Corrine Kvamme, a Chemistry major at the University of North Dakota, is also a Registered Nurse who has returned to school with the ultimate goal of acceptance into medical school. Her educational journey brought a newfound interest in chemistry. She does undergraduate research with Dr. Irina Smoliakova. The research involves preparing exo-glucal, a complex carbohydrate derivative. The compound is synthesized using a sequence of five reactions and requires thoroughness at each step. Corrine finds the work both enriching and challenging. She has presented her work at the national American Chemical Society conference in New Orleans this past spring. Corrine says she has discovered the importance of chemistry in all walks of life.

Her nominator, Irinia Smoliakova, writes: "Corrine is a very pleasant, smart, focused, and very energetic person. She has many friends. Last spring, the chemistry students elected her President of our Undergraduate Chemistry club." Her other recommender, David Tilotta, noted that Corrine often asked questions in class that showed a "real world" appreciation for modern chemistry. He felt that her appreciation stems from the fact that Corrine is an older-than-average student who gained valuable insight while working before returning to school.

The MAL Award committee had the following to say about Corrine's application. "Her high grades, her career switch, and experience in her previous career will yield a chemist who has a unique perspective on potential beneficial uses of chemistry in society." Carol Brevett. "In addition to her "book" knowledge, she also is able to use her classes and knowledge in an applied way. She is a leader in the classroom and the laboratory." Donna Ianotti. "She represents the meaning of the MAL award, and has demonstrated a true love of chemistry - going beyond what some starting chemistry majors never achieve, or desire." Gabrielle Rum. "Ms. Kvamme represents the spirit of the MAL award. It is refreshing to read about a person's enthusiasm for chemistry, especially for research. I could feel her excitement about presenting at a national meeting and mingling with other scientists. Anyone who wants to make a career change needs the encouragement of her colleagues. Collegiality is the fuel that keeps science alive." Rosanne Savol

I would like to thank all the Iotans who served on the MAL Award Committee this year: Carol Brevett, Donna Ianotti, Gabrielle Rum, Rosanne Savol, and Helen Stewart.

Make a Donation 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. Last year we successfully auctioned off the quilt. This year I'm resorting to the 'please send money' plea. 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 treasure, Vicki Grassian. Please make your check payable to Iota Sigma Pi, and you can put MAL Scholarship Fund on the memo line if you wish.

Questions for Thought and Response

The information about Alice and Fred Ottoboni's book titled: *The Modern Nutritional Diseases - Heart Disease, Stroke, Type-2 Diabetes, Obesity, Cancer - and How to Prevent Them* has generated questions. Grace Miller asks for clarification concerning Diabetes and heart disease. She writes: "The American Diabetes Association is saying that Diabetes is not a risk factor for heart disease, but that Diabetes IS heart disease. I'm trying to figure all this out. It is particularly difficult when the American Heart Association has had difficulty dealing with this data and still blames fat for heart disease and hyperlipoproteinemia." Alice Ottoboni has responded with the following article as a potential explanation.

Fat Does Not Make Fat

"Fat does not make fat" is a frequently heard pronouncement from critics of the low-fat diet that governmental health and nutrition agencies have promoted for the past several
decades as "heart-healthy." Is there any justification for such and illogical claim? Actually, the answer is a qualified yes. There is an element of truth in it, but for an explanation, we must look to biochemistry.

After absorption into the body, all macronutrients that are not used for maintenance or repair are directed to the main energy-producing factory of the body. This factory, which converts the foods we eat to the chemical energy the body needs for its life functions, is known as the Krebs cycle, the citric acid cycle, or the tricarboxylic acid (TCA) cycle. The major entry point into the Krebs cycle is the biochemical acetyl-coenzyme A (acytetyl-CoA). Fatty acids are broken down to two-carbon units that become acetyl-CoA. Carbohydrates, which are composed almost entirely of glucose, go through a more complex series of reactions. Glucose is released, metabolized by a pathway termed glycolysis, and finally yields acetyl-CoA. Proteins are not generally used for energy, but suffice to say that, when they are, each component amino acid has its own individual pathway into the Krebs cycle.

For readers who are biochemists, acetyl-CoA is a familiar biochemical. For all other readers, the important point is that all of the macronutrients in our food funnel into a central pool (acyetyl-CoA) and that the energy-producing factory (Krebs cycle) is supplied from that central pool. The balance of this discussion deals only with the acetyl-CoA that is in excess of what the body needs for energy. This excess must go somewhere. The macronutrient composition of the diet comes into play here; it dictates what happens to excess acetyl-CoA.

High-carbohydrate diets direct excess acetyl-CoA to body fat and cholesterol. Low-carbohydrate diets direct excess acetyl-CoA to ketone bodies and foster mobilization of stored body fat. Regardless of carbohydrate content of the diet, the fate of acetyl-CoA is related to blood glucose concentration and the hormones insulin and glucagon. Here, we beg the indulgence of biochemist-readers because the explanation that follows is, of necessity, much oversimplified.

Diet high in sugars and starches (carbohydrate) cause a rapid rise in blood glucose, which, in turn, causes a release of high levels of insulin to prevent blood glucose from rising to life-threatening levels. To lower blood glucose levels, insulin undertakes several actions. For purposes of this discussion, the most important is to break glucose down to acetyl-CoA. To accomplish this, the existing pool of acetyl-CoA must be drawn down to make room for acetyl-CoA from glucose breakdown. There are two pathways for reducing the pool of acetyl-CoA. One is the pathway that makes and deposits body fat. The other is the pathway that goes to cholesterol. Incidentally, it is this pathway that the anticholesterol drugs inhibit.

Diets low in carbohydrates tend to be deficient in glucose; thus, rather than stimulating the release of insulin, the cause the release of glucagon, the hormonal counterpart of insulin. Glucagon's job is to keep the blood glucose concentration from falling too low. Glucagon uses several methods to protect the blood glucose level. First, in the absence of carbohydrates, it makes glucose from alternate sources. These sources are almost exclusively amino acids (protein). Human biochemistry can make new glucose from protein, but not from fat.

The second method glucagon uses to conserve glucose is to stop its use for energy by inhibiting its conversion to acetyl-CoA. To make up for the loss of acetyl-CoA from glucose, glucagon stimulates mobilization of body fat from adipose issue and its conversion to acetyl-CoA. This provides sufficient acetyl-CoA to supply energy through the Krebs cycle; however, there is a hitch. the Krebs cycle is bogged down because it needs glucose metabolites, now unavailable because of inhibition by glucagon, to function properly. Thus, acetyl-CoA must find some way other than the Krebs cycle to provide energy. Glucagon provides the other way by turning acetyl-CoA away from the pathway that insulin uses to make cholesterol to the pathway that makes ketone bodies. Ketone bodies are excellent sources of energy that the body uses when supplies of glucose are low, such as several hours after eating. Despite arguments to the contrary, they are normal and desirable biochemicals that are always present in our bodies.

Incidentally, ketone bodies that are not needed for energy are excreted in the breath or urine along with the calories they contain. This important fact is the basis for the very interesting debate about whether calories are or are not equal. Excess calories from carbohydrates are converted to body fat and/or cholesterol, whereas excess calories from fat (in the absence of carbohydrates) are excreted in the breath or urine and not converted to fat or cholesterol.

In summary, body fat is made from acetyl-CoA that is in excess of what the body needs for energy. The acetyl-CoA pool is derived almost exclusively from carbohydrates and fats, so theoretically they are equal contributors to body fat. However, as described above, body fat (and cholesterol) will not be made without stimulation by insulin, and only carbohydrates (glucose), not fats, cause insulin release. Dietary carbohydrates will make body fat even in the total absence of dietary fat, but dietary fats cannot make body fat without the presence of dietary carbohydrates. Thus, fat per se cannot make fat!

Alice Ottoboni

Do you know anyone who would be interested in marketing a diagnostic kit for vaginal yeast infections? A diagnostic kit for vaginal yeast infections is important
Welcome New Members

The following have become new members by National Council Action within the past quarter. 

Jacqueline Besinaiz, Kingsville, TX
Rachel Burdge, Burlington, VT
Kristine Carlson, East Grand Forks, MN
Hannah Chang, Princeton, NJ
Dorothy Gnann, Kennesaw, GA

Ashley Hopkins, Owasso, OK
Lindsay Keintz, Trenton, NJ
Cheryl Longfellow, Philadelphia, PA
Refinds Mawo, Grand Forks, ND
Jelena, Petrovic, Loretto, PA
Heather Whitney, Fort Collins, CO

Lindsay Keintz writes: "I am currently finishing up my junior year at Monmouth University, located in West Long Branch, NJ. I am working towards a Bachelors of Science degree in Chemistry with a Concentration in Advanced Chemistry, and will be graduating in May of 2004. While at school, I keep pretty busy tutoring my fellow students, working as a laboratory assistant, and participating in a research project with one of my professors (which will continue throughout the summer) -- detection of copper and lead using hydride generation laser induced fluorescence. I also enjoy playing the piano, rollerblading, and spending time with my family and friends in Mercer County, NJ."

Here is a notes from one of last quarter's new members:

Karen Wendling writes: "I am a senior at Chestnut Hill College in Philadelphia, PA. I am currently finishing up my double major in Chemistry and Environmental Science. I have been accepted into three chemistry graduate programs and am trying to decide which one to choose! It is an exciting time at Chestnut Hill College. We are an all-women's school that is going coed in the fall of 2003. While I am glad to be graduating, part of me wishes I could stay and observe my college's coed transition. One thing that I am sure of, though, is that my college will always remain a supportive environment for women in the sciences."

Member News

Ashika Severin writes that she is enjoying her studies at Morgan State University. She is in her senior year and graduated in May. She is applying to graduate schools, but is also interested in a job for a new BS in Chemistry graduate. She has a resume available: email: ashikaseverin@netscape.net.

Gabrielle Rum writes that on March 19, 2003, her son Nicolas, had his first birthday!

Zaida C. Morales-Martinez writes: "I was awarded the first American Chemical Society Women Chemists Committee Southeast Region Award for Contributions to Diversity in the chemical Science. The award consists of a plaque and $250 and it was presented at the Southeast Regional Meeting of the American Chemical Society (SERMACS) in Charleston, South Carolina on November 15, 2002. Also, Florida International University (FIU), where I have been teaching for the last 30 years, presented me with the University Distinguished Service Medallion for outstanding service at their Arts and Sciences"
Fall Commencement exercises on December 17, 2002. I will be retiring on June 30, 2003 after 46 years of college teaching. I will continue being the Mentoring Consultant for the American Chemical Society Scholars Program.”

**Joke of the Day**

Recall last time we had the a variety of answers to the question: Why did the chicken cross the road? Here is an answer submitted by Helen Stewart:

Shakespeare: “To cross or not to cross, that is the question. Whether it is nobler in the mind to suffer traffic..........................and by opposing.......To die.”

We have two jokes today. This one was submitted by Sue Marine.

In this life I’m a woman. In my next life, I’d like to come back as a bear.

When you’re a bear, you get to hibernate. You do nothing but sleep for six months. I could deal with that.

Before you hibernate, you’re supposed to eat yourself stupid. I could deal with that, too.

When you’re a girl bear, you birth your children (who are the size of walnuts) while you’re sleeping and wake to partially grown, cute cuddly cubs. I could definitely deal with that.

If you’re a mama bear, everyone knows you mean business. You swat anyone who bothers your cubs. If your cubs get out of line, you swat them too. I could deal with that.

If you’re a bear, your mate EXPECTS you to wake up growling. He EXPECTS that you will have hairy legs and excess body fat.

Yup...gonna be a bear