and processes involved in maintaining nuclear shape and organization, the functional significance of different subnuclear compartments/territories.

PIVOTAL EVENTS

The things that had the most profound affect on my success as a scientist were not events, but rather people. As a woman, the uncertainty involved in deciding to become a scientist was twofold: Am I good enough to lead a group of young scientists toward new and exciting discoveries, and can I do so without giving up my desire to have a family? Throughout the years, I've received tremendous support from my mentors, colleagues, and husband. My mentors encouraged me to follow my passion, my colleagues shared with me their thoughts and experiences, and my husband shared full responsibility (and sometimes more) in raising our kids. Moreover, the environment at NIH inspired me to embark on a new research direction, allowing me to take risks and explore uncharted territories. As it turns out, to create a scientist also takes a village.

MENTORING & WORK/LIFE BALANCE

Balancing family and career is challenging; one is constantly faced with the dilemma that neither is receiving the attention they deserve. But having done it, I can say that I wouldn't have it any other way. Having a family makes me a better scientist: it puts things in perspective and it makes me a more balanced person. Likewise, being a scientist makes me a better parent: much of what we teach our kids is by example, and my kids see that pursuing one's passion is a sure recipe for happiness and a sense of fulfillment. My teenage daughter is set on becoming a scientist; surely I must be doing something right. I always

felt that I could be just as successful as my male counterparts, and having done so while raising a family makes it all the more rewarding. I undoubtedly sleep less than they do, but I'll catch up when I retire.

Ann Dean, Ph.D.

Senior Investigator and Chief, Gene Regulation and Development Section, Laboratory of Cellular and Developmental Biology, Division of Intramural Research

EDUCATION

Ph.D.: (Biochemistry) George Washington University, 1981

B.A.: (Chemistry) Bucknell University, 1966

**RESEARCH INTERESTS**

My interests are in fundamental aspects of gene activation by distant enhancers, which underlie the control of numerous gene families with important roles in mammalian development. The areas of interest covered by research in my laboratory include human globin gene regulation and therapeutic possibilities to address genetic diseases such as sickle cell disease and β -thalassemia, control of gene expression by enhancers and chromatin insulators, and epigenetics of gene regulation.

PIVOTAL EVENTS

My undergraduate education was begun in a period when it was still unusual for women to enter professional ranks and in many cases they were discouraged from doing so. Indeed, my undergraduate chemistry advisor suggested that if I intended to marry, I should not apply to graduate school. I feel very fortunate to have had professional mentors at the NIH such as Dr. Christian Anfinsen, winner of the 1972 Nobel Prize in Chemistry, who first encouraged me to enter graduate school and Dr. Robert Simpson, who unceasingly and strongly supported the launching of my independent research career. I have particularly prized the continuity of NIH support in my research efforts.

MENTORING & WORK/LIFE BALANCE

I have mentored almost 30 students and postdoctoral fellows who are all engaged in professional studies or have obtained academic or research appointments. I have found it tremendously rewarding to follow the paths of these individuals, both the students, almost all of whom have gone onto medical school or to the pursuit of a Ph.D., and the young scientists building research careers.

My husband and I have four children. During the time when the children were young, I maintained a relatively small lab group in order to maximize the time and involvement I was able to devote to both my children and trainees. I have found that there has been a strong synergy to these endeavors and I feel that raising children has made me a better mentor, while mentoring young scientists has made me a better parent.

Carol Renfrew Haft, Ph.D.

Senior Advisor for Cell Biology and Associate Director for Grants Administration, Division of Diabetes, Endocrinology, and Metabolic Diseases

EDUCATION

Postdoctoral Fellowship:
Diabetes Branch, NIDDK,
1991–1996

Ph.D.: (Biochemistry and
Cellular and Molecular Biology),
The Johns Hopkins University,
School of Medicine, 1991

B.S.: (Chemistry),
University of Delaware, 1984



RESEARCH INTERESTS

Obesity and diabetes with a particular emphasis on fat cell and pancreatic beta cell biology, protein trafficking, protein misfolding and misprocessing, and science administration

PIVOTAL EVENTS

As an undergraduate, Dr. John Burmeister, chairman of the Chemistry department, regularly encouraged me to talk to faculty with graduate students and postdoctoral fellows, and to consider doing some research in my spare time. Eventually, curiosity got the best of me, and the more I learned about bench research, the more interested I became in giving it a try. During my junior and senior years of college, I learned firsthand about academic laboratory research and liked it, but unfortunately, I had never seen firsthand any women lecturers, lab technicians, graduate students or postdocs in the Chemistry department, and this was concerning. Then during my senior year, I got approval to take a graduate-level biochemistry course, and to my great surprise and delight, many of the lectures were taught by a woman, Dr. Roberta Coleman. She was engaging, knowledgeable, and accomplished. She was a wonderful role model, approachable and personable, and also married with two children. The next year I applied to graduate school.

MENTORING & WORK/LIFE BALANCE

Throughout my career, I have actively been involved in different kinds of mentoring: advising high school, college, and medical students in various research activities; giving career day talks in local middle schools; serving as a facilitator at lunches for women in cell biology; and in my present job, assisting young scientists obtain NIH research support. I would encourage all to consider mentoring as an important way to improve our ability to recruit and maintain a varied pool of individuals in the biomedical research workforce. In addition to scientific mentoring, it is important to discuss strategies for dealing with stress and balancing professional and personal responsibilities. Being a mother of two, and having type 1 diabetes since childhood, I have learned that having ambitious but realistic goals, a well-constructed plan to achieve the goals, and strong partnerships with family members, coworkers, and various health professionals can go a long way to achieving peace at home and success at work.

Maren R. Laughlin, Ph.D.

Senior Advisor for Integrative Metabolism, Division of Diabetes, Endocrinology, and Metabolic Diseases

EDUCATION

Ph.D.: (Physical Chemistry)
Yale University, 1988

A.B.: (Chemistry)
Oberlin College, 1982

RESEARCH INTERESTS

The study of intermediary metabolism as it relates to diabetes and obesity and the application of imaging technologies to research and medicine in diabetes and obesity

PIVOTAL EVENTS

Science can be faddish, and current trends include the general notions of Integrative or 'Team' science and 'Systems Biology'—but these overused terms have personal resonance for me. My scientific training took place in highly integrative environments where projects routinely required experts, ranging from clinicians and basic biologists through quantum physicists, mathematicians and electronics engineers. This tremendously stimulating environment forced me to think about problems from multiple points of view. My most interesting work in the extramural NIH has been where cross-fertilization from one field to another was required, usually in the form of innovative technology developed for and applied to novel biological questions. This requires new shared language and leads to new, interesting ideas, and is part of an exciting trend toward bigger picture thinking in biology and medicine.



NIDDK

MENTORING & WORK/LIFE BALANCE

It was difficult as a woman in science to learn to think through problems independently and trust my own opinions. This ability developed first through a series of painful shocks and eventually through professional successes. This process cannot be replaced by mentoring, but certainly a culture where mentoring is globally valued can improve the chances of success, especially for women. A major part of my job in extramural NIDDK is to advise applicants regarding the grant process and the specific area of science. Over time, I've learned far more than I've transmitted, and it has given me the chance to interact with many outstanding, fascinating people. Mentoring is needed for staff career development here at the NIH as well—it is not an easy place to negotiate.

Like many of us, my scientist husband and I have sacrificed both being near family and job opportunities in order to be together. The NIH and Washington, DC, has provided a rich, stimulating environment to work and live happily within the constraints of a two-scientific-career family.

Barbara Linder, M.D., Ph.D.

Senior Advisor for Childhood Diabetes Research, Division of Diabetes, Endocrinology, and Metabolic Diseases

EDUCATION

Fellowship: (Pediatric Endocrinology) NIH, 1986–1989

Residency: (Pediatrics) Children's Hospital of Philadelphia, 1982–1985

M.D., Ph.D.: (Physiology) Columbia University College of Physicians and Surgeons, 1982

B.S.: (Biology) Cornell University, 1975

RESEARCH INTERESTS

Pediatric endocrinology, with a special emphasis on diabetes

PIVOTAL EVENTS

I was fortunate to have a great mentor during a summer research experience while I was in college. I wasn't exactly sure what I wanted to do with my life. This individual steered me to applying to M.D./Ph.D. programs, which enabled me to combine my interest in medicine with my desire to conduct research. I didn't even know such programs existed! Although my training was long and sometime schizophrenic (alternating between purely clinical work and basic science in the lab), eventually I was able to find an area—pediatric endocrinology—that captured my imagination as a clinician and a scientist. Although I have now left laboratory science behind, those experiences have enabled me to bring scientific rigor to the conduct of clinical research, a passion that I try to impart to pediatric

fellows whom I mentor.

MENTORING & WORK/LIFE BALANCE

Balancing family and a demanding job is difficult. There is always more work to do than can be squeezed into a work day, and sometimes the stress of the day comes home. I have been very fortunate at the NIH to work in an environment where family is valued. I think this is critical because many working mothers feel guilty about taking time off for family and tend to "overcompensate" for doing so. A great mentor will make it clear that it is not only acceptable, but it is important to take time off to see the school play or tend to a sick child, and that you are not valued less because you do so. I also feel that working in an environment where parents (working moms AND dads) can share stories about their children helps increase productivity, because it creates a shared bond that promotes cooperation and collegiality.

Catherine McKeon, Ph.D.

Senior Advisor for Genetic Research, Division of Diabetes, Endocrinology, and Metabolic Diseases

EDUCATION

Ph.D.: (Human Genetics)
Medical College of Virginia, 1980

B.A.: (Cell and Molecular Biology)
State University of New York
at Buffalo, 1975

RESEARCH INTERESTS

Human genetics, genetic diseases

PIVOTAL EVENTS

While I was always interested in science, I wanted to do research that improved human health. In graduate school, I began a project where I was studying patients with a rare genetic disease. In studying these children, it became clear from my research that two children had a different but related genetic disease that could benefit from large doses of a particular vitamin. This discovery improved the symptoms for these two patients. From that time on, I have been involved in research on genetic diseases or overseeing grant programs in genetic diseases that can improve diagnosis and treatment for patients with these conditions.

MENTORING & WORK/LIFE BALANCE

I think one of the most challenging aspects of a career is balancing family life and professional responsibilities. I have two children and I used to dread the memo that would come from the school that said something like, "Your child has been chosen to receive an award tomorrow and we know you will be there to support your child." While I did miss some of these impromptu award ceremonies, I was able to make most of



them. Since many of my responsibilities require reading and writing, they can be conducted at home or after hours. Communication is now done mainly through e-mail and many meetings can be joined by phone. The NIH provides laptops, blackberries, and computer support, which supports working from remote locations.

Catherine M. Meyers, M.D.

Senior Scientific Officer and Director, Inflammatory Renal Diseases Program, Division of Kidney, Urologic, and Hematologic Diseases

EDUCATION

Fellowship: (Nephrology)
University of Pennsylvania, 1991

M.D.: University of Illinois, 1984

A.B.: (Chemistry) University
of Chicago, 1980

RESEARCH INTERESTS

Renal inflammation and progression of kidney disease, kidney transplantation, diabetic nephropathy, polycystic kidney disease, hemodialysis access



PIVOTAL EVENTS

Mentoring has an enormous impact on one's success. Although early life events initiated a keen interest in studying the sciences and finally medicine, mentors I have had along the way provided crucial guidance for important professional decisions and milestones. Training at an outstanding institution with a strong history of biomedical research was a major decision that facilitated my commitment to a career in science. This environment provided experienced mentors, requisite facilities for research, and a diverse community of researchers with whom to collaborate. In my early career, some mentors and successful collaborators were also women scientists—a trend that has continued throughout my career. Lessons learned at the early stages were essential for moving beyond the training phase and pursuing my own scientific interests, as well as appreciating the need for providing similar insights to younger scientists.

MENTORING & WORK/LIFE BALANCE

From early years of training in medicine, I was fortunate to have had several mentors who were nephrologists. Their palpable enthusiasm for their work provided a solid foundation for my future interests in nephrology, and ultimately in basic research. Perhaps the most useful advice given to me was to focus on pursuing my own goals and interests in research, rather than simply pursuing professional opportunities.

Balancing a family life with professional responsibilities presents obvious challenges to women scientists. Time is a limited resource and demands of rich professional and personal lives are considerable. Harmonizing the two requires more than just organization and inspiration. Fortunately, new concepts of family life are emerging in the 21st century. A supportive and involved spouse has been essential for helping me balance these two responsibilities.

Rebekah Sarah Rasooly, Ph.D.

Deputy Director, Division of Kidney, Urologic, and Hematologic Diseases

EDUCATION

Ph.D.: (Genetics)
Michigan State University, 1989

A.B.: (Biology)
Harvard University, 1982

RESEARCH INTERESTS

Genetics, genomics, genetic disease, model organism research, meiosis, ethical use of biospecimens



PIVOTAL EVENTS

As a high school junior and senior, I worked in the lab of a distinguished female microbiologist. Terry Krulwich trained one or two Westinghouse Science Talent Search contestants each year for many years, and I was privileged to be one of her protégées. Terry was a great mentor, committed to excellent science, but also to training of students at all levels and to her young family. Watching her run a large lab, handle administrative responsibilities, analyze data, write papers and get grants erased any doubts in my mind about a career in science.

MENTORING & WORK/LIFE BALANCE

It is very difficult to balance any serious career with family obligations. It is especially difficult when the career is academic laboratory research, which can consume every waking hour with new experiments, new literature to read, new grant applications to write, and various teaching and administrative responsibilities. Nevertheless, I loved running a research lab in the 1990s, and teaching my kids and my students about the excitement of discovery. More recently, I have found that moving to NIH to oversee large research programs is an even better way to enjoy scientific discovery; my job demands that I keep up with a broad range of research projects and follow the progress of many of the scientists contributing to the field. As my children get older, they also appreciate the significance of my work, which has a national (international?) impact.

NIDDK

Barbara Rehemann, M.D.

*Chief, Immunology Section, Liver Diseases Branch,
Division of Intramural Research*

EDUCATION

Clinical Fellow and Principal Investigator: (Gastroenterology) Medizinische Hochschule Hannover, Germany, 1995–1998

Postdoctoral Fellow (Immunology): The Scripps Research Institute, La Jolla, CA, 1993–1995

Residency: (Gastroenterology) Medizinische Hochschule Hannover, Germany, 1992–1993

Internship: University Clinic Essen, Essen, Germany, 1991–1992

M.D.: Medizinische Hochschule Hannover, Germany, 1991

RESEARCH INTERESTS

Basic and translational immunology; virus/host interaction; mechanisms of viral and autoimmune liver diseases

PIVOTAL EVENTS

I consider a key factor the early exposure to analytical thought processes with both a classical humanities (Latin) and science education (biology, chemistry, and physics) during preparatory school. I entered medical school with the aims to learn how to treat patients as a physician and to understand the molecular and immunologic basis of diseases as a researcher. This was also reflected in both clinical and research postdoctoral fellowships.

A second key factor was the opportunity to work for and learn from outstanding experts who introduced me to the world of research and to explore uncharted territory: Drs. Marta Szamel, Klaus Resch, and Michael Manns, Medizinische Hochschule Hannover; Dr. Francis Chisari, The Scripps Research Institute; and Drs. Jake Liang and Jay Hoofnagle, NIDDK.

A third factor was the opportunity to experience research in international settings. After completing a 2-year research thesis during medical school, I received a scholarship for advanced research at Memorial Sloan Kettering Cancer Center. After a clinical internship and residency in Hannover, Germany, I then moved across the Atlantic a second time to pursue a postdoctoral research fellowship at The Scripps Institute and finally, to my current position at NIH.

**MENTORING & WORK/LIFE BALANCE**

Mentoring extends beyond supervisor/staff relationships. Often, a mentor can be found outside one's own division or department, yet still closely involved in guidance, asking questions, inviting self-reflection, and sharing experiences. At NIH, I served as mentor to several NIH postdoctoral fellows outside my own Institute. Within NIDDK, I helped institute a mentoring program for tenure-track investigators and organized career development meetings for international postdoctoral fellows. Mentoring is rewarding not only for the mentee, but also for the mentor—I enjoy keeping in contact with and following the careers of investigators who trained in my laboratory and are now located at research institutions in the United States, Europe, Asia, and South America.

The statement "Balancing family with professional responsibilities" suggests that both sides must match like two weights placed on a scale. This can be misleading, because the actual proportions may change during life. At the same time, one should not be one-dimensional: work, family, and the development and maintenance of other interests such as arts, sports, etc. are all essential to realize one's full potential.

Susan Z. Yanovski, M.D.

*Co-Director, Office of Obesity Research,
Office of the Director*

EDUCATION

M.D.: University of Pennsylvania, 1985

B.S.W.: Widener University, 1978

RESEARCH INTERESTS

Prevention and treatment of obesity and the study of binge eating disorder

PIVOTAL EVENTS

I was able to develop my own protocols and serve as Principal Investigator on several clinical research projects while still a fellow in intramural NIH. I can't think of any other research institution where someone at my early career stage would have been given that opportunity.

MENTORING & WORK/LIFE BALANCE

I've been fortunate to have mentors and supervisors who have understood the importance of balancing work and family life, and whose flexibility has enabled me to be successful in both "careers."



National Institute on Drug Abuse

NIDA

Nora Volkow, M.D.

Director, NIDA; Chief, Laboratory of Neuroimaging, Division of Intramural Clinical Biological Research, National Institute on Alcohol Abuse and Alcoholism

EDUCATION

Residency: (Psychiatry) New York University, 1980–1984

M.D.: National University of Mexico, Mexico City, 1980

B.A.: (Biomedical Science) Modern American School, Mexico City, 1974

RESEARCH INTERESTS

I am interested in understanding how the human brain works. I am particularly interested in investigating the processes that drive our motivations on day-to-day activities as well as the processes that allow us to exert control over our emotions and desires and how these get disrupted by the repeated use of drugs and how they lead to addiction. I am also interested in how these two circuits (motivation and inhibitory control) participate in obesity and in Attention-deficit hyperactivity disorder (ADHD) and how they change as we age.

PIVOTAL EVENTS

My maternal grandfather committed suicide when I was 8 years old. However, it was not until many years later that my mother revealed to me that he suffered from alcoholism and in desperation had killed himself. My mother had kept this a secret for fear I would be ashamed of him. But of course I was not; it just made me keenly aware of the loneliness and isolation of a person with addiction, and of the suffering their families experience. I knew then that I wanted to commit my career to bringing treatment to individuals affected by addiction just as one brings treatment to any of the other medical diseases.

MENTORING & WORK/LIFE BALANCE

My work is an integral part of my life and I am fortunate to have a husband who is as passionate about his work as I am about mine. This has allowed me to focus my energies into my professional life. Mentoring promising young scientists has been one of the most rewarding aspects of my career. Among the many women whose training I have guided who have gone on to achieve notable success in their scientific careers are Rita Goldstein, Nelly Klein, and Congwu Du.



NIDA

INSIGHTS

Before assuming the role of Director of the National Institute on Drug Abuse (NIDA), I spent most of my professional career at the Department of Energy's Brookhaven National Laboratory (BNL) in Upton, New York, where I held several leadership positions, including Director of Nuclear Medicine, Chairman of the Medical Department, and Associate Director for Life Sciences. In addition, I was a professor in the Department of Psychiatry and Associate Dean of the Medical School at the State University of New York-Stony Brook. I have published more than 400 peer-reviewed articles, over 65 book chapters, and edited 3 books on the use of neuroimaging in studying mental and addictive disorders. I was selected for membership in the Institute of Medicine of the National Academy of Sciences (2000) and have been honored with numerous awards for scientific leadership, including the Kuhl-Lassen Award from the Society of Nuclear Medicine, (1999); the Joel Elkes International Award for Clinical Research from the American College of Neuropsychopharmacology (ACNP) (1999); the Paul Aebersold Award from the Society of Nuclear Medicine (2003); the Thomas William Salmon Award from the New York Academy of Medicine, (2004); the Simon Bolivar Award, American Psychiatric Association, (2005); the Public Service Award from the Society for Prevention Research (2005); the American Academy of Addiction Psychiatry's Founder's Award (2005); the American Psychological Association's Presidential Citation (2005); and the Star of Science Award from the Children's Brain Research Foundation (2006). I was recently named one of 20 people to watch by *Newsweek* magazine in its "Who's Next in 2007," selected among the 100 the most influential people in the world by *TIME* (2007) and named "Innovator of the Year" by *U.S. News & World Report* in 2000.

Marilyn A. Huestis, Ph.D.

Chief, Chemistry and Drug Metabolism Section,
Clinical Pharmacology and Therapeutics Research
Branch, Intramural Research Program

EDUCATION

Ph.D.: (Toxicology) University of Maryland, 1992

M.S.: (Clinical Chemistry) University of New Mexico, 1979

A.B.: (Biochemistry and Physiology) Mount Holyoke College, 1970

RESEARCH INTERESTS

My research program seeks to discover mechanisms of action of cannabinoid agonists and antagonists, effects of in utero drug exposure, and the neurobiology and pharmacokinetics of MDMA (Ecstasy). My section also supports medication development projects, including the use of buprenorphine and methadone in opioid dependence in pregnant and lactating women.

PIVOTAL EVENTS

I have worked in interesting positions in analytical, emergency and forensic toxicology, therapeutic drug monitoring, and clinical chemistry from the time of my undergraduate degree. As a military wife, moving every 2 years, opportunities for graduate education were restricted, and employment options diverse. I took advantage of each circumstance to gain knowledge and experience in biomedical applications, instrumentation, method development and validation, laboratory management, and most importantly, developed a passion for understanding how toxicology can contribute to resolving one of the major problems in our country, drug abuse. I enjoyed and took full advantage of the chance to network with professionals around the country and to actively participate in national professional organizations that enriched my education and skills. I directed 1 of the first 10 laboratories, out of over 200 applicants, to be certified to conduct federally mandated drug testing. At the first opportunity, I began my doctoral research into the pharmacodynamics and pharmacokinetics of cannabinoids in humans, at a time when my children were finishing high school and starting college. The challenges, excitement, joy, and frustration of clinical research ensured that I would not return to the corporate world, but attempt to forge a research career at the National Institute on Drug Abuse. Based on my analytical skills, I was selected to work at NIDA while I pursued my doctorate,



and learn the new skills of study design, and correlation of the onset, peak, and duration of cognitive, physiological, subjective, and biochemical effects with drug and metabolite concentrations. I was fortunate to have a Scientific Director who valued hard work, productivity, and ideas, and I entered the tenure-track program and became Acting Chief and later Chief, of the Chemistry and Drug Metabolism Section.

MENTORING & WORK/LIFE BALANCE

I have held leadership positions in multiple laboratories hiring, training, and mentoring many young women in a field with few female scientists. I also balanced career and parenthood raising a young son and daughter during my master's and doctoral degrees. Perhaps the most satisfying and enjoyable aspects of my career has been mentoring women in the United States and developing countries. I am an adjunct associate professor of toxicology at the University of Maryland and have had the pleasure of directing the doctoral research of nine graduate students (six women). Balancing work and home responsibilities has always been a challenge, especially handling the self-imposed guilt feelings about work when you are with your children, and about your children when you are at work. A positive aspect of having a career outside the home is that your children see your passion for your work, see the effort that you invest, and learn what hard work and dedication can achieve. I feel that finding the right balance between your research and your family is one of the most difficult aspects of my career.

INSIGHTS

I have more than 140 peer-reviewed manuscripts, book chapters, and monographs and over 220 abstracts presented at national and international meetings. In 2007, I received the Irving Sunshine Award for excellence in clinical toxicology from the International Association of Therapeutic Drug Monitoring and Clinical Toxicology. I was awarded the American Academy of Forensic Sciences' Rolla N. Harger Award for lifetime contributions in forensic toxicology in 2005, and the Irving Sunshine Award for "Outstanding Research in Forensic Toxicology" in 1992. I am past president of the Society of Forensic Toxicologists, past Chair of the Toxicology Section of the American Academy of Forensic Sciences, and the first woman president of the International Association of Forensic Toxicologists in its 44-year history. I serve on the U.S. Anti-Doping Agency's Research Advisory Panel, was recently selected for the World Anti-doping Agency's Prohibited List Committee, and provide consultation for the Office of National Drug Control Policy, and Departments of Defense, Transportation, and Health and Human Services. I received tenure in 2005, illustrating that there is no one correct path or age or sex for success at NIH; opportunities exist for all who are willing to dedicate themselves to their work and who don't give up their dreams.

Amy Hauck Newman, Ph.D.

Chief, Medicinal Chemistry Section,
Medications Discovery Research Branch,
Intramural Research Program

EDUCATION

Ph.D.: (Medicinal Chemistry) Medical College of Virginia, Virginia Commonwealth University, 1985

B.S.: (Chemistry) Mary Washington College, 1980

RESEARCH INTERESTS

Design and synthesis of novel compounds to elucidate neurochemical mechanisms underlying the reinforcing effects of drugs of abuse;

characterizing drug-receptor interactions at the molecular level and relating these to behavior; current targets are dopamine and serotonin transporters, D₂-receptor family, with a focus on D₃, mGluR₅ receptors



PIVOTAL EVENTS

The most pivotal event in my early research career was when I was leaving my postdoctoral fellowship to become a principal investigator at Walter Reed Army Institute of Research (WRAIR). Before leaving, I discussed with my postdoc advisor a project idea that stemmed from a discovery I had made in his lab. He strongly discouraged me from pursuing that project and insisted that I establish my own distinctive program, not an extension of his. Although at that moment, I felt much like a baby bird being catapulted from the nest, it forced me to design a unique research project that did not overlap with anything I had done before and turned out to be quite interesting. A few years after I had established my own lab at WRAIR, I was recruited to come to NIDA to build a medicinal chemistry program, a second milestone in my career as a scientist.

MENTORING & WORK/LIFE BALANCE

When I was being recruited by NIDA in 1990, I was 7 months pregnant with my first child. I explained that I was committed to having a successful and integrative research program in medicinal chemistry, but that this would necessarily have to coincide with my family responsibilities and would require flexibility. My soon-to-be lab chief, Dr. Jon Katz said, "o.k." and he has been true to his word ever since. Over the next 3 years, I had two more children, was grandfathered into the new NIH tenure track, and published the first of many papers (with Jon) describing our novel dopamine uptake inhibitors that were not cocaine-like in animal models, which was essential heresy of the time. There were no female role models at NIDA,

NIDA

few women in Principal Investigator (PI) positions, and none who had the time to take notice of an underling. But I had the support of those who worked with me and was ultimately able to build a multicollaborative and exciting research program that continues to challenge me to balance both worlds.

INSIGHTS

One of the most exciting aspects of my career at the NIH has been to be able to “grow” my program in so many directions, essentially “on a dime” and watch drug design on paper progress through a tricky chemical synthesis to a final new compound that has pharmacological properties like no other. Every step along the way, we derive insight, and every piece of biological data is then used to design that next chemical modification. Molecular biology technology has provided a particularly exciting partner for us as we can now work with the chemistry of both our small molecules and the target protein, to pinpoint those drug-receptor interactions and translate that resulting dynamic connection into hypotheses about how our compounds affect behavior. In this regard, mentoring is an easy and natural projection of my own enthusiasm and love of science that instills in my group the passion to work through that tough synthetic scheme or that complicated set of spectra to ultimately characterize that next critical piece to the puzzle. Moreover, I believe that one of my “keys to success” is my desire to work with other neuroscientists to ensure that we are making important molecular tools and that they are being used in the most effective way to answer biological questions. I now collaborate with more than 25 scientists around the world who evaluate our novel compounds in multiple *in vitro* and *in vivo* models of drug abuse and other neuropsychiatric disorders. In essence, my work-life and family-life often parallel, with many tenets I teach my children finding applicability in scientific success.

With regard to being a woman scientist, I have certainly experienced my own set of barriers and made choices that have provided their own set of challenges. We all have our stories. The goal that I have always set for myself is to achieve a balance with family time, focused work in the lab, attentiveness to the people around me, and maintaining the thrill that keeps me going on all fronts. Having a sense of humor helps too! My husband is also an NIH scientist and thus we can provide valued support to one another. I believe as a wife and mother, my enthusiasm for what I hope to achieve career-wise is not only infectious to my children, but has provided them with a model that, although imperfect in many ways, is achievable. I believe that the members of my lab and my colleagues also appreciate this model, although I’m sure my lifestyle has scared away a few. The fact is that every woman who has worked in my lab, either as a postdoc, postbac, or summer student has remained in science or medicine. Many are married. Some have children of their own. Even my own eldest daughter, who is attending Penn in the fall, has every intention of pursuing a challenging career—in science? Who knows?

Toni Shippenberg, Ph.D.

Chief, Integrative Neuroscience Section, Behavioral Neuroscience Branch, Intramural Research Program

EDUCATION

Ph.D.: (Pharmacology)
Baylor College of
Medicine, 1985

B.S.: (Neuroscience)
Colgate University, 1979

RESEARCH INTERESTS

My research program uses cellular, neurochemical, and behavioral approaches to identify alterations in brain function that contribute to the pathophysiology

of addiction in order to identify effective therapeutics for the treatment of addiction and novel targets for the treatment of persistent pain resulting from inflammation and nerve injury. Our studies have shown that tonically active and functionally opposing opioid systems regulate a circuit in the brain upon which natural rewards and drugs of abuse act to motivate behavior. Working with other laboratories, we have identified the neural substrates upon which cocaine and other drugs of abuse act to disrupt the regulatory activity of this circuit.

PIVOTAL EVENTS

As an undergraduate, I became fascinated by the discovery of naturally occurring opioids in the brain. Five years later, Ph.D. in hand, I applied for a postdoctoral fellowship in the laboratory of Dr. Albert Herz, a pioneer in opioid research, at the Max Planck Institute for Psychiatry in Martinsried, Germany. My postdoctoral research experience was unique. Fellows were expected to work 7 days a week and female scientists were a rarity. With no time to take a formal language course, German was learned after leaving the lab and heading to the nearest beer garden for a later dinner and scientific discussions. My mentor, however, gave fellows the rare freedom to follow their scientific hunches wherever they might lead. This freedom enabled me to build an independent research group examining how dysregulation of endogenous opioid systems contributes to drug and alcohol addiction, an interest that continues to this day. After a 3-year postdoc and the birth of my daughter, I was appointed Chief of the Drug Abuse Unit at another Max-Planck Institute. There, I learned how to build a laboratory from scratch, write grants, and navigate a system in which foreigners and female scientists were few. Three years later, after having finally learned German, and having suffered and recovered from a broken neck, I was recruited to the NIDA Intramural Research Program (IRP) to lead a research program on opiate addiction.



MENTORING & WORK/LIFE BALANCE

An important aspect of my career has been the ability to mentor other scientists. My postdoctoral mentor gave me the freedom to pursue my love of science. My laboratory is guided by this same principle. I believe that such freedom is essential for scientific growth of both the student and mentor. In addition to supervising doctoral students and postdoctoral fellows, I am a mentor for the NINDS Specialized Research Initiative in Neuroscience (SNRP), a program that supports neuroscience research at underprivileged medical institutions. As a mentor and scientific advisory board member, I work with scientists at various stages of their careers; providing guidance in developing an independent research program.

Pursuing a career in science has not been easy. As a woman, the need to balance family and career is always present. Importantly, however, the juggling makes one more attuned to the difficulties facing younger scientists. As a single mother, who battled cancer and survived a broken neck, achieving the balance between career, family, and health has often been difficult. The joy and satisfaction that I have experienced as a scientist and mother are unsurpassed. I am paid to solve puzzles of my choosing. My daughter is entering college and even after having had to listen to too many of my talks, she is considering a career in medicine.

INSIGHTS

A career in science can be challenging. It is not without frustrations and long hours. When I entered science, it was still a predominantly male profession. I remember sitting at scientific sessions and counting the few number of females in a room. Although the glass ceiling still does exist, we have made many strides. In 1996, I was the first woman to be awarded the young investigator prize by the College on Problems of Drug Dependence. Since that time, several women scientists have received the award. Recently two women scientists were recognized by the Society of Neuroscience and the American College of Neuropsychopharmacology for their contributions to the addiction field. Previous awardees had all been men. Although the number of women scientists is increasing, it is essential that we gain positions where we can affect scientific policy and help others build successful careers. I have chosen to do this by serving as an editor of several journals, participating in scientific advisory boards, and serving on various study sections both in the United States and abroad. Although these activities have added to my workload, they have improved my science, introduced me to colleagues who have become lifelong friends, and allowed me to develop scientific collaborations that would not otherwise have been possible.

Amina Sarah Woods, Ph.D.

Tenure-Track Investigator, Cellular Neurophysiology Section, Cellular Neurobiology Research Branch, Intramural Research Program

EDUCATION

Ph.D.: (Pharmacology)
The Johns Hopkins University School of Medicine, 1992

M.S.: (Pathology)
University of Maryland Medical School, 1975

B.S.: (Chemistry)
Loyola College, 1972

RESEARCH INTERESTS

Application of bioinformatics, modeling and mass spectrometry to study structure and elucidate the mechanisms of dynorphin-mediated NMDA neurotoxicity and receptor heteromerization

PIVOTAL EVENTS

After obtaining an M.S. in pathology in 1975 and taking a break to raise a family, I joined the clinical pharmacology laboratory at The Johns Hopkins University School of Medicine where I set up biochemical assays to evaluate new therapeutic compounds. My interest in structural biology started in 1986 when I spent time in Dr. Gertrude Elion's laboratory working on Acyclovir and AZT, the first antiviral drugs designed with structure in mind. She explained that to design successful therapeutic agents, one should first study their targets' structure, as function is determined by structure and conformation. Two years later, at the age of 45, I went back to graduate school, where I characterized viral proteins and when conventional methods fell short, learned mass spectrometry (MS) to solve the problem at hand and study biomolecular interactions. After graduating in 1992, I joined the Oncology Department at Johns Hopkins. During my fellowship, I tackled MHC class I peptides purification and sequencing. Isolation of CD1d1 ligand led me to identify the first lipid MHC ligand, which reinforced my belief in the structural importance of all biomolecules.

MENTORING & WORK/LIFE BALANCE

As a Ph.D. graduate student and during my fellowship, most of my classmates, but particularly young women, came to me for advice and support, and told me that my going back to school after raising a family reinforced their belief that women could have both a good family life and a successful career. I believe that in addition to perseverance, my success in science was due to the support of my family, especially my husband who



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always encouraged me to choose the path that satisfied my intellectual curiosity, regardless of the financial burden, and my colleagues, particularly women who encouraged me to persevere, regardless of my age. I have tried to give back what I have received by always being available to help all students and colleagues in mapping a path to scientific success, and trying to convince young women that they have a future in science, and that taking a break after college does not necessarily prevent one from going back to graduate school. I always feel a thrill when I participate in scientific meetings to see that I am not anymore one of the few, but rather one of the many women present.

INSIGHTS

In the past two decades, I have published over 100 papers (citation index 3900), mostly pertaining to structural work; obtained a patent for a peptide drug; was appointed to the editorial board of the *Journal of the American Society for Mass Spectrometry*; and was elected to the post of Secretary of the American Society for Mass Spectrometry.

I obtained my M.S. in 1975, and returned to graduate school in 1988, at the time I was 45 years old. I have done my best and most creative work in my late 50s and early 60s. I was 64 on July 22, 2007, still looking forward to developing new concepts and never felt younger.

Lula Andrea Beatty, Ph.D.

*Director, Special Populations Office,
Office of the Director*

EDUCATION

Ph.D.: (Developmental Psychology) Howard University, 1989

A.B.: (Psychology) Lincoln University, 1971

RESEARCH INTERESTS

I am interested in research that focuses on strength and resiliency, to understand how people and groups are able to function and sometimes thrive in stressful, less-than-optimal conditions. I am also interested in intervention and translational research that focuses on structural factors that can reduce addiction-related health problems and other drug-related outcomes in racial/ethnic minority populations, e.g., HIV/AIDS, criminal justice involvement.

**PIVOTAL EVENTS**

Attending Lincoln University was the most critical event in my professional and personal development. I entered at a time of exciting change in the country and at the university. Lincoln, a historically Black college in Pennsylvania, had been all male. I was recruited as part of an effort to increase representation of women and Southern students. I went not knowing that very few women attended, that the male-to-female ratio was about 7 to 1. I entered the newly created 13 Colleges program, a program to establish "a new curriculum" for college studies. There was pressure to achieve as women and Southerners. Everything was demanding—the coursework, faculty, fellow classmates. I learned to cope with change and resistance to change, to embrace diversity, and to think and question. I was given many, varied opportunities that included working as a teaching assistant, and doing a residential clinical practicum in a mental hospital as a "January Project." I was encouraged to pursue a graduate degree and to try to make a difference.

MENTORING & WORK/LIFE BALANCE

In the early years of my career, I sometimes had to make choices between what was good for my academic/professional career and what was good for my child and family, e.g., extended travel, availability on demand. I almost always chose my family. This slowed my early professional growth a bit. Some of my earlier advisors/mentors were not sensitive to the concerns of women and believed that one had to adjust to the model in place. Changing the model didn't seem to be an option, especially if you were a woman of color. Some of these inherent biases are still in place. We must make sure that people mentoring women are aware of some of the limitations they face, especially in academia, and we must develop program, institutional, and personal strategies to ensure that women succeed without having to make unnecessary sacrifices.

Christine M. Colvis, Ph.D.

Director, Program Integration, Office of the Director

EDUCATION

Ph.D.: (Biochemistry and Molecular Biology) Oregon Health Sciences University, 1998

A.B.: (Biochemistry) Illinois Benedictine College, 1990

RESEARCH INTERESTS

Although the diseases I have studied have varied, my research interest has consistently been in biochemistry and protein chemistry.

I continue to be fascinated with nature's molecular machines, including how they are created, regulated, and find the appropriate location in a cell or organism for their activity. Biology continues to surprise and impress me at every turn. My broad scientific interest is well-suited to my work as a program director, a position that affords me the opportunity to catalyze research in exciting new areas and follow ongoing research in some more established areas.

PIVOTAL EVENTS

After receiving my Ph.D., I came to the NIH to postdoc at the National Eye Institute, where I trained for 3 years under Dr. Donita Garland. With outstanding support and mentorship from Dr. Garland, I was able to quickly gain recognition in the field of proteomics as well as cataract research and was promoted to research fellow. I also became the basic science co-chair of the NIH Fellows Committee. In 2001, I joined NIDA as a program director and with strong support from the Institute, was able to establish two neuroproteomics research centers. In 2008, I assumed the role of NIDA's Director of Program Integration.

MENTORING & WORK/LIFE BALANCE

Throughout my own training and career, I have worked with students and postbaccalaureate women, presenting them with challenging, but achievable goals while helping them identify a career that best suited them. I have also participated in science and career fairs for all ages, from grade school to postdoctoral trainees. While working in vision research, through outreach programs, I would teach children in local grade schools about vision and the anatomy of the eye. I have received numerous awards, including Director's Awards from two NIH Institutes as well as two NIH Director's Awards. I attribute my success to my family, teachers, mentors, and superiors who have encouraged and supported me and continue to do so today.



Lucinda L. (Cindy) Miner, Ph.D.

Deputy Director, Office of Science Policy and Communications, Office of the Director

EDUCATION

Ph.D.: (Psychology)
University of Colorado, 1986

M.A.: (Psychology)
University of Colorado, 1983

B.A.: (Psychology)
University of Colorado, 1980

RESEARCH INTERESTS

Behavioral, molecular genetics and behavior analysis



PIVOTAL EVENTS

I completed my degree in psychology with an emphasis in behavior genetics at the University of Colorado. Following that, I finished two postdoctoral fellowships at the University of Minnesota and the University of Pittsburgh to become grounded in protein analysis and molecular neurobiology. While this transdisciplinary training laid the groundwork for research I conducted for NIDA's intramural program, it also prepared me for my current position guiding NIDA's outreach and communications efforts.

Prior to joining the Office of Science Policy and Communications (OSPC), I worked as a research scientist in NIDA's Intramural Research Program in Baltimore, Maryland. There, I helped to establish the Molecular Genetics Section and served as its first Acting Branch Chief. During that time, I was able to fully integrate my two primary scientific interests: molecular genetics and behavior analysis. Having a broad scientific base and an ability to clearly communicate complex information to diverse audiences have helped me to achieve my current position at the NIH, working at the forefront of addiction science.

MENTORING & WORK/LIFE BALANCE

As the Deputy Director of OSPC, my main responsibility is to oversee the coordination of NIDA's legislative, constituent, research training, science education, and press outreach activities, as well as the Institute's research planning and evaluation efforts. In this role, I have many opportunities to mentor the largely female staff who comprise NIDA's research communications team, and to influence the many audiences they reach—students, teachers, health professionals, the lay public, and more—with NIDA's important public health messages on drug abuse and addiction.

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Marisela Morales, Ph.D.

Tenure-Track Investigator, Cellular Neurophysiology Section, Cellular Neurobiology Research Branch, Intramural Research Program

EDUCATION

Ph.D.: (Cell Biology) Universidad de Guanajuato, Mexico, 1985

M.S.: (Cell Biology) Universidad de Guanajuato, Mexico, 1982

B.S.: (Biochemistry and Microbiology) Instituto Politecnico Nacional, Mexico, 1977

RESEARCH INTERESTS

Molecular and cellular pathways that mediate physiological and behavioral responses to drugs of abuse

**PIVOTAL EVENTS**

My interest in neuroscience began as a postdoctoral fellow at The Scripps Research Institute in the laboratory of Dr. Floyd Bloom. During my training, I discovered specific patterns of cell expression of genes encoding serotonin receptors. This work led to my current research investigations at NIDA on the molecular and cellular pathways that mediate physiological and behavioral responses to drugs of abuse. In these studies, we use a wide range of tools from the fields of molecular and cellular biology to identify neuronal networks implicated in these responses. Results from clinical studies and experimental animals provide evidence indicating that behaviors associated with intake of drugs of abuse are affected by stress. For example, we recently discovered that neurons producing the stress-mediated molecule corticotropin-releasing factor make synaptic contacts with dopaminergic neurons of the ventral tegmental area; these dopaminergic neurons are known to play an important role in motivation and reward. Our identification of a novel interaction between the stress system and reward system provides a new and exciting direction for future studies of how drugs of abuse modify this interaction and affect brain functions and, ultimately, human behavior.

MENTORING & WORK/LIFE BALANCE

As a mentor, I encourage promising young scientists to remain focused, informed, and persistent in achieving their long-term goals, while providing them with key information and guidance on scientific methodology, knowledge, and culture. I have successfully nurtured the development of a number of promising students, postdoctoral fellows, and technicians during my scientific career. These activities have

afforded me great personal satisfaction in helping others achieve their scientific career goals.

My successes in research derive from an abiding passion for science and dedication to the profession. They would not have been possible without the encouragement and support of my wonderful colleagues at NIDA and elsewhere who have generously provided me over the years with valuable advice, reagents, and assistance. This support has been instrumental in developing a research program at NIDA that is at the forefront of my field.

At times it can be challenging juggling the joint responsibilities of being a scientist, wife and mother. Fortunately I have a scientist-husband and teenaged son who often assume key domestic duties while providing unwavering moral support. Therefore in my case, efforts to balance professional and personal responsibilities rely deeply on the understanding and support of my family.

Lisa Onken, Ph.D.

Chief, Behavioral and Integrative Treatment Branch and Associate Director for Treatment, Division of Clinical Neuroscience and Behavioral Research

EDUCATION

Ph.D.: (Clinical Psychology) Northwestern University, 1981

B.S.: (Psychology) Tufts University, 1976

RESEARCH INTERESTS

My main research interest is on developing treatments for people who are experiencing psychiatric and drug use disorders. I am particularly interested in the relationship between behavioral interventions, behavioral change, and biology, and in understanding how to promote positive behavioral changes. The relationship between sleep, circadian rhythms, and behavior is also of interest, particularly as it relates to drug abuse and mental health treatment.

**PIVOTAL EVENTS**

As a clinical psychologist, I have worked with many skilled, dedicated psychotherapists who helped their patients learn how to thrive. But I have also witnessed times when patients were not as well-served. Seeing the plight of some patients—especially while knowing how powerful and positive psychotherapy could be for others—played a pivotal role in my life. As a therapist, I

knew that top-notch treatment could make all the difference in a person's life, but it wasn't always provided. As a researcher, I believed that to maximize the likelihood that people receive top-notch treatment, the treatment must be defined, scientifically studied, and proven to work. At NIH it has been possible to create a program of research that supports the development and testing of effective treatments for people in need, with the ultimate goal of providing all patients with outstanding treatment.

MENTORING & WORK/LIFE BALANCE

I have had the privilege of working with and mentoring many young women with careers in clinical science who have made great contributions to public health. As a health scientist administrator, but also as the mother of two young women, I am especially concerned with supporting the career development of promising young women.

Balancing a career in science with a family is extremely difficult, but it can be done—especially if one has a supportive work environment, and a supportive spouse. I urge women to consider where, when, and how to place limits on themselves. More specifically, I believe that placing limits on what one aims to accomplish on any given day is a necessity, or there will be no balance. However, placing limits on one's vision of what one can accomplish in a lifelong career in clinical science would be a disservice not only to oneself, but to the public's health.

I'd like to thank my parents for not placing limits on what their daughters could achieve, my spouse for supporting me every step of the way, and my children for helping me keep a balance by showing me what really matters.

Kenzie L. Preston, Ph.D.

Chief, Clinical Pharmacology and Therapeutics Research Branch, Intramural Research Program

EDUCATION

Ph.D.: (Pharmacology) University of Illinois at Chicago, 1982

B.S.: (Pharmacy) University of Illinois at Chicago, 1976

RESEARCH INTERESTS

Investigating combined pharmacological and behavioral treatments for polydrug abusers (especially cocaine and heroin abusers), identifying individual characteristics and environmental factors that influence drug taking and response to treatment, and investigating the causes and prevention of relapse



PIVOTAL EVENTS

A pivotal decision that shaped my career and success as a scientist was my choice of pharmacy for my undergraduate training. Pharmacy school gave me a sound foundation in the sciences as well as clinical experiences that paved the way for a career in clinical research. It didn't hurt that it paid well as part-time employment during graduate school. A second pivotal event was my decision to switch from laboratory-based studies to applied clinical research. Taking the chance to try a new research direction stretched my abilities and gave me a fresh start in the middle of my career.

MENTORING & WORK/LIFE BALANCE

The major positive influence on my career was that of my mentors, who taught me good science and supported my career development while also serving as good models for my own future role as a mentor. One of the most satisfying aspects of my experiences as a scientist is seeing undergraduate students accepted into graduate school and fellows develop into full-fledged members of the scientific community. My mentors also modeled the importance of having a full life outside of the laboratory and balancing family and professional responsibilities. I hope that through my own career, I can do the same for other women.

Joni L. Rutter, Ph.D.

Associate Director for Population and Applied Genetics, Division of Basic Neuroscience and Behavioral Research

EDUCATION

Ph.D.: (Pharmacology and Toxicology) Dartmouth Medical School, 1999

B.S.: (Biology, minor in Chemistry) Eastern Nazarene College, 1991

RESEARCH INTERESTS

I am now actively involved in oversight and continued development of human genetics and genomics research at NIDA where I am responsible for providing leadership in planning, developing, directing, and evaluating NIDA's programs related to human genetics research. I am particularly interested in human genetics as it relates to other areas of science, such as pharmacogenetics, epigenetics, and bioinformatics. I am also interested in how our genes interact with how we develop and how we respond to the environment.



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PIVOTAL EVENTS

Throughout my career, I have received several awards, including a Fellowship Achievement Award (NCI) and a Janssen Research Foundation Young Investigator Award, and some of my accomplishments include coidentifying and cloning the Neurofibromatosis Type-2 gene, patenting my graduate work on the matrix-metalloproteinase-1 gene, and coediting a book entitled, "The Cell Biology of Addiction." I can recall three times where I felt like there was an "Ahha!" moment; they were important because of the long-lasting rewarding effects they had on me, and they continue to drive my love for science in search of the next moment. Importantly, there have been a series of key opportunities, and the pivotal events for me have been in recognizing those opportunities and running with them. For example, picking my mentor/advisor in graduate school was critical. She had the most indelible influence on my scientific career. I still hear her voice when I write and when I interpret results. I am also proud to serve with one of a few female NIH Institute Directors, who leads by example and expects nothing less than your best.

MENTORING & WORK/LIFE BALANCE

I came from a rural town in Kansas with a mother who fearlessly paved her own way and a father who encouraged me to aim high. However, it was my father's business partner, a strong, successful, brilliant woman who inspired me the most. She instilled in me the understanding and belief that a woman's passion can and should be followed as well as the knowledge and confidence that I could be anything I wanted to be. I am thankful for scientists, such as Rosalind Franklin, who eased my path in the world of women in science. Although, the gender gap in science still exists, it is narrowing. As years pass, I recognize that I am increasingly surrounded by female colleagues. Mentoring is important to me not only because of what it has meant to my own career, but because it also provides an opportunity for me to facilitate professional and personal growth as others have guided me. I encourage my students and colleagues to keep an open mind about where a path may lead.

Balancing family and career is a daily challenge. The fulcrum for me is a partner who loves me, shares my vision, supports my ambition, and keeps me grounded. Because of this, I have the fulfillment of following my passion and I am honored to be recognized as a woman in science at NIH.

Betty (Chung-Yui) Tai, Ph.D.

Director, Center for Clinical Trials Network

EDUCATION

Ph.D.: (Physiology/Pharmacology)
George Washington University
Medical School, 1982

M.S.: (Genetics) University of
Massachusetts, 1970

B.S.: (Zoology) National Taiwan
University, 1967

RESEARCH INTERESTS

I acquired my training and experience in research at leading laboratories at Yale University, George Washington University, and intramural NIH in the substantive areas of cell biology (microscopy, autoradiography), cell physiology, cellular endocrinology, and membrane transport of electrolytes and weak electrolytes across epithelia and blood-brain barriers. My research on the kinetic approach of weak electrolytes transport guided my interests toward the application of pharmacokinetics and pharmacodynamics to translational research from animal to man. My current research interests relate to the broad topic of "translational research"—mostly from clinical research to clinical care with a specific focus on the exploration of innovative clinical trial methods that can enhance the relevance of research results to clinical care.

PIVOTAL EVENTS

The most pivotal decision that has led my career path has been the desire to stay in the Washington, DC, area with my family. This decision provided me the opportunity to explore the wealth of scientific career opportunities in the Federal Government that go beyond hands-on laboratory or clinical research. Through these opportunities, I have learned and appreciated the significant role of being a Federal health science administrator: just as a group of accomplished musicians can be transformed into a great orchestra by a skilled conductor, a team of talented scientists can also be coordinated to generate significant contributions to impact public health by a program director with vision. Also pivotal to my career are the many great mentors I have had. These mentors have provided me with the necessary guidance and encouragement throughout my professional life to develop my own skills and, more importantly, to be a mentor to others.



MENTORING & WORK/LIFE BALANCE

I am married to a biomedical researcher and have two grown children. Admittedly, the biggest challenge for me has been maintaining the priorities and balance between my family and professional responsibilities. For this, I acknowledge my family: the understanding and willingness of my husband to share family responsibilities has enabled me to focus on my professional pursuits. The willingness of my children to learn about my work and to appreciate the importance of and the pride that I take in my work have also enhanced the satisfaction and happiness I have gained through my professional pursuits.

Susan R. B. Weiss, Ph.D.

Chief, Science Policy Branch, Office of Science Policy and Communications, Office of the Director

EDUCATION

Ph.D.: (Psychology)
University of Maryland, 1982

M.S.: (Psychology)
University of Maryland, 1978

B.A.: (Psychology) State University
of New York at Stony Brook, 1975

RESEARCH INTERESTS

My varied research interests include addiction and other mental health disorders. As chief of the Science Policy Branch for the National Institute on Drug Abuse, I help infuse the latest science advances and health information into strategic planning, public education, and other outreach efforts aimed at stopping drug abuse and addiction—an urgent public health problem. The scientific research underlying these efforts focuses on how drugs of abuse interact with other influences—environmental, genetic, and neurochemical, to name but three—to alter the brain and behavior, and make some individuals more vulnerable than others to drugs' harmful effects. There is still so much to learn about these topics, making the neurobiology of drug abuse a fascinating scientific frontier where important discoveries are being made every day.

PIVOTAL EVENTS

My mentor and collaborator at NIMH, Dr. Robert Post, played a pivotal role in my development as a scientist and an individual. After receiving my doctorate in biopsychology, I took a position in Dr. Post's laboratory, which was dedicated to understanding and treating bipolar disorder. I originally had considered this job as perhaps a transitional one, and that I might later go to medical school. However, the excitement of working at the forefront of this important area and the thrill that accompanies



scientific discovery were so compelling that I remained in the Biological Psychiatry Branch for 18 years. Dr. Post created an environment that welcomed questions and fostered curiosity and creativity. Moreover, this was truly a translational research environment, in which basic and clinical science continually informed each other and guided the research program. Through this collaboration, I was able to expand and develop my research interests, and interact with other clinician scientists throughout the world. Most importantly, however, I had the opportunity to work closely with and learn from a superb and uniquely innovative scientist and clinician, who showed me a new paradigm defining the qualities most important for success.

MENTORING & WORK/LIFE BALANCE

During my time at NIMH, I have mentored over 40 students and postdoctoral fellows, most of whom have gone onto successful careers in research and/or medicine. In my current position at NIDA, I supervise a dozen staff members working on various aspects of drug abuse and addiction, such as conducting outreach and education programs for elementary school students, overseeing the training of young scientists and new grantees, and preparing scientific and policy communications for members of Congress and the public. In all these roles, I provide mentoring and direction to help staff attain the knowledge and self-sufficiency to effectively fulfill NIDA's important mission.

I am fortunate in having a spouse who is also a scientist and who can share my intellectual and personal interests, who supports me in both, and who understands the demands of this career. My family life is a source of great happiness, and my professional life is deeply gratifying. This I have no doubt is possible only because of the extraordinary people in both.

Cora Lee Wetherington, Ph.D.

Women and Sex/Gender Research Coordinator, Office of the Director; Program Officer, Behavioral and Cognitive Science Research Branch, Division of Basic Neuroscience and Behavioral Research

EDUCATION

Ph.D.: (Experimental Psychology) University of North Carolina, Greensboro, 1976

M.A.: (Experimental Psychology) University of North Carolina, Greensboro, 1972

B.A.: (Psychology) University of North Carolina, Greensboro, 1969



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RESEARCH INTERESTS

I have two positions at NIDA. As NIDA's Women & Sex/Gender Research Coordinator, I engage in activities aimed at promoting, infusing, and integrating the study of women and sex-gender differences into all areas of drug abuse research. As a program officer in NIDA's Behavioral Sciences Research Branch within the Division of Basic Neuroscience and Behavioral Research, I develop and oversee a program of extramural research focusing on a variety of animal and human laboratory topics, including vulnerability to drug abuse, the behavioral effects of exposure to drugs across lifespan development, and, of course, sex-gender differences and issues unique to females.

PIVOTAL EVENTS

As I read Mitch Albom's *The Five People You Meet in Heaven* a few years ago, it evoked for me, and probably most readers, thoughts about how our everyday interactions with people can be pivotal in changing the course of our life, and that often-times we realize it only in retrospect. That has been the case for me both educationally and professionally. I think, for example, about my kind high school guidance counselor who took it upon herself to make sure I applied for scholarships and other funding, without which I probably would not have gone to college. And the psychology college professors whose influence shifted my interests from clinical psychology to experimental psychology. And the graduate school professors who provided me with a naturalistic conception of behavior and who taught me about the nature of scientific inquiry. And the graduate school mentor who helped me to obtain an academic position straight out of graduate school. And the NIH representative at a grantsmanship workshop who gave me crucial advice and encouragement that, as a young assistant professor, resulted in my receiving an NIH-funded grant. These are just a few of the individuals who were pivotal early in my career and to whom I am grateful. The list continues and continues.

MENTORING & WORK/LIFE BALANCE

Throughout my career, first as a university professor and then here at NIDA, I have received immense satisfaction from mentoring young investigators, perhaps in part because of the importance such mentorship has played in my own career. I am grateful to teachers, colleagues, family, friends and others—both men and women, scientists and nonscientists—who have inspired, encouraged and challenged me in my scientific development. I find that trying to return that mentorship to others is very satisfying.

Balancing family and professional responsibilities is often challenging, but helps to make life exciting, and I am grateful to my husband who is a professor/scientist and to our two college-student children for their support.