THE IOTAN

Iota Sigma Pi

National Honor Society for Women in Chemistry

February, 2004 No. 86

Iota Sigma Pi Honors Three Outstanding Students in 2003

by Vicki Grassian, (MAL) Director for Student Awards

ANNA LOUISE HOFFMAN AWARD FOR OUTSTANDING ACHIEVEMENT IN GRADUATE RESEARCH

Rachel Brewster

Georgia Institute of Technology

Professor Katherine L. Seley describes Rachel "Beth" Brewster as a "top-notch" scientist. Professor Seley goes on to call Beth a self-starter, excellent mentor to undergraduates and one of the brightest and most dedicated students she has ever met. Beth's graduate research is in the general area of organic chemistry and is focused on designing molecular capsules and catalysts using calix[4]arenas as peptide scaffolds. She has won several other honors and awards for her research including the Suddath Memorial Award for work in Bioscience and she was named a Pfizer Fellow at the Gordon Research Conference on Natural Products.

Undergraduate Award for Excellence in Chemistry

Mary Rozenman

Columbia University

Professor Ronald Breslow describes Mary Rozenman as an absolute superstar and one of the most impressive undergraduates that he has ever met in his 46 years at Columbia University. Professor Breslow goes on to say that Mary is bright, creative and has tremendous drive. To say that Mary is involved in undergraduate research is an understatement. She has already co-authored 2 publications, one in the prestigious Journal of the American Chemical Society and is expected to publish another one or two manuscripts by the time she leaves Columbia. Her research is in the area of bio-organic chemistry. She plans to continue working at the interface of chemistry and biology in her graduate studies at Harvard University this year.

Gladys Anderson Emerson Scholarship

Jelena Petrovic

Saint Francis University

Professor Rose Clark rates Jelena Petrovic as one of the top students that she has ever met and predicts that she is on track to becoming a very successful scientist. Jelena engaged in undergraduate research and recently presented her at work the National American Chemical Society meeting in Boston. Jalena is on the Dean's list at St. Francis University. She is also involved in many activities including St. Francis University Science Day volunteer and a Rural Outreach

IN THIS ISSUE...

Letter to the Members From the President

Dear Iota Sigma Pi members:

My best new year wishes for 2004 to you and your family! In addition, since I am writing this on the eve of the Chinese New Year, a very happy year of the Monkey (4702) to all of you. According to Chinese astrology, the year of the Monkey is a year in which everything will be workable. "There will be success even in impossible ventures; there will be inventions and improvisations galore. This year will be an extremely progressive time. We will all steam ahead, and even if we do not apply ourselves to the utmost, we will be carried forward by the surging tide of the Monkey's natural talent for learning and advancement." Well!

We are now half way in our triennium. Your 2002-2005 National Council, the first National Council of the second century of our Society, has been working hard on various recommendations that came out of the 2002 Centennial Convention. Committees have been formed to address the recommendations of the convention delegates. We met in the summer of 2003 for our Interim Council Meeting. I would like to report to you some of our major achievements during the first half of this triennium.

(1) We have now "an easily identifiable website domain name": www.iotasigmapi.info , thanks primarily to our webmaster, Jennifer Muzyka. Visit the site soon and often to get up-to-date information about your Society and to contact us with your comments.

(2) We have recognized the first recipient of the Centennial Award for Excellence in Undergraduate Teaching, Esther Gibbs. Hopefully this award, established during our centennial celebration, will continue to recognize women chemists in a category that is so important to the future of our profession but for which they are so rarely recognized.

(3) We have fine-tuned the Society's objectives, reflecting the 2002 Centenial Convention delegates' opinions, and we are now asking for your vote of approval.

(4) We have developed a membership survey to ask for your comments and suggestions on the future directions of the Society. It has been ten years since the last membership survey. This is YOUR Society and we hope that you will all help to guide the Society at the beginning of its second century. You will find instructions for submitting the survey elsewhere in this issue of the Iotan.

(5) We have started a Society wide Member-get-a-Member campaign since Fall 2002. Just imagine: if each member can convince a new member to join, the membership of the Society will double in size or more during the triennium. Please consider nominating your professional friends and worthy students. The Society will be that much stronger for all of us.

On a personal level, I have been seriously considering some special ways that, as members of Iota sigma Pi, we can help and support each other to foster professional advancement. Based primarily on my personal experience of the last few years, I would like to suggest that we consider the development of a list of volunteers, with their chemical expertise and professional experience, who would be willing to act as external reviewers for promotion and tenure, reviewers/readers of proposals and publications, and who would be or are seeking collaborations in joint research projects. My reasons for this suggestion originated from my personal experience during my application for promotion. My Department's Peer Review Committee's recommendation of external reviewers did not include any women chemist! These reviewers have to be at arm's length and cannot be collaborators. Finally, I was able to recommend to the Peer Review Committee several women chemists who are members of Iota Sigma Pi and who are related to my field of research. I will forever be grateful that these women graciously consented to review my promotion dossier. Their evaluations offered insights of my accomplishments that were different from those of the male colleagues and, I believe, were influential in the university granting me my promotion. Since then I have also acted as reviewers for promotion and tenure and readers for proposals to be submitted to NSF and NIH for colleagues inside and outside my university. I have found these experiences very rewarding especially when the colleague is promoted and the proposal funded. I have also been able to develop fruitful collaborations with female colleagues, both academic and industrial chemists, whom I met at conferences or proposal-review panels. To say the least, it feels good to be able to do that. Almost all granting agencies are now requesting or requiring multi-institutional collaborations. The list of volunteers if developed will help in forging joint research projects also. So let me know what you think by email: l.ng@csuohio.edu . Meanwhile, whether such a list will be established or not in the future, I am volunteering my service to act as reviewers and readers for any of you. I have also been acting as nominator for national and regional awards for colleagues inside and outside ISP. We have so many women with such talents in Iota Sigma Pi. Let me know also if I can help in that capacity.

Let me conclude by thanking all of you for your support to the Society. Without you there is no Iota sigma Pi. Your National Council loves to hear from you so contact any or all of us to share your thoughts about the Society. And don't forget to complete the survey. Thank you!

Best,
Lily Ng

Iota Sigma Pi
National Honor Society for Women in Chemistry

ΙΣΠ Merchandise

ΙΣΠ Necklace.....$5.00

ΙΣΠ Key Pin.....$5.00
(can also be worn as a necklace)

Available at no charge

Three Different Gift Cards:
"In Memory"
"In Honor"
"In Celebration of Our Friendship"

Centennial Poster, 17"x11"

Available from Supplies Coordinator.

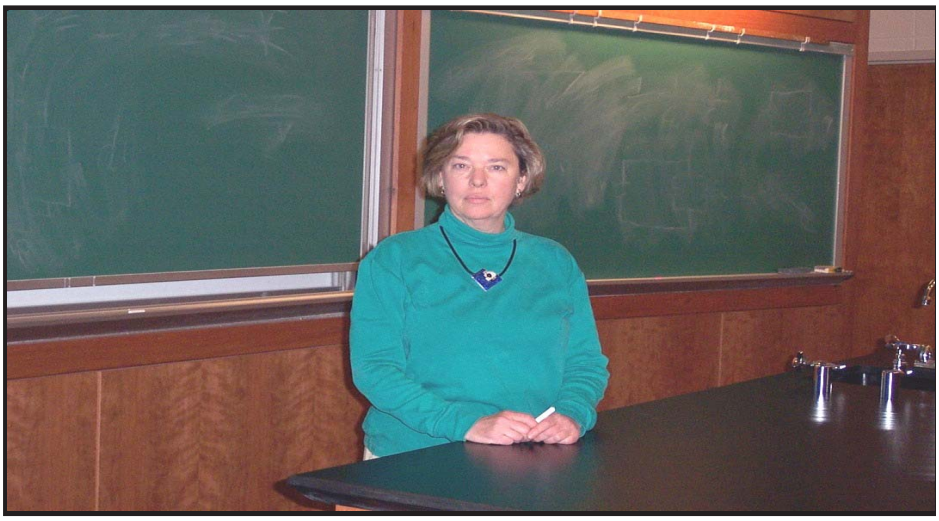
Money Is Available!

Do you need money for a SPECIAL EVENT? Receive up to $250 for your local chapter! Apply for a Mini-grant from National Council. Simply send the following information to our National Vice President, Julie Teetsov at teetsov@crd.ge.com.

- Chapter and officer names
- Brief description of the proposed SPECIAL EVENT
- Reason why this event will help your chapter achieve the objectives of ISP
- Estimation of costs

National Council has money put aside to support chapter activities so keep your ideas coming! We ask that the grant awardees submit a short summary of their special chapter event in a future edition of the Iotan. Pictures would be great!

Esther Gibbs Receives 2003 Iota Sigma Pi Centennial Award for Excellence in Teaching



Esther Gibbs
Goucher College

by Christine K.F. Herman (Ag)

Professor Esther Gibbs is the 2003 recipient of the **Iota Sigma Pi Centennial Award for Excellence in Teaching**. This award is given for excellence in teaching chemistry, biochemistry, or a chemistry-related field at an undergraduate institution that does not offer a graduate program in that field.

Dr. Gibbs has been a member of the Chemistry Department at Goucher College for 21 years. During that time, she has been a leader in chemical education both at Goucher and nationally. She has a strong commitment to and record of excellence in teaching, in the classroom and in the laboratory. At Goucher, she earned the Goucher College Award for Outstanding Research and Teaching in1985 and 1993 and was awarded Women of the Year in 1986 by the Baltimore Chapter of The Association for Women in Science.

A very active member of several national organizations and initiatives, Dr. Gibbs has also overseen major changes in General Chemistry offerings at Goucher. She has been a Co-PI on three NSF, HHMI, and Drefyus Grant grants for curricular improvement. Among many other initiatives, she recently implemented the Peer-Led Team Learning (PLTL) approach. This approach, in which students are guided by peer facilitators in mastering worksheet activities, engages students in more active, inquiry-based learning. This approach has been quite successful, increasing student performance and fostering a more positive attitude about chemistry.

Professor Gibbs has been extremely active in mentoring undergraduates in research. Numerous undergraduate students performing research under her supervision have been co-authors on a large number of journal articles. Her excellent research productivity has led to 35 peer-reviewed publications or book chapters. In addition, she has been PI or co-PI on a wide range of research initiatives from the NSF and NIH that have benefited undergraduate students by providing them with the opportunity to do research in the summer months and through new, state-of-the art instrumentation.

Dr. Gibbs' interaction with students is extraordinary — she has a true gift. Her enormous energy and enthusiasm for science and learning are infectious. She has the ability to get the most from students and to instill in them the desire to perform to the best of their ability. She is direct, honest, and upbeat with students, encouraging them, challenging them, and inspiring them. She never gives up on a student. Former students testify to the positive impact that Dr. Gibbs has had on them, both professionally and personally.

Professor Tamar Schlick Wins 2003 Iota Sigma Pi Agnes Fay Morgan Research Award

Tamar Schlick
New York University

by Christine K.F. Herman (Ag)

Professor Tamar Schlick is the 2003 recipient of the Iota Sigma Pi Agnes Fay Morgan Research Award. This annual award is given for research achievement in chemistry or biochemistry. The nominee must be a woman chemist or biochemist, not over forty years of age at the time of her nomination.

Dr. Schlick's interdisciplinary research involves the development and application of computational techniques to understand the complex three-dimensional structure and function of biological macromolecules. With her solid mathematical science background, she has developed various innovative methods and models for molecular dynamics, multivariate geometry optimization, and large DNA/protein simulations and has, in particular, made significant contributions in the area of DNA structure, from the base pair level to supercoiled DNA systems. These modeling approaches have been used in important applications to large macromolecular complexes, such as transcription regulation, recombination processes in long supercoiled DNA, DNA replication, and DNA repair. Recently, her group has pioneered a new graph-theory approach to representing RNA molecules and is developing it further with the goal of designing novel RNAs and drug-binding RNAs, and for locating RNA genes in genome databases. All these works blend sophisticated mathematical and computational tools with atomic-level insights into fundamental molecular processes, some of which are studied in collaboration with experimentalists.

Dr. Schlick currently holds appointments in the Departments of Chemistry, Mathematics, and Computer Science at New York University's Faculty of Arts of Science and the Courant Institute of Mathematical Sciences. She also holds appointments in the Biochemistry Department at New York University's School of Medicine and the Howard Hughes Medical Institute.

Dr. Schlick has earned more than 25 awards and honors and has about 100 published papers. She is a member of many editorial boards and advisory committees. Nineteen postdoctoral fellows and 27 research students have worked with Dr. Schlick. Her textbook, *Molecular Modeling: An Interdisciplinary Guide*, was published by Springer-Verlag in 2002. Dr. Schlick has given or participated in 137 invited presentations and colloquia. She has been married to Richard Solway for 18 years.

The Iotan

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Feature Editors are needed! If you are interested in "covering a beat" such as interviewing 50+ year members, chapter news, industrial chemists, etc., please contact the editor, Jodye Selco at the above e-mail address, at (909) 869-4552, or at
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Manuscripts for *The Iotan* may be submitted to the Editor at the above address. Suggestions for articles are appreciated. Feature articles and book reviews are acceptable. Documents should be on floppy disk, or emailed, typed, double spaced, and no longer than one page.

Deadlines for consideration for the November, February, and May issues, respectively, are September 15, December 15 and March 15. Manuscripts will not be returned and are subject to editing. Publication is based on editorial assessment of reader interest and space available.

Letters to the Editor are encouraged and may be published. Letters should be no longer than 250 words.

Member News

Alice and Fred **Ottoboni** (MAL) published a book titled: *The Modem Nutritional Diseases - Heart Disease, Stroke, Type-2 Diabetes, Obesity, Cancer - and How to Prevent Them* (Vincente Books, Inc., Sparks, Nevada). The book has been generating 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 hyperlipoprotemenia." Alice Ottoboni has responded with the following article as a potential explanation.

"Fat Does Not Make Fat" is a frequently heard pronouncement from critics of the lowfat 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; however, biochemistry provides an explanation.

After absorption into the body, all macronutrients 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 acetylcoenzyme A (acetyl-CoA). Fatty acids are broken down to two-carbon units that become acetyl-CoA. Carbohydrates, composed almost entirely of glucose, go through a more complex series of reactions. Glucose is released, metabolized via glycolysis, and finally yields acetyl-CoA. Proteins are not generally used for energy, but when they are, each component amino acid has its own individual pathway into the Krebs cycle.

For biochemists, acetyl-CoA is a familiar biochemical. For other readers, the important point is that all of the macronutrients in our food funnel into a central pool (acetyl-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 in the diet, the fate of acetyl-CoA is related to blood glucose concentration and the hormones insulin and glucagon. We beg the indulgence of biochemists because the following explanation is oversimplified.

Diets high in sugars and starches (carbohydrates) 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 produces cholesterol. Incidentally, it is this pathway that the anticholestrol drugs inhibit.

Diets low in carbohydrates tend to be deficient in glucose. Instead of stimulating the release of insulin, glucagon (the hormonal counterpart of insulin) is released. 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 which 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 tissue 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 Otoboni (MAL)

Vote for Constitution and Bylaws Amendments

During the Interim National Council Meeting, July 17-20, 2003, amendments were proposed for the Constitution and Bylaws to reflect our updated objectives and the new Centennial Award for Excellence in Undergraduate Teaching. According to the Constitution of Iota Sigma Pi, amendments and Bylaws must be approved by two-thirds of National Council (passed in July) and a two-thirds vote of the active membership.

Please take a moment to review these changes and cast your vote accordingly by **emailing a short message to President Lily Ng (l.ng@csuohio.edu) and Secretary Janet Clark (jclark@smwc.edu) indicating a vote of yes or no for *each* proposal**. Email is preferred; however, you can also vote by mailing in the enclosed postcard. You vote is important to us so please cast it promptly! **Ballots need to be returned by March 1, 2004.**

Proposal 1. Article II, Section 1, Objectives reads:

Article II - Objectives

SECTION 1. The objective of ΙΣΠ shall be to encourage, in the broadest manner, the interest of women in chemistry and related or allied fields; to foster advancement in academic, business, professional and social life; to stimulate personal accomplishments in chemistry and allied fields; and to recognize outstanding accomplishments through an Honors and Awards program.

Propose to change objectives to read "The objectives of ΙΣΠ shall be to encourage and promote interest in chemistry among women students; to facilitate networking to provide personal and professional support; to foster professional advancement of women in chemistry and related fields; and to recognize outstanding accomplishments of women students and professionals in chemistry and related fields."

Proposal 2. Article 10, Section 1 of the Bylaws, Awards and Scholarships reads:

Article X - Awards and Scholarships

SECTION 1. The National Awards and Scholarship of the Society are the following:

a. National Honorary Member
b. Agnes Fay Morgan Research Award
c. Award for Professional Excellence
d. Undergraduate Award for Excellence in Chemistry
e. Anna Louise Hoffman Award for Outstanding Achievement in Graduate Research
f. Gladys Anderson Emerson Scholarship

Propose to add item which will be "d" entitled "Centennial Award for Excellence in Undergraduate Teaching". All the remaining awards following this list will be re-lettered correctly.

Please cast your vote by March 1, 2004! Questions? Ask any member of National Council.

Notice of Change of Name or Address

Attach mailing address here or write new name and address in this space

New Address

Name Chapter

Address

City, State, Zip

Effective Date

New position, School, or Employer

Please mail to Pat Fish
Iota Sigma Pi Records Chair

May-Oct: 1213 South Shore Court
Amery, WI 54001-5102

Oct-May: 16588 Bear Cub Ct.
Fort Myers, FL 33908-4323

Going to the ACS Anaheim Meeting?

Prizes! Raffle! Food! Good Company!

Join us at the
Alumni Social Hour
Monday 29 March
6-7:30 in the evening
Anaheim Convention Center

Sources of Iota Sigma Pi Supplies and Information

Supplies

The publicity pamphlets: "Membership Information" and "National Awards". History, Constitution and Bylaws, Rituals of Iota Sigma Pi, Rules and Regulations, *The Iotan*, Speakers Bureau

Supplies Coordinator
QuynhGiao N. Nguyen
NASA John H. Glenn Research Center
Mail Stop 106-1
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Cincinnati, OH 44138

Initiation

Membership Application
Report of Initiation Forms
National Secretary

Forming a Chapter

Procedural information and application forms
National Vice President

Charter Certificates
National Historian

Financial Reports

Financial Report Forms
National Treasurer

Awards

Awards criteria and nominations forms
Director for Professional Awards
Agnes Fay Morgan Research Award
National Honorary Member
Award for Professional Excellence

Director for Student Awards
National Undergraduate Award for Excellence in Chemistry
Anna Louise Hoffman Graduate Research Achievement Award
Gladys Anderson Emerson Scholarship

Dues

Dues statements and payments
National Treasurer

Chapter Operations

Changes in the Chapter Officers list
Forms for reporting local elected officers
National Vice President

Address Labels and Membership List
Change of address and member death
Records Chair

Historical Information
National Historian

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See National Council listings elsewhere in *The Iotan* for officers' names and addresss.

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3) New positions, appointments, promotions, awards, honors retirements, postdoctoral research
4) Offices held in professional societies
5) Avocational achievements, miscellaneous

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