Members-at-Large NEWSLETTER

National Honor Society for Women in Chemistry **June 2004**

Meredith Shetley Wins 2004 MAL Award!

Meredith Shetley, a Chemistry major at Missouri Southern State University, has returned to school after dropping out of high school to support her family. While working at a local pharmacy she disovered that she really enjoyed the work, but wanted more. So she enrolled at the local community college, Northeastern Oklahoma A&M, in Miami, Oklahoma and started taking pre-pharmacy courses. Since she had never taken a class in chemistry before, her advisor suggested she take the lowest level course. She found herself not only understanding what she was learning, but enjoying the subject as well. At this point, she decided that she wanted a career in Chemistry. Meredith wishes to be called Dr. Shetley one day. With her goals set, she had to decide the area in Chemistry to pursue. She really enjoys Biology as well as Chemistry. She plans to go to graduate school in Biological Chemistry or some aspect of Pharmaceutical Chemistry.

Her nominator, Dr. Marsi E. Archer writes: "Meredith has returned to school and is one of the most promising students (nontraditional or traditional) I have ever seen. Meredith received one of the highest grades in a fast-paced summer General chemistry course that contained several very bright and highly motivated students. She was always willing to answer questions in class and learned difficult concepts quickly. In class and in lab, Meredith worked well with her peers. She and her lab partner worked efficiently, and were usually the first out of the lab with lab reports that demonstrated a high level of proficiency in their laboratory skills, written language skills, and understanding of chemical concepts. She has maintained a 3.79 GPA while balancing her chemistry coursework with her family."

Recommender, Dr. Michael P. Garoutte writes: "Meredith is making the most of a difficult situation. She dropped out of high school and obtained her GED in 1997. Meredith is a wife and mother and has recently had to mover her household to another state. She is trying to afford daycare and deal with all those scheduling issues while taking a full load of coursework. Commendably, she is overcoming all these challenges and is succeeding in her studies. She works together well with other students, and while budgeting her time carefully, helps (and receives help) from them on a regular basis. She has a clear goal for her career, and is admirably doing everything she can to reach that goal."

Members of the MAL Award committee made the following comments. "Meredith Shetley epitomizes, I believe, the type of female scientist that this award was designed to help. She has struggled with early motherhood and overcome difficulties to excel academically despite being out of academics for 4 years. She has well-defined goals, to pursue graduate studies in the Pharmaceutical area, and she obviously has the skills and determination to achieve those goals. She has shown that she can overcome difficulties and has the potential to be an outstanding scientist." Denise Mills.

"I was impressed with Mrs. Shetley's persistence in completing her GED, returning to college, and taking a chemistry course despite her fears of the subject. She has exhibited a positive attitude in overcoming difficulties and determination in reaching her goals." Carol Brevett.

"Meredith Shetley has become an outstanding student in her undergraduate chemistry courses despite responsibilities to her family. Her 3.79 GPA at Missouri Southern State University speaks well for her academic abilities, and her work experience as a Pharmacy Tech will be invaluable for her further studies in Biological or Pharmaceutical Chemistry. She says, "I wanted more than a B.A. I want to be called Dr. Shetley one day." I hope that the MAL scholarship helps her achieve that goal." Ruth Russso.

The MAL Scholarship Committee Bobbijo van Beusichem, Carol Brevett, Denise Mills, Gabrielle Rum, and Ruth Russo, had a challenging decision for this year's tough competition. Thanks for all your work and contributions!

Donate to the MAL Award Fund!

You should notice the insert in this issue of the MAL Newsletter is a form requesting donations to support our MAL Award. It's a great way to support promising students,

really neat ladies, and Iota Sigma Pi! Any amount is welcome and tax deductible. I have enclosed an envelope and a form addressed to the MAL treasurer, Donna Iannotti. Please make your check payable to Iota Sigma Pi, and you can put MAL Scholarship Fund on the memo line if you wish.

Websites

For the national □□□

http://www.iotasigmapi.info/

For MALs

http://www.iotasigmapi.info/MAL/

Member Get-a-Member Campaign

As MALs, we have a policy in place for nominating new members. If you get two new members to join within a year, you are eligible for free □□□ merchandise from the supplies coordinator. National council lets you use the honor system so when you've found to tell the supplies coordinator and she will send you something. The new supplies coordinator is

QuynhGiao N. Nguyen
NASA John H. Glenn Research Center at Lewis Field
Mail Stop 106-1 Environmental Durability Branch
21000 Brookpark Road
Cleveland, Ohio 44135
Email: Quynhgiao.N.Nguyen@NASA.gov

Look around you. Are there colleagues, subordinates, friends or students who qualify? Qualifications for membership can be found on our website mentioned above. Remember, *students don't need to be majoring in chemistry, but must have taken the minimum of chemistry courses (see the undergraduate qualifications). Professionals also just need to meet the minimum number of Chemistry credits, they don't need to be working as Chemists.* You can contact me for application forms. I look forward to seeing your nominations for new members. institutions and chemists in the area must be included.

MAL Listserv

Unfortunately, our Listserv is no longer functioning. We need a new list serve. We need a volunteer to start a new one. Please contact me ASAP is you think you might be interested!

The Atkins Diet & the First Law Are Both Scientifically Sound

In our book, *The Modern Nutritional Diseases*, we explained the biochemistry of why low-carbohydrate diets, such as that of Atkins, result in weight loss. Although our book does not recommend the Atkins diet, except perhaps for people who are obese but otherwise healthy, a number of readers took issue with the scientific basis for the Atkins Diet and raised a question about the soundness of the First Law of Thermodynamics. The following is our response.

We learned a long time ago that when our data were in disagreement with the First Law, the reason (always, for sure) was that our data were somehow wrong. There are no reasons to doubt the First law, and there is nothing magic about the Atkins diet.

The human body uses dietary components (fat, protein, and carbohydrate) in ways that sometimes make it seem that calories do not add up. The error here is that although all calories are the same when burned in a bomb calorimeter, they do not always appear to be the same when metabolized and used by the body. To assume the human body, an almost infinitely complex dynamic system, works like an ordinary furnace or bomb calorimeter is to greatly oversimplify the matter.

According to the First Law of Thermodynamics, "energy in" equals "energy stored" plus "energy out" (with appropriate plus or minus signs). However, this energy balance cannot be useful in nutritional studies unless the terms, "energy in," "energy stored," and "energy out" are meticulously and accurately measured, including energy transfers via the respiratory system and excretory routes.

Most of the confusion about diet that arises in discussions of dietary energy balances is caused by failure to carefully define, understand, and measure these terms before announcing the discovery of problems associated with the First Law.

The body not only converts food to energy, but also converts food (protein and fat) to tissues such as muscle, brain, and bone, and to a host of other biochemicals that are required to grow and to replace all of these body components. It stores calories in excess of its requirements as fat or glycogen, and it excretes some calories with digestive and metabolic waste products.

Several points relating to the Atkins diet and the First Law can be drawn from the above. Point #1: Any energy balance must recognize that dietary fat and protein are not all burned to heat, CO_2, and H_2O, but also are used as construction materials. The low-fat, low-protein, high-carbohydrate diet widely promoted for good health frequently does not provide enough fat and protein to satisfy the body's optimum need for construction materials. Carbohydrates cannot fill this need. What carbohydrates can do is raise insulin levels, stimulate synthesis of cholesterol, and cause deposition of body fat. Individuals trying to lose weight by seriously following the low-fat, low-protein, high-carbohydrate diet, usually lose weight at first, but after a short time begin burning off muscle mass followed by deposition of fat, particularly around the midsection.

Point #2: Diets affect intensity of hunger. The biochemical mechanism for stimulation of hunger is well known. High-glycemic carbohydrates are quickly converted to glucose, causing a rapid rise in blood glucose levels. High blood glucose stimulates a rapid release of excess insulin, and a rapid drop in

blood glucose follows. The resulting hypoglycemia creates a demand, expressed as the sensation of hunger, for more glucose. This type of dietary regime has several adverse outcomes: The roller coaster hyperglycemia/hypoglycemia (or unstable blood glucose) is stressful to the body and can lead to insulin resistance, obesity, and type-2 diabetes. In an effort to prevent damage from high blood glucose, insulin directs the metabolism of excess glucose to body fat and cholesterol.

In contrast, people on low-carbohydrate diets usually eat less because they are not constantly hungry. Atkins-type diets, with ample fat and protein, satisfy hunger at mealtimes with relatively few calories, and intense hunger does not occur between meals. The reason is that dietary protein and fat do not affect blood glucose. Hence, the Atkins-type diet (with its low levels of carbohydrates) avoids the unhealthy insulin spikes induced by high carbohydrate diets.

Point #3: The Atkins-type diet induces the burning of body fat. In the absence of high-glycemic carbohydrates and the accompanying insulin spikes, the conversion of glucose to body fat and cholesterol does not occur. Further, to preserve glucose for maintenance of blood glucose levels, body fat is mobilized and converted to ketone bodies. Ketone bodies are then used for energy in place of glucose. Ketone bodies in excess of the need for energy are excreted in breath and urine along with the calories they contain. This ketone pathway is a normal metabolic pathway routinely used by the body to supply energy when glucose supplies are limited. Dietary ketosis, if it occurs, bears no resemblance to diabetic ketosis.

To sum up, the Atkins-type diet has a sound scientific basis. And if the energy balance equation accounts for all energy movements in and out of the body, no diet, including the Atkins-type, would violate the First Law of Thermodynamics.

Alice Ottoboni

Questions for Thought & Response

Is water really better than soda pop? We have run several articles concerning the American diet and how it affects health. Recently there has been a lot of attention to soda pop drinks as a potential cause for obesity. For example a recent article in the local newspaper reports that a high intake of sweetened carbonated drinks probably contributes to childhood obesity and that this is leading to a movement to cut back on the availability of soft drinks in schools ('Ditch the fizz' by Emma Ross, *Grand Forks Herald*, Section 1B, April 23, 2004). Research examining the effect of children drinking carbonated drinks (J. James et al., in the *British Medical Journal*, doi:10.1136/bmj.38077.45838.EE published April 23, 2004) concludes that a modest reduction in the number of carbonated drinks consumed is associated with a reduction in the number of overweight children.

I have also been recommended by a variety of health care professionals to drink more water and less pop (sweetened or diet) and coffee. I've even heard Opra Winfrey say the same on television. Here is a simple experiment that was inspired by my massage therapist, JoAnn Cory, to help get the point across that what you put into your body can really affect your health. It should be a fun simple experiment that might provide insight into why water is better than soda pop. It's good summer project for kids or adults, and I'll be very happy to publish your results in our newsletter.

Find good seeds of your favorite local plant. Get good quality potting soil. Place the soil in two or more pots. Place a few seeds in each pot. Be sure to label each pot by what liquid you plan to 'water' it with (e.g., tap water, sweetened soda pop, etc.). If you want to compare a lot of different liquids, you could compare bottled water, tap water, water out of a local source (river, stream, pond or lake) different kinds of pop including sweetened and diet, coffee, etc. You don't need to compare a lot if you don't wish to, just water versus some favorite drink. Put all your pots in a place where they can receive the same amount of sunshine, preferably the amount recommended for that particular plant. Then 'water' one as directed with real water and the others with soda pop (or whatever your favorite beverage is). Be sure to follow the labels you put on the pots. Follow the progress of your seeds for at least a month. Make observations, preferably daily (like taking notes in a laboratory notebook). In a month, is there an observable difference in the resulting plants?

When I proposed this idea to my colleagues, they just laughed an said it would backfire because they were certain that a strongly acidic soda pop would win. Considering the soil available in my apartment complex's back yard, they may be right; it's so alkaline is has trouble growing grass. This is why I mentioned using good quality potting soil. This experiment could potentially turn into an interesting science project for kids or just a fun conversation piece for adults. Please share your results; they should be quite interesting.

Kathryn Thomasson, kthomasson@chem.und.edu

Member News

Bobbijo van Beusichem writes "In August, I started a new job at Ciba Specialty Chemicals in Tarrytown, NY as a Staff Scientist managing one of the Separations Labs."

Donna Iannotti writes "Just wanted to share the good news--my grant got renewed, so I'm gainfully employed until the fall of 2005 at U of FL. Which gives me another year plus to look for a more permanent solution."

Coretta Fernandes shares a link of an article in the Lansing State Newspaper about the Science Olympiad. http://www.lsj.com/news/schools/040229_olympiad_1b-3b.html. Coretta organizes and holds this event at her college every year for high school and middle school kids. She has been interviewed for TV and the interview will be broadcast on MI cable TV.

Sue Marine writes: "Last week was Spring Break for us. My family went to the big island of Hawaii to celebrate my tenure and promotion, my 50th birthday, my son's 50th state, all in the 50th US state! (It was the 50/50/50 trip.) Yes, the final approval has been received from the Miami University Board of Directors that I will be tenured and promoted to associate professor effective July 1, 2004, with the new school year. What a long process! I am relieved it is over, and I thank all of you for your support and help through the years.

Postdoctoral Position Available

Applications are invited for a postdoctoral research associate position in theoretical/computational chemistry at the University of North Dakota. See http://www.iotasigmapi.info/positions.htm for more details.

Joke of the Day

Five tips for a woman:

1. It is important that a man helps you around the house and has a job.
2. It is important that a man makes you laugh.
3. It is important to find a man you can count on and doesn't lie to you.
4. It is important that a man loves you and spoils you.
5. It is important that these four men don't know each other.

MAL Newsletter
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