

Frontiers of Discovery

Association for Women in Science at 40

October 20-21, 2011

This was a 2-day conference celebrating 40 years of AWIS. This conference was a collaboration among AWIS-Philadelphia Chapter, AWIS-Central New Jersey Chapter, and the Chemical Heritage Foundation. The conference was held at the Chemical Heritage Foundation. Session summaries appear below.

Workplace Frontiers: The Bench and Beyond

October 20, 2011

Report by Allison Beal, PhD

The 2-day conference honoring the 40th anniversary of AWIS began with a panel that could jumpstart anyone's career. The panel consisted of 4 talented women scientists with a variety of careers as well as a broad range of experiences. **Dr. Mary Domieniecki**, Associate Group Director at National Analysts Worldwide, started the discussion by describing how she got to her current position. Her path went through many stops, including Clinical Publications Lead at AstraZeneca, Medical Director, Senior Medical Writer, and Professor at Slippery Rock University. The next panelist was **Dr. Kristen Kahle**, Research Scientist at Integral Molecular, Inc. She received her PhD in Molecular and Structural Biology at Thomas Jefferson University. While at Jefferson, she became interested in antiviral research, ultimately leading to her current position. Next, **Dr. Jodi Wesemann**, Assistant Director for higher education at the American Chemical Society (ACS), told her story. She started out as a professor at a liberal arts college. She learned of her current position through contacts she made through involvement with the ACS as an academic scientist. The last panelist was **Dr. Julia Heinrich**, who has over 20 years of experience in the pharmaceutical industry. Most of these years were spent as a Principal Research Scientist at Wyeth. She recently transitioned jobs to become a Patent Analyst at Bristol-Myers Squibb.

While their careers are varied, a common thread was woven through all of their experiences: the importance of networking. Each panelist commented in her own way about how she relied on her networks to reach her current position. One example came from Dr. Kahle who emphasized reaching into all corners of one's networks: she found out about her current job from a friend who isn't even in the science field! Another important quality stressed by the panel was self-confidence, and not just for one's research findings. Rather, scientists must realize they have transferable skills that are very marketable. Dr. Heinrich recommended a book called *StrengthsFinder* for anyone looking to uncover his or her own skills.

The panel wrapped up with a question and answer session. The first question, "What challenges did you face as a woman in your career?" led to a discussion of gender differences in society. In current society, gender norms expect and reward assertive men, while assertive women are often perceived to be both unusual and argumentative. On a related note, Dr. Wesemann warned against falling into stereotypes. She recalled falling into one herself when she baked a cake for a TA meeting in grad school. Dr. Domieniecki mentioned a good book that addresses many common pitfalls: *Nice Girls Don't Get the Corner Office*. On a more positive note, the panel also answered the flipside to the original question, namely "What advantages did you find being a woman in science?"

The numerous answers to this question included leadership and mentoring abilities, organizational and multitasking skills, and diversity in thinking and approach. In the session there were two final questions that were intimately related, “How did you find out about your careers and if they were right for you?” and “What did you do to help get the skills you need in your current position?” The answers to these questions echoed the importance of networking and brought up the need to tap into professional organizations. Professional organizations may include more general organizations such as AWIS, or field-specific organizations such as ACS. The panel underscored that one should talk to people doing what they want to do, find out exactly what it is they do, and what skills are necessary to execute the tasks. Also, in addition to networking, there are other skills in one’s “non-science toolbox” that are nonetheless essential for a successful career in science. These skills include perseverance, communication, coordination and planning, people and management skills, and problem solving.

From the seeds of the Q & A session, many fruitful discussions sprang up throughout the night. However, the take home messages from the panel still persisted: network, identify the skills you already have, and have confidence in your abilities.

Frontiers in Medical Discovery Panel Discussion

October 21, 2011

Report by Arati Sadalge Kreibach, PhD

Personalized medicine is being hailed as the new paradigm shift in the delivery of healthcare. The first speaker at the Frontiers in Medical Discovery Panel talked about how this trend towards personalized medicine using targeted therapies may be achieved in cancer treatment. **Dr. Marielena Mata** (Centocor R&D, Inc.) summarized the use of circulating tumor cells (CTC) found in the blood of patients with metastatic breast, colorectal and prostate cancers as biomarkers. Specifically, she described the use of the proprietary (FDA approved) CellSearch System in order to sort, tag and identify these rare cells in blood samples. This assay has prognostic implications for patients with metastatic breast, prostate, and colon cancer. Importantly, it may also be helpful in identifying aberrant intracellular signaling pathways, which are targets of novel cancer drugs. The potential of the CellSearch system is to allow assessment of the efficacy of new therapies sooner, in an easier and less invasive manner than with traditional biopsies. Tailoring specific therapies towards the individual may then become a feasible and cost-effective strategy in cancer treatment.

The second panelist, **Dr. M. Katharine Holloway** (Merck Res Labs) delineated the preclinical process of designing and optimizing new antiviral drugs, using medicinal chemistry and modeling structure-based design. In an engaging presentation, she used the “Rock, Paper, Scissors,” game to explain the role of viral proteases (“scissors”) in protein (“paper”) biochemistry. Using medicinal chemistry and computer aided drug design, Dr. Holloway’s group synthesized novel protease inhibitors (“rocks”) in order to block the action of proteases and create novel antiviral drugs. She detailed the development of early protease inhibitors during the 1980s and how the emergence of these drugs revolutionized the lives of those infected with HIV. Currently, the drug development effort is targeted at Hepatitis C, due to its increased prevalence. Dr. Holloway detailed the use of “collaborative molecular design,” using published structures of protease inhibitors (e.g. BILN 2061, a serine protease made by Boehringer Mannheim) in order to model best fit and synthesize optimal targets (e.g. vaniprevin, MK-7009 with increased potency).

Dr. Erica Golemis (Fox Chase) rounded out this panel by exploring the potential for bioinformatics to improve drug resistant cancer therapy by identifying signaling hubs when “mining through” the public access bioinformatic

resources. The key idea was to use the concept of “synthetic lethality” (when mutations in genes that are involved in redundant, parallel pathways, or are vertically linked in the same pathway, lead to lethality) in order to design new drugs that target functionally linked genes. Dr. Golemis detailed how her group mined data on protein-protein interactions and mRNA expression in humans to develop a targeting library enriched around the oncoprotein, epidermal growth factor receptor (EGFR). Her group identified a set of genes that had multiple linkages with EGFR and screened these subnetworks using knockdown (siRNA) in both prokaryotic and eukaryotic libraries. They then showed that several clinically available drugs that inhibited the candidate proteins demonstrated a synergistic effect with an EGFR inhibitor on reducing viability of various cancer cell lines. Her work suggests that drug development for cancer therapies may benefit tremendously from this “network-centered” approach.

All three panelists explored emerging new trends in translational medicine and encapsulated the frontiers of the drug development process, from using basic research to identify biomarkers and bioinformatics to predict and identify protein-protein interactions to using medicinal chemistry to optimize effective drug treatments for refractory diseases.

Frontiers in knowing what we know

October 21, 2011

Report by Arati Sadalge Kreibach, PhD

The user-machine interface has become more complicated, as computer processing power has exponentially increased. This presents a challenge for systems engineering, that **Dr. Susan Regli** (Lockheed Martin Advanced Technology Laboratories) attempts to solve. She uses the Interaction Design and Engineering for Advanced Systems (IDEAS) process, an iterative method to involve the human operator. She facilitates communication between the users and the engineers during the design process, enabling a mutual understanding of both the capacity as well as the usefulness of the technology being developed. Importantly, this approach utilizes user-centered design along with systems-engineering approaches) to account for human cognitive processes in designing a flexible interface. For example, Dr. Regli cited an example of a machine requiring increased input from the operator during low cognitive load (everyday applications), but decreased input during times of high cognitive load and stress (assessed by neurophysiologic sensors). This type of adaptable system may optimize and improve operator performance overall.

While most of us are familiar with the presentation of various forms of data, not many use visual representation in order to *explore* millions of pieces of data. **Dr. Peggy Rheingans** (University of Maryland) showed how massive quantities of data could be transformed into visual representations that may be used to construct and test many informal hypotheses. She detailed the progression of data, such as census bureau statistics, from bits of numbers converted via various computer models to rendered images. She showed how her group uses traditionally artistic techniques, such as tone shading and flow illustration in order to depict the what, where and when of various processes. The frontier, she contends, is using this to figure out the why?

Making sense of data was also the theme that **Dr. Margaret Gabanyi** (Rutgers Univ/Structural Biology Knowledgebase and RCSB Protein Data Bank) approached, from a different perspective. In the last 40 years, the description of protein structures has increased exponentially, from 7 structures solved in 1971, to more than 76,000 described today. The creation of the Structural Biology KnowledgeBase (SBKB), a website developed by the Protein Structure Initiative, (funded by the National Institutes of General Medicine) is an effort to collate this data, housed in disparate places, to make the protein structures widely available for use. SBKB contains combined protein data banks and annotations from 150+ sources. A single search gives information on structures, models, targets, protocols and materials used to create the information. Dr. Gabanyi described how the content is integrated into “hubs” and a functional sleuth organizes proteins of unknown functions. In addition, the pathway

data also details annotations, the existence of plasmids, and contact/ordering information, enabling research and collaborations to grow by leaps and bounds.

A better grasp of knowing what we know is clearly an essential part of understanding the world around us. This panel dealt with the problem of wrestling with the loads of information generated by machines and transforming that into knowledge, by using better interfaces, collating and sharing information and exploring it to the fullest by optimizing visual representations of data.

Keynote Address: Nancy B. Jackson

October 21, 2011

Report by Pushpinder K. Multani, PhD

Dr. Nancy Jackson is an outstanding woman scientist representing one of the largest professional societies in the world. She holds a vision of great responsibility for global chemical security. Her day job starts at Sandia National Laboratories (SNL) with a desire to develop chemistry technologies and educational programs all across the developing world. For this reason, her job allows her to work with chemists from Morocco to Malaysia. In her talk, she described how the global landscape of science and technology (S&T) research is changing with the advancement of communication styles such as "SKYPE". This promotes the globalization of economies and commerce with increased access to goods and knowledge. Various technical challenges such as the AIDS epidemic, climate change, sustainability, energy, U.N. millennium goals, and food have also become part of global concern. Her talk acquainted us with how the increased global S&T capacity has allowed great opportunities for increased collaboration. As a result, more scientific personnel are available for tackling intriguing problems posing both a challenge and an opportunity for the United States to improve the ongoing economic crisis. She revealed how countries like India and China are booming their economies and are the most emerging markets in today's world. The main investment areas such as energy, neuroscience, materials science, and information technology define the economic growth of six countries: Japan, Brazil, Russia, India, China and Singapore. Looking at the unemployment rate and layoffs in research and development (R&D) in various companies, Dr. Jackson's perception is that the United States should prepare for and transform to a successful global S&T innovation environment in order to remain in preeminent S&T prosperity. This innovative environment should be in specific areas such as global exchanges in education, international as well as national recruitment of R&D talent, multinational corporate collaborations and public policies that alleviate or restrain the worldwide leadership of the United States in the expansion of S&T.

Frontiers in Sustainability Panel Discussion

October 21, 2011

Report by Kerstin Nordstrom, PhD

The Frontiers in Sustainability Panel at the AWIS 40th anniversary conference consisted of three speakers, all from different areas of environmental science.

The first speaker, **Ms. Kristen Graf**, is the Executive Director of the Women of Wind Energy organization (WoWE). Ms. Graf started out as an engineering major intent on developing wind technology, but realized the technology itself is already developed. However, fossil fuels and nuclear energy still dominate the generation of electricity over renewable energy sources. The relative proportions of nonrenewables and renewables have actually remained fairly stagnant even with all of the media buzz and politicking surrounding renewables. This has happened despite

wind power growing in popularity worldwide. Puzzlingly, this stagnation has occurred despite the increase in wind turbine production in the U.S. So why is this? These U.S. produced turbines are being installed in rapidly developing nations such as China and India. She addressed the need to keep some of the turbines here, both for the economic impact as well as the environmental impact. (She echoed Nancy Jackson's remarks earlier in the day: if science jobs in the U.S. are in peril, then improving opportunities for women in science in the U.S. is bleak.) Ms. Graf's interest in effecting this change in wind power usage led her to leave engineering and ultimately to WoWE. She stressed that there is only a small window of time left to act on issues related to global warming. Ms. Graf presented some real examples of success (Cornell and Denmark) in using renewables.

Dr. Helen White was the next speaker, and is an Assistant Professor of Chemistry at Haverford College. She presented the audience with an interesting environmental mystery that only a chemist could solve. Dr. White's most recent research involved collecting samples from the Deepwater Horizon oil spill. While much of the media coverage of the event focused on surface tragedies, such as the plight of birds, the impact of the spill on the deep sea was rarely mentioned. In the deep sea near the spill, brown oil flocculates were observed. In the same area, biologists noticed deep sea coral with rare tissue damage: the polyps were literally falling off. The biologists attributed this damage directly to the spill. Dr. White was skeptical of the causation; there is a lot of oil found naturally in the Gulf of Mexico. In order to address this from a chemist's perspective, she traced the source of the oil. After all, oil is not just one compound; it is a mixture. So oil from different sources will have different chemical signatures. After testing several samples using a novel technique called 2D gas chromatography, she determined the spill was not to blame for the coral damage. This result was unpopular with the biologists, but the evidence was striking. In doing this work, Dr. White found a new mystery to solve: she found some quite improbable chemical signatures in some of the oil samples. Her next quest is to uncover this mystery. She speculates that there may be undiscovered biodegradation pathways in the deep sea.

The last speaker was **Dr. Cat Shrier**, President and Founder of Watercat Consulting, LLC. Her company focuses on finding innovative approaches to sustainable water management. Dr. Shrier emphasized the need for the water industry to pay attention to the whole water cycle. While the main goal might be to deliver water to customers, issues such as water waste, integration with nature, energy cost of water, and energy production from water should be given higher priority. However, water utility companies tend to be very conservative and not supportive of public discussion. Dr. Shrier underscored the need to fight this, to create open spaces for education and public discussion. She mentioned her website for this, waterwonks.com, which will be unveiled soon. The conservatism and close-mindedness of the water industry naturally creates huge problems for women in this industry. While there are more women coming into the pipeline, there is a dearth of women in management positions. The industry is also self-regulated and there is no national association, making it difficult for these issues to even be raised. She stressed that these problems in the water industry are not history, they are happening now. Dr. Shrier believes the ultimate solution is to stop treating diversity as a nonessential, secondary issue in the water industry; however, she admitted being unsure how to make this change happen.

All of the speakers touched on issues facing women in science that warrant a separate summary. Institutions, companies, and government all need diverse voices to make change and to be successful. We need more women leaders. As an example, we are woefully lagging behind other developed nations in the percentage of women holding an elected office. Women need mentors and to be mentors. Dr. White supervised an undergraduate woman for the research she presented. Ms. Graf mentioned a dark quote from Madeleine Albright, "There is a special place in hell for women who don't help other women." Further, we need men to be involved. Dr. Shrier noted that women cannot be solely responsible for their success or failure, as so much of career success has to do with standing on the shoulders of others. Lastly, all of the speakers testified to the importance of speaking one's mind, whether it's a call to action, an unpopular viewpoint, or bringing up a topic isn't normally discussed.

About the Keynote

Nancy B. Jackson **2011 President, American Chemical Society**

Nancy B. Jackson is manager of the International Chemical Threat Reduction Department in the Global Security Center at Sandia National Laboratories, which assists the U.S. Department of State and other federal agencies in solving problems related to international chemical security. With the Department of State, Jackson has developed the Chemical Security Engagement Program, an international program to raise awareness of chemical safety and security among chemical professionals and to enable the practice of safety and security in the research, teaching, and commerce of chemicals. Previously, Jackson was deputy director of Sandia's International Security Program, and over the past four years was leader of the Laboratory Directed Research and Development program for the Global Security Center. Prior to her positions in Global Security, Jackson was involved in research and development at Sandia as a principal investigator and as a manager.

Jackson is a National Affiliate of the National Academies, where she has served on several boards and chaired studies. She is a fellow of the American Association for the Advancement of Science and was recipient of the 2005 American Indian Science and Engineering Society Professional of the Year Award. Jackson is a former member of the Board of Trustees of Rocky Mountain College and is a research associate professor in the Chemical and Nuclear Engineering Department of the University of New Mexico.

Jackson has a B.S. in chemistry from George Washington University, from which she won a Distinguished Alumni Achievement Award in 2005. She also has a Ph.D. in chemical engineering from the University of Texas at Austin.

Frontiers of Discovery Planning Committee Members

Hilary Domush, Chemical Heritage Foundation
Joanne Gere, AWIS, Central Jersey Chapter
Sarah Hunter, Chemical Heritage Foundation
Lisa Kozlowski, AWIS, Philadelphia Chapter
Alice Marcy, AWIS, Philadelphia Chapter

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Frontiers of Discovery

October 20-21, 2011 in Philadelphia



Program

8:00 a.m. *Networking Breakfast*

9:00 a.m. *Welcome*

Tom Tritton, President, Chemical Heritage Foundation
Joan Herbers, President, Association for Women in Science

9:20 a.m. *Frontiers in Medical Discovery Panel*

Marielena Mata, Centocor R&D, Inc.
“Biomarkers in Drug Development—Working Towards Personalized Medicine”
M. Katharine Holloway, Merck Research Laboratories
“Arresting AIDS and Halting Hepatitis C: Structure-Based Design of Antiviral Therapies”
Erica A. Golemis, Fox Chase Cancer Center
“Mining Through Complex Cancer Signaling Networks to Improve Cancer Therapy”

10:40 a.m. *Networking Break*

11:00 a.m. *Frontiers in Knowing What We Know Panel*

Susan Harkness Regli, Lockheed Martin Advanced Technology Laboratories
“IDEAS: Interaction Design and Engineering for Advanced Systems”
Penny Rheingans, University of Maryland, Baltimore County
“Taming the Firehose: Using Visualization to Explore Data”
Margaret Gabanyi, Rutgers University/Structural Biology Knowledgebase and RCSB Protein Data Bank
“Enabling Biology: the Structural Biology Knowledgebase”

12:30 p.m. *Lunch and Keynote Address*

Nancy B. Jackson, 2011 President, American Chemical Society

“The Future Prospects for Science in the U.S. and its Implication for Women”

2:15 p.m. *Women in Science Oral History Collection*

Hilary Domush, Program Associate, Oral History Program, Chemical Heritage Foundation

2:45 p.m. *Networking Break*

3:15 p.m. *Frontiers in Sustainability Panel*

Kristen Graf, Women of Wind Energy
“Harnessing the Winds of Change: Sharing the Stories of Women in Renewable Energy”
Helen K. White, Haverford College
“Investigating the Fate of Oil in the Deep-Sea”
Cat Shrier, Watercat Consulting LLC
“Where are the Women Leaders in Water and Sustainability?”

4:30 p.m. *Concluding Remarks*

Association for Women in Science 40th Anniversary Celebration
Chemical Heritage Foundation, Philadelphia PA
Biographical Sketches for Featured Participants

Thursday October 20, 2011 Career Panel

Mary Dominiecki, National Analysts Worldwide (Panel Moderator)

Mary Dominiecki is an Associate Group Director at National Analysts Worldwide with the firm's Healthcare practice with responsibility for design, analysis, and management of both qualitative and quantitative assignments with pharmaceutical and bio-technology companies. Mary has been involved in studies addressing a broad range of marketing problems, including buying process, new concept and product testing, market segmentation analysis, and product usage. Her assignments have included complex studies covering diverse areas including hematologic malignancies, surgical devices, and motor disorders. She serves as the overall project manager with all the day-to-day responsibilities, in addition to acting as the client contact, supervising field, data collection, and data processing, and crafting reports and final presentations.

Prior to joining National Analysts Worldwide, Mary held various positions serving the pharmaceutical industry. She was a Clinical Publications Lead at AstraZeneca with responsibilities for oncology products as well as diabetes products. Prior to joining AstraZeneca, Mary worked as the Medical Director for an oncology-focused medical communications agency and as a Senior Medical Writer in several therapeutic areas including liver disease, rheumatology, respiratory, infectious diseases, pain management, oncology (solid tumors, hematologic malignancies, and supportive care), and anti-psychotics. She also has extensive experience teaching undergraduate and graduate courses in biology, genetics, immunology, and microbiology. Mary holds a Ph.D. in Basic Medical Sciences from The New York University and a B.S. in Biology from The Pennsylvania State University.

Julia Heinrich, Bristol-Myers Squibb

Julia Heinrich has twenty years of experience in the pharmaceutical industry as an R & D research biologist, where she advanced from a postdoctoral fellow at Bristol-Myers Squibb (Jan 1990-Jul 1994) to Principal Research Scientist at Wyeth Research, now Pfizer (Aug 1994-Apr 2008). Julia transitioned to a Patent Information Analyst at Sanofi in Bridgewater, NJ (Mar 2010-Aug 2011) and continuing as a Senior Patent Analyst, Bristol-Myers Squibb (BMS), Hopewell, NJ. Julia obtained her B.A. in Biology from Brown University, Ph.D. from Cornell University, the Memorial-Sloan Kettering Cancer Institute Division of Cornell Medical School, NY and a Rutgers mini-MBA in Bio-Pharma Innovation.

Soon after joining Wyeth Research (August 1994), in collegial support Julia joined the initiative of the late Kathy Young to establish Central Jersey Chapter, now New Jersey Chapter (1994). Her first "official" responsibilities included Chair of the Grant position and recruiter of Webmasters. Later, Julia assumed board positions of President in 2000 and 2009 and Treasurer for the past two years. The history of her 2 cents to CJC/NJ is captured on Google in Newsletters and web posting. Throughout the years Julia has benefited immensely from the networking events and activity AWIS affords its membership.

Kristen Kahle, Integral Molecular, Inc.

Kristen Kahle is a Research Scientist at Integral Molecular, Inc., located at the University City Science Center Research Park in Philadelphia PA. Integral Molecular is a biotechnology company that provides innovative solutions for antibody development, drug discovery, and scientific research involving cellular and viral integral membrane proteins. Kristen is the project leader for a multidisciplinary NIAID contract focused on investigating B-cell epitopes and the mechanisms of antibody protection for Dengue, Hepatitis C, and Chikungunya viruses.

Kristen received her B.S. in Biochemistry and Molecular Biology and her M.S. in Biotechnology from Pennsylvania State University. After working as a research associate at Thomas Jefferson University studying hematopoietic

stem cells, Kristen earned her Ph.D. in Molecular Pharmacology and Structural Biology at Thomas Jefferson. Her graduate research involved investigating the kinetics of HIV-1 deactivation and its implications for fusion inhibitor design and the acquisition of viral resistance. During these studies Kristen developed a deep interest in antiviral research and is excited to explore the mechanisms by which antibodies neutralize and, in specific instances, enhance viral infection to provide information for vaccine efforts.

Jodi L. Wesemann, American Chemical Society

Jodi Wesemann is the Assistant Director for Higher Education at the American Chemical Society, where she works with the Undergraduate Programs Office, the Office of Graduate Education, and the Office of Two-Year Colleges. Prior to assuming this position in 2002, she was Associate Professor of Chemistry at Saint Mary's College of California. She earned her B.A. in chemistry from Augustana College in Rock Island, IL and Ph.D. in inorganic chemistry from Indiana University-Bloomington. Jodi was a Fulbright Fellow at Universität Braunschweig, Germany and a postdoctoral fellow at Harvey Mudd College supported by the Camille and Henry Dreyfus Foundation Scholar/Fellow Program for Undergraduate Institutions. Having previously chaired the ACS Southern Indiana Section and the Younger Chemists Committee, she currently serves as Treasurer for the Association for Women in Science. With Mary K. Boyd, she co-edited *Broadening Participation in Undergraduate Research: Fostering Excellence and Enhancing the Impact*, published by the Council on Undergraduate Research in 2009.

Friday October 21, 2011

Hilary Domush, Chemical Heritage Foundation

Hilary Domush is a program associate for the Oral History Program, where she conducts research and works with program staff to propose and develop new projects as well as help manage the program. Hilary is the lead researcher on the Women in Chemistry Oral History project which she began in 2008. In particular she is interested in different avenues to success in industry, academia, and national laboratories, the role of science education in increasing gender diversity, interdisciplinary science, and globalization of science. Hilary also contributes to CHF publications *Periodic Tabloid* and *Distillations*.

Hilary earned an M.S. in history of science and an M.A. in chemistry from the University of Wisconsin, Madison, and a B.S. in chemistry from Bates College. Her graduate research in the history of science focused on 19th-century chemistry at the University of Edinburgh and the Edinburgh School of Arts. Before joining the history of science department she conducted studies toward the total synthesis of Phorboxazole B in Steven D. Burke's laboratory.

Margaret J. Gabanyi, Rutgers, The State University of New Jersey

Dr. Gabanyi is the Scientific Liaison and Project Manager for the scientific search portal, the Structural Biology Knowledgebase (SBKB, <http://sbkb.org>). Maggie's role is as the coordinator for research data and information from the \$665 million NIH-funded project, the Protein Structure Initiative, where 25 centers are targeting tens of thousands of proteins in a high-throughput mode. Most of the information is experimental data, released prior to publication, in order to fast-track results for scientists across the world.

She also liaises with the Nature Publishing Group to highlight the PSI's efforts on the web. Her main interests are in "open access science", and in convincing the entire biological community to use the results of structural biology studies as one of their primary tools when investigating living systems and disease.

Maggie earned a Masters degree in Basic Health Sciences and a Ph.D. in Physiology and Biophysics from Stony Brook University for her work on the structural biology of translesion DNA polymerases. After earning her degree, she decided there were enough protein crystallographers and instead went straight to the Research Collaboratory for Structural Bioinformatics - Protein Data Bank, one of four groups that maintain the global archive of 3D atomic

protein structures, to work in outreach. There, she became one of the leads of the SBKB project, which promotes new ways of using protein structure to enable biological research. She has one 18-month-old daughter, and still finds time to play video games with her husband.

Erica A. Golemis, Fox Chase Cancer Center

Erica Golemis is a Professor at Fox Chase Cancer Center, and serves as Deputy Chief Scientific Officer, and Co-Leader of the Program in Developmental Therapeutics. Her research program at Fox Chase seeks to consider the signaling networks governing carcinogenesis as fully integrated systems. Her initial graduate studies used bioinformatics approaches to identify the common enhancer core for a large set of leukemia inducing viruses, and provided groundwork for the discovery of the key RUNX/AML leukemic regulators.

As a postdoctoral fellow at Massachusetts General Hospital and Harvard Medical School, Erica was lead developer of the Interaction Trap, an independently developed yeast two-hybrid system that became a major platform for the identification of protein-protein interactions in the 1990s. Building from this background, one set of projects in the laboratory arose from a functional genomics screen to identify human genes that coordinately affected cell cycle and cell polarity cues in yeast. Among the numerous genes that were identified by this approach, much of her work has focused on NEDD9/HEF1, encoding a scaffolding protein that supports both tumor initiation and metastasis, based on its central role in coordinating signaling cascades that regulated cell cycle, invasion, and survival. For these studies, she combines analysis in human cell culture with use of mouse and *Drosophila* models. Other work integrates protein network modeling and RNA interference-based mid- and high-throughput screening to address the multifactorial basis for the drug resistance commonly found in advanced cancers. Her core belief is that the next-generation in cancer therapeutic development will require simultaneous inhibition of multiple central hubs in tumor signaling networks, and all of her work is focused on identifying productive inhibition targets.

Erica received a B.A. in English and Biology from Bryn Mawr College and her Ph.D. from Massachusetts Institute of Technology.

Kristen Graf, Women of Wind Energy

Kristen Graf is the Executive Director of Women of Wind Energy (WoWE), a national nonprofit. WoWE promotes the education, professional development, and advancement of women to achieve a strong diversified workforce and support a robust renewable energy economy.

Before making her way to WoWE, Kristen spent five years with the Union of Concerned Scientists (UCS) in Boston. As the Clean Energy Program Coordinator and Research Associate at UCS she worked on renewable energy policy at the state and national level with particular focus on wind and biomass energy in New England as well as working to hone some of her nonprofit management skills.

In 2011, Kristen was named a Senior Fellow in the Environmental Leadership Program's Eastern Region. She holds a Bachelors Degree in Agricultural and Biological Engineering from Cornell University. Originally from Pittsburgh, Kristen now lives in Brooklyn where she loves being able to ride her bike to work, spend time with her niece and nephew, and practice surfing in the cold waters of Long Island.

Joan M. Herbers, President, Association for Women in Science

Joan Herbers was born and grew up in St. Louis Missouri. She is the third-eldest of a large family, with 7 sisters and 5 brothers. Joan went to college at the University of Dayton, and to graduate school at Northwestern University. After receiving her Ph.D. she spent a year of postdoctoral study at Stanford University. She became a faculty member at the University of Vermont in 1979, where she rose from Assistant Professor to Professor. While there, she also served as Associate Dean of the Graduate College. In 1993 she moved to Colorado State University to become the chair of the Biological Sciences Department. Then in 2002 Joan moved to Ohio State University to become Dean of the College of Biological Sciences, a position she held for six years. Her

professional specialty is the study of insect societies, mostly ants. Her research has taken her to Australia, Costa Rica, and India and she has published many scientific papers about how ant colonies are organized.

Joan is currently a Professor at Ohio State and President of the Association for Women in Science. She joined the national board of AWIS as a Councilor in 2007. She has been committed to strengthening the work of AWIS chapters by forging stronger links between members, chapter activities, and the national office. She became president on January 1, 2010 and has led a new three-year AWIS strategic plan that included strengthening advocacy, breaking down barriers and growing capacity of women in science, technology, engineering and mathematics (STEM).

Herbers currently lives in Columbus, Ohio, with her husband of 26 years; their two children are pursuing careers in archeology and military.

M. Katharine Holloway, Merck Research Laboratories

Kate Holloway is a Senior Investigator at Merck Research Laboratories in West Point, PA, where she is involved in the computer-aided design of drugs to fight infectious diseases. Kate received a B.S. in Chemistry and French from the University of Southern Mississippi in 1979 and a Ph. D. in theoretical organic chemistry from The University of Texas at Austin in 1985. During her career at Merck, she has been most closely identified with the design of protease inhibitors for the treatment of HIV/AIDS (Crixivan™, approved 1996) and Hepatitis C infection (MK-7009, currently in Phase 3 clinical trials in Japan). She has been honored with several awards as a co-inventor of Crixivan™. These include the Intellectual Property Owners National Inventor of the Year Award in 1997, the American Chemical Society Award for Creative Invention in 1999, and the EU Inventor of the Year Award (non-EU country) in 2007. She was also featured in the 2004 Chemical Heritage Foundation exhibit and website titled "Her Lab in Your Life: Women in Chemistry" and was named as part of a \$2000 answer in the category "She Invented What?" on the TV game show Jeopardy in 2005. Kate has over 70 publications and patents in the area of computer-aided drug design. She also currently serves as Chair of the Computers in Chemistry division of the American Chemical Society.

Nancy B. Jackson, 2011 President, American Chemical Society

Nancy B. Jackson is manager of the International Chemical Threat Reduction Department in the Global Security Center at Sandia National Laboratories, which assists the U.S. Department of State and other federal agencies in solving problems related to international chemical security. With the Department of State, Jackson has developed the Chemical Security Engagement Program, an international program to raise awareness of chemical safety and security among chemical professionals and to enable the practice of safety and security in the research, teaching, and commerce of chemicals. Previously Jackson was deputy director of Sandia's International Security Program, where she assisted the director in fulfilling its mission to create technology-based solutions through international cooperation to reduce the threat of weapons of mass destruction proliferation and terrorism. During the past four years, Jackson was responsible for leading the Laboratory Directed Research and Development program for the Global Security Center, which requires identifying and overseeing the research program in support of the center. Prior to her positions in Global Security Jackson was involved in research and development at Sandia as a principal investigator and as a manager. Primarily her research was in heterogeneous catalysis with an emphasis on energy applications. Later work involved chemical imaging with a wide variety of applications from biological systems to homeland defense problems.

Jackson is a National Affiliate of the National Academies, where she has served on several boards and chaired studies. She is a fellow of the American Association for the Advancement of Science and was recipient of the 2005 American Indian Science and Engineering Society Professional of the Year Award. Jackson is a former member of the Board of Trustees of Rocky Mountain College and is a research associate professor in the Chemical and Nuclear Engineering Department of the University of New Mexico.

Jackson has a B.S. in chemistry from George Washington University, from which she won a Distinguished Alumni Achievement Award in 2005. She also has a Ph.D. in chemical engineering from the University of Texas at Austin.

In 2009 Jackson was elected to the presidential succession of the American Chemical Society. She served as president-elect for 2010, serves as president for 2011, and will serve as immediate past president in 2012.

Marielena Mata, Ortho Biotech R & D

Marielena Mata, Ph.D. is a Principal Research Scientist in the Oncology Biomarkers group at Ortho Biotech R&D, Inc. leading the development of Circulating Tumor Cell based assays as companion diagnostics for Oncology therapeutics. In that role, Marielena is responsible for development and implementation of CTC driven biomarker strategies within the context of the larger Biomarker program. In addition, she is involved in collaborations with Veridex LLC diagnostics, another Johnson & Johnson unit, to extend CellSearch capabilities to additional cell types and increased molecular characterization. Earlier, she established and managed the Biomarkers biobank. In that capacity, she led the team responsible for evaluation of commercial biobanks, implementation of a LIMS system across multiple J&J companies and the development of processes and documentation associated with the Biobank. She was also responsible for technical assessment of multiple technology platforms for biomarker research with an emphasis on cell based assays and proteomics.

Prior to joining the Biomarkers group, Marielena had joined Centocor as a Research Scientist in the Department of Clinical Pharmacology and Experimental Medicine. In this position, she led the development and execution of cell based assays to support clinical trial studies. In addition, she supported PK, PD and IR bioanalysis for Oncology studies and represented the department in clinical teams and Compound Development teams for new oncology programs at Centocor.

Marielena obtained a B.A. in Biology at the University of North Carolina at Greensboro and her Ph.D. and postdoctoral training in Immunology at the University of Pennsylvania.

Susan Harkness Regli, Lockheed Martin Advanced Technology Laboratories

Dr. Harkness Regli is Lead, User Center Interfaces at Lockheed Martin Advanced Technology Laboratories and conducts research in the Informatics Laboratory at Lockheed Martin Advanced Technology Laboratories (ATL) where she serves on the Technical Council. Dr. Regli has spearheaded a broad range of advanced human-computer interaction research for enhanced human cognitive and collaborative activities at ATL, Xerox PARC, Carnegie Mellon University, and VerticalNet, Inc.

She is the Principal Investigator on ATL's Interface to the Warfighter program for the Office of Naval Research and has researched user-centered design for multimodal and natural-language understanding technology; electronic mail in computer supported collaborative work; mobile computing applications for use at the tactical edge; and applications of intelligence technologies to enhance medical information collection and usage.

Dr. Regli earned her doctorate in Rhetoric from Carnegie Mellon University, where she was affiliated with the Human-Computer Interaction Institute. She also holds masters degrees in English from the University of Virginia and Hollins College, specializing in poetry and creative writing (<http://drsoozpoetry.wordpress.com/>).

Penny Rheingans, University of Maryland Baltimore County

Penny Rheingans is Professor in the Department of Computer Science and Electrical Engineering and Director, Center for Women and Information Technology at the University of Maryland Baltimore County. Dr. Rheingans' current research interests include the visualization of predictive models, visualization of data with associated uncertainty, volume rendering, information visualization, perceptual and illustration issues in visualization, non-photorealistic rendering, dynamic and interactive representations and interfaces, and the experimental validation of visualization techniques.

As Director of the Center for Women in Technology, she oversees a scholarship program for undergraduates committed to increasing gender diversity in the technology fields and develops programs to increase the interest and retention of women in technology programs.

She received a Ph.D in Computer Science from the University of North Carolina, Chapel Hill and an AB in Computer Science from Harvard University. Dr. Rheingans has over eighty published works in such locations as the IEEE Transactions on Visualization and Computer Graphics, Proceedings of the IEEE Visualization Conference, Proceedings of Eurovis, IEEE Computer Graphics and Applications, and the SIGGRAPH Film Show, as well as included as chapters of various books. In particular, she coauthored the NIH/NSF Visualization Research Challenges report, published in 2006 by IEEE.

Cat Shrier, Watercat Consulting LLC

Cat Shrier Ph.D. is the President and Founder of Watercat Consulting LLC, which facilitates innovative approaches to sustainable water planning and management. She has 25 years of experience with state legislative and congressional offices, agencies, university research institutes, and environmental consulting firms. Cat serves as Co-Chair of the Energy, Environment, and Entrepreneurs issues group for Women Impacting Public Policy, and as Chair of the Water issues group for Women's Council on Energy and the Environment.

She holds bachelor's degrees in Government from Dartmouth College and Geology from North Carolina State University. She also has a master's degree in Environmental Science and Engineering, in the program on Environmental Management and Policy, from UNC-Chapel Hill and a Ph.D. in Civil Engineering, in the program on Water Resources Planning and Management, from Colorado State University.

Tom Tritton, Chemical Heritage Foundation

Tom Tritton is the second president of CHF, succeeding Arnold Thackray, who founded the organization in Philadelphia in 1982. Tom served as the twelfth president of Haverford College from 1997 to 2007. He is a cancer chemotherapy research expert with over 150 publications and whose work was continuously funded by the American Cancer Society and the National Institutes of Health. Before Haverford he was a professor of pharmacology for twelve years each at Yale University and the University of Vermont. At UVM he also served as deputy director of the Vermont Comprehensive Cancer Center—a Designated Center of the National Cancer Institute—and as vice provost of the university.

In 2007, before assuming the CHF presidency, Tom was at Harvard University, where he held the title of "president in residence" at the Graduate School of Education. He worked with graduate students in higher education, wrote and taught about leadership and the college presidency, and also designed a new course on "Social Justice." Tom earned a bachelor of arts degree from Ohio Wesleyan University and a Ph.D. from Boston University.

Helen K. White, Haverford College

Helen K. White is an Assistant Professor of Chemistry at Haverford College. She received an M. Chem degree in Chemistry from the University of Sussex, U.K. in 2000 and a Ph.D. in Chemical Oceanography from the Massachusetts Institute of Technology and Woods Hole Oceanographic Institution (WHOI) Joint program in 2006. After teaching Oceanography at Boston University for a year, she was awarded a Microbial Science Initiative postdoctoral fellowship in 2007 from Harvard University. I enjoy working in the field, collecting samples from rivers, salt marshes and other coastal environment. Her doctoral work focused on utilizing variations in natural abundance radiocarbon and stable carbon of different fractions of sediments to examine the distribution, chemical associations and overall fate of marine, terrestrial and fossil fuel-derived organic matter in the marine environment.

At Harvard University she investigated how energy can be harnessed from the microbial metabolism of carbon in the ocean via microbial fuel cells placed in sediments, hydrothermal vents and surface water plankton blooms. This research focused on quantifying the different groups of microbes that contribute either directly or indirectly to power production and the relationship between microbial community structure and the chemistry of the environment.

Helen's teaching and research interests are centered in the field of biogeochemistry; a multidisciplinary approach focused at understanding the chemical, physical, geological and biological processes that govern the composition of the Earth's environment. As a chemist, she mostly employs chemical techniques to address questions in this area. In particular, Helen is interested in understanding the sources, sinks and cycling of organic carbon in marine sediments.