

National Cancer Institute

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Susan Gottesman, Ph.D.

NIH Distinguished Investigator and Chief, Biochemical Genetics Section, and Co-Chief, Laboratory of Molecular Biology, Center for Cancer Research

EDUCATION

Ph.D.: (Microbiology and Molecular Genetics)
Harvard University, 1972

B.A.: (Biochemical Sciences) Radcliffe College,
Harvard University, 1967

RESEARCH INTERESTS

Novel regulatory mechanisms: protein turnover and small noncoding RNAs and the regulatory networks they participate in. I study these in the bacteria *E. coli*. Our lab and our collaborators have identified the ATP-dependent Clp proteases, akin to the eukaryotic proteasome, and their *in vivo* roles, and, more recently, dozens of noncoding RNAs that act to posttranscriptionally regulate gene expression and are similar to microRNAs and RNAi in eukaryotes.



PIVOTAL EVENTS

Family constraints and serendipity brought me to NIH for a postdoc while my husband, Michael, was in the Public Health Service in place of the draft; a continuation of my postdoc project led to beginning work on energy-dependent proteolysis, a major focus of the lab. An invitation from my Ph.D. advisor to chair a session at a Gordon Conference relatively early in my career led to invitations to write some important reviews, which in turn, led to other opportunities. Collaborations with M. Maurizi and S. Wickner in the NCI moved this work forward in ways I would not have been able to do myself. The freedom to follow up on some unexplained results led to the development of our work on small noncoding RNAs, and the opportunity to collaborate with others at the NIH (particularly G. Storz at NICHD) again moved this project ahead in directions and ways we could not have achieved alone.

MENTORING & WORK/LIFE BALANCE

My two children were born while I was a graduate student and a postdoc, when, even though things were busy, we didn't have any obligations other than our own work and the family. Both the labs I was in at the time were supportive (my grad student advisor provided extra funds for child care), and I basically didn't take a lot of time off. However, we've always managed to

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live near the lab, allowing quick visits to school or other activities when the children were young, and limiting the time spent commuting. My husband, also a scientist, and I shared child-care duties, and because both of our schedules were relatively flexible, this worked out with only occasional chaos. Working at NIH made this a lot easier as well—no teaching and no grants meant there was time to attend PTA meetings in addition to being in the lab.

INSIGHTS

After leaving the NIH, I was a research fellow at MIT for 2 years while Michael finished his residency; David Botstein provided support and allowed me to continue on my own project, continued from my postdoc. Work on this led me to pursue energy-dependent proteases when I established my own lab at the NIH, and our demonstration of the role of proteolysis in turning over a cell division inhibitor, as well as collaborative work to identify other bacterial proteases and their function, led to my election to the National Academy of Sciences (NAS) in 1998. This work serves as the basis for understanding how protein turnover is used as a regulatory mechanism in bacteria. A side project on regulation of an unstable protein led, in the mid-90s, to the recognition of the function of a noncoding RNA, leading to other noncoding RNAs, and analysis of how they work, projects that gradually have taken center stage in my lab, and that have attracted excellent postdocs and some attention from the rest of the scientific world, in part because of the important role of small RNAs in eukaryotic cells.

As a woman doing science at a point when there were not quite as many of us around, I had the opportunity to serve on committees or give talks that I might not otherwise have been chosen for. While this can get out of hand, it often provided a broader view of my science, introductions to other scientists in many fields, and chances to participate in decisionmaking on policy issues.

Elaine S. Jaffe, M.D.

*Senior Investigator and Chief,
Hematopathology Section, Laboratory of Pathology,
Center for Cancer Research*

EDUCATION

M.D.: University of Pennsylvania School of Medicine, 1969

Cornell University Medical College, 1965–1967

A.B.: (Zoology) Cornell University, 1965

RESEARCH INTERESTS

Diagnosis, biology, and pathogenesis of benign and malignant lymphoproliferative disorders; relationship of lymphomas to the normal immune system

**PIVOTAL EVENTS**

As a second-year medical student, pathology captured my interest immediately. By examining cells and tissues, I could see with my own eyes disruptions in normal physiology and function. Certainly one could later study these at the biochemical or molecular level, but it is careful morphological analysis of the diseased tissues that often provides the first insight into the problem. Additionally, examination of a microscopic section can tell a whole story, revealing the patients' signs, symptoms, and expected clinical course. The pathologist is like a detective, deciphering the morphological clues to arrive at the correct solution, and still today, discovering and uncovering a difficult diagnosis provides me with great satisfaction.

MENTORING & WORK/LIFE BALANCE

I benefited from wonderful mentors, and for me, facilitating the careers of young scientists is a great reward. I began my studies of lymphoma at a time when immunology was entering the modern age, and one was first able to identify and dissect the functions of T-cells and B-cells. A wonderful partnership was forged between Costan Berard, my mentor in pathology in the 1970's, and Ira Green and Michael Frank, immunologists working in NIAID. Ira, in particular, was gregarious, curious, and eager to share his knowledge of the immune system. The marriage of immunology and pathology was critical to my career success.

My first child was born during my fourth year of medical school; my second during my pathology residency. While balancing career and family was a challenge, my husband and family were always supportive. I think my children appreciated

my enthusiasm for my work, but knew that it did not diminish my interest and delight in their lives and achievements. My immediate supervisors always understood the competing demands in my life. However, I think a key for anyone in this situation is good organizational practices, maintaining your priorities, and staying focused at work.

INSIGHTS

One of my earliest papers dealt with follicular lymphoma, which was then called “nodular lymphoma,” because of its uncertain relationship to lymphoid follicles. Using red cells bound with antibody and complement, we showed that the cells in the lymphoma expressed the same receptors as normal germinal center B-cells. This provided critical evidence linking “nodular lymphoma” to the lymphoid follicle. This paper, which was published in 1974 in the *New England Journal of Medicine*, became a Citation Classic. This work, done during my fellowship, provided some of the first evidence that neoplastic lymphoid cells recapitulated the functional properties of their predecessors. I have spent the subsequent 30 years dissecting the immunological diversity of lymphomas, and showing how they miraculously can inform us, not only about the biology of disease, but also about the normal immune system.

I think a few other milestones stand out in my mind. In 1999, I was named by *Science Watch* as one of the 10 most frequently cited researchers in clinical oncology between the years 1981 and 1998. I was the only woman named on the list. Hopefully, when the next tabulation is conducted, the contributions of women in science will merit greater recognition.

I have been fortunate to be recognized by my peers in pathology, hematology, and medicine. I served as the President of the Society for Hematopathology, President of the United States and Canadian Academy of Pathology (USCAP), and Chair of the Medical Sciences Section of AAAS. An amusing incident took place during my tenure as President of USCAP. During an Executive Committee meeting, we were discussing potential nominees to run for the Council. A number of women pathologists were mentioned as candidates. The Executive Director of the Society commented that “we could not have too many women on the slate, as we were in danger of having an all female ballot.” I replied that somehow it was never a problem when exclusively male slates were proposed in prior years. I think the point hit home, because that individual has recounted that story several times, and taken the message to heart.

A recent milestone was serving as Senior Editor of the World Health Organization classification, *Pathology and Genetics of Tumors of Haematopoietic and Lymphoid Tissues* (2001). It is the first system for the classification of hematolymphoid neoplasms to be adopted on a worldwide basis. Moreover, the process we used to generate this classification has been looked to as a model of consensus development to be adopted by others. Indeed, following this success, I was asked to serve as

one of four international editors for the next Edition of the WHO Monographs.

Elise C. Kohn, M.D.

Senior Investigator and Head, Molecular Signaling Section, Medical Oncology Branch and Affiliates, Center for Cancer Research

EDUCATION

M.D.: University of Michigan Medical School, 1983

B.S.: (Cellular and Molecular Biology) University of Michigan, 1979

RESEARCH INTERESTS

Bench to bedside and back studies related to regulating the tumor and its microenvironment for clinical benefit. Targets include survival and chaperone proteins in ovarian cancer.

PIVOTAL EVENTS

Important experiences in my career include opportunities, such as being an NCI summer student and having outstanding mentors such as Lance Liotta, Richard Wyatt, and Eddie Reed. Exposure to both clinical and laboratory research allowed me to identify aspects of the laboratory science that could be applied to the clinic and components of the disease that I could apply to the laboratory. Finally, the freedom to be creative and follow the science, something still unique at the NIH for early-stage clinicians and scientists, was essential to my development.

MENTORING & WORK/LIFE BALANCE

Mentoring is one of the most important aspects to the successes I feel I have had and I am indebted to my mentors, especially Lance Liotta. It is also one of the most important aspects of my position as a clinician and scientist in the Medical Oncology Branch. Mentoring from high school students through near tenure-track investigators adds a major dimension and satisfaction to my job. I call my lab and clinical teams my other family.

I am a “late bloomer” as a parent, not becoming a parent until well after attaining tenure and my independent laboratory. However, I did experience the diagnosis, treatment, and death from cancer of my mother and mother-in-law early in my career. These experiences gave me a different insight into what it meant to me to be a cancer doctor and researcher. This is now further reinforced by my current experiences as a cancer



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patient and how it affects my young son, my husband, and our relatives. There is no such thing as balance. I am always feeling that I am shortchanging either my home family or my lab family at one time or another.

INSIGHTS

I graduated from the University of Michigan Medical School where I also completed residency training in internal medicine. I came to the NCI for medical oncology training in the Medicine Branch and then joined the Laboratory of Pathology to investigate signal transduction molecular targets in invasion and angiogenesis, and ovarian cancer. My clinical focus is on translational clinical studies of ovarian cancer. I have participated in or led the Medical Ovarian Cancer Oncology Group since 1989 and have been a member of the Gynecologic Oncology Group since 1995.

I serve on a number of NIH, NCI, and extramural NIH committees and programs, which include serving as a participating member and protocol investigator in the Gynecologic Oncology Group, judging the Fellows Award for Research Excellence competition yearly, serving as the co-Chair of the Breast and Gynecologic Malignancies Faculty, and as an editor or on the editorial boards of a number of medical journals. I have been honored to receive recognition for my work, which includes election as a Fellow of the American Association for the Advancement of Science in 2002 and the Rosalind Elsie Franklin Award for Excellence in Ovarian Cancer Research from the Ovarian Cancer National Alliance in 2006.

Dinah S. Singer, Ph.D.

*Director, Division of Cancer Biology;
Chief, Molecular Regulation Section, Experimental
Immunology Branch, Center for Cancer Research*

EDUCATION

Senior Staff Fellow,
Immunology Branch, IIRP,
DCBD, National Cancer
Institute, NIH, 1978–1982

Staff Fellow: Nucleic Acid
Enzymology Section,
Laboratory of Biochemistry,
DCBD, National Cancer
Institute, NIH, 1975–1978

Ph.D.: (Human Genetics
and Development)
Columbia University, 1975

M.Phil.: (Human Genetics and Development)
Columbia University, 1974



B.S.: (Biology) Massachusetts Institute of Technology, 1969

RESEARCH INTERESTS

Regulatory mechanisms governing gene transcription;
cancer biology

PIVOTAL EVENTS

Scientific success—whether based in the laboratory, clinic, or administration—is seldom based on either pivotal findings or events. Rather, success comes from cumulative “small” successes. In research, these successes derive from novel observations, which build on one another. For me, each novel observation was a “pivotal” event: the realization that I was learning something that had never been known before. The thrill of each discovery encouraged me to continue onto the next one.

It is important to note and remember that success in science is never achieved alone, but in collaboration with colleagues, fellows, and trainees. I am grateful to all of the outstanding individuals with whom I’ve been fortunate to work; my successes are equally their successes.

MENTORING & WORK/LIFE BALANCE

One of the greatest rewards of my scientific career has been the ability to mentor trainees at all levels: high school students, college students, post-bacs, graduate students, and postdoctoral fellows. Being able to teach them the pursuit of scientific questions, to watch their growth as scientists and share in the enthusiasm for scientific research has been and continues to be a great joy; watching their independent careers develop has been a continuing pleasure.

The skills required for mentoring trainees in a lab are not fundamentally different from those needed to raise a family. Indeed, they are probably mutually supportive. So, balancing family and professional responsibilities does not require distinct skill sets, just a commitment to both and careful time management. Needless to say, I couldn’t have performed the “balancing” act without the continuing support of my family.

INSIGHTS

I have been fortunate to have had two parallel careers in science—one laboratory based and one administratively based—that were complementary and mutually supportive. My laboratory-based career has been centered on studies of the molecular regulation of MHC class I genes and conducted within the Experimental Immunology Branch, Center for Cancer Research (CCR), NCI.

My accomplishments in this arena include the generation and characterization of the first MHC class I transfected cell lines and transgenic mice; the discovery that HIV Tat represses MHC class I transcription, thereby contributing to viral avoidance of immune surveillance; the discovery that susceptibility to autoimmunity correlates with MHC class I expression and that

down regulation of MHC class I expression confers protection from autoimmune disease; the discovery of a novel class of core promoters, the ATG deserts, that support transcription from multiple start sites and thus create a platform for integration of regulatory pathways; the discovery that general transcription factor complexes are dynamic structures that actively participate in the regulation of gene expression.

As a science administrator, I have served as special advisor to the Deputy Director for Intramural Research where I formulated the original tenure-track policy; as special advisor to the Director, NCI, where I developed the NCI Scholars Program and the K22 award mechanism; as a Senior Science Officer at the Howard Hughes Medical Institute, where I managed the research programs of HHMI investigators; and most recently as Director, Division of Cancer Biology, NCI, where I am responsible for oversight of the NCI grant portfolio in cancer biology and for facilitating and supporting the emergence of new ideas, concepts, technologies, and opportunities in cancer biology. Examples of the initiatives that I have been responsible for are the implementation and management of the Mouse Models of Human Cancer Consortium, the Integrative Cancer Biology Program, and the Tumor Microenvironment Network.

Margaret A. Tucker, M.D.

*Chief, Genetic Epidemiology Branch and
Director, Human Genetics Program,
Division of Cancer Epidemiology and Genetics*

EDUCATION

Fellowship: (Medical Oncology) Stanford University Medical Center, 1981–1983

Residency: (Internal Medicine) Stanford University Medical Center, 1976–1978

M.D.: Harvard Medical School, 1976

B.A.: (Biology) Wellesley College, 1972



RESEARCH INTERESTS

Etiology of melanoma; familial cancers; multiple primary cancers; genetic and environmental components of cancer risk

PIVOTAL EVENTS

During my time in medical school, there were no women in leadership positions, and only one female professor (whom I

did not encounter). I worked part-time for Dr. Fred Li interviewing families having at least two children with cancer. Fred introduced me to Dr. Joseph Fraumeni and Dr. Robert Miller at the NCI. I spent part of my elective time there working on familial non-Hodgkin lymphoma, and developed a fascination for family studies and cancer epidemiology. After residency, I returned to the NCI, where I have worked in cancer epidemiology ever since. Dr. Fraumeni and Dr. Robert Hoover have offered challenging opportunities and good mentoring. I have enjoyed working with and learning from colleagues in my branch. Family members who have participated in our studies have been, perhaps, my greatest teachers and my deepest inspiration. Their generosity is extraordinary.

MENTORING & WORK/LIFE BALANCE

Mentoring is essential to help young investigators grow into independent scientists, but is also important at all career stages. All scientists need others to help them grow, develop new approaches, test out novel hypotheses, and continue to learn. Wallace Clark was an outstanding role model for me, with his boundless enthusiasm for learning across many disciplines—from pathology to poetry to philosophy to photography.

Balancing family life and a demanding career is difficult for everyone; I don't know anyone who feels they have been successful at achieving perfect balance. There have certainly been periods in my life when I worked far too many hours and was less attentive to my family than I would have liked. There have been other periods when family needs were higher priority than work. I certainly have no regrets about the time I have taken to be present with my family.

INSIGHTS

I have worked with melanoma-prone families for about 30 years. When I returned to NCI, Mark Greene was initiating a clinical evaluation of melanoma-prone families with Wallace Clark. When Mark left several years later, I took over the study. Alisa Goldstein has taken the lead in the genetic analyses of these families. Mary Fraser has been the research nurse for almost 30 years. We have identified two major susceptibility genes for familial melanoma, *CDKN2A* and *CDK4*. These findings have been replicated in other families worldwide. We were founding members of the international melanoma genetics consortium, GenoMEL. We are working with GenoMEL to find additional melanoma susceptibility genes, evaluate gene–gene interactions, estimate penetrance of the mutations, conduct genotype–phenotype analyses, and define the associated cancers.

I also conducted a case-control study of melanoma in collaboration with investigators from the University of Pennsylvania and University of California, San Francisco. We demonstrated that dysplastic nevi, unusual nevi first identified in NCI melanoma-prone families, are a central risk factor for melanoma

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in the general population. In collaboration with Thomas Fears and DuPont Guerry, we developed a risk prediction model for 5-year absolute risk of melanoma. This model is posted at <http://www.cancer.gov/melanomarisktool/>.

It is exciting to see so many women investigators currently at the NIH. When I first came, there were few in leadership positions. When I became a branch chief in 1992, I was the only woman lab/branch chief in the Division of Cancer Etiology. Drs. Fraumeni and Hoover, and Dr. Sheila Zahm have been proactive in recruiting and promoting women. Division of Cancer Epidemiology and Genetics (DCEG) has been ahead of other intramural components at NIH in the percentage of women postdocs who become tenure track and tenured investigators. The leadership in DCEG is pretty evenly split between men and women.

Rachel Ballard-Barbash, M.D.

*Associate Director, Applied Research Program,
Division of Cancer Control and Population Sciences*

EDUCATION

Malbrook Fellow:
(Clinical Nutrition)
Mayo Clinic, 1984–1986

Fellowship: (Preventive Medicine)
Mayo Clinic, 1983–1986

M.P.H.: (Epidemiology)
School of Public Health,
University of Minnesota, 1985

Residency: (Internal Medicine)
Northwestern University, 1981–1983

Internship: (Internal Medicine and Pediatrics)
Bowman Gray, 1980–1981

M.D.: University of Michigan School of Medicine, 1980

B.S.: (Natural Resources) University of Michigan, 1976

RESEARCH INTERESTS

I direct the Applied Research Program within the NCI's Division of Cancer Control and Population Sciences. The program's mission is to understand how and why cancer care and control activities in the United States influence patterns of care and trends in cancer incidence, morbidity, mortality, and survival through evaluation of patterns and trends in cancer-associated health behaviors and risk factors, health-care services, economics, and outcomes, including patient-reported outcomes. My personal research focuses on 1) examining the association of diet, weight, and physical activ-



ity with cancer risk and prognosis in order to identify targets for prevention and control of primary and recurrent disease; 2) advancing research on policy, environmental, and contextual factors that may influence adoption of recommended health behaviors; 3) improving systems for evaluating cancer control in national and local populations; and 4) examining healthcare utilization and quality of cancer care.

PIVOTAL EVENTS

I have very little sense of having experienced pivotal events that influenced my career. However, one of the earliest events was training from my parents who taught their eight children that a life of service to people was a great honor and that if you started a job, you completed it. Growing up in a family of 10 strong people also taught me the importance of negotiation in achieving a goal. The process of bringing together new ideas from very different perspectives has always excited me and seemed a foundation of scientific discovery. Early in my career, I spent some time working across different Federal agencies in the field of nutrition. From that experience, I learned that NIH provides unique opportunities to influence the direction of research discovery in health and medicine, which is one of the reasons I am here.

MENTORING & WORK/LIFE BALANCE

One approach to ensuring growth in a field of research is to excite other investigators about the promise of that field. Mentoring new investigators provides the greatest opportunity to engage new thinking and excitement as they are often much more open about approaching a problem from a new perspective. A vital factor in sustaining a research career is the ability to balance family and personal goals with professional goals and responsibilities. In fact, sharing this perspective on how to accomplish that balance is a key part of mentoring. Research and professional work provide opportunities to contribute intellectually and to societal and health goals; my children, family, friends, and personal growth enrich life and give it meaning. A great tool for me in achieving balance has been to exercise regularly—it clears my mind of clutter. I often have my best insights while running!!

Louise A. Brinton, Ph.D.

Chief, Hormonal and Reproductive Epidemiology Branch, Epidemiology and Biostatistics Program, Division of Cancer Epidemiology and Genetics

EDUCATION

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

M.P.H.: (Epidemiology)
University of North Carolina at
Chapel Hill, 1972

B.A.: (Anthropology)
Beloit College, 1971



RESEARCH INTERESTS

Epidemiology of breast and gynecologic cancers; effects of exogenous hormones

PIVOTAL EVENTS

My success as a scientist has primarily reflected the influence of mentors who have allowed me to pursue my true interests. This included a department chair in graduate school who allowed me to transfer to the epidemiology department when I discovered that medical anthropology was not the best fit for me. Although individuals without medical training had not previously been accepted into the department, he provided me a unique opportunity through his recognition that social factors are essential in predicting health. At NCI, my mentors have provided me with opportunities to become involved in many interesting and challenging research projects, some of which appeared on the surface not to be logistically feasible. This has included a number of international projects, which interestingly have allowed me to fulfill my initial interests in medical anthropology in a much more effective manner than had I stayed within the field of anthropology.

MENTORING & WORK/LIFE BALANCE

As indicated previously, effective mentoring has been essential to my development as a scientist. I began work at NCI as a graduate student and my success is largely due to unselfish mentoring by a number of talented colleagues. These important individuals provided sufficient nurturing, but also allowed me an opportunity to develop as an independent scientist through their efforts to recognize my strengths. I have also had a tremendous advantage in working in a division that offers great flexibility in terms of merging personal and career interests. This has allowed me the opportunity to pursue my interests while maintaining a reasonable balance between work and family life.

Michaele Chamblee Christian, M.D.

Associate Director, Cancer Therapy Evaluation Program, Division of Cancer Treatment and Diagnosis (Former)

EDUCATION

M.D.: Georgetown University
School of Medicine, 1980

Pre-med courses, George
Washington University, 1974–1975

B.A.: (Political Science)
Manhattanville College, 1969



RESEARCH INTERESTS

Early therapeutics development, ovarian cancer treatment, clinical trial design and methodology, health disparities and enhancing the participation of underrepresented populations in clinical trials

PIVOTAL EVENTS

In high school, I was not very good at math and, therefore, science courses such as chemistry and physics, and was discouraged from pursuing pre-med studies in college. I followed that advice and studied political science and art. Seven years later, I decided that I should pursue medicine since that had been my childhood dream and dreams deferred give rise to long-term regrets. I had to take the required pre-med courses before entering medical school. I did so with some trepidation but got A's in nearly all of them and went onto graduate first in my medical school class. Because of the 7-year hiatus in my education, I did not pursue a Ph.D. despite the fact that I loved the laboratory when I was finally exposed to it late in my career. However, I have had a very satisfying career in clinical research and cancer medicine.

MENTORING & WORK/LIFE BALANCE

Effective mentoring is one of the most challenging needs of academic scientists and, yet, lack of mentoring is a common complaint of women and minorities. I did not have good mentoring, which is one reason that I had no basic science laboratory exposure until late in my academic career. As a black woman physician–scientist, I have attempted to provide and foster mentoring and to work with oncology professional societies to ensure that they are active in this area.

Having a family was a very high priority to me. I had the first of my three children as an intern and the second as a senior resident. Although this wasn't ideal timing, I have successfully combined raising a family and managing a successful career. This has required compromise, a strong support system—especially from my husband—and resources. It requires that you either get housekeeping help or learn to deal with a few dust

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balls. I chose a flexible work setting that allowed me to be present for “important” events in my children’s lives. Some very prominent women scientists have stopped working while their children were young and gone onto achieve significant scientific prominence. The most critical element is to clearly define what’s important, your priorities, and then arrange your career life to achieve them.

Kathleen A. Cronin, Ph.D.

Mathematical Statistician, Statistical Research and Applications Branch, Surveillance Research Program, Division of Cancer Control and Population Sciences

EDUCATION

M.P.H.: (Epidemiology)
The Johns Hopkins University
School of Hygiene and Public
Health, 1996

Ph.D.: (Operations Research)
Cornell University, 1995

M.S.: (Operations Research)
George Washington University,
1989

B.S.: (Industrial Engineering) Buffalo University, 1985

RESEARCH INTERESTS

Modeling factors influencing population trends in cancer incidence and mortality, including risk factors, screening and treatment, developing statistical methods for measuring and reporting cancer survival, developing methods to measure cancer burden in the population, modeling individual risk for cancer patients

PIVOTAL EVENTS

I entered graduate school with the intention of continuing in engineering, but was quickly attracted to the area of biostatistics. The application of statistical methods to public health problems captured my interest and represented an area where I hoped I could make a contribution. After graduate school, I came to NCI as a cancer prevention fellow, which allowed me to change the direction of my career to focus on cancer research and included the opportunity to study epidemiology through an M.P.H. program. Statistical and engineering training in combination with an understanding of public health issues provided me with a unique point of view. The fellowship also gave me the opportunity to work with several groups at NCI, including the surveillance research program. Population-based research matched my skills and interests and I have continued to work in surveillance for the previous 10 years.

**MENTORING & WORK/LIFE BALANCE**

With an 8-year-old son and a 5-year-old daughter at home, balancing family and professional responsibilities is a constant struggle. It is very easy to get caught up in trying to do everything and setting unrealistic goals for yourself. The advice that I have received was to acknowledge constraints both at home and at work and then be satisfied with your accomplishments in both areas. There have been times when I took on less responsibility and even worked part-time for several years after my daughter was born. Finding and maintaining the balance that is right for me certainly contributes to my quality of life in many ways and allows me to better enjoy the time I spend at work.

Brenda K. Edwards, Ph.D.

Associate Director, Surveillance Research Program, Division of Cancer Control and Population Sciences

EDUCATION

Ph.D.: (Biostatistics)
University of North Carolina
at Chapel Hill, 1975

M.S.: (Biostatistics)
Vanderbilt University, 1970

B.S.: (Mathematics & Biology)
Murray State University, 1968

RESEARCH INTERESTS

Cancer surveillance, biostatistics, national health data systems, survival analysis, clinical trials

PIVOTAL EVENTS

The research environment and colleagues with diverse interests and expertise who work at the National Cancer Institute have been very influential in my scientific career. At NIH, posing questions and engaging a multidisciplinary scientific team to develop a series of studies that will provide answers is a normative but challenging aspect of each day. The role of a biostatistician provides many opportunities to work on a wide range of research projects. Fortunately, I have been involved in cancer prevention and control since its formative days and continue to collaborate with other public and private partners to integrate surveillance systems for reporting on progress in reducing our national cancer burden.

MENTORING & WORK/LIFE BALANCE

It has been my privilege to be trained by some of the leading statisticians in the world who valued their role as mentors and thoroughly enjoyed the field of statistics and analysis of data. Naturally, passing along this inheritance of genuine enthusiasm for applying innovative solutions to important public



health issues is something I try to do. Balancing professional responsibilities with personal interests and needs can get off-centered more often than I would like. Realignment of priorities and time are required whenever either the joy of work grows dim or the concerns of family are being neglected.

Ann W. Hsing, Ph.D.

Senior Investigator, Hormonal and Reproductive Epidemiology Branch, Epidemiology and Biostatistics Program, Division of Cancer Epidemiology and Genetics

EDUCATION

Ph.D.: (Epidemiology)
The Johns Hopkins University
School of Hygiene and Public
Health, 1988

M.P.H.: (Biostatistics) University
of California at Los Angeles, 1981

B.S.: (Public Health)
China Medical College, Taiwan,
Republic of China, 1979



RESEARCH INTERESTS

Epidemiology of prostate and hepatobiliary cancers; racial disparities in prostate cancer; westernization; endogenous hormones/growth factors; obesity, insulin resistance, and metabolic syndrome; chronic inflammation; genetic susceptibility; molecular epidemiology

PIVOTAL EVENTS

Joining NCI was the most important milestone in my professional life. The Division of Cancer Epidemiology and Genetics has provided me with a rich environment in which to grow as a scientist and a unique opportunity to conduct high-risk, high-impact research in China and Africa. This is my childhood dream come true. As a child, I wanted to become a health professional and help people on the African continent.

Two key events during my early years at NCI shaped my attitude as a scientist. The second day I arrived at NCI, my Branch Chief, Dr. William Blot, a world-renowned epidemiologist, asked me to comment on a manuscript he was writing. I could not believe that such a well-respected scientist would value the opinion of a new postdoc. The following year, before I traveled to China to launch my first study, Dr. Blot told me that, although I was a postdoc, I was representing NCI and everything I said or did mattered. Both times, I was filled with a great sense of pride and responsibility, and I told myself that, regardless of my rank, I would always hold myself and my studies to the highest standard.

MENTORING & WORK/LIFE BALANCE

I have been fortunate to have had great mentors throughout my career. Three giants in epidemiology helped transform my professional life. At Hopkins, Drs. Frank Polk, my academic advisor, and George Comstock, my thesis advisor and former editor-in-chief of the *American Journal of Epidemiology*, taught me epidemiology and scientific writing. At NCI, I worked closely with Dr. Joseph Fraumeni, Jr., one of the best epidemiologists and writers in the field of science. Learning the ropes from these masters helped me develop solid skills and confidence. I have also received excellent career mentoring from Dr. Shelia Zahm, who has always generously shared her experience and wisdom with me and guided me through critical moments of my professional career. My colleague and dear friend, Dr. B.J. Stone, has provided invaluable peer-mentoring daily for the last 19 years. My success cannot be attributed to my efforts alone; I am grateful to my mentors, fellows, and collaborators.

I view mentoring junior investigators as both a privilege and an obligation. As a senior investigator, it is my responsibility to nurture, protect, and help promote the careers of young scientists. I am especially committed to mentoring young women scientists, in particular minority women, as they are more often faced with unique obstacles along their journey to success.

My two children were born before I was tenured. They brought enormous joy to my life, but also presented me with tremendous challenges in balancing professional and family responsibilities. I have not yet been able to achieve a perfect balance; however, with good time management, organizational skills, and strategic prioritization, it is quite possible to have a productive professional and personal life.

Crystal L. Mackall, M.D.

Chief, Pediatric Oncology Branch,
Center for Cancer Research

EDUCATION

Fellowship: (Pediatric Hematology/Oncology) Pediatric Branch,
NCI, NIH, 1989–1992

Residency: (Combined Pediatrics/
Internal Medicine) Children's
Hospital Medical Center of Akron/
Akron General Medical Center,
1984–1988

Combined B.S. (Natural Sciences)/
M.D.: Northeastern Ohio Univer-
sities College of Medicine, 1984



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RESEARCH INTERESTS

Immunotherapy, immune reconstitution, T cell homeostasis, pediatric oncology, tumor immunology

PIVOTAL EVENTS

The single most important element of my NIH experience that provided me the opportunity to succeed was the availability of committed and qualified mentors within the NIH environment who made their interactions with junior members of their team a priority in their own busy schedules. Among these, Ron Gress was a pivotal influence in my scientific development and without his guidance and commitment, I would not have achieved my current level of success. In addition, having come to NIH with very little research experience (but plenty of drive and determination), my success depended largely upon the steadfast commitment that the Intramural Research Program has made to the training of physician–scientists. Fulfilling this commitment requires that the Intramural Research Program maintain strong clinical and scientific communities that work side-by-side and encourage the recruitment and training of talented young physicians who are dedicated to careers in science.

MENTORING & WORK/LIFE BALANCE

Each individual has to make a personal decision regarding priorities in his/her life. For me, I determined early in my career that my desire to have, and be part of, a family is my highest personal priority. Thus, while I love science and am incredibly dedicated to my professional career, I have found that life's day-to-day stressors are more manageable by making a clear personal commitment to putting my family first. This does not mean that my family has not sacrificed on behalf of my career, but rather when "push-comes-to-shove" and the goals of each are irreconcilable, my family comes first. As a result, I am blessed to be raising two wonderful sons, currently aged 9 and 12, and to be part of a loving and committed relationship of 27 years with my life partner.

Because I know that my own success was directly related to the commitment and talent of my mentors, I believe that my impact, in the long run, will ultimately depend upon my ability to impart my enthusiasm and love of science to young researchers. In this venture, I am careful to focus on both their intellectual and personal development, teaching them how to be good citizens within the greater scientific community and helping them to find their own personal happiness by exploring and defining their life's goals and priorities. For most of the students and fellows that I mentor, this involves finding that same balance between work and family that I have found and that I encourage. When my fellows are happy and successful in both their personal and professional lives, then I believe that I have succeeded in mentoring.

Cheryl L. Marks, Ph.D.

Program Director, Mouse Models of Human Cancers Consortium and Associate Director, Division of Cancer Biology

EDUCATION

Ph.D.: (Biochemical Genetics)

The George Washington School of Medicine, 1985

M.S.: (Chemistry)

Southern Connecticut State University, 1970

A.B.: (Chemistry) Randolph-Macon Woman's College, 1966

RESEARCH INTERESTS

Developmental biology, systems genetics, animal models of disease, techniques to foster innovation and facilitate team science

PIVOTAL EVENTS

When I came to the NIH in 1971, I had an M.S. in chemistry, and no personal goal to obtain further formal education. But the laboratory chief for whom I worked had a different objective for me: To ensure that I had optimal career choices for the future. He facilitated my studies for a doctorate, obtaining permission for me to perform research in his laboratory while continuing to work for him. It was a busy 5 years—combining work and study and dissertation research—but his mentoring, unstinting support, and infectious love of science made the experience an exceptionally exciting time in my career. I owe the abundance of science opportunities that earning a Ph.D. affords to him and his wisdom.

MENTORING & WORK/LIFE BALANCE

I cherish the many opportunities I have had to advise young researchers on their research programs in the course of managing extramural grants. Deciding to leave research at the bench after 20 years for science administration was a positive career decision; it is very satisfying to have an impact on the research direction in laboratories in many institutions and to help new investigators secure their first grants.

In balancing family and work, it has helped immeasurably to have a spouse who supports my choices with enthusiasm and candor, especially when we confronted together the challenges of managing care of elderly parents with the responsibilities of two careers.

Eva Szabo, M.D.

Chief, Lung and Upper Aerodigestive Cancer Research Group, Division of Cancer Prevention

EDUCATION

Fellowship: (Oncology) NCI, NIH, 1989–1993

Internship/Residency: New York University–Bellevue Hospital in New York, 1986–1989

M.D.: Duke University Medical School, 1985

B.S.: (Molecular Biophysics and Biochemistry), Yale University, 1982



RESEARCH INTERESTS

Chemoprevention, lung cancer, head and neck cancer, differentiation-based therapies for cancer prevention and treatment

PIVOTAL EVENTS

I completed my training in internal medicine at Bellevue Hospital in New York at the height of the AIDS epidemic, prior to the advent of antiretroviral drugs. Our patients were very sick and there was little infrastructure in place to support the physicians. Especially after hours, the interns typically did almost everything for the patients, from drawing their blood to wheeling them to the radiology suite for X-rays. Since sleep was generally out of the question when one was on-call, I quickly learned that survival depended on “working smart”—quick thinking, efficiency, and organization. We all learned early to accept responsibility because if we did not do what needed to be done, there was no one else to do so. And, I learned the critical importance of being thorough and seeking advice when faced with uncertainty. These lessons have served me well both in patient care and in research.

MENTORING & WORK/LIFE BALANCE

Mentoring young investigators and raising children have many similarities. Both require protection, exposure to new ideas, and a supportive environment to allow them to grow into independence. The mentor feels responsibility for the trainee, much as a parent is responsible for a child’s well-being. Mentoring is a life-long process; you mentor those younger than you, but you continue to learn from those around you. I have had the good fortune of learning from outstanding scientists in the field of chemoprevention and find them a constant source of inspiration.

Balancing family with work is particularly challenging, especially for women. That’s where “working smart” is critical, to juggle the demands of home and work. Flexibility and commitment from both spouses are required—your spouse must be your willing partner. Setting priorities (which include quality family time) and, at times, sacrificing personal leisure time, are the keys to managing the balance.

Sheila E. Taube, Ph.D.

Director, Cancer Diagnosis Program, Division of Cancer Treatment and Diagnosis (Former)

EDUCATION

Postdoctoral Associate: (Human Genetics) Yale University Medical School, 1971–1973

Ph.D.: (Microbiology) University of Pittsburgh School of Medicine, 1970

B.A.: (Biology) Brandeis University, 1963



RESEARCH INTERESTS

Development of improved diagnostics for cancer, including biomarker trial designs, assay standardization, prediction of response to therapy and prognosis

PIVOTAL EVENTS

Two mentors had major impacts on my pursuit of science and on my success. My college advisor’s ability to impart the excitement of the hypothesis-testing approach to scientific thinking and discovery enhanced my ability to critically evaluate data and enabled successful research. My Ph.D. advisor taught me how to effectively communicate research findings both to other scientists as well as to lay audiences. The fascination with biology, the excitement of discovery, and the ability to convey the importance as well as the excitement with clarity have all enabled success in my career as an extramural science administrator.

MENTORING & WORK/LIFE BALANCE

I mentored graduate students as a faculty member at the University of Connecticut Medical School before joining the NIH, particularly helping women plan their careers. I also served on the Committee on the Status of Women Microbiologists and worked on development of programs to help women scientists understand professional options and how to approach job decisions as they pursued scientific careers. This included balancing family and career, a nontrivial pursuit. In my case, I believe I could not have managed to raise two children, now both pro-

NCI

professionals, and pursue my career without the active support of my husband. There were few women role models when I began and little infrastructure that could facilitate dual-career families. We had to create our own infrastructure and make many compromises to allow both careers to progress and the children to be raised successfully.

Barbara K. Vonderhaar, Ph.D.

Chief, Mammary Biology and Tumorigenesis Laboratory, Center for Cancer Research

EDUCATION

Ph.D.: (Oncology)
McArdle Laboratory, University of Wisconsin, Madison, 1970

B.A.: (Chemistry)
Clarke College, 1965

RESEARCH INTERESTS

My research examines local, hormonally driven growth regulatory mechanisms associated with normal mammary gland development and tumorigenesis. Particular emphasis has been placed on clarification of the role(s) of prolactin and the variety of prolactin receptor isoforms expressed within mammary tissues in concert with estrogen, progesterone, and growth factors during these events. The goal is to utilize multidisciplinary approaches encompassing areas such as endocrinology, molecular genetics, stem cell biology, growth factors, oncogenes, cell signaling, and animal model systems to understand the pathobiology of breast cancer.

PIVOTAL EVENTS

As a second-year postdoctoral fellow in the NIH laboratory of Dr. Yale Topper, a pioneer in the area of mammary gland development, I was asked to present my work at the Gordon Research Conference on Mammary Gland Biology when he was suddenly unable to do so. Thus began the long association with the Gordon Research Conferences that has been pivotal to my research success. Over the subsequent 34 years, I attended over 50 Gordon Conferences covering a variety of topics, but primarily the Conferences on Mammary Gland Biology, Prolactin, Cancer, and Hormonal Carcinogenesis. At these intense and exciting meetings, even as a postdoc, I was able to meet the leaders in the field, debate concepts, share insights, and establish and nurture valuable collaborations. I later was elected to Chair the Mammary Gland Conference and to serve on the Board of Trustees (and as Board Chair) for the Gordon Research organization.

**MENTORING & WORK/LIFE BALANCE**

Mentoring young investigators is one of the privileges and joys of my research program. Since a career in science does not begin at the postdoctoral level, I have had students in my laboratory at the predoctoral level, including high school students as unpaid volunteers. I have mentored 142 high school and undergraduate students, postbaccalaureate and postdoctoral fellows and visiting scientists on sabbatical. I have won several mentoring awards, including the Association for Women in Science (AWIS) Bethesda Chapter Award for Excellence in Mentoring, the Colgate University Visiting Howard Hughes Medical Institute (HHMI) Scholars Mentoring Award, and the NCI Outstanding Mentor Award.

I have been married for 33 years. Together with my husband, I have raised two wonderful sons, clearly demonstrating that it is possible to balance a family and a highly successful scientific career. I have never regretted a decision where I placed family before career. Only when all is well with the family can one effectively concentrate on career.

Lauren V. Wood, M.D.

Senior Clinical Investigator, Vaccine Branch, Center for Cancer Research

EDUCATION

Postdoctoral Fellowship:
(Allergy and Immunology) NIAID,
NIH, 1988–1991

Residency: (Internal Medicine
and Pediatrics) Baylor College of
Medicine Affiliated Hospitals,
Houston, Texas, 1984–1988

M.D.: Duke University School
of Medicine, 1984

B.A.: (Biology) Oberlin College, 1980

RESEARCH INTERESTS

Vaccines and immune-based therapies for cancer and HIV infection, dendritic cell vaccines, human papillomavirus (HPV) vaccines, adolescent HIV/AIDS

PIVOTAL EVENTS

The pivotal experience of my career has involved professionally living through the transformation of HIV/AIDS from a death sentence to a life of possibilities as a result of advances in basic and clinical research. When I joined the NCI in 1992, we were taking care of the sickest kids on the planet, routinely had 15–20 inpatients that we rounded on until 11pm at night



and averaged over 50 deaths a year. As a consequence of one phase I drug study after another, and ultimately the advent of highly active antiretroviral therapy (HAART), hospitalization became a thing of the past and deaths dropped dramatically. Not everyone made it, but it is the thrill of my lifetime to see my former “babies” getting driver’s licenses, graduating from high school, going to college, and even getting married. It’s the reason I continue to pursue trying to harness the immune system to produce even better outcomes in HIV and cancer.

MENTORING & WORK/LIFE BALANCE

I consider my father, Don H. Wood, M.D. (deceased 1995), to be my greatest mentor. He was a neurologist whose clinical research focus was stroke and improving stroke outcomes. It made me feel all grown up when we would get to have lunch together over in the Bldg. 31 cafeteria during the rare occasions he was on campus for NINDS Board of Scientific Counselors (BSC) advisory meetings. We could “talk shop” about medicine and research and he would always encourage me to hang tough.

I didn’t have quite the challenge that many women do of balancing work and family responsibilities because I didn’t get married until later in life—a first-time bride at 45! I was blessed not to have to make a decision that many professional women encounter when they get married: whether to change or hyphenate their name. My husband’s last name is the same as my maiden name (and no, we’re not related) so I just became Mrs. Dr. Wood. It’s definitely a challenge and a lot of juggling, but worth every minute of the wait and the effort. Nothing that’s really great comes easy—whether it’s a great family life or a great work life and it is possible to have both.

National Eye Institute

NEI

Deborah A. Carper, Ph.D.

Special Assistant to the Director

EDUCATION

Ph.D.: (Department of Zoology)
University of Maryland,
College Park, 1984

B.S.: (Zoology)
University of Maryland,
College Park, 1972

RESEARCH INTERESTS

Pterygium, cataract,
retinopathy of prematurity,
omega-3 long-chain
polyunsaturated fatty acid
prevention of ocular neovascularization



EVENTS

The most outstanding day I had in the laboratory was when we absolutely knew we had cloned the cDNA for aldose reductase, an oxido-reductase implicated in diabetic complications. This event opened a 10-year quest to characterize the gene, its regulation, and the protein's structure/function properties. It was exciting to carry out this research in the early days of molecular biology, with new techniques and machinery coming online in rapid succession.

As another pivotal event, I must mention my gratitude to Dr. Jin Kinoshita, who was my mentor for many years. While working as his technician, he encouraged me to obtain my Ph.D. I can only assume that he saw some scientific potential. He gave research guidance and yet the freedom to grow as an independent investigator. I hope that he would see the following as my greatest compliment to him: "how would Jin do this?"

MENTORING & WORK/LIFE BALANCE

Effective mentoring is so important for a young (and not so young) scientist. Mentors have life experiences that are invaluable when making career decisions, such as how to choose the right laboratory environment, how to network, and how to give back to the science community. The mentor is also enriched. I have delighted in seeing young investigators from my laboratory become scientists and clinicians in their own right.

Balancing family with professional responsibilities is challenging, but manageable as long as you keep a calendar and memo book with you at all times, and have a spouse with a great sense of humor! There is nothing more wonderful than raising a child (my daughter, Katie) and having the support of a loved one (my husband, Steve) on life's journey. Science is the icing on the cake. It adds a dimension of personal identity, it allows you to

dream and discover and make a contribution to our collective knowledge and public health endeavors.

INSIGHTS

One of the early milestones in my career was characterizing a cataract mouse model called the Philly mouse (from Philadelphia). My research showed a deficiency in a functional mRNA for beta-crystallin, a major protein of the lens. Publications in *Science*, *Developmental Biology*, and the *Proceedings of the National Academy of Sciences* were heady experiences for a young investigator. A second milestone was the cloning of aldose reductase, which led to many years of rewarding investigation. At that time, I built a laboratory and learned how to manage and mentor. I realized that one should encourage and welcome the new and exciting ideas and technologies that postdoctoral fellows bring to the laboratory. Lastly, I have participated in rewarding and exciting collaborations. Recently, working with Dr. Lois Smith's laboratory, we found that mice fed a diet high in omega-3 polyunsaturated fatty acids have reduced pathological retinal angiogenesis. Dr. Smith will begin a study in premature babies to see if adding this nutrient decreases the risk of eye damage.

I would consider sharing and discussing your research with mentors and scientists inside and outside NIH a crucial component of a successful scientific career. Positive criticism helps us grow as scientists. It is important to be open to new ideas and suggestions. Asking questions and participating in scientific dialogue has many benefits, which include framing your own future experiments and possibly building lasting and productive collaborations.

Rachel R. Caspi, Ph.D.

Chief, Immunoregulation Section and Deputy Chief,
Laboratory of Immunology,
Division of Intramural Research

EDUCATION

Fogarty Postdoctoral
Fellowship: (Immunology)
NEI, 1984–1986

Ph.D.: (Immunology) Bar
Ilan University, Israel, 1984

B.A.: (Microbiology)
Tel Aviv University

RESEARCH INTERESTS

Autoimmune disease

PIVOTAL EVENTS

As a Postdoctoral Fellow, I discovered in a rat model of uveitis, a potentially blinding disease, that glial Müller cells in the eye regulate activation and function of autoimmune T lymphocytes that cause retinal damage. The mechanism involved down regulation of the high affinity IL-2 receptor, required direct contact, and was not antigen, strain, and even species-restricted, suggesting an evolutionarily conserved role conferring a survival advantage, such as immune privilege. Subsequently similar phenomena were identified for other cells in the eye as well as in other tissues. These findings were published in *Science* magazine in 1987. Another important advance was the development of a mouse model of autoimmune uveitis, which catapulted forward research on basic mechanisms of the disease and is now being used by scientists in this field worldwide.

MENTORING & WORK/LIFE BALANCE

During my postdoctoral and early years as an independent investigator, there was much less awareness of and emphasis on the issue of mentoring than we give it today. Mentoring consisted mainly of interactions about the science being done rather than career development strategies. You had to either sink or swim. As for career and family, I have two grown sons, who were born during my undergraduate and early graduate years. While the timing was a personal decision, I found that it is much easier to miss a lecture when you are not the person giving it. Clearly institutional support for women scientists with family is important, but there is only one formula for success in balancing family and career: strong family support and an equitable division of child care and household duties between the parents.



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INSIGHTS

Success as a scientist starts with choosing a subject that is important, asking central questions, and studying them using state-of-the-art approaches. But this is not enough. For a woman scientist in particular, assertiveness and tenacity make all the difference between failure and success. This applies to family as well as to professional issues. It seems that we, women, are our own worst enemies on the road to success. We are often unassertive, shy away from confrontation, and give in too easily. We expect that if we work hard and sacrifice, it will be seen and rewarded, and we are reluctant to “toot our own horn” and insist on recognition. Unfortunately, life does not work that way. You have to aim high, believe in yourself and persevere, or you will never get there. On the other hand, it is important to know when something is not worth a fight. But when opportunity knocks, you should be willing to step forward, be visible, and take on responsibility. Having good female role models can help, and those of us who have become successful are eager to help those on their way up. But it is you who actually has to climb the ladder and no amount of institutional support, pep talk, and good advice can substitute. You really can have it all, if you are willing to work for it with strength of purpose, integrity, and determination.

Janine Austin Clayton, M.D.

*Deputy Clinical Director (Former);
Deputy Director, Office of Research on Women's
Health, Office of the Director, NIH*

EDUCATION

Fellowship: (Uveitis and Ocular Immunology)
National Eye Institute,
NIH, 1994–1996

Fellowship: (Cornea and External Diseases)
Wilmer Ophthalmological
Institute, The Johns
Hopkins University,
1993–1994

Ophthalmology
Residency: Medical
College of Virginia, 1990–1993

M.D.: Howard University College of Medicine, 1989

B.A.: (Natural Sciences) The Johns Hopkins University, 1984

RESEARCH INTERESTS

Immune-mediated diseases of the cornea and conjunctiva, pediatric uveitis, role of sex and gender in ocular disease



PIVOTAL EVENTS

As I reflected on this question, I realized there is no single pivotal event, but rather a collection of blessings in circumstances, opportunities, networks of support, and role models that allowed me to grow first as a young girl interested in science into a physician scientist who happens to be a woman. Early exposure of students to all aspects of science is critical to initiate an interest and I was fortunate to have had many teachers who fostered that interest along the way, and incredible parents who provided me with love, support, and a firm foundation on which to grow. Being excited about learning was nurtured by family and teachers and I had many science-related educational experiences. I emphasize these early events because I believe they were critical to prepare a foundation sufficient to buoy me through the challenges of the rigorous education required. This foundation was built partly on educational, but also incorporated personal and broad exposure, encouragement, and validation in a wide variety of arenas. It solidified my resolve to become a physician and researcher.

MENTORING & WORK/LIFE BALANCE

One of my mentors, Dr. LaSalle D. Lefall, Jr., is fond of the saying, “equanimity under duress.” As a surgical oncologist and the first African-American president of the American College of Surgeons, he undoubtedly experienced challenges in many arenas. His calm presentation, steadfast commitment to excellence, caring demeanor as a physician, and honorable manner in all aspects impressed upon me the importance of these ideals, first as a human being and second, as a physician. By having Dr. Lefall and others as mentors, I learned first-hand how mentors can have a profound impact by serving as credible role models, recognizing and fostering potential, and through personal validation. Mentors for women don’t necessarily have to be women.

There’s no magic answer to balancing work and family, but it’s so very important to find what works for you. Having the choice is the ultimate commodity; we each carve our own path with the choices we make.

INSIGHTS

Formalized clinical research training facilitated my development as a researcher and having spent time in the laboratory broadened my perspective to encompass a translational approach as a clinician scientist. Fellowship training took more time, but provided invaluable expertise that permitted further career development. Women should not allow their responsibilities to deter them from obtaining the best foundation possible early in career development. Don’t short change yourself! It is important to take advantage of opportunities to broaden your horizons when they present themselves; these experiences open doors and provide valuable skills and networks, which are built upon over time. I found it important to look at challenges in terms of what I could learn from them and as part of the journey rather than obstacles. Your outlook can make all the difference.

Sarah Sohraby, M.D., Ph.D.

Deputy Scientific Director

EDUCATION

Ph.D.: (Physiological Sciences) Free University of Brussels School of Medicine, Belgium, 1988

M.D.: Free University of Brussels School of Medicine, Belgium, 1977

RESEARCH INTERESTS

Ion transport in epithelia

PIVOTAL EVENTS

As a foreign Postdoctoral Fellow at NIH, I was lucky to be introduced to a new field—ion transport in cultured renal cells—and to work with a very open-minded and brilliant lab chief (Dr. M. Burg) and an outstanding principal investigator (Dr. J. Turner). I was allowed to use my imagination while they were building my skills. As a team, we obtained beautiful results on a new ion transport protein called the Epithelial Sodium Channel and published in top scientific journals such as *Nature* and *Science*. This really boosted my confidence. But it was only when I joined Harvard Medical School for a second postdoc that I realized how well I had been prepared to work on my own. Moving from the nurturing environment of NIH to the incredibly competitive Harvard atmosphere could not have been smoother for me. Again, I was lucky to work with another outstanding and brilliant mentor, Dr. B. Brenner, who had the means to let me have a vision.

MENTORING & WORK/LIFE BALANCE

During the eighties, I think mentoring was so good that there was no need for career development strategies. I never heard those words. It was a given that postdoctoral training in a top lab would open all avenues for a successful career. This is the reason I came to the United States in the first place. And lab chiefs were proud to contribute to those successes. As for family decisions, each of us makes personal choices. I chose to raise my four children with the help of an au-pair who lived in my home. Again, the thinking was different a generation ago and we were more into the 'self-help' mode. I never missed a day of work because of a child's issue. The perception that a woman who takes care of a child is not dedicated to her profession may be the most important impediment to a successful career. It is very unfortunate that to this day, a woman who stays at home with a sick child is never viewed as a competitive professional.



INSIGHTS

As in any career, one has to like what they are doing to do it well. Of course, we can joke about the fact that a working woman always has two jobs, but it is a reality, no matter how much help she gets from her partner. Some women are capable of handling huge loads and we should be proud of that. As a professor in Belgium, I chaired a number of faculty committees and always raised awareness of other committee members, mostly men, that the ability of a woman to balance work and family commitments demonstrated particularly strong dedication and extraordinary capabilities. Although I have never expected those I have mentored to follow my path, I have challenged them, men and women alike, to look deeply within themselves, understand and work on their weaknesses, and capitalize on their strengths. And by the way, those children to whom we devote so much time, but still never enough, will be very proud when they boast about our achievements.

Santa J. Tumminia, Ph.D.

Special Assistant to the Director

EDUCATION

Senior Staff Fellowship:
(Mechanisms of
Ocular Diseases)
NEI, NIH, 1991–1998

Postdoctoral Fellowship:
(Biochemistry) Roche Institute of Molecular Biology,
Hoffmann La-Roche,
Nutley, NJ, 1987–1991

Ph.D.: (Biology) Rensselaer Polytechnic Institute,
Troy, New York, 1987

M.S.: (Biology) Rensselaer Polytechnic Institute,
Troy, New York, 1984

B.S.: (Biology) St. Joseph's College, Brooklyn, New York, 1982

RESEARCH INTERESTS

My research over the years has included studies of biochemical and structural differences of the major protein components of normal skeletal muscle and muscle obtained from patients diagnosed with neuromuscular disease; protein-nucleic acid interactions, specifically the relationship between ribosomal proteins and RNA; and the mechanisms involved in the disease processes of cataractogenesis and glaucoma. As Special Assistant to the Director of NEI, I undertake special assignments on behalf of the Director, involving program planning, science



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policy, intramural and extramural assignments, and special initiatives necessary to accomplish the mission of NEI.

PIVOTAL EVENTS

Although I had always wanted to be a scientist, I had the opportunity to see first-hand what that entailed while in college. As a student researcher at the Oak Ridge National Laboratory, I learned how to formulate a hypothesis, design and implement experiments, and critically analyze data. When I finished the 10-week program, I knew that science was the path my career should take.

A second pivotal event was the transition from bench scientist to science administrator. With the birth of my daughter, I found that I needed to rethink my career. At the Foundation Fighting Blindness (FFB), I learned the “business end” of a grants program. I served as a spokesperson for a variety of media sources, e.g., taped/live radio and national/local newspapers and presented public testimony at congressional briefings. I participated in partnerships with pharmaceutical/biotechnological corporations. I found that science administration could be as satisfying and challenging as bench science.

MENTORING & WORK/LIFE BALANCE

During my research endeavors, I’ve had the opportunity to supervise and mentor the work of technicians, postdoctoral fellows, graduate students, and undergraduates. It has been a rich experience for me. I found that getting to know each mentored individual not only as a scientist, but as a person, greatly assisted in making the learning experience more satisfying and rewarding for both of us.

Balancing a personal life with professional responsibilities can be a challenge. My biggest challenge occurred when my husband and I were ready to start a family. The entire pregnancy was fraught with difficulties and my daughter was born 3 months premature. After her birth and during her first year, we struggled with her many health issues. At the same time, I juggled a full-time job—planning and carrying out experiments, and writing publications. My NEI supervisor was exceptionally supportive and worked closely with me during this time.

INSIGHTS

As a Science Executive with 20 years’ experience in research and administration in government, nonprofit, and corporate environments, I have learned that science can take you in many different directions and they can all be equally rewarding. From research on protein-nucleic acid interactions to studying the mechanisms involved in cataract formation to managing a grants portfolio as the Director of Grants and Awards for a nonprofit foundation, it has all been a wonderful learning experience. Not only for the contributions made to research or the collaborations made with other scientists and funding institutions, but for the relationships forged along the way.

These experiences enabled my return to the NEI to serve as Special Assistant to the Director. In this capacity, I stay abreast of current developments and advances in vision research, and maintain an awareness of national efforts in NEI program areas by attending and representing the NEI Director at professional society meetings, national/international workshops, conferences, and symposia. I develop concept plans for future NEI research, programmatic, or policy initiatives. I participate in the identification of emerging scientific developments, which are of interest to the NEI and recommend program plans and strategies for dissemination of information. I develop and implement new policies, procedures, and science initiatives to meet the goals set by the Director. An example of this is the National Ophthalmic Disease Genotyping (eyeGENE™) Network, which involves a partnership of extramural laboratories and eye healthcare providers across the vision community.

My one observation throughout this journey has been that every experience is a learning opportunity. Yes, even those that don’t turn out exactly as you planned. Take advantage of every opportunity to interact with others. Serve on committees, work on special projects, and network, network, network. There is a huge resource of help and information out there, if you’re just willing to reach out and look for it.

S. Patricia Becerra, Ph.D.

Senior Investigator and Chief, Protein Structure and Function Section, Laboratory of Retinal Cell and Molecular Biology, Division of Intramural Research

EDUCATION

Ph.D.: (Biochemistry) University of Navarra, Pamplona, Spain, 1979

B.Sc.: (Chemistry, Biology) University Cayetano Heredia, Lima, Peru, 1976

RESEARCH INTERESTS

Structure-function relationships of proteins with current emphasis in the biochemistry and molecular biology of proteins affecting the retina

PIVOTAL EVENTS

My mentors played an important role in inspiring my career. Most of them were women with strong careers, enthusiasm for science, and a good sense of balance between work and family life. However, my husband’s encouragement and support was decisive in my continued dedication to science. A first paper



accepted without revisions, a patent issued by the U.S. government, tenure given by the NIH, and the success of postdocs, all have contributed to my continued service to science. The Tenure-track Program at the NIH has had a positive effect on my profession.

MENTORING & WORK/LIFE BALANCE

Our laboratory seeks to achieve its research goal through cutting-edge basic research and training of junior scientists in aspects of RPE/retina related science that are critical to the mission of NEI. The training of scientists is one of the most important activities and a privilege in my scientific life. The responsibility of being a role model for trainees has motivated me to seek a sound preparation for this task, be available, receptive and sensitive to mentees. Our research group has had postdoctoral fellows that share enthusiasm for science, appreciate cultural and individual differences, and enjoy networking and building a scientific and social community.

During my postdoctoral years, I was exposed to outstanding women scientists. One of them gave me advice at a crucial time in my career: family and science are to be the main priorities in your life, she said, while another emphasized the importance of establishing family as early as possible. Sharing science with my family is part of my life, as much as sharing my family with those in the lab. The availability of reliable childcare providers and schools along with good health, reasonable salaries, and understanding supervisors have been essential to maintaining a balance between my family and professional responsibilities.

Emily Y. Chew, M.D.

*Deputy Clinical Director; Deputy Director,
Division of Epidemiology and Clinical Applications*

EDUCATION

Fellowship: (Medical Retina and Genetics) University of Nijmegen, Holland

Fellowship: (Medical Retina) Wilmer Eye Institute, The Johns Hopkins University

Residency: (Ophthalmology) University of Toronto, 1981

M.D.: School of Medicine at the University of Toronto, 1977



Undergraduate: (Science) University of British Columbia, (Arts & Sciences) University of Toronto

Six-year combined undergraduate and medical school program

RESEARCH INTERESTS

My main areas of research are clinical studies, both epidemiologic and controlled clinical trials for retinal diseases, age-related macular degeneration (AMD), and diabetic retinopathy, two leading causes of blindness in the United States. We collaborate with both intramural and extramural investigators on large multicenter trials. We also participate in translation research with our colleagues in basic science labs using animal models and others to evaluate hypotheses generated from epidemiologic data. We are particularly interested in the genetic studies of these retinal diseases.

PIVOTAL EVENTS

During my training as an ophthalmologist, I was inspired by a mentor who conducted research in retinoblastoma. She emphasized the importance of research in moving forward in helping our patients. This was further emphasized while I was at the Wilmer Eye Institute, Johns Hopkins University, as a fellow working in the field of medical retina. This was a center that initiated a number of clinical studies, especially in the field of AMD and diabetic retinopathy.

MENTORING & WORK/LIFE BALANCE

I am particularly proud to be a director of the Medical Retina Fellowship program at NEI and a mentor to medical students from the Clinical Research Training Program (CRTP) and the Howard Hughes Scholars at NIH. They become a vital part of my group as they bring in new perspective and enthusiasm. They have taught me a great deal and we have enjoyed watching them grow in their academic and personal lives. I have been very fortunate to have supportive and talented colleagues and we work as a team on our research and our training programs.

The most difficult part of my life is balancing the work, the mentoring, and research with the family. I am very fortunate to have a very supportive husband and three daughters. We have learned the importance of patience, flexibility, and the ability to enjoy every part of life.

NEI

Mary Frances Cotch, Ph.D.

Chief, Epidemiology Branch, Division of Epidemiology and Clinical Applications

EDUCATION

Ph.D.: (Epidemiology) The Johns Hopkins University, 1988

B.A.: (Mathematics) University at Albany, State University of New York, 1983

RESEARCH INTERESTS

Epidemiology, understanding clinical and genetic aspects of disease within and across diverse populations, public health

**PIVOTAL EVENTS**

At the start of my professional career, I had the opportunity to work on AIDS surveillance efforts in the District of Columbia. It was early in the HIV epidemic, and this experience gave me a fundamental understanding of the various aspects of doing fieldwork in an inner-city setting under difficult conditions. It also made me realize how important empathy is in collecting detailed information from individuals within an ethnically and economically diverse community and gave me an appreciation for important human facets to consider in the design and implementation of preventive and therapeutic intervention programs.

MENTORING & WORK/LIFE BALANCE

While I was her student, my doctoral mentor had two children and still managed to advance from Assistant Professor to Full Professor. I learned from her the importance of organization, prioritization, and focus, and the need to select carefully among opportunities and to decline the rest. This approach worked for her, and I think it's worked for me. I was fortunate to have the opportunity to establish my research career before having a family, and although the balancing of family with professional responsibilities is a constant challenge, it helps to plan ahead and have flexible scheduling, good child care, an understanding and supportive family, and a sense of humor.

Chyren Hunter, Ph.D.

Program Manager, Retinal Neuroscience, Division of Extramural Research (Former); Deputy Director, Division of Extramural Activities and Training Officer, Extramural Research Programs, National Institute on Aging

EDUCATION

Ph.D.: (Biomedical Sciences, Neurobiology) Mount Sinai School of Medicine, City University of New York, 1988

B.A.: (Bio-Psychology) Wesleyan University, 1978

RESEARCH INTERESTS

Information processing and neural computation in sensory systems

**PIVOTAL EVENTS**

I have been blessed with caring family, mentors, and friends. Their support and guidance sustains me in my pursuit of new opportunities and challenges in my professional career. A pivotal event that affirmed my decision and desire to pursue a career in research occurred during my first postdoctoral position. This position was in a laboratory at the forefront of research on neurotransmitters in sensory systems. It was very gratifying to be fully engaged in this research and have my results selected for a platform session at an important international meeting. Adding new, significant knowledge to a field of research was a thrill; of personal significance is its reinforcement of my own internal barometer for success based on focused effort and hard work. This and other events helped confirm my interest in science and helped prepare me for my current position.

MENTORING & WORK/LIFE BALANCE

My responsibilities during my tenure at the National Eye Institute and currently at the National Institute on Aging include helping new investigators acquire research funding. In addition to basic information on grant deadlines and opportunities, the new investigator often also seeks advice on navigating professional and personal challenges to their career success. This has required me to take on mentoring and advisory roles. Although time-consuming and demanding, it is gratifying to follow the career of an investigator, seeing their scientific accomplishments and accolades accumulate. In my own experience, my professional responsibilities are both a joy and a burden when it comes to balancing family and career. The myriad duties and tasks I am responsible for are both a joy and a refuge, where I am capable and confident. Time spent in my

professional career also means less time spent accompanying a parent to appointments and insuring that the family unit is running smoothly and is happy and fulfilled. My siblings and extended family represent an essential support system in navigating my professional and familial responsibilities.

Maryann Redford, D.D.S.

*Program Director, Collaborative Clinical Research,
Division of Extramural Research*

EDUCATION

Postdoctoral Fellowship:
(Clinical Trials) The Johns
Hopkins University School of
Hygiene and Public Health,
1998–1999

M.P.H.: (Epidemiology)
Uniformed Services University
of the Health Sciences, 1990

D.D.S.:
Georgetown University, 1983

B.S.: (Biology) Adelphi University, 1979

RESEARCH INTERESTS

Clinical research; multicenter clinical trials

PIVOTAL EVENTS

Several years after graduating from dental school, I was a practicing dentist and in the process of exploring the market to buy my own dental practice. In the course of that effort, I came to realize that, despite enjoying the interaction with patients, the day-to-day practice of clinical dentistry wasn't satisfying my intellectual curiosity. In reaching out for guidance, I was fortunate to be introduced to a network of dynamic female health professionals who had built upon their clinical training to pursue careers in public health and research. Their enthusiasm for research careers was contagious and inspiring. Although not completely sure of where an additional degree would take me, I followed the lead of these women and went back to school and earned a Masters in Public Health (M.P.H.).

One of the women I was lucky enough to be referred to was another dentist at NIH, Dushanka Kleinman. When we first met, Dushanka was a Program Director at the National Institute of Dental Research, but over the years, she assumed many leadership positions within the Institute and the U.S. Public Health Service. Dushanka encouraged me to earn the M.P.H. and guided me to my first position at NIH. She has continued to provide friendship and mentoring throughout my career and remains a valued friend and colleague.



NIH has provided a stimulating and nurturing environment for professional growth and development. Another pivotal opportunity occurred when I was provided support by NIH to complete a postdoctoral fellowship at the Johns Hopkins Center for Clinical Trials. I was truly fortunate to work closely with the founding father of the Center and a pioneer in clinical trials research, Curtis Meinert. Curt took me under his wing, oversaw my training, and mentored me in the art and science of multicenter clinical trials. This unique training experience enhanced my clinical research skills and launched me on an exciting and truly satisfying career track.

MENTORING & WORK/LIFE BALANCE

It was a phone call to a complete stranger that started me on my sojourn as an NIH scientist. I appreciate the many people who have positively influenced my career path and try to be mindful that I too may be serving as a role model. I also make it a practice to talk to children about what they want to be when they grow up—especially girls—hoping to elicit some interest in science and medicine, but also to encourage them to believe that they can successfully pursue any profession they choose.

My work with multicenter clinical trials involves considerable travel often impacting my weekends and occasional holidays. While this travel schedule takes away from family and personal time, the satisfaction I receive from working with these talented and dedicated study groups inspires me and more than makes up for the personal hardship.

National Heart, Lung, and Blood Institute

NHLBI

Elizabeth G. Nabel, M.D.

Director

EDUCATION

Postdoctoral Basic and Clinical Fellowship: (Cardiology) Brigham and Women's Hospital, Harvard Medical School, Boston, 1987

Postdoctoral Fellowship: (Hypertension) Brigham and Women's Hospital, Harvard Medical School, 1984

M.D.: Cornell University Medical College, 1981

B.A.: (Psychology) St. Olaf College, 1974

RESEARCH INTERESTS

For several decades, my research has focused on basic mechanisms of vascular diseases and on clinical research in the molecular and genetic targeting of treatments to blood vessel diseases. I have explored mechanisms of growth regulation of vascular smooth muscle cells by cell cycle proteins, and I have delineated the mechanisms that regulate the vascular proliferation and remodeling that lead to blood vessel blockages. Currently, my research focuses on the role of genetic factors in blood vessel diseases, including atherosclerosis and Hutchinson Gilford Progeria Syndrome, a rare, premature-aging syndrome.

PIVOTAL EVENTS

One important lesson that I have learned is to pay attention to patients' signs and symptoms, reflect upon them, and try to understand aspects that "don't make sense" through basic or clinical research. An example occurred during my early days as an Interventional Cardiologist at the University of Michigan when I took care of many patients with coronary blockages who required angioplasty. The high rates of coronary restenosis were not amenable to repeat device procedures, and I became intrigued by the biology of abnormal vascular remodeling, or coronary restenosis, that lead to their recurrent symptoms. These clinical insights have informed my basic and clinical research for the past 20 years.

MENTORING & WORK/LIFE BALANCE

Balancing a career with family responsibilities is a challenge for women and men in all professions. My generation of women has gone through a transition when women typically pursued



their careers at home (my mother’s generation) to an expectation that women will lead fully balanced lives, integrating professional aspirations and family commitments (my daughters’ generation). My advice to my daughters is to find your passion and then pursue it “with all you’ve got”—don’t be afraid to live your dreams. You will find a way to balance your love of your career and your love of your family.

INSIGHTS

My second piece of advice is to find what you love to do, and then live it each and every day. It is about following your heart. I was lucky. I found my passion relatively early in life. I was always drawn to scientific research through my father, who was a chemist, but I also yearned for a human connection. I didn’t decide to pursue medicine until late in college, which required me to take premedical courses as a postbaccalaureate. This was unusual at the time, especially for a woman, but fortunately is much more common now. I was drawn to cardiology during my fourth year of medical school, and my love for medicine was further solidified that year as I spent 6 months with the Flying Doctors Service in East Africa. My career has taken twists and turns. We all face bumps in the road as well as major hurdles. But what has sustained me is my passion for medicine, patient care, and science. So my message to you is to find what you love to do in medicine and then don’t lose faith. Passion in your life’s work will sustain you through the good times and the bad times. Your work is going to fill a large part of your life, and the only way to be truly satisfied is to do what you believe is great work. And the only way to do great work is to do what you love to do.

Susan Blakely Shurin, M.D.

Deputy Director

EDUCATION

Postdoctoral Fellowship: (Pediatric Hematology-Oncology) Children’s Hospital Medical Center, Boston, 1974–1977

Residency: (Pediatrics) Johns Hopkins Hospital, 1971–1972; Boston City Hospital, 1972–1974

M.D.: The Johns Hopkins University School of Medicine, 1971

B.A.: (Biology) Harvard-Radcliffe, 1965



RESEARCH INTERESTS

Laboratory: Neutrophil physiology

Clinical: sickle cell disease, hemophilia, pediatric oncology, bioethics

PIVOTAL EVENTS

I had spectacular and inspired mentors in my family and among my teachers as a high school student, college undergraduate, and medical student. All encouraged me to do as much as I wanted, and to pursue a scientific and research career. As a fellow, I had a mentor who deliberately ensured that I learned useful political and management skills, and that I appreciated the importance of collaboration, networking, and building and repairing relationships (skills that are often neglected in the mentoring of young scientists).

MENTORING & WORK/LIFE BALANCE

My older son was born when I was a fourth-year medical student and my younger was born when I was chief resident in pediatrics. My entire professional career has been spent meeting both sets of responsibilities.

I have been an active and involved teacher since I was an intern in pediatrics. I was a director of a training program and clinical division for 17 years, responsible for training medical students, house officers, and fellows, as well as for nurturing the careers of junior faculty. Four of my students and trainees are now on the faculty at Case Western Reserve University; 4 of my Ph.D. and M.D./Ph.D. students are on the faculty at other universities; and 12 of my trainees (residents and students) are on the faculty at several hospitals and universities. In my present position, I mentor professional staff and trainees at the NHLBI.

INSIGHTS

My grandmother’s sister was the second woman to graduate from Washington University Medical School (in 1922), and my grandfather was a pediatrician. Both assumed that a woman had to choose between a family and a career. Graduating from college, I was terrified that I would be bored or be stuck doing work that wasn’t meaningful. I entered a medical school class that included 15 women out of 77 students. The prevailing attitude—even at Johns Hopkins, which was unusual in being willing to accept women—was that a woman (especially a married woman) was taking the place of a man, and did not really belong in medical school. I was determined not to have to choose between having a family and a career. I was fortunate not to require much sleep, and have never regretted my choices. What I have loved the most is the sense that in science and in medicine, there really are no upper limits—one never knows or masters everything, and there is always more to do.

As my career developed, I found that I needed new challenges to keep growing. It was challenging to find “next steps” that met

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my needs and that were as meaningful as teaching, doing research, and taking care of patients. I have found my later career choices to be even more personal than my earlier ones, because they have required that I know more about myself than I knew when I entered the profession. My colleagues have had more varied success at making later career shifts than they have had with their more uniformly successful primary career choices.

Perhaps most important has been learning to recognize “success.” Early on, others define success for you. As you mature, you really have to define it for yourself. I spent a lot of time trying not to look inward, because I felt that “it wasn’t about me.” I now recognize more vividly that an effective servant-leader must have insight and self-awareness that is an expansive, rather than an introspective, process. It is exciting to know that one can continue to grow life-long.

Cecilia Wen-Ya Lo, Ph.D.

Chief, Laboratory of Developmental Biology and Director, Genetics and Developmental Biology Center, Division of Intramural Research

EDUCATION

Postdoctoral Fellowship:
Harvard Medical School,
1980

Ph.D.: (Cell and
Developmental Biology)
Rockefeller University, 1979

B.S.: (Biology)
Massachusetts Institute of
Technology, 1974

RESEARCH INTERESTS

The main research focus of my laboratory is on elucidating the genetic basis for human congenital heart disease. We use mouse models together with genetic, cell, and molecular, and imaging tools to unravel the developmental mechanisms that regulate and pattern cardiovascular development. Findings from our mouse models have provided the basis for several ongoing translational projects on children with complex congenital heart disease. The long-term goal of these studies is to help improve the standard of care and the prognosis for children with congenital heart disease.

**PIVOTAL EVENTS**

I had two teachers who really stimulated my interest in science and taught me how to think—a science teacher in 7th grade (Mr. Inguini in IS161), and an advanced placement (AP) biology teacher in 12th grade (Mrs. Shapiro at Bronx High School of Science). They both challenged me with questions for which there are not necessarily any answers and showed me how to think for myself. They showed me the scientific process at its best. They gave me the joy of learning, which to me is what a career in scientific research is all about.

MENTORING & WORK/LIFE BALANCE

Unfortunately, at my previous institution (University of Pennsylvania), there were no female role models. I was one of three female professors in the Biology Department, which comprised 28 faculty, and neither of the other two women had children. Perhaps because of this, I did not have children until long after I was tenured, a decision I regret now. However, at the time, I did not think having a family was an option given my dedication to my career. I felt it would have been unfair to have children because I thought I would not have sufficient time to devote to raising them. Knowing what I know now, I would have done some things much differently.

INSIGHTS

Being a woman in science is not easy, and in reality, being a scientist, male or female, is not easy. However, I do think women often carry more than half the load, if nothing else, at least during the 9 months of pregnancy! I think there is something to the old saying that if there is a will, there is a way. Clearly, many women have been able to balance having a family with a very successful career. Our Institute director, Dr. Nabel, is a great example! From my own personal experience, nothing can compare with having a child to love and watching him or her grow, and when you have one (or more), somehow you make it work. The key to success is being highly organized, both at home and at work, and having a network of support, either by way of school, spouse, family, friends, nannies, and/or babysitters. I think young women today need to know that it is possible to balance the demands of a successful career in science with those of a family—it just takes careful planning and purposeful action. The good news is that now there is much more public awareness and support for women who are balancing family life with a career. I have never regretted having my son, only regretted that I did not have him much earlier.

Helena O. Mishoe, Ph.D.

Rear Admiral, U.S. Public Health Service; Associate Director for Minority Health Affairs and Director, Office of Research Training and Minority Health

EDUCATION

M.P.H.: (Health Services Administration) Uniformed Services University School of Medicine, 2002

Postdoctoral Fellowship: NICDR, Laboratory of Oral Medicine, 1987–1988

Postdoctoral Fellowship: NIDDK, Laboratory of Chemical Biology, 1984–1987

Postdoctoral Fellowship: NIAID, Laboratory of Biology of Viruses, 1981–1984

Ph.D.: (Microbiology) Georgetown University, School of Medicine, 1981

B.S.: (Biology) Delaware State University, 1974



RESEARCH INTERESTS

My expertise is in molecular biology and gene expression in DNA tumor viruses, hemoglobinopathies, and diabetes. As a program director, my portfolio included stem cell biology and transplantation, and blood cell development. Of particular note, I developed an initiative entitled, “Stem Cell Transplantation to Establish Allochimerism” that was among the first efforts to focus on a nonmyeloablative approach to significantly reduce the morbidity and mortality associated with transplantation and provide a potentially curative therapeutic option previously unavailable to the hemoglobinopathy patient population.

PIVOTAL EVENTS

The most pivotal event that affected my success as a scientist was my commissioning into the United States Public Health Service (USPHS). The USPHS’ day-to-day oversight and management is the responsibility of the U.S. Surgeon General. Our service is composed of 11 public health professional disciplines with the common mission of protecting the health and safety of the Nation. As a Scientist Officer, I have had the opportunity to work with scientists across the Nation and abroad in both agencies within and outside of the Department of Health and Human Services. This extraordinary exposure to other scientific disciplines with various perspectives in approaching sci-

entific problems has been invaluable. In 2005, I was appointed by the Surgeon General to serve as Chief Scientist Officer. This opportunity has provided even greater exposure to view public health across the 11 professional disciplines. I was recently promoted to the rank of Assistant Surgeon General. The Public Health Service has provided me with a phenomenal skill set that has been central to my success as a scientist.

MENTORING & WORK/LIFE BALANCE

In contrast to the laboratory setting, the extramural program provides mentoring opportunities at various general schedule (GS) levels. Mentoring is very important because it allows me to listen, as well as share personal challenges, with the hope of helping others. Currently, I work most closely with students whose career goal is either graduate or medical school. In addition, I spend time sharing my experiences with mid- and senior-level individuals in the workplace. I also utilize mentors for guidance as well as share my failures and successes.

Regarding appropriate balance between professional responsibilities and family, I remained continuously challenged by this important need. With previous responsibilities to elderly parents that both suffered from stroke and related complications, to my own immediate family, and meeting professional responsibilities, I have sometimes felt that excellence in all areas is difficult to achieve. We must learn to take better care of ourselves so that we are able to serve others in their time of need.

INSIGHTS

I challenge myself daily to model the following values: leadership, integrity, excellence, and service. Illustrative of leadership and service, the following quote has become my motto,

“Because of my title, I was the first one to enter here. I shall be the last to go out.”—*Duchesse d’Alencon, refusing help during a fire at a Paris charity bazaar in 1897.*

Regarding excellence, I routinely share the following with my students, other mentees, as well as a personal reminder, “It is better to be prepared and not have an opportunity than to have an opportunity and not be prepared.” In addition, I encourage taking on new challenges, always be willing to volunteer, writing down your goals, and keeping track of your successes. Let each of us prepare to lend the next generation our hopes and dreams as others have so generously given to us.

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Martha Vaughan, M.D.

Chief, Section on Metabolic Regulation, Translational Medicine Branch, Division of Intramural Research

EDUCATION

Research Fellow:
Laboratory of Cellular
Physiology, National Heart
Institute, 1952–1954

Research Fellow:
Department of Research
Medicine, University of
Pennsylvania, 1951–1952

Intern: Medical Service,
New Haven Hospital,
1950–1951

Research Fellow:
Department of Physiological Chemistry, Yale University, 1949

M.D.: Yale University School of Medicine, 1949

Ph.B.: University of Chicago, 1944

RESEARCH INTERESTS

Current research on signal transduction and ADP-ribosylation factors emerged more than 15 years ago from our earlier studies of mechanisms of action of hormones that involve GTP-binding regulatory proteins and of cholera toxin, which mimics certain effects of those hormones. After we showed that the toxin is an ADP-ribosyltransferase, others using the toxin enzyme as an experimental tool found that it was activated by a 20-kDa GTP-binding protein, which they named ADP-ribosylation factor, or ARF. To define the mechanism of its action on cholera toxin, we purified ARF—in fact two different ARFs—from bovine brain, cloned multiple ARFs from diverse organisms, and investigated gene structures to define three classes of human ARFs. This classification continues to provide a useful framework for relating and comparing the ubiquitous ARF molecules, which are so similar in all eukaryotes. When a critical role for two yeast ARFs in protein secretion and vesicular trafficking was reported, we initiated studies to identify guanine nucleotide-exchange proteins (GEPs) that would activate specific human ARFs and thereby regulate their action. We continue to demonstrate novel, often surprising, activities of some of these molecules that contain, in addition to the signature Sec7 domain responsible for GEP activity, several other potentially functional sequences. Thus far, we have characterized only a few of these and related even fewer to the ARF-activating function.

**PIVOTAL EVENTS**

This is impossible for me. I cannot decide at what date to place “success,” or the “event(s).”

MENTORING & WORK/LIFE BALANCE

Throughout my life, at many different times and places, I have enjoyed and benefited from the kindness, assistance, and advice of teachers, colleagues, and friends. I cannot recall, however, any of these related to “balancing family with professional responsibilities.” In the 1950s, it was not a problem that concerned many people. For the extent to which we succeeded in that endeavor, I am grateful to my husband, Jack Orloff, also a physician–scientist, and our three wonderful sons. It would not have been possible, however, had I not learned early in my life how responsible, caring families “work” to be that way.

INSIGHTS

My contributions as a “mentor or model for women who are going into science careers” are probably less than those of more recent medical school graduates, because during the first decades, none of my postdoctoral fellows or other professional colleagues were women. In those years, relatively few M.D.s, men or women, were involved in biomedical research. Then, as before and since, my goal was to help all students, fellows, and other coworkers to learn to make informed, thoughtful, and responsible decisions followed up by effective implementation, whether in the sphere of laboratory investigation, patient care, or personal and family concerns.

Diane E. Bild, M.D.

*Deputy Director,
Division of Prevention and Population Sciences*

EDUCATION

M.P.H.: (Epidemiology)
University of Michigan, 1984

Residency: (Internal
Medicine) Medical College
of Wisconsin, 1983

M.D.: University of Illinois, 1980

B.S.: (Biology)
University of Illinois, 1976

**RESEARCH INTERESTS**

Through my training in Internal Medicine, I became interested in chronic diseases, such as diabetes, hypertension, and heart disease, which affected most of the patients I encountered. More important, I became interested in their prevention, which seemed to be a better way to improve quality of life than

treatment, which is often not completely effective. Through my training in epidemiology, I learned the methods for identifying risk factors for disease and later applied this to diabetes complications and heart disease. As the Project Officer for several large population-based epidemiology studies, I became interested in ethnic differences in cardiovascular disease (CVD) risk, prevention of CVD, and subclinical CVD measurement. One specific area of recent interest has been the identification of early or subclinical CVD through noninvasive testing, using these methods to understand the development of disease, and determining whether such tests have clinical value.

PIVOTAL EVENTS

The first turning point in my career came when I discovered the Public Health Service Epidemiology Training Program Fellowship, a program that encouraged and facilitated physicians to become epidemiologists. At the time, I was looking for a way to apply my internal medicine training to preventive medicine. That opportunity led me into the field of epidemiology and preventive medicine.

The second major turning point came several years later, when I accepted a position in the Division of Epidemiology and Clinical Applications at the National Heart, Lung, and Blood Institute, where I have remained for 18 years (though the Division has changed its name). NHLBI has provided a place for my career to develop both breadth and depth while also allowing balance in my life.

MENTORING & WORK/LIFE BALANCE

The key to balancing family and professional responsibilities is to have a lot of help at home. The flexibility that NIH offered was also very important. I worked part-time for several years to keep my work life and home life in balance. I have been able to meet the school bus, attend daytime school events, and be at home when needed. However, I have not identified any "magic bullet" that makes it all fall into place easily—it is hard work!

Dorothy Berlin Gail, Ph.D.

*Chief, Lung Biology and Disease Branch,
Division of Lung Diseases*

EDUCATION

Ph.D.: (Physiology),
Georgetown University, 1973

M.A.: (Physiology)
Boston University, 1968

B.A.: (Zoology)
Hunter College, 1966

RESEARCH INTERESTS

My laboratory research was in the field of lung cell biology. Specific areas included regulation of the lung surfactant system, non-respiratory, or "metabolic" functions of lung cells, including protein synthesis and metabolism, and the effects of anesthetic agents on lung function. It has been extremely rewarding for me to have had the opportunity to continue to contribute to lung cell biology research as part of my responsibilities in the extramural program phase of my career. These responsibilities now include other areas of lung research as well, including acute lung injury, lung developmental biology, pediatric lung disease, interstitial lung diseases, and pulmonary vascular biology.



PIVOTAL EVENTS

In 1970, my husband and I moved to Washington, DC, so he could fulfill his military obligation. I met with Dr. Estelle Ramey, Professor of Physiology at Georgetown University, to ask about job openings for a laboratory technician. We talked for a while and then she leaned back and looked me over. "You do not want to be a technician," she informed me, "you want to go for your Ph.D." I hesitantly agreed, but told her that I would be in DC for 2 years and could not possibly complete my Ph.D. in time. "Nonsense!!" she said. "Just get started. It will be ok. Trust me. Find an advisor, and get to work!"

And I did. I found an advisor, received my Ph.D., and worked in research and then as a health scientist administrator and Branch Chief at the NHLBI. None of this would have been possible without Dr. Ramey's support and encouragement.

MENTORING & WORK/LIFE BALANCE

Clearly, mentoring is a key factor in building one's career. Everyone needs a mentor, and ideally, more than one, in every career phase. My thesis advisor and his colleague and wife have been my mentors for over 30 years. Their support has been invaluable. I very much enjoy mentoring young people who come to work in the Branch and the Division. Several have gone onto

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become professionals in science or other fields. Changes in the workplace including flextime and telecommuting are helping staff deal with challenges of balancing family. These are great innovations, which I strongly support.

Alice M. Mascette, M.D.

*Chief, Heart Failure & Arrhythmias Branch,
Division of Cardiovascular Diseases*

EDUCATION

Fellowship: (Cardiology) Walter Reed Army Medical Center, 1987

Residency: (Internal Medicine) Walter Reed Army Medical Center, 1983

M.D.: Georgetown University School of Medicine, 1980

B.A.: (Biology and Psychology) Cornell University, 1976

**RESEARCH INTERESTS**

I am a Program Director of the Heart Failure Clinical Research Network, a collaboration of eight regional coordinating centers and a data coordinating center established to promote research in the diagnosis and management of heart failure.

I am also the Chief of the Heart Failure & Arrhythmias Branch, which conducts and manages an integrated basic and clinical research program to study normal cardiac function and pathogenesis to improve diagnosis, treatment, and prevention of heart failure and arrhythmias. In addition, the branch supports research in myocardial protection and resuscitation science.

PIVOTAL EVENTS

I was the first woman selected to the cardiology fellowship program at Walter Reed, and 11 years later, was the first woman to be selected as a teaching chief, directing a fellowship training program, in the Army. Being the first of anything imposes a certain set of performance standards that compel one to do the best job possible. I thoroughly enjoyed the process of clinical teaching and training and find it one of the most rewarding aspects of medicine. The transition to the much broader arena of multicenter clinical trials at the NHLBI translates to a far greater impact on public health and clinical practice.

MENTORING & WORK/LIFE BALANCE

Women still constitute a definite minority of cardiologists and as long as that's the case, I think there will be a chain of mentoring. I was inspired by the female cardiologist (Dr. Esther Ocuin) who helped teach me angiography and angioplasty in

the catheterization laboratory and I helped some young women with their own career choice of cardiology who have gone onto be mentors for yet another generation of women. I was sent a newspaper article recently about a woman I mentored and the women in cardiology she went onto influence. So that's a nice example of a direct lineage of women helping women in their career choice in cardiology.

The field of clinical interventional cardiology is a demanding one in terms of hours, call schedules, emergencies, and the physical demands of working at meticulous procedures while wearing a leaded apron and jacket. For many women, the time spent doing procedures involving radiation makes planning a family complicated. Luckily, the field of cardiology is broad with alternate areas of specialization that can provide a work environment that can be made more family-friendly. The type of work that we do on the extramural side of NHLBI creating and managing new initiatives and clinical trials provides a wonderful opportunity to approximate the type of work week that most people have and allows the opportunity to have a richer family life.

Susan E. Old, Ph.D.

*Acting Deputy Director,
Division of Cardiovascular Diseases*

EDUCATION

Senior Staff Fellow: National Eye Institute, NIH, 1991–1994

Staff Fellow: National Eye Institute, NIH, 1989–1991

Postdoctoral Research Fellow: Division of Pediatric Neurology, Columbia University College of Physicians & Surgeons, 1987–1988

Ph.D.: (Human Genetics) University of Michigan, 1987

B.S.: (Biological Sciences) University of California, Irvine, 1981

**RESEARCH INTERESTS**

I began my research experience as an undergraduate, and continued as a research technician, prior to going to graduate school in human genetics. My hands-on research experiences were in molecular genetics and protein chemistry. Since taking on an extramural scientist position, my areas of scientific interest have expanded to include genetics, genomics, proteomics, bioinformatics, and systems biology.

PIVOTAL EVENTS

Early in my career, I moved from doing bench science to science management and administration. This led to tremendous scientific growth and career opportunities. The chance to shape research direction, enhance the scientific enterprise, and explore creative leadership models provides great personal and career satisfaction. I have found the keys to being successful are mentorship, networking, and team building. Developing viable and positive mentoring relationships is essential. I was fortunate to engage successful individuals in mentoring relationships and I took advantage of the guidance and opportunities they provided. In addition, opportunities to interact with influential and creative people within and across the NIH Institutes/Centers, as well as with leading academic scientists, were instrumental for success. Early in my career, I participated in and led trans-NIH and trans-NHLBI groups (both strategic vision and program management). This facilitated access to innovative thinking and enabled my ability to move new ideas forward.

MENTORING & WORK/LIFE BALANCE

I attribute much of my success to finding and engaging successful individuals in a mentoring relationship. Mentoring takes the time and energy of everyone involved, so having clear goals and expectations is helpful. In turn, I have mentored others to help them reach their career goals. Being able to help others also helps me focus on and grow toward my career goals.

I have been very fortunate to be able to balance family with my professional responsibilities. Having priorities is important, and my family is at the top of my priority list. I have been allowed the flexibility, both at home and at work, to be able to participate fully in my children's activities. I have tried to provide similar flexibility for those who work with me. The ability to be organized and multitask, as well as having people who support you, makes the balancing act possible.

Gail D. Pearson, M.D., Sc.D.

Chief, Heart Development and Structural Diseases Branch, Division of Cardiovascular Diseases

EDUCATION

Fellowship: (Pediatric Cardiology) Children's National Medical Center, 1994–1997

Internship and residency: (Pediatrics) Children's National Medical Center, 1991–1994

M.D.: The Johns Hopkins University School of Medicine, 1991

Sc.D.: (Health Policy and Economics) The Johns Hopkins University School of Hygiene and Public Health, 1990

M.P.A.: (Health Care Management) American University, 1978

B.A.: (Sociology) University of Michigan, 1974

RESEARCH INTERESTS

Pediatric cardiology encompasses many different conditions with varied physiological implications for the affected children. Systematic evidence on which to make treatment decisions has been limited by small numbers of patients and the absence of an infrastructure to support multicenter studies. My principal research activity here at NHLBI has been to establish and participate as a scientific partner in the Pediatric Heart Network, www.PediatricHeartNetwork.org. Since 2001, we have designed and launched four randomized trials and three observational studies. One of the trials, a randomized comparison of two surgical strategies for the first-stage repair of hypoplastic left heart syndrome, is a landmark for the field because of the surgical community's recommendation for and agreement to participate in randomization. Another trial, comparing the effects of losartan vs. atenolol on aortic root growth in individuals with Marfan syndrome, is based on exciting findings in mouse models of Marfan syndrome and offers the unique opportunity to determine whether these findings can be translated to children and young adults.

I am interested in all aspects of pediatric translational and clinical research, and also represent NHLBI in several pediatric scientific and policy activities across NIH, and with outside groups such as the American Heart Association.



NHLBI**PIVOTAL EVENTS**

As a pediatric cardiology fellow, I was often frustrated by the need to base medical decisions on experience and anecdote rather than systematic evidence, and envisioned an academic career that would help change this. My career path diverged, however, when the call came from NHLBI to discuss joining their extramural staff. I recalled the words of a medical school mentor who had encouraged me to consider many career options, so I approached this opportunity with curiosity and an open mind. Joining NHLBI and developing the Pediatric Heart Network, while also continuing to treat children with heart disease, have given me unprecedented opportunities to bring evidence-based medicine to pediatric cardiology. The Network opens many scientific doors and allows me to work with and learn from many talented individuals, and my patients provide an essential perspective that informs the clinical research.

MENTORING & WORK/LIFE BALANCE

I see life as a continuous learning experience, so for me, being mentored is an ongoing process involving multiple relationships over time. I have received superb advice from colleagues and friends and as a result, have learned the value of thinking outside the box and forging novel collaborations. Mentoring others is also an important part of my professional life, and is as valuable to me as the advice I receive from others.

Meeting family and professional obligations requires dexterous juggling and accepting that the occasional ball will fall on your head. Having a wonderful husband who is a full partner in parenting helps enormously, and having shared interests makes family time more cohesive. I have learned to delegate and use electronic resources to improve efficiency at home and at work. Finally, I have been fortunate to work in an environment that supports professional flexibility in the interests of improving science.

Denise G. Simons-Morton, M.D., Ph.D.

*Senior Scientific Advisor,
Division of Prevention and Population Sciences*

EDUCATION

Ph.D.: (Epidemiology,
minor in Biostatistics)
University of Texas School of
Public Health, Houston, 1991

Postdoctoral Fellow: Training
Program in Behavioral Research
(NIH Training Grant), Center for
Health Promotion R&D, Uni-
versity of Texas Health Science
Center, Houston, 1987–1989

M.P.H.: The Johns Hopkins University School of Hygiene
and Public Health, 1982

Resident: (Preventive Medicine) University of Maryland
School of Medicine, 1980–1983

Residency: (Family Practice) University of Maryland,
School of Medicine, 1980–1981

M.D.: University of Maryland School of Medicine,
Baltimore, MD, 1979

B.S.: (Zoology & Psychology) University of Maryland,
College Park, 1973

RESEARCH INTERESTS

I have been a Project Officer and scientific collaborator on numerous clinical trials relevant to prevention of cardiovascular diseases. Topics include effects of dietary interventions on blood cholesterol or blood pressure, effects of treatment strategies for diabetes on cardiovascular disease events, effects of behavioral approaches on healthcare-seeking behaviors, and approaches to improve cardiovascular-related health behaviors. I am an expert in clinical-trial design, including trials using individual-level as well as group-level randomization. My primary research interests are clinical trials testing lifestyle approaches and risk factor treatments for primary prevention of cardiovascular disease.

PIVOTAL EVENTS

My sixth-grade teacher, Mr. Sell, gave me C's because he said I could "do better." This was very motivating—as I really wanted As. I worked harder as a consequence, and continue to work hard until this day. My Ph.D. advisor, Fred Annegers, always paused to think before he answered a student's questions, resulting in very thoughtful answers. This was a good role model, and one I hope one day to emulate. My husband, Bruce Si-



mons-Morton, himself a behavioral scientist, taught me about the complex nature of behaviors as they relate to health. I believe that behaviors strongly affect health; this area is a major focus of my research activities.

MENTORING & WORK/LIFE BALANCE

As a junior faculty member in academia, I had no real mentor. It was difficult to figure out what to do to advance my career. However, when I came to the NHLBI, Jeffrey Cutler became my supervisor and mentor. I learned a great deal from him about the importance of a scientific evidence base for new research and the need to attend to details.

Balancing family with professional responsibilities has been a struggle throughout my two children’s lives, from infancy through teenage years. Being able to equally split household responsibilities was extremely important, as was making it a priority to leave the office at a reasonable hour. Now that my children have left home, I try to balance professional responsibilities with personal growth activities. I believe we need a balanced life for mental and physical health. Achieving this, however, sometimes requires forgoing professional opportunities.

Sonia I. Skarlatos, Ph.D.

Acting Director, Division of Cardiovascular Diseases

EDUCATION

Senior Staff Fellow: (Atherosclerosis) NIH/NHLBI, 1985–1992

Ph.D.: (Physiology) Pennsylvania State University, 1985

M.S.: (Biology) Shippensburg State University, 1982

B.S.: (Biology) Shippensburg State University, 1981



RESEARCH INTERESTS

I became involved in research on lipids and lipoproteins early in my career within the intramural research program at the NHLBI. In 1992, I moved to the NHLBI Extramural Program where I continued my interest in cardiovascular diseases by developing, overseeing, and managing programs in atherosclerosis, peripheral arterial disease, and gene therapy. As the gene therapy coordinator, I ensure proper monitoring and evaluation of ongoing NHLBI gene therapy clinical trials.

PIVOTAL EVENTS

When I moved to the Extramural Program, I had experience in planning experiments, analyzing data, and writing manuscripts, but I had no research administration experience. Thus, my first goal was to obtain fundamental knowledge and perspectives on how to successfully perform my duties as a health scientist administrator (HSA). I successfully competed for a position in the NIH Health Scientist Administrator Program. This 1-year program was essential for my career, because it provided an excellent knowledge of my position and a network of colleagues across the NIH. However, the most pivotal event in my career was to take the initiative to identify and arrange to have an outstanding mentor. From the start, my mentor involved me in promising and high-visibility programs, gave me the opportunity to assume responsibility for these programs, provided access to senior leadership in the Division and the Institute, and provided insight into the dynamics of NIH. With hard work coupled with creative approaches to problems, senior leadership recognized my capabilities. This was the beginning of a very rewarding career as an extramural scientist: from HSA to acting director of an extramural division that supports over \$1.3 billion in grants and contracts.

MENTORING & WORK/LIFE BALANCE

Over the years, I have enjoyed mentoring staff at different levels—from support staff to professional staff. I have engaged staff in helping me with different projects, motivated them to develop their own projects, and encouraged them to be proactive in seeking new responsibilities. As a woman scientist, it was not always easy to balance family and professional responsibilities. I already had a family by the time I went to graduate school, so I learned to manage my time well. The ability to plan ahead and organize my day-to-day activities became very useful when I started as a fellow at the NIH, and later as an HSA. Experiments never start at 9 am or end at 5 pm, nor do the responsibilities of senior-level extramural positions. In addition, keeping physically fit by running three miles each day has given me the stamina to successfully meet professional and family demands.

NHLBI**Gail G. Weinmann, M.D.***Deputy Director, Division of Lung Diseases***EDUCATION**

Pulmonary Research Fellow:
The Johns Hopkins University
School of Hygiene and Public
Health, 1981–1983

Pulmonary Clinical Fellow:
The Johns Hopkins University
Hospital, 1980–1981

Pulmonary Research Fellow:
Cardiovascular Research
Institute, San Francisco, CA, 1979–1980

Resident: (Straight Medicine) University of California
Medical Institution, San Francisco, CA, 1978–1979

Resident: (Straight Medicine)
Georgetown University Hospital, 1976–1978

M.D.: Cornell University Medical College,
New York, New York, 1976

A.B.: (Biology) Barnard College, New York, New York, 1972

**RESEARCH INTERESTS**

My past research, while in academics, included high-frequency ventilation, airway control, and the health effects of ground-level ozone exposure. Initially, after arriving at the NIH, I supervised chronic obstructive pulmonary disease (COPD) and environmental lung diseases research, followed by research across airways diseases, including asthma, COPD, and cystic fibrosis, and now across all lung diseases. The research varies from basic mechanisms to phase III trials evaluating new therapies, and includes training and educational activities.

PIVOTAL EVENTS

Becoming a scientist is a life-long process with many branch points. An important factor was always being in an environment in which research was a top priority. These environments provided support, infrastructure, mentors, and like-minded colleagues, all of which create a rich basis from which to grow.

MENTORING & WORK/LIFE BALANCE

Mentors are extremely important and they are everywhere. One mentor may be for the overall scientific direction, one for hands-on help in the lab, and another for ways to mentor others. A champion is important early in a career as an advocate and guide through the initial steps on the career ladder.

When you love what you do, a balance between family and work comes naturally, but will require decisions, based upon each personal situation and preferences. One family may be content with and able to afford outside child or parent care, and another may not. One family may choose a transcontinental commute, another a transcontinental move. Work and family are always evolving and full of surprises, so an open mind and flexibility are important.

National Human Genome Research Institute

NHGRI

Joan Ellen Bailey-Wilson, Ph.D.

Senior Investigator and Head, Statistical Genetics Section and Co-Chief, Inherited Disease Research Branch, Division of Intramural Research

EDUCATION

Postdoctoral Training: (Statistical Genetics) Louisiana State University Medical Center, 1980–1982

Ph.D.: (Medical Genetics/Biomathematics) Indiana University, 1981

B.A.: (Biology) Western Maryland College, 1975

RESEARCH INTERESTS

Genetic epidemiology of complex diseases; genetic susceptibility to lung cancer, prostate cancer, breast cancer, myopia, and other eye diseases, and cleft lip and palate; gene–environment interactions; development and evaluation of statistical genetics methods

PIVOTAL EVENTS

My parents encouraged my early interests in science and, at a time when it was uncommon, never suggested that a little girl should NOT want a chemistry set and a microscope for Christmas! They sacrificed to get them for me and to help me attain my goals. Having grown up during the Depression, they always said that a good education was the one thing no one could take away from you! Their pride in my every accomplishment and their unflinching belief that I could be a scientist were critical to my success. In college, Dr. Jean Kerschner, a wonderful female geneticist, ignited my interest in genetics. My graduate school mentors, Drs. Joe Christian and John and Judy Gersting, furthered my interests in statistical genetics and computing. Finally, Dr. Robert Elston, my postdoctoral advisor, long-term friend, and colleague increased my statistical knowledge, my ability to think critically, and my mentoring abilities.

MENTORING & WORK/LIFE BALANCE

Mentoring young scientists is something I enjoy immensely! I was so lucky to have wonderful mentors, who guided me in science and in how to balance family and career. My husband (a statistical geneticist and my co-Branch Chief) and I have always considered ourselves colleagues rather than competitors, and we share family responsibilities equally. We owe a lot of that to our mentors, who were all devoted to their families. We learned the team approach from the Gerstings, mathematics/computer scientists at our graduate school who were passionate about their careers, each other, and their two wonderful little boys!



NHGRI

From Robert Elston (with four great kids) I learned to review/write/edit articles while waiting at ballet or soccer practice—so you can be there for your family, and still get your work done efficiently! But most importantly, don't expect your house or life to be perfect, and don't sweat the small stuff!

INSIGHTS

When I was growing up in the 1950s and 1960s, it was unusual for a woman to have a career. A high school guidance counselor advised me that college was a waste of time since I would "just get married and have kids." My response was, "Why can't I do ALL of that?" I have seen science, and our culture, change so that now my daughter (like my son) has never been told she "can't" pursue her career of choice. Most of my colleagues, both male and female, have spouses/partners and children. As current President of the International Genetic Epidemiology Society, collaborator on successful grants, tenured Senior Investigator at the NIH with over 150 publications, and a devoted wife and mother, I hope that young people will see that they can have a good life AND be a good scientist! You CAN do "all of that" and enjoy it!

Elaine A. Ostrander, Ph.D.

Senior Investigator and Head, Comparative Genetics Section and Chief, Cancer Genetics Branch, Division of Intramural Research

EDUCATION

Ph.D.: (Microbiology and Immunology)
Oregon Health Services University, 1987

B.S.: (Medical Technology)
University of Washington, 1981

RESEARCH INTERESTS

My laboratory is broadly interested in the question of mammalian genetic variation and we are using two approaches to explore this topic. Advances from the human genome project have proven critical to our studies of genetic variants that contribute to breast and prostate cancer in high-risk families and individuals from the general population. Our work has led to clearer understanding of the role of the BRCA1 and BRCA2 genes, as well as an understanding of factors that play a role in prostate cancer susceptibility, aggressiveness, or progression.



In a second avenue of work, we have led the field in developing the canine system as a model for understanding the role of genetic variation in disease susceptibility, morphology, and behavior. Toward that end, we have and continue to identify genes contributing to diseases of interest for both humans and companion animals that have proven difficult to study in small, limited, human families. Our most recent work has focused on finding genes that control growth regulation in dog breeds differing in size and shape which, when gone awry, likely play a role in cancer susceptibility and progression.

PIVOTAL EVENTS

While finalizing my Ph.D. thesis, I had succeeded in isolating 1Dg of an extremely valuable DNA sample. As I admired my handiwork, the tube slipped, spilling all over my laboratory bench paper. Hearing my screams, a graduate student from an adjacent lab ran over and announced that we should try to save the sample. In two sleepless days, we reisolated 95 percent of the DNA leading to a published paper aptly titled, "Isolation of Critical DNA Samples from Laboratory Bench Paper" by Ostrander, Maslen, and Hallick.

That single experience bonded us, leading to a 25-year personal and professional relationship that encompasses our experimental quests, manuscript euphoria, grant writing struggles, family life frustrations, and marital puzzles. It does not take an army of cheerleaders to survive as a scientist; it takes just one strong friendship born of common experiences, compassion, shared goals, and reciprocal mentorship. I am forever grateful I found that.

MENTORING & WORK/LIFE BALANCE

While pregnant with my first child, I developed complications. As I lay in the hospital listening to my baby's heartbeat, one of my unbelievably energetic graduate students walked in and announced that since I was hospitalized and away from the phone, it would be a good chance for us to work on a paper together. I was momentarily taken aback, but then decided why not? We got the paper done, the student is now a fellow at Harvard, and I have learned so much from my students about how to just get things done. Each day presents a set of conflicting choices and there is no magic formula for organizing your time. My advice to other women is to never feel guilty, integrate your family into your work life as much as possible, and see each challenge as an opportunity to grow together.

INSIGHTS

I have been very fortunate throughout my career to work with extremely talented people at all levels. These relationships and scientific collaborations have resulted in numerous discoveries that have been published in high-impact journals. These accomplishments have surpassed my wildest imagination, and I owe it to my family and the many scientific collaborators I have been fortunate to work with over the last several years.

Throughout my research career, I've learned three important things. First, your family must always be your first priority. They are the only people who love you unconditionally and without that knowledge, you will ultimately falter. Second, talented and generous collaborators are a rarity and need to be treated as such. And lastly, many of my most significant papers were taken up a notch by the contributions of specialists in statistical genetics, epidemiology, or phylogenetics, and out of those experiences have been born life-long friendships and collaborations.

It is also important to note that the questions you seek to answer at the start of your career may not be the ones that present themselves to you on a silver platter. Flexibility is key. Science is about satisfying curiosities, making novel discoveries, and for a few moments every now and again, being the only person on the planet who knows how something works. Having a job where your goal is to understand how life works is an unbelievable privilege. I want my daughters to know I made a difference in the world, and in doing so, I want to see them shoot for the stars as well.

Jane Louise Peterson, Ph.D.

Program Director, Large-scale Sequencing Program and Associate Director, Division of Extramural Research

EDUCATION

Postdoctorate:
(Molecular Biophysics
and Biochemistry) Yale
University, 1975–1978

Ph.D.: (Molecular, Cellular
and Developmental Biology)
University of Colorado, 1975

B.S.: (Biology)
Western College, 1969

RESEARCH INTERESTS

Genomics: Comparative sequencing, medical sequencing, Human Microbiome Project, The Cancer Genome Atlas, Knockout Mouse Project

PIVOTAL EVENT

My career in genomics has been guided by a series of experiences. I was fortunate that my early interests led to work in laboratories where I studied chromatin. When I made the decision to leave the bench, my first science administration experience at NSF was quite broad and included working with a "Women in Science" program. I then moved to NIGMS to a program focused on chromatin research. When the idea for the



Human Genome Project (HGP) arose at NIH, its initial home was in NIGMS, where I was working in a small DNA sequencing program. As the project evolved, I was fortunate to work on it, resulting in 15 years of one "pivotal" event after another. I owe my success largely to inspiration and guidance from the leaders I have been fortunate to work with: Dr. Watson, Dr. Collins, and the outstanding grantees in genomic sequencing.

MENTORING & WORK/LIFE BALANCE

Mentoring throughout my career has allowed me to help women find their places in science. With each encounter, I learn more about life, science, people, careers, and opportunities. Young women today are savvier about career paths than I was at their ages and I often get more from the interactions than I give! Mentoring is a lot of fun and it gives me tremendous energy for my own work.

In raising two children, I experienced the challenges of balancing my commitment to science and home. It is demanding and requires sacrifices, but is rewarded by the joy of seeing one's children find their own passions. One child shares my love of science (medical student) and the other, who heard "genome politics" at dinner, developed a passion for politics (environmental lobbyist). As is often true, this balancing act could not have happened without the support of my husband and children.

INSIGHTS

The experience of watching the HGP develop from an idea to early implementation and then through a rapid redefinition as the technology and strategy changed, has been the journey of a lifetime. The experience of working on a new, controversial, and high-profile project came with challenges and demanded innovative approaches as compared to more established programs. For example, working on the HGP required that I develop an ability to change directions frequently, take risks, think innovatively about how to get the job done, maximize flexibility within a bureaucracy, and use and extend my scientific background in nontraditional ways. Subsequently, I have had the opportunity to lead several trans-NIH projects that grew out of the HGP. This has given me the opportunity to continue to use these skills in other NIH programs. Learning these lessons and applying them has made for a rewarding, fun, and exciting career. I feel fortunate that now I can share the excitement that I have for genomics with a new generation of students through lectures and personal interactions.

NHGRI

Pamela L. Schwartzberg, M.D., Ph.D.

*Senior Investigator and Head, Cell Signaling Section,
Genetic Disease Research Branch, Division of
Intramural Research*

EDUCATION

Postdoctoral Fellowship:
National Cancer Institute
1993–1997

Internship: (Pediatrics)
Boston Children's
Hospital, 1993

M.D./Ph.D.: (Molecular
Biology) Columbia
University College of Physi-
cians and Surgeons, 1992

B.S.: (Biochemistry)
Princeton University, 1981

**RESEARCH INTERESTS**

Lymphocyte signal transduction, T cell differentiation, immune responses to infectious disease, disease mechanisms in primary immunodeficiencies

PIVOTAL EVENTS

During my training, I have been fortunate to have a series of wonderful mentors, including Stephen Goff, Elizabeth Robertson, and Harold Varmus. Among the most important gifts they gave me in my training was the freedom to pursue my own interests and projects. Even as a technician working for Steve Goff, I was told, "go to the library and figure out what you would like to do." There is a tremendous amount of trust and responsibility that is bestowed upon you when you are given this gift early in your career and ultimately, I think that having that freedom is what allows you to become an independent scientist. To be successful in science, I always think one has to be "bitten by the scientific bug." Being able to take ownership of my work early on certainly had a tremendous influence on my interest and drive in science.

MENTORING & WORK/LIFE BALANCE

I try to instill in my trainees the excitement and wonder of science, and also provide the support and freedom to pursue their own interests. It takes a certain amount of trust, but I think that is important for your trainees and having been given that gift, it is one that I hope to share. I suspect that I will always find balancing family and science a challenge. Science for me can be all-encompassing—I never have enough time to learn all I want. Having said that, I would find balancing near impossible without the strong support of my partner, Alan Kimmel, who is also an investigator at NIH and who has been

a tremendous intellectual and emotional support, in addition to being an incredible father. For me, it has been essential to have strong support systems both at home and from colleagues at work, and I have been fortunate.

INSIGHTS

One of the most important influences on my career has been the decision to join the intramural faculty of the NIH. The interactive environment and collegiality of the intramural program at NIH, combined with its broad depth and diverse range of interests, has provided me with a wealth of scientific interactions, and has greatly contributed to the direction and success of my work. In particular, both the NHGRI and the immunological community on campus have incredible strengths and have provided me with wonderful colleagues and a great intellectual community. NIH is a great place to do science and I feel very fortunate to have the opportunity to work here.

Julia Angela Segre, Ph.D.

*Senior Investigator and Head, Epithelial Biology
Section, Genetics and Molecular Biology Branch,
Division of Intramural Research*

EDUCATION

Postdoctoral Training:
(Molecular Genetics and
Cell Biology) University
of Chicago, 1996–2000

Ph.D.: (Genetics)
MIT, 1996

B.A.: (Mathematics)
Amherst College, 1987

RESEARCH INTERESTS

Gene-environment inter-
actions at the skin surface
that result in dermatologic disorders

**PIVOTAL EVENTS**

Strangely, the event with the most impact on my success as a scientist was the most devastating. I was "scooped" on my Ph.D. thesis research, which means that just as I was finalizing my research discovery, I found that similar experiments were being published by a competing group. Although it was initially painful, I never regretted my hard work and personal dedication, because through this I found the love of scientific inquiry. From that moment on, I have always been sure that my goal as a scientist is to satisfy my own curiosity and not for glory. This freedom has enabled me to confidently strive to answer challenging questions, to follow my own interests, and not worry if the path is unconventional.

MENTORING & WORK/LIFE BALANCE

I've been lucky or perhaps astute enough to only work for and with people whom I respect tremendously, which includes during my Ph.D. and postdoctoral training and in my current position. My grandparents, parents, sisters, and husband have always been my greatest supporters, sharing my respect for intellectual pursuits and providing the environment in which I can "go for it." While on tenure-track, I've had two daughters (now aged 3 and 5) and I've loved being a mom more than I ever imagined. There's no substitute for time spent with my daughters, so I never compromise this. Although it is a constant juggling act, I remain deeply committed to being a scientist, mentor, mentee, wife, daughter, granddaughter, sister and mother.

INSIGHTS

I was a mathematics major in college, and I was the first woman in my department to be awarded summa cum laude on my undergraduate thesis. Although there were very few other women in my math and physics classes, these skills have prevented me from being intimidated by data analysis that requires quantitative or computational skills. I've never believed that "girls can't do math."

I've really valued my friendships with other women scientists who have opened up their lives to me. These friendships have guided and supported me through challenges including job searches, returning to work after childbirth, and the tenure process. The world is changing and senior male colleagues, who have their own daughters trying to combine successful careers and families, have been some of my most unexpected, but strongest, supporters.

Laura Elnitski, Ph.D.

Investigator and Head, Genomic Functional Analysis Section, Genome Technology Branch, Division of Intramural Research

EDUCATION

National Research Service Award (NRSA) Postdoctoral Fellowship: (Comparative Genomics) Pennsylvania State University, 2001–2004

Ph.D.: (Biochemistry and Molecular Biology) Pennsylvania State University, 1998

B.S.: (Molecular and Cellular Biology) Pennsylvania State University, 1991

**RESEARCH INTERESTS**

The major aims of the Genomic Functional Analysis Section are to identify cis- and trans-acting functional elements in vertebrate genomes. Approaches I use to find these elements incorporate computational and experimental components, including whole-genome comparative analyses, machine-learning techniques, and laboratory testing. Major projects in my group aim to (1) identify bidirectional promoters in the human genome and elucidate their involvement in cancer, (2) understand the relationship between sequence-based regulatory features and expression patterns from alternative promoters, and (3) develop high-throughput assays to identify silencer elements throughout the human genome.

PIVOTAL EVENTS

Early in my graduate career, I transferred from an esteemed, scientific training program to a smaller academic department. Although the scope and opportunities differed in my new environment, I found myself surrounded by exuberant scientists, whose mentoring was pivotal toward my scientific development. Over the course of those ensuing years, whole-genome comparative analysis projects were developing in the research community. The experience of participating in those projects meant that I could observe how statisticians, geneticists, and programmers conducted their research. I watched as leaders in the field assembled enormous amounts of data into focused conclusions. I also met colleagues with whom I have forged long-term collaborations. No matter which career stage I was in (including now), I found motivation in the idea of making significant contributions toward the betterment of human health.

MENTORING & WORK/LIFE BALANCE

The best mentoring prepares trainees for success on their own. When I mentor people, I strive to make them aware of the expectations of the research community: strong basic skills, a professional network, and the ability to recognize opportunities. Most importantly, I encourage people to cultivate independent thoughts and have confidence in their own ideas. Mentors provide the opportunity to excel, yet the motivation necessary for achievement rests within one's self. Patience and perseverance are the best lessons I've learned while pursuing a research career.

Academic research frequently requires exceptional hours to fulfill the obligations of work, sometimes creating a direct conflict with the expectations of the outside world. I find that no magic formula exists for all situations, and the best solution is to determine one's own comfortable balance between work, family, and self. Prioritize projects for work, form a support system to help with children, and seek advice when needed.

NHGRI

Bettie J. Graham, Ph.D.

*Associate Director and Program Director,
Division of Extramural Research*

EDUCATION

Grants Associate Program:
NIH, 1978–1979

Staff Fellow:
(DNA Viruses) National Cancer
Institute, 1974–1978

Postdoctoral Fellowship: (RNA
Tumor Viruses) Albert Einstein
College of Medicine, 1971–1974

Ph.D.: (Virology)
Baylor College of Medicine, 1971

B.S.: (Biology/Chemistry) Texas Southern University, 1962

**RESEARCH INTERESTS**

Genomics, technology development for genomic sciences, and training and career development.

PIVOTAL EVENTS

I was very fortunate to have parents who valued education and supported my thirst for knowledge. In my early years, I had outstanding and committed teachers who instilled the importance of learning the basics, demanded excellence, and provided extracurricular activities in mathematics and the sciences. My first introduction to research was as an undergraduate, and while I did not participate in my advisor's research project, I was exposed to the research environment. I received my first introduction to research at Baylor, where I received my doctoral degree. The quality of the faculty and the range of research topics provided me with a rich introduction to virology. My mentor was very involved in ensuring that my academic and career development goals equaled or exceeded my expectations. Throughout my career, all my mentors have been outstanding, supportive, and committed to my success as a scientist (research and management).

MENTORING & WORK/LIFE BALANCE

Mentoring complements didactic and on-the-job training. It provides direction to one's career. Without mentoring, individuals may find the path that leads to their success uncertain and often with barriers that are difficult to overcome. Mentoring is important at all stages of one's career. In the case of the extramural program, new health scientist administrators who come from academia or industry need an orientation to NIH's extramural programs in order to make their tasks easier. Given my wealth of knowledge and experience about the NIH, I provide such an orientation and am always available to provide advice to new and seasoned health scientist administrators.

Marjan Huizing, Ph.D.

*Associate Investigator and Head, Cell Biology of
Metabolic Disorders Unit, Medical Genetics Branch,
Division of Intramural Research*

EDUCATION

Research Fellow: Medical Genetics
Branch, NHGRI, NIH, 2002–2003

Postdoctoral Visiting Fellow:
Heritable Disorders Branch,
NICHD, NIH, 1998–2002

Ph.D.: (Medical Sciences)
Nijmegen University,
Netherlands, 1998

Teacher's degree: (Science and
Biology) Wageningen University, Netherlands, 1993

Internship: (Molecular Biology) Monash University,
Melbourne, Australia, 1991–1992

M.S.: (Molecular Biology and Biochemistry) Wageningen
University, Netherlands, 1992

B.S.: (Molecular Life Sciences) Wageningen University,
Netherlands, 1990

RESEARCH INTERESTS

Cell biology of human metabolic disorders; the study of patients' cells with rare biochemical diseases to elucidate (unknown) intracellular pathways and processes; special interests include intracellular formation and trafficking of lysosome-related organelles, mitochondrial membrane transport, glycobiology, and sialic acid metabolism.

PIVOTAL EVENTS

As a graduate student, I had the opportunity to perform parts of my research in different laboratories, including at Monash University (Melbourne, Australia), the Max Planck Institute (Göttingen, Germany), University of Bari (Italy), and The Wadsworth Center (Albany, NY, USA). In each of these laboratories, I learned new aspects of approaches to scientific research, experimental design, laboratory etiquette, and interpersonal contacts. In each of these settings, I also had to adjust to living in a different country and speaking a foreign language. These experiences have helped me get a broad view on how things work in scientific research, in collaborations, and in adjusting to different laboratory situations and techniques. These experiences were challenging and adventurous and certainly influenced me to become the person and scientist that I am today.



MENTORING & WORK/LIFE BALANCE

I have had good mentors throughout my career. My mentors were strong role models for me, giving me opportunities to develop further as a scientist. I strive to be an equally good mentor by helping students feel responsible and enthusiastic about their work, integrating them into research projects, providing encouragement and praise, and giving them opportunities to present their work at scientific meetings.

I am driven by enthusiasm for challenges and adventure in my personal life as well. In addition to traveling throughout the world, I also compete internationally in athletic competitions, including speed-skating, rowing, running, cycling, and triathlons. I won the 1999 amateur world championships duathlon, and several U.S. duathlon national championships. The attempt to combine laboratory research, athletic competitions, travel, and social life is a challenge by itself. I believe that enthusiasm and drive for whatever you take on in life are vital factors to succeed.

Laura M. Koehly, Ph.D.

Investigator and Head, Social Network Methods Section, Social and Behavioral Research Branch, Division of Intramural Research

EDUCATION

Ph.D.: (Quantitative Psychology)
University of Illinois at
Urbana-Champaign, 1996

M.S.: (Statistics)
University of Illinois at
Urbana-Champaign, 1995

A.M.: (Quantitative Psychology)
University of Illinois at
Urbana-Champaign, 1994

B.S.: (Psychology, Statistics)
University of California, Davis, 1989



RESEARCH INTERESTS

Social network methods, family systems, hereditary risk dissemination, communal aspects of coping with hereditary risk, network-based interventions

PIVOTAL EVENTS

I attribute my success to the people along my career path who have gone above and beyond to help me grow professionally, and my determination in pursuing my research interests. Early in my career, one of my professors was instrumental in guiding me toward a discipline that excites me still! A chance meeting at

a conference led to a postdoctoral experience that focused my interests on families as they communicate about and cope with hereditary disease. I was persistent in pursuing my research interests, which did not fit within the mainstream of my field. I trusted that the direction of my work would make an important contribution to the field and have important implications in translational work. Since arriving at NHGRI, the community of scientists, their clear investment in my success, and interest and support of my innovative approach to studying families has been a significant contributor to my accomplishments.

MENTORING & WORK/LIFE BALANCE

The mentoring that I received as a young researcher was pivotal in moving me toward my professional goals. One of the most important aspects of my current position is providing similar support and guidance toward the professional development of my postdoctoral fellows, graduate students, and trainees. Sometimes this comes at a cost, as I need to shift my focus away from the work at hand, but the growth and success of my fellows is essential.

Since I do not have children and am not married, the challenge for me is creating a balanced life for myself. Often, I find my research and the demands of my work-related responsibilities take up my evenings and weekends. I need to consciously force myself out of that pattern and create time that is focused on nonwork-related activities. A successful balance between work and play grounds me so that I am a better mentor.

Donna Krasnewich, M.D., Ph.D.

Deputy Clinical Director

EDUCATION

Residency: (Pediatrics) Children's
National Medical Center, 1989

Internship: (Pediatrics)
University of Minnesota, 1987

M.D.:
Wayne State University, 1986

Ph.D.: (Pharmacology)
Wayne State University, 1986

BS: (Cell Biology)
University of Michigan, 1977



RESEARCH INTERESTS

Congenital disorders of glycosylation, metabolic disorders in children

NHGRI

PIVOTAL EVENTS

During pediatric residency, my mentors explained that there is something learned from every clinical situation. Children showed me how to learn, their parents taught me how to listen, and astute clinicians honed my knowledge base and judgment. However, it was one newborn with significant visible differences, born into a family struggling to cope, who helped me recognize that there is more to medicine. Clinical research requires both the ability to analyze data and the recognition that each affected individual makes a contribution to medical knowledge. Treating each subject with respect creates a research environment conducive to a successful project.

MENTORING & WORK/LIFE BALANCE

A supportive personal network is the key to both mentoring and balancing family with professional responsibilities. While maintaining my career, I raised three children, one with significant disabilities, because I had a supportive husband, strong clinical colleagues, and a network of women to discuss work and life strategies. There is no question that we need to support the younger members of our community in their quest to be both happy at home and academically successful. We listen, we advise, we support, and we teach by example. When problems arise, no matter how big or small, we address them with honesty and concrete solutions. Mentoring is much like raising children; doing it successfully requires patience, a sense of humor, and flexibility. The rewards are boundless.

Teri A. Manolio, M.D., Ph.D.

Director, Office of Population Genomics and Senior Advisor to the Director, NHGRI, for Population Genomics, Office of the Director

EDUCATION

Ph.D.: (Human Genetics/Genetic Epidemiology) The Johns Hopkins University School of Hygiene and Public Health, 2001

M.Hlth.Sc.: (Epidemiology) The Johns Hopkins University School of Hygiene and Public Health, 1987

M.D.: University of Maryland at Baltimore, 1980

B.S.: (Biochemistry) University of Maryland at College Park, 1976

**RESEARCH INTERESTS**

Genome-wide association in complex diseases, modification of genetic associations by nongenetic factors, risk factors for subclinical cardiovascular disease, impact of self-defined race/ethnicity and ancestral origin on genetic associations

PIVOTAL EVENTS

Two pivotal events in my NIH career were both fortuitous and providential—becoming the project officer of the Cardiovascular Health Study (CHS) in 1987, and becoming involved in nascent population-based studies of genetic variation in 2003. I inherited the massive effort that became CHS 6 months after joining NHLBI, when the prior project officer unexpectedly stepped down. Though totally unprepared, I was incredibly fortunate to work with and learn from true giants in cardiovascular epidemiology who showed me, step by step, how to develop and lead a successful cohort study. Sixteen years later, experience gained in CHS and similar studies led to the opportunity to work with Francis Collins and colleagues in developing a large-scale prospective study of genes and environment. This eventually produced a well fleshed-out study design, a series of preparatory research projects, and ultimately led to my moving to NHGRI to apply genomic technologies to population studies.

MENTORING & WORK/LIFE BALANCE

I have been most fortunate in the mentors I've had and in the colleagues I've mentored, and found that one of the best ways to facilitate mentoring is to find ways to be useful to your mentor, to unload them of time-consuming tasks, so that they have time to devote to you. I've also been struck by the enormous satisfaction I receive from seeing someone I've mentored develop and grow, even when they've followed my advice.

Balancing family demands has generally been easier for me than for my colleagues, as I do not have children, so I've often had more flexibility in expanding my hours when something particularly exciting was going on. As my parents have aged, however, I've increasingly encountered the need for sudden absences from work and am gratified by the support I receive from my colleagues in my attempts to meet these new obligations.

Colleen M. McBride, Ph.D.

Senior Investigator and Head, Public Health Genomics Section and Chief, Social and Behavioral Research Branch, Division of Intramural Research

EDUCATION

Postdoctoral Training:
(Health Services Research)
Group Health Cooperative, 1992

Ph.D.: (Behavioral Epidemiology)
University of Minnesota,
Minneapolis, 1990

M.A.: (Sociology) University
of Arizona, Tucson, 1982

B.A.: (Sociology) University
of Wisconsin, Madison, 1980



RESEARCH INTERESTS

Developing effective population-based interventions for health behavior change, using genetic risk feedback to motivate behavior change, reducing disparities in health outcomes

PIVOTAL EVENTS

Being awarded my first NIH R01 grant as an independent investigator was a very powerful affirmation that I had support for my ideas from my peers. I worked very hard on the grant, taking over a year to carefully construct my argument and study design, picked a team of great scientists whom I also liked a lot, and gave the effort my full-force focus. The hard work paid off; I got the grant on the first try. It was life-altering in that it had been such a labor of love through which I had followed my own instincts and then it was all punctuated by such a terrific happy ending. This experience infused me with the mix of confidence and fire-in-the-gut motivation that I believe has been critical to my success.

MENTORING & WORK/LIFE BALANCE

I have had the great good fortune to have had several outstanding and tough mentors. That said, mentoring has been and continues to be by far the greatest challenge for me as a scientist. Finding the optimal balance between being critical while nurturing the independent intellectual spirit of a junior scientist is an elusive and continuing challenge. But when I do have a moment of mentoring chemistry between myself and a junior scientist, there is nothing I do that is as satisfying.

I am no expert at balancing personal and professional responsibilities. I try simply to recognize signs that my spirit is flagging and take time to regenerate and restore. Most of that comes from regularly getting away from the work, really away,

off the cell phone, e-mail and blackberry, and turning full attention to the other important areas of life.

Yardena Samuels, Ph.D.

Tenure-Track Investigator and Head, Molecular Cancer Genetics Section, Cancer Genetics Branch, Division of Intramural Research

EDUCATION

Postdoctoral Fellowship: The
Sidney Kimmel Comprehensive
Cancer Center, The Johns Hopkins
University School of Medicine,
2003–2006

Ph.D.: (Molecular Cancer Biology)
Ludwig Institute for Cancer
Research, Imperial College,
London, 2002

M.Sc.: (Immunology and Cancer
Research) Hebrew University of Jerusalem, Hadassah Medical
School, 1997

B.Sc.: (Cancer and Genetics) Newnham College,
Cambridge University, 1993

RESEARCH INTERESTS

Cancer genetics: Identification of genes that are mutated in melanoma and the elucidation of the cellular pathways that these alterations perturb; functional evaluation of mutant PI3K α , which is one of the most highly mutated oncogenes in human cancer

PIVOTAL EVENTS

Ever since I could remember, I was drawn to science, from writing stories at an early age about biological systems to doing mini-chemistry experiments at home. However, I never showed a clear preference for any particular scientific discipline until the day we found out that a member of my family had cancer. From that day, I found myself sitting with my books, studying more biology. During my B.Sc. at Cambridge, I read about Bert Vogelstein's genetic model of colorectal tumorigenesis. Its ingenuity struck me and compelled into this field. Much later, during my postdoc, I was part of a group that discovered and characterized mutations in the PIK3CA gene. This event strengthened my conviction that my scientific path was to pursue cancer genetics as a means of understanding tumorigenesis and thereby combating it. These three events had a reinforcing power that I want to be part of a community of people that contribute to the understanding and treatment of cancer.



NHGRI

MENTORING & WORK/LIFE BALANCE

Balancing my family and my scientific career is not always easy. It requires delicate tweaking to be both the best mother and the best scientist I can be. Balancing the two successfully stems from good fortune and enormous support from my husband, colleagues, and mentors.

I was fortunate to do my postdoctoral training with mentors who had a compassionate attitude with respect to my first pregnancy. My pregnancy couldn't have come at a more exciting and challenging time in my scientific development. I was part of a rather demanding project, the support of my mentors and fellow postdocs were crucial for its successful completion. My second pregnancy came at an equally challenging time, while I was setting up a lab at NHGRI. Once again, with enormous help from supervisors, colleagues, and mentees, the lab operated smoothly during my maternity leave. Having such people around gives one great confidence and a feeling of being very fortunate.

Ellen Sidransky, M.D.

Senior Investigator and Head, Molecular Neurogenetics Section, Medical Genetics Branch, Division of Intramural Research

EDUCATION

NIH Interinstitute Genetics Fellowship, 1989

Residency: (Pediatrics)
Northwestern University, 1984

M.D.: Tulane University
School of Medicine, 1981

B.A.: (Biology)
Brandeis University, 1977

**RESEARCH INTERESTS**

Human genetics, lysosomal storage disorders, Mendelian disorders, Gaucher disease, genetic modifiers

PIVOTAL EVENTS

Balancing different aspects of my research, both at the bench and the bedside, has been most important in my success as a scientist. I am continually amazed by how the patients whom I encounter in the clinic have driven my research directions. For example, the evaluation of a patient with Gaucher disease who had features of parkinsonism subsequently led to my discovery of a link between mutations in the Gaucher gene and Parkinson disease and may contribute to a better understanding of both disorders. Likewise, observations made in the laboratory have resulted in some of my most important clinical insights.

The unexpectedly severe phenotype of a mouse model of Gaucher disease helped me to recognize a similar lethal phenotype in human newborns. The ability to translate findings in both the basic research and clinical arenas has greatly enriched my career, and has helped to keep it interesting and meaningful.

MENTORING & WORK/LIFE BALANCE

During my 19-year career at the NIH, I have raised four children. While at times this has been challenging, exhausting, and even frustrating, I believe that the experience has made me a better scientist, manager, clinician, and person. In many ways, the demands of family seemed to limit my scientific productivity, but, in the long run I believe that the skills, prioritization, and efficiency that I had to develop because of my busy life have ultimately benefited my career. Also caring for a sick parent or child provided me with insights into the frustrations and needs of my patients. The parenting experience has also made me a better mentor, for through the differences in each of my children, I have come to appreciate the different needs, talents, and learning styles of trainees. This has also provided me with a greater understanding of their struggles, accomplishments, and successes.

Yingzi Yang, Ph.D.

Senior Investigator and Head, Developmental Genetics Section, Genetic Disease Research Branch, Division of Intramural Research

EDUCATION

Postdoctoral Fellow:
(Molecular Genetics)
Harvard University, 1996–2000

Ph.D.: (Molecular Biology),
Weill Medical College of
Cornell University, 1996

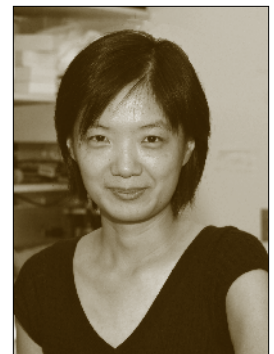
B.S.: (Biophysics)
Fudan University, China, 1988

RESEARCH INTERESTS

Genetics of mammalian embryonic development

PIVOTAL EVENTS

I was brought up in a family that loves science. I like science also because I was good at math and science when I was a kid. I was fortunate enough to get in one of the most prestigious Universities in China, where I received my first rigorous scientific training. My career in biomedical science was greatly influenced by Dr. Lee Niswander, who was my graduate school mentor, and Dr. Andy McMahon, who was my postdoctoral mentor. Both Lee and Andy are the world's most renowned



scientists in the research fields of molecular genetics and developmental biology. They let me understand that to have a successful scientific career, one has to have the true passion for science and be dedicated, persistent, fair, and unbiased.

MENTORING & WORK/LIFE BALANCE

I think mentoring and training the next generation of biomedical scientists is one of my most important responsibilities as a lab head. I hope that trainees in my lab will learn how to think independently, identify the fundamental questions in science, and come up with appropriate and novel approaches to find answers to the questions. I believe my daily interactions with them play a bigger role in influencing their thoughts and attitudes about science and career.

Science is a demanding career. As a woman with a family, I think I am lucky to have a very understanding husband who has been very supportive to my career. I was able to stay at work for long hours and travel several times a year if needed. To spend quality time with my family, I try hard not to bring work home and make the best use of my flexible schedule.