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Foundation for Science and Disability Newsletter

President's Corner



October 2009

It has been a pleasure serving as chair of the student grants committee of the Foundation for Science and Disability (FSD) for the last several years, interacting with future colleagues at the beginnings of their careers. In this Newsletter, we are pleased to feature the Awardee of the 2009 FSD Student Grant, Emma Sacks, seen in the photo below. Ryan McKindles, who received the 2008 award, and previous awardees, Cheryl Fogle and Cassandra Quave, also have sent us

updates on their progress.

This year's newsletter also features a report from Sherry Chavez, who is finishing up a PhD in Chemistry at the University of Utah. Sherry has written up a guide to some products and adaptations that have helped her function in her organic chemistry laboratory.

Robert Van Etten, who has provided excellent service as FSD Treasurer for the last two years, is stepping down at the end of his term in February 2010. Angela Foreman,

Assistant Professor of Science and Mathematics at the Rochester Institute of Technology, National Technical Institute for the Deaf, has been nominated for the position. My term as FSD President will end in February 2011. Erica Penn, Biologist, Center for Aerobiological Sciences, US Army Medical Research Institute for Infectious Diseases, has been nominated for this position. Please fill out the ballot and the membership form and send both back to Robert Van Etten.

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Richard Marklin
10/08/09



Pledge board signed by African heads of state at Conference on Maternal and Child Health in South Africa, agreeing to make maternal and child health a priority in their countries

Notes from Student Awardees

Emma Sacks

Low birth weight and prematurity contribute to approximately one third of newborn deaths and to an unknown amount of subsequent disability. I am interested in finding ways to reduce the mortality and morbidity of newborns in developing countries by improving the identification of ill newborns and enhancing the care they receive at birth. This past year, I completed all of my course requirements and was the teaching assistant for two global health courses at Johns Hopkins. I am currently working on getting various committee approvals (ethics) to pursue my Low Birth Weight

Qualitative research on home-based care of premature (low birth weight) infants in sub-Saharan Africa

project and I am looking forward to beginning the fieldwork phase of my research. In November, a trip is planned for Tanzania, where I will meet with a group of African midwives who are working to improve newborn care practices in local hospitals and clinics. I am hoping to make a return visit to Tanzania and Kenya in the spring as well. I was recently a co-author on a paper examining incidence of



newborn infection in Bangladesh (Darmstadt, GL, et al. Population-Based Incidence and Etiology of Community-Acquired Neonatal Bacteremia in Mirzapur, Bangladesh: An Observational Study. *Journal of Infectious Disease*. 2009 Sep 15;200(6):906-915.)

Ryan McKindles

This last year has brought about some dramatic changes in my research focus and thesis direction. Although I continue to broaden my knowledge of neuroimaging, signal processing, and neuromechanics, I have decided to focus my thesis on the motor control of walking.

Conventional electroencephalography (EEG) recordings in humans are difficult to acquire during gait due to motion artifacts and small signal amplitude. Therefore, my research uses modulation of somatosensory evoked potentials (SEPs) as a probe to indirectly measure underlying cortical activity during walking.

Motor control of walking

Preliminary results have confirmed SEP temporal morphology similar to previous literature, where signals over sensory/motor cortical areas that are associated with leg movement show distinct differences between standing and walking. My current research examines the frequency content of these EEG signals, especially the beta-gamma frequency band (20 to 40 Hz), which correlates with sensory and motor cortical activity.

In future studies, this technique will be used to evaluate the effects of different interventions to promote or inhibit cortical involvement during locomotion. Particularly it



will be used with disabled populations, such as people who have had a stroke or spinal cord injury, in hopes of increasing our knowledge of the motor control of movement to develop better rehabilitation strategies.

I am excited to be presenting this data at both the Biomedical Engineering Society and Society of Neuroscience conferences this coming October.

Cheryl Fogle

In May 2010, I expect to graduate with my Ph.D. in Anthropology from the University of New Mexico in Albuquerque. I am studying the stylistic similarities and differences among stone projectile points

Spear tips of Great Plains Paleoindian hunters

(spear tips) that were made and used by prehistoric, Late Paleoindian hunters of the Cody Archaeological Complex who inhabited the American Great

Plains approximately 9000 years ago. I have examined just over 400 projectile points housed in four museums: the Smithsonian Institution National Museum of

Natural History, Texas Archaeological Research Laboratory in Austin, University of Colorado in Boulder, and University of Wyoming in Laramie. The projectile points are from 13 archaeological sites: 6 in Colorado, 4 in Wyoming, 1 in Nebraska, and 2 in New Mexico.

The manufacture of projectile points is a process that requires multiple stages to complete. After the stone is quarried, flakes are removed, and there are several techniques to produce the

projectile point. There are regional projectile point styles because flintknappers learn how to manufacture tools from members of their own social groups. Characteristics of these regional styles include cross sectional shape (flat or diamond), range of metric dimensions, and flake scar patterns that show how material was removed from the artifact during manufacture.

My dataset contains 6 quantitative variables and 4 qualitative variables, and I'm still in the

process of analyzing the data. I am using the ANOVA procedure to see if there are statistically significant differences among the archaeological sites. I have some comparisons to run based on geographic proximity and others dealing with temporal differences between earlier (9500 years ago) and later sites (8500 years ago). Previous researchers have analyzed two or three sites, but I will be the first investigator to analyze a large number of Cody Complex sites.

Cassandra Quave

I am currently a post doctoral fellow in the Department of Microbiology and Immunology, College of Medicine, at the University of Arkansas for Medical Sciences in Little Rock, AR. This fellowship is funded by a grant from the National Institutes of Health: Ruth L. Kirschstein National Research Service Award for Postdoctoral Training in Complementary and Alternative Medicine (F32). The focus of my research involves the study of natural products from Italian medicinal plants and their potential to prevent the formation of staphylococcal biofilms. Biofilms caused by *Staphylococcus aureus* are the primary culprits in many infections subsequent to orthopedic surgery, including osteomyelitis and implant related infections. As an amputee, and previous victim of osteomyelitis following the amputation of my right leg at the age of three, I have a very personal interest in the development of novel therapeutics that could be used to prevent the post-operative formation of staphylococcal biofilms.

Potential of natural products to prevent formation of *Staphylococcal* biofilms

This year, I have given presentations on my research at several scientific congresses, including the annual meetings of the Society for Economic Botany, the Society of Ethnobiology, and the Oxford International Conference on the Science of Botanicals. I have also recently published my first book, entitled "Medicina Popolare del Vulture. Traditional Medicine of the Vulture-Alto Bradano area, southern Italy." The book is bilingual (Italian and English) and is geared towards a lay audience, describing the traditional medical practices of this region of southern Italy. Remedies made from plant and animal products are discussed and descriptions of several magical healing rites are also included.

I am still undecided as to the direction of my career, and am debating whether to pursue academics or employment in the private sector (pharmaceutical



biotechnology). I am very interested in continuing my research in what some would call "translational ethnobotany" – which involves learning about traditional medicines from different cultures and gathering clues from this knowledge for applications in drug discovery and development. To read more about my work, feel free to visit my website for updates and free access to my publications: www.ethnobotanica.us.

Student Grant Awardees since 1990

1990	Wendy Pava, Birgit Wolz, Elaine Hall	2000	Jennifer Last
1991	Kevin Wilkins, Shan Ming Lee	2001	Cassandra Quave
1992	Meghal Antani, Lynn Hanninen, Mara Frohlinger	2002	My Lien Nguyen
1993	David Fass, William Hylton	2003	Mark Woods
1995	Chris Tromborg	2004	Jessica Mahood
1996	Anne-Michelle Singleton	2005	Cheryl Fogle
1997	Leslie Harper	2007	Melodi King
1998	Maura O'Modhrain	2008	Ryan McKindles
1999	Joseph Barbera, Byunggyoo Kim	2009	Emma Sacks

A Guide for Laboratory Adaptive Devices Problems and Solutions for Independence in a Chemistry Lab Sherry Chavez, University of Utah

In my second year of graduate school I was diagnosed with Rheumatoid Arthritis. My battles with this autoimmune disease had begun to take a toll on some of my fine motor skills that I need to perform every day tasks in the lab. Not giving up. I am on a continuous quest to remain a functional, productive and happy chemist. Every time I am presented with a new problem I search out solutions but there are not many available for problems with the upper extremities so I make my own solution.

Keep in mind these products were not designed by a doctor, occupational or physical therapist. Please consult your medical team to design the perfect lab setup for you.

Here are some problems that I have encountered and some solutions that I have designed.

When doing an extraction, turning the stopcock on the separatory funnel can be difficult due to instability of joints in both the thumb and first finger.

The Chemist's Little Helper. (AKA Stopcock Turning Thingamajig) was the first adaptive equipment I designed.



Originally made from popsicle sticks, glue, a plastic syringe, and duct tape, it was light weight and easy to use but lacked stability and solved resistance. The second generation was much more adaptable to an organic lab environment.

Our machine shop made the first Helper out of aluminum. This proved to be too heavy for smaller scale tasks but works well for large scale extractions and for reactions that contain toxic reagents such as tin. (It can easily be decontaminated by soaking in dichloromethane or bleach)

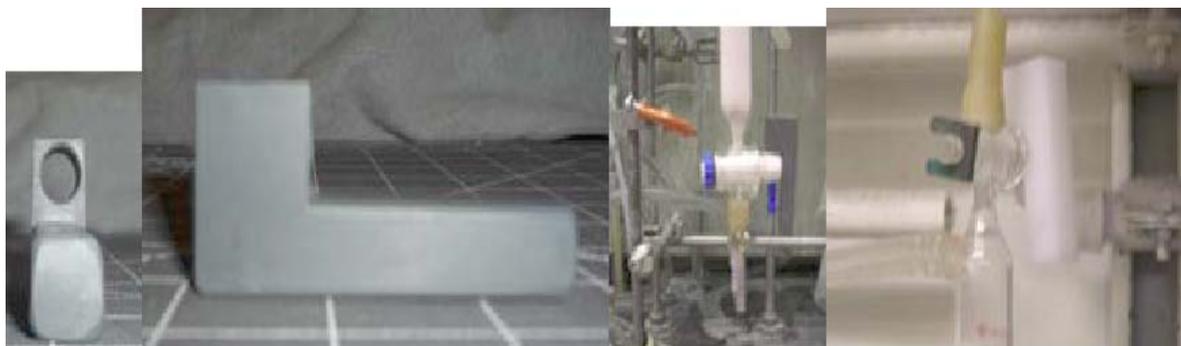


A Teflon® version was also made that is much lighter in weight and is dichloromethane-resistant. Both models come with 2 different size bore holes that will accommodate both small and large stopcocks.

To use, take the sep. funnel out of the stand, place the Helper on the stopcock handle, shake, and push the Helper away from you with your palm to open. To close you simply rotate it over and pull towards you.



A second set of smaller Helpers were made that contain a single size bore hole and fit perfectly on stopcocks on columns or rotovaps.



One major issue I had was turning the star knobs on my hood to turn on the water, nitrogen and air lines. Turning the knobs put my wrist at a very strange angle and exerted a lot of pressure on a lax joint. Again, our wonderful machine shop helped me design these covers.



The plastic covers fit snugly over the existing knobs and are secured with an Allen screw. They allow me to turn the knob with the palm of my hand. These put no force at all on my fingers and my wrist is in a more neutral position.

The faucet on my sink proved to be a challenge due to its height and angle. The plastic covers did not provide the torque needed to turn the faucet on and off without putting pressure on my wrist.

The solution was adding a handle to provide the necessary leverage. A sewer pipe cap covers the faucet and is secured with a clamp. Weaved into the larger clamp is a smaller clamp that attaches a short piece of PVC plumbing pipe that acts as the needed lever. All of these supplies were found for under \$30 at ACE Hardware.



We don't have automated fraction collectors so our column chromatographs have to be done by hand. I needed a way to help me move the test tube rack fast enough to keep up with the pressurized column flow and at the same time allow me to sit in a comfortable position for an extended period of time.

The Adjustable Test Tube Slider is made from small PVC plumbing pipe (same as used for the sink handle) and elbow joints purchased from Home Depot for about \$20.



It fits snugly around the test tube rack and can be adjusted for all 3 size racks we have (standard racks for 10x75 mm, 13x100 mm, and 18x150 mm test tubes)

The handles can be adjusted to any length to allow for good posture and optimum wrist and arm angle. By pushing or pulling slightly on the handles, the test tube rack slides smoothly in any direction.

I love the 1 L amber bottles we have for solvent dispensing, but lifting them to pour solvent is very hard on my wrist and elbow. Because I have small hands, sometimes it is difficult to get a good grip on the bottle particularly when it is full and I am wearing gloves. I found an interesting chrome bottle holder for a soda bottle on the internet but the bottles I use are smaller than that and the email listed with the product is no longer active. So I designed something based off what I liked about that holder.

The Solvent Bottle Hugger is made from plastic coated wire found at ACE Hardware (\$8 for 100 ft.) and Thermoplastic pellets ordered from a medical-physical therapy supply store. (\$15 per pound, prices vary).



The plastic coated wires secure the handle against the solvent jar and can easily be removed for use on another bottle. The handle is molded from Thermoplastic pellets for a comfy-custom fit. The handle design allows you to lift and pour like you would a pitcher of tea or you can use it to assist your grip by securing the back of your hand.

Finally, the small C-clamps you get at any hardware store for \$1-3 are perfect for adapting the flat screws on monkey clamps. The clamp is a much bigger surface to grab particularly when trying to clamp something down in a tight space or awkward angle.



Acknowledgments: Special thanks to: Dennis Romney from the University of Utah Department of Chemistry Machine shop for the construction of the Knob adaptors and The Chemist's Little Helper, and to Dr. Bob Gilles who helped me design some of the initial concepts and critiques of all the prototypes.

A list of material, estimated cost, and building instructions can be obtained by contacting Sherry Chavez at chavez.sherry@gmail.com. All products and rights are reserved.

**The next annual meeting of FSD is February 18-22,
2010 at the AAAS conference in San Diego**

Minutes of the Annual Meeting of the Foundation for Science and Disability (FSD)
February 13, 2009
Hyatt Regency Skyway 261
Chicago, IL 60601

Call to Order - 9:00 am

Attendees:

Caroline Adenberger (adenberger@ostina.org)
Ted Conway (Tconway@nsf.gov)
Anna Fong (annafongca@gmail.com)
Angela Foreman (AngelaLeeForeman@yahoo.com)
Lorna Gonzales
Richard Mankin (rmankin@nersp.nerdc.ufl.edu)
Erica Penn (ericalyne@aol.com)
Virginia Stern (vsfern@aaas.org)
Michelle Hamlet (hamletm@mail.nih.gov)
Dan Poux (dpoux@aaas.org)
Helen Jones
Bob Ingram

Each attendee gave brief descriptions of their current professional activities. Caroline Adenberger discussed the interest of the Austrian Embassy, Office of Science and Technology in US programs and activities that enhance participation of scientists and engineers with disabilities in the work force. Michelle Hamlet discussed NIH programs that may be of interest to postdoctoral associates and scientists with disabilities. Dan Poux discussed the AAAS fellowship program. The minutes from the last meeting (February 16, 2008 - Boston, MA) were reviewed and approved as posted at <http://www.ars.usda.gov/sp2UserFiles/person/3559/annmeetminute08.html>.

Treasurer's Report

Robert Van Etten (not present) submitted a report for the 2008 calendar year.

	<u>2007</u>	<u>2008</u>
Initial Assets		
Cash on hand	9748.57	10,553.57
Total Initial Assets	9,748.57	10,53.57

Income		
Dues	805.00	610.00
Contributions	--	525.00
Interest	--	--
Total Income	805.00	1135.00
<hr/>		
Expenses		
Newsletters	--	0.00
Student Awards	--	1,000
Bank Service Charge	--	0
Total Expenses	--	1,000.00
<hr/>		
Net Income	805.00	135.00
Net Balance	10,553.57	10,688.57

Science Student Grant Committee Report - Richard Mankin

Committee - Richard Mankin, Betty Weaver. Four of 23 applicants met the grant application criteria. The membership approved the committee recommendation that a grant be awarded to Emma Sacks, a Ph. D. student in Public Health at Johns Hopkins University, for a study entitled, "Qualitative research on home-based care of premature (low birth weight) infants in sub-Saharan Africa."

Officer Nominations

Treasurer (for year beginning in 2010)- Angela Foreman, **President (for year beginning in 2011)-** Erica Penn

These nominees will be placed on the ballot in the next newsletter. Other nominations can be emailed to President Richard Mankin (rmankin@nersp.nerdc.ufl.edu). Deadline for additional nominations is April 1, 2009.

New Business

Ted Conway suggested that the Foundation for Science and Disability request proposals and award a grant to identify best practices that scientific societies and similar organizations could use in providing a welcoming environment for attendees with disabilities. Currently, most such organizations hold conferences and meetings that are "technically" accessible to persons with disabilities but, in practice, some of the facilities or activities may not be accessible without extreme efforts. The report developed from the grant would provide organizations with a better understanding of commonly occurring problems and successful solutions to such problems. The members authorized Ted Conway and Richard Mankin to prepare the proposal criteria and disseminate the request for proposals. The meeting adjourned at 11:00 AM.

Submitted February 19, 2009
Richard Mankin

About Angela Foreman, Candidate for FSD Treasurer



Dr. Angela Lee Foreman is a Deaf Scientist working with Deaf and Hard-of-Hearing (D/HH) students at the National Technological Institute for the Deaf (NTID) at Rochester Institute of Technology (RIT) in Rochester, New York as an Assistant Professor. Since starting at RIT/NTID in Fall of 2007, Dr. Foreman has been involved with teaching, tutoring, advising, and working on her research project with D/HH students. Dr. Foreman received her Ph.D. from University of California at Davis and her current research project involves investigating into the antibody variable region using the *Xenopus* frog model in infectious diseases. In December 2008, Dr. Foreman was appointed as a member of the Committee On Opportunities in Science (COOS) within American Association for the Advancement of Science (AAAS)

Treasurer's Report—Robert Van Etten

Report for the period of January 1st – September 25th 2009

	<u>2008</u>	<u>2009</u>
<u>ASSETS:</u>		
Cash on Hand	10,553.57	10688.57
Total Assets	10553.57	10688.57
<u>INCOME:</u>		
Dues	610.00	100.00
Contributions	525.00	0
Total Income	1135.00	100.00
<u>EXPENSES:</u>		
Newsletters	0	0
Student Award	1000.00	1000.00
Bank Service Charge	0	0
Total Expenses	1000.00	1000.00
<u>NET INCOME:</u>	135.00	(900.00)
<u>NET BALANCE</u>	10688.57	9788.57

Above is the treasurer report with a net balance of \$9,788.57.

Foundation for Science and Disability 2009 Ballot and Dues Notice

BALLOT

Treasurer (beginning 2010):

_____ Angela Foreman

_____ Write in: _____

President (beginning 2011):

_____ Erica Penn

_____ Write in: _____

Membership Application / Renewal Form

Dues Schedule:

Please make checks out to:

Student \$5.00

Regular \$25.00

Foundation for Science and Disability

and mail to:

Contribution _____

Robert Van Etten

4981 SE Sterling Circle

Total _____

Stuart, FL 34997

Please list a change of address, if any, and / or list any comments for the Board of Directors below. Also, please forward us your email address if you have not already done so.

Foundation for Science
and Disability

<http://stemd.org>

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Gainesville, FL 32607

Return Service Requested

Phone: 352-374-5774

E-mail: rmankin1@aim.com

The logo for the Foundation for Science and Disability (FSD) consists of the letters 'FSD' in a large, bold, serif font. The letters are dark teal with a lighter teal outline, giving them a three-dimensional appearance.

The Foundation for Science and Disability (<http://stemd.org>) was founded in 1978 to promote the integration of persons with disabilities into the mainstream of the scientific community. A major focus of FSD has been the removal of barriers that restrict opportunities to develop careers and conduct scientific research. The Foundation also provides grants to students with disabilities who are conducting research in the fields of Science, Technology, Engineering, or Mathematics.

President: Richard Mankin (rmankin1@aim.com)

Treasurer: Robert Van Etten (robvanetten@comcast.net)
