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AWIS San Diego Chapter NEWSLETTER

Mission Statement: The Association for Women in Science, Inc. (AWIS) is a non-profit organization dedicated to the achievement of equity and full participation of women in all areas of science and technology.

AWIS-SD and the CALIFORNIA WOMEN'S CONFERENCE

After years of proposing an AWIS-SD booth to exhibit at the California Governor and First Lady's Conference on Women (see sidebar), board member Liz Yoder finally succeeded. AWIS-SD was to make a showing at the 2007 event held in Long Beach. The PR committee began making preparations in earnest, with Valerie Delmar taking the lead, assisted by Huong Huynh. The team met and brainstormed for several weeks. AWIS-SD now has a brilliant new banner. AWIS National contributed professional brochures outlining the organization's mission and strategic plan to 2010. The exhibit team was set to make a splash at this prestigious event.

The day before the conference, wild fires started ravaging large areas of San Diego. Some team members scattered from evacuation zones and elected to stay with their families during this disastrous time. Nothing was going to stop Liz Yoder from achieving her dream and she battled her way up I-5 to arrive in time for set up. Jenny Chaplin joined her the next morning, regardless of having been evacuated from her home the night before.

The AWIS booth proved to be a professional and attractive display in the exhibit hall. The hall buzzed with people from all walks of life who browsed exhibits ranging from accessories to educational and support groups. Many visitors to the AWIS-SD display expressed interest in finding out more about the organization. Scientists and non-scientists alike admired the efforts made in advancing women in science. The display was a success in increasing awareness of AWIS and of the benefits the organization provides to its members and its community. At the conference end, Yoder and Chaplin made their way back to a smoky San Diego, inspired by the energy of 14,000 women eager to make a difference.

The California Governor and First Lady's Conference on Women, empowers women to be architects of change in their homes, their communities and across the state. The conference began 20 years ago as a government initiative and in 2004 First Lady Maria Shriver transformed it into the leading women's conference in the nation.

Inside this Issue **Page**

Upcoming Events

Compiled by Janice Payne

December 6. AWIS Open House. This annual event highlights what AWIS is all about. Bring a friend and learn about AWIS committees and activities. Location: Biogen IDEC. Time: 5:30pm. RSVP: http://awis.npaci.edu/calendar/eventdetails.php?event_id=354

December 10. Strategy Session. Leadership Skills. Members only event. Salk Institute. 6pm.

December 13: Nanobionexus Holiday & NanoArt Extravaganza. Join us for holiday cheer at this two-part holiday event. Two speakers (Mirianas Chachisvilis, William Trogler) start off at 4:30pm and are followed by an exhibit and sale of NanoArt hosted by world renowned Cris Orfescu. Location: Moores UCSD Cancer Center. RSVP: http://www.nanobionexus.org/events.aspx.

January 10. Winter Happy Hour. Charlie's By the Sea in Cardiff. Join us for this purely social event in a beautiful private room which overlooks the ocean at Charlie's By the Sea. Wine tasting & appetizers will also be available. Time: 5:30pm RSVP: http://awis.npaci.edu/calendar/eventdetails.php?event_id=363.

SPECIAL REPORTS

Marian C. Diamond Lectures

Co-sponsored by The Doris A. Howell Foundation, Women in Science & Engineering (UCSD), and Graduate Women in Science & Engineering (UCSD)

Part I: Passions of a Scientist, Teacher and Author

By Norma Velázquez Ulloa

Marian Diamond walks in the room and all turn to see her. She projects a warm personality that fills the room. She wears her hair up, not one hair out of place. Her outfit is colorful and elegant, complemented by a beautiful scarf, a hallmark of her style. Her reputation precedes her, yet she is not unapproachable. She is a true mentor and is visibly happy to interact with students and share her experiences. She introduced herself and shook hands with everyone in the room at a meet-the-speaker event organized by GradWISE.

Diamond, a prominent neuroanatomist and a pioneer of the study of experience-dependent changes in the brain, discovered her passion for this organ as an adolescent. She used to accompany her physician father during rounds at the County Hospital and one day she noticed something on a table she could see through a half-open door. It was a brain. She saw it and thought, "those cells used to be able to create ideas," and it became clear to her: she wanted to study brains.

Diamond carved her own path, taking opportunities as they came. She knew what she wanted, and had the confidence that she would get it in due time. It worked. She was patient when it came to achieving goals. She tried several alternative paths along the way, yet never lost focus: she wanted to raise a family and study brains. That's what she did. She made the best of the circumstances she had and was always ready to face new challenges to reach her goals.

Diamond is a compassionate person, and not surprisingly, another of her passions is teaching. Her research has established the importance of an enriched environment for the brain, and she is proactive about creating an enriched environment for herself and those around her through her teaching and outreach activities. She started locally at UC Berkeley, and has now reached out internationally through a program for Cambodian orphans. Diamond is also author of several books with practical ways of applying results from the lab to everyday life.

Diamond's enthusiasm is contagious, which explains why many of her students followed in her footsteps to become scientists. Sparks in her eyes lit up every time someone asked something related to her passions. And she has many. She is a balanced person, who always knew she wanted a family as much as a career studying brains. She managed to do and succeed at both. Her secrets: passion, self-confidence, perseverance, patience, flexibility, tolerance, gratitude, and a good sense of humor.

All of Diamond's efforts focus on making the lives of others better, another of her passions.

What are your passions?

Part II: "An Enriched Life: My Experiences in Academic Science"

By Sharon Dana

Marian Diamond is equally respected by her students for her teaching style and her peers for her outstanding research into the effects of environmental enrichment on brain development, structure, and function. She enjoys teaching undergraduates, which she has been doing for over 50 years. She is an unexpected, but not uncommon, sight on the UC Berkeley campus: a stylish octogenarian carrying a flowered hatbox. That hatbox is her trademark and contains a Tupperware bowl from which her gloved hands withdraw a fixed human brain to share with her undergraduate class in General Human Anatomy. Within the first 10 minutes of the first class of IB131, she has introduced herself and her teaching approach, shown the students a real human brain, encouraged them to introduce themselves to their neighbors "brain to brain," and invited two students to lunch at the faculty club. That invitation will be repeated to two new students each week of the 15-week semester.

Marian Cleeves Diamond is a native Californian with a strong attachment to the UC Berkeley (known as Cal) campus. She has B.A., M.A., and Ph.D. degrees from Cal, granted from 1948 – 1953. Her first of four children was also born during that time period and she continued to work half time through much of their childhoods. Although she has taught at Cornell and UCSF, Berkeley students are her favorites, so much so that she has continued to make Berkeley her academic home since marrying UCLA professor Arnold Scheibel in 1982. New Berkeley student, Glenn Freund, finds her to be "simply an amazing woman" and recalls, "the first time I went into her office she sat me down and offered me chocolates that another someone had given her. I told her no and to save them for a special occasion and she said to me 'well I am sitting with you; that is a special occasion.'"

For over an hour in a lecture hall of the Leichtag Biomedical Research Building at UCSD, Diamond interwove the story of her family and academic lives, revealing the many ways one can enrich one's experience and maintain a satisfying and intellectual life well past conventional retirement age. The findings of her decades of research include:

1) Environmental enrichment can increase the thickness of the cerebral cortex, increase the number of glial cells and increase the size of nerve bodies, as well as the length, number, and branching of dendrites. That enrichment was accomplished by housing laboratory rats together and including various items for play and exploration in their shared cages. She was one of the few individuals who had an opportunity to study Albert Einstein's brain post-mortem and found significantly greater number of glia in area 39 of the cortex when compared to 11 other male brains. Environmental enrichment and handling (what she calls "Tender Loving Care") can continue to alter cortical thickness in very old rats and help them to live well beyond the usual laboratory lifespan.
2) Seven years of Diamond's research was spent studying normal changes in development and aging of the cortex. One striking finding was that in early and adult life, male rat brains are asymmetric, with the right cortex being significantly thicker than the left while in female the left cortex is slight larger than the right, but not significantly. She believes the differences are related to sex-related role differences; males need to focus on establishing territory

and finding females while females need to be able to react to environmental changes in order to protect and care for their pups. By very old age, both sexes have nearly symmetrical cortexes.

3) In the 90s, Diamond's group began research on interactions between the cerebral cortex and immune function. They found differences in cortical thickness between immunodeficient (nude) mice and immune competent control mice. The decreased volume of the cortex in the nude mice could be corrected by transplant of a functional thymus. In a human study, blood samples were taken from adult women before and after playing bridge for 1½ hours. The number of circulating $CD34^+$ T lymphocytes increased in the bridge-playing subjects while this was not the case for women listening to music for the same time period.

Diamond shared a few examples of sexism that impeded her early career progress but didn't slow her down in terms of accomplishments and instead made her appreciate the value of perseverance. Perseverance is one of the four Ps she recommends for leading an "enriched life." Others are:

- personal priority (friends and family);
- professional priority (brains, students, and colleagues);
- positive attitude ("look at the alternative!")

Her recommendations for a healthy brain are healthy diet, exercise, challenge, newness, and love. She continues to enrich the lives of others by teaching undergraduate and graduate courses, supervising students in an "Each One Teach One" outreach program in Berkeley and Albany public schools, and overseeing the Enrichment in Action project in Cambodia. By so doing, she enriches her own life and continues to be a positive force in the Berkeley and larger communities. On Veterans Day, Marian Diamond celebrated her 81st birthday and shows no signs of slowing down.

EVENTS

Investing Scientifically in the Future

AWIS Strategy Session
Roshni Mitra Chintalapati

"From birth until 18, a girl needs good parents; from 18-35, she needs good looks; from 35-55, she needs a good personality; from 55 on, she needs good cash. I am saving my money!" These are the words of comedian, Sophie Tucker, as quoted by Muriel McElhinney, a Merrill Lynch financial advisor. McElhinney along with colleague Vivian Chan lead a seminar on investment options tailored for 'smart career women in science' at the October AWIS strategy session.

McElhinney stated early on that although investment strategies should be gender blind, the actual scenario is different. There are three major reasons for such differences: Genetics, society and psychology.

Genetically, women are likely to outlive men. This means that at the last phase of women's lives, they will probably have to take care of themselves.

In our society, generally women take time off from their careers to take care of family, which means loss of money in the form of benefits and pensions. However much people shout from the rooftops about gender equality in the workplace, it is a fact that women still earn 70 cents to a dollar earned by a male colleague; when we change careers, we don't increase our salary concomitantly. Statistics also show that divorce actually decreases a woman's wealth, whereas it increases a man's. This last fact was news to me considering all we hear about alimony and women making a killing over dragging their husbands to court!

McElhinney also specified the psychological aspect about women that I intimately knew about myself, which is that we generally avoid anything containing the word "financial." If forced to think about it, I would probably choose something safe, like just stuffing my money in a checking account and forgetting about it. The idea of doing any form of aggressive investment, even though it may bring me rich dividends, is something which I would definitely shy away from. But that doesn't help me or any of our so-called smart breed who are typically not so smart with investments.

McElhinney and Chan gave us a case study, which brought wry smiles to many of our faces because it was so like our own cases. Mary was portrayed as a woman who finishes her PhD and postdoctoral work at 35, and then gets her first "real" job and sees real cash of $80K. McElhinney and Chan took us through all the planning and strategizing they did with Mary to help her secure her financial future. Here are the steps they suggested:

- List expenses versus revenues
- Calculate savings per month
- Allocate excess earnings toward
    - Disability insurance
    - Emergency accounts
    - Asset allocation
    - Rebalancing a portfolio
    - Maximizing a retirement account
    - Tax-advantage flexible spending accounts

Be as smart about investing hard-earned money as you are in your science career!

Women in Flight

August AWIS Event
By Janice Payne

Would you have guessed that the first female to design and build an aircraft actually did so in 1906? E. Lillian Todd, a stenographer, who as a child was fascinated by typewriters and clocks, designed her aircraft in a tiny one-room apartment. Todd and a host of women aviators who made history in the early 20th century were the topic of our August AWIS event. Our speaker, Karen Lacy, is the first woman curator at the San Diego Air and Space Museum in Balboa Park. Lacy is responsible for the "Women of Flight: Aerobatics Exhibit" at the museum and she gave us an enlightening review of the historical research she has done for the exhibit.

One early female aviator mentioned by Lacy was Bessica Raiche. A dentist and physician, Raiche built airplanes with her husband out of the lightweight materials silk and bamboo. In 1910 Raiche was the first woman in the United States to make an accredited solo flight.

Lacy was aided in her research by the San Diego chapter of The Ninety-Nines, a group of 99 women aviators who joined forces in 1929 to promote aviation. One member of the 99s, Helen Richey,

was the first female pilot hired by a commercial airline. Richey joined Central Airlines in 1934 but was only allowed to fly during fair weather and was later forced to step down by the all-male pilots union. It wasn't until 1973 that Emily Howell Warner became the next female pilot hired by a commercial airline.

Women aviators stepped up during World War II and formed the Women Airforce Service Pilots (WASP). These women were true heroes and were charged with transporting military aircraft to various locations during the war. After the war, NASA began to appreciate the skill of women in flight and they admitted women into the space program. In 1983, Sally Ride was the first female American astronaut to fly in space.

We had the privilege of meeting an aviation hero, Martha King, at our event. She and her husband started the King Schools over 30 years ago and have been training pilots ever since. They began with classroom instruction and have moved into video and electronic instruction.

Martha King is the only woman in history to hold every class of pilot and instructor rating. She can fly everything from the blimp to jets to powered parachutes. King was honored as one of the "100 Heroes of Aviation" at a ceremony at Kitty Hawk on Dec 16, 2003. King attributes her success to "following her passion" and to "always learning."

For more information about King Schools, visit http://www.kingschools.com/. For more information about women in aviation, visit the 'Women of Flight: Aerobatics Exhibit" at the San Diego Air and Space Museum.

Presentation Skills Outreach Committee Workshop

By Norma Velázquez Ulloa

We met at UCSD Scripps Institute of Oceanography on a Saturday morning. The workshop was organized as a roundtable discussion led by Jeannine Stucka and Diane Retallack, who have been involved with the committee for several years and started co-chairing it last year. We covered three main topics: presentation overview, tips and tricks for a successful presentation, and presentation demonstrations.

Jeannine and Diane first told us about the different events the Outreach Committee normally goes to and the types of workshops they present in each case. Short workshops have a "poster-like" format, where participants come up to a booth and presenters do a quick demonstration or manual activity. One example of this format is the Sally Ride Festival. Other events, such as Expanding Your Horizons, or the CHEMEXPO involve longer workshops, normally in a classroom set up.

In both, the long and the short format, the topics are chosen to teach a scientific concept. However, the goal is also to represent female scientists, encourage science education and inspire more girls to go into science by showing participants, normally kids from elementary school to high school, that all kinds of people can become scientists.

In the tips and tricks part of the workshop we talked about ways to make presentations more interesting.

- Make it active by setting the interaction with participants as a two-way conversation.
- Make it personal by talking about what you do and your career path.
- Go from simple to complex: start with easy questions to the group that anyone could answer, then move on to more difficult questions.
- Customize the workshop to the level of knowledge of your audience. Be flexible and think on your feet.

The last part of the workshop consisted of demonstrations of presentations that have been used in the past. The first one was set up resembling a CSI case where students use the scientific method to find the culprit while getting hands-on experience with chromatography, microscopes, and fingerprinting. The second one dealt with genetics. It was an easy and fun demonstration of how genes and environment interact. Then we saw a workshop about learning engineering principles by building a tower with spaghetti and marshmallows. Last we witnessed a workshop about enzymes in food. In all cases, presenters highlighted the importance of providing participants with a hands-on experience and connecting the science to everyday life. They also emphasized that workshops need not be complicated, they should be fun for both, participants and presenters.

Anyone interested in preparing a workshop, presenting an existing workshop, or helping out with a presentation can contact the Outreach Committee at outreach@awissd.org. More information about the Outreach Committee can be found at http://awis.npaci.edu/committees/outreach1.htm.

FEATURES/OPINIONS

Johnson and Johnson Hosts Symposium

By Sharon Dana

Johnson & Johnson Pharmaceutical Research & Development hosted a Metabolic Diseases Symposium on the afternoon of September 20. The speakers presented a look at the interplay between stress, inflammatory responses, genetics, and nutrition in the pathogenesis of obesity, diabetes, and coronary artery disease. Researchers now appreciate that adipose (fat) tissue is far more metabolically sophisticated than a simple storage depot for excess energy. As Jerrold Olefsky from the UCSD Dept of Medicine pointed out, adipose tissue is the largest endocrine organ in the body, signaling to other metabolic tissues and the central nervous system. Other researchers presented evidence that it is not only adipocytes, but macrophages, nerves, endothelial cells, and platelets in adipose tissues that participate in the communication of stress, inflammatory, and energy homeostatic signals.

Olefsky spoke about *The Role of Inflammation in the Pathogenesis of Insulin Resistance* and how macrophages and inflammatory signaling pathways contribute to insulin resistance in adipose tissue and in the whole body. Olefsky, Christopher Glass, and their colleagues at UCSD have dissected these pathways by creating knockout animals as well as chimera. In these chimera, the bone marrow of a wild type animal is replaced by bone marrow of a knockout animal, or vice versa. With some of these animals they were able to dissociate obesity from insulin resistance, pointing to a primary role for the bone marrow-derived macrophage in insulin resistance, the hallmark of type 2 diabetes. Further studies revealed that there are actually two populations of bone marrow derived cells

in adipose tissue in a good guy, bad guy struggle between remodeling and inflammation. The "bad guy" bone marrow derived dendritic cells respond to circulating free fatty acids, increased by a high fat diet, to promote inflammation and insulin resistance.

Zofia Zukowska and her colleagues at Georgetown University Medical Center have been using rodent stress models, thereby *Linking Stress and Obesity via NPY*. Although the association between adrenocortical stress hormones and metabolism has been known for some time, Zukowska presented evidence that a neuropeptide, NPY, is produced locally in adipose tissue by sympathetic nerves as well as by platelets and endothelial cells. They have identified the NPY receptors involved that participate in a stress-induced feed forward loop that expands adipose tissue, especially abdominal fat, and ultimately can lead to the metabolic syndrome. One receptor, NPY2R, is particularly attractive as a target for pharmacologic intervention.

Eric J. Topol, Director of the Scripps Translational Science Institute, spoke about *The Convergence of Diabetes, Obesity and Coronary Artery Disease via Genomics.* He said there has been a "sea change" in the understanding of the pathogenesis of coronary artery disease (CAD), particularly in the importance of inflammation in the process. As an example, he said that "CRP trumps LDL." C-reactive protein (CRP) is a circulating marker of inflammation and recent data has shown that CRP is more predictive of coronary events than low-density lipoprotein, or LDL, the "bad cholesterol." Topol reviewed mechanisms by which adipose tissue and macrophages participate in the etiology of CAD. He then went on to introduce the importance of translational medicine and "The Genomics Gold Rush" in future therapies for diabetes, CAD, and other diseases in which a combination of sequence polymorphisms at several genetic loci is involved. He pointed out that a risk locus for both type 2 diabetes and CAD maps to a relatively precise region of chromosome 9 that lies between two genes but in a region devoid of coding sequence (or open reading frame). Hence, several lines of attack are required to link basic research discoveries to clinical relevance.

Finally, Christopher Newgard, Director of the Steadman Institute of Nutrition and Metabolism at Duke University, presented data demonstrating the power of using NMR to study metabolism. While most basic research looks at steady state levels of mRNA, proteins, hormones, signaling molecules, or metabolites, all of which are static measurements, this approach uses stable isotopes of carbon and hydrogen to follow the flux of fuel molecules through the pathways of intermediary metabolism. Newgard's group is applying this approach in combination with expression microarrays, traditional biochemistry, mass spectroscopy for "metabolomic" profiling, and genetics to follow patients in various weight loss trials. Newgard presented proof of principle data comparing obese to lean individuals in a baseline state. He found that a major difference between the two groups was in branched chain amino acid catabolism that is defective in obese individuals. Animal studies followed, where the combination of a high fat diet supplemented with branched chain amino acids induced insulin resistance. This calls into question the suitability of Atkins and South Beach diets, for rodents if not for humans! The application of these tools in comparing various weight loss regimens in patients should be quite revealing.

It was an information-intensive symposium and only a few of the highlights are presented here. With such powerful new technologies, novel insights into the interplay of various signaling pathways, and an explosion in genomic information, we are well on our way to radical changes in the practice of medicine and the potential for novel and individualized therapies.

The work presented by Olefsky on the role of BMDC in insulin resistance is available as a free full text epub ahead of print (October 4) at JBC online. A commentary on The Genomic Gold Rush by Topol et al. is a good summary of the promise, pitfalls, and economic issues of the genomic revolution and implications for drug discovery and medical practice (JAMA 2007, 298:218-221).

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About the AWIS Newsletter

The AWIS Newsletter is published six times per year and provides AWIS members and supporters with information on Chapter activities, career development, and issues related to women in science.

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If you are an AWIS-SD member, we encourage you to contribute articles to the Newsletter. Please send articles as MS Word attachments to newsletter@awissd.org. News articles should not exceed 250 words, and event summaries should not exceed 500 words. Feature articles (special-interest stories and profiles) should not exceed 1000 words.

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Update your contact information! Go to the member services page using the following link:
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