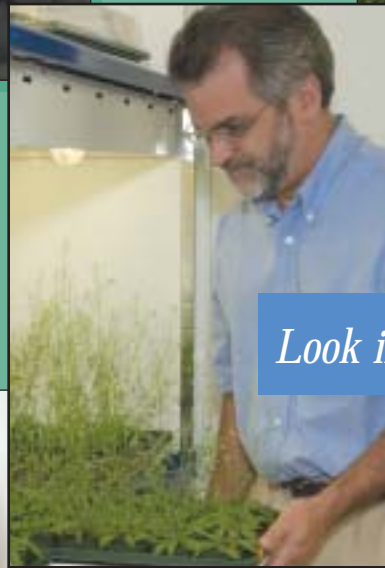
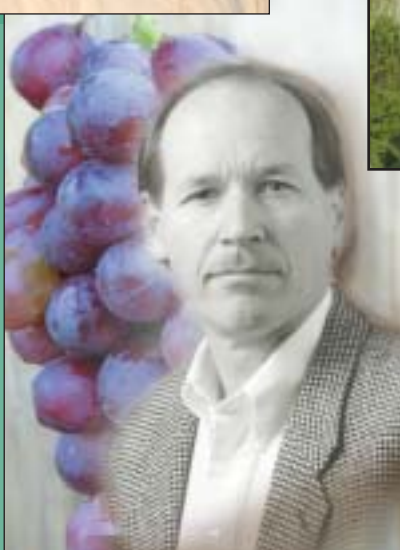


BIOCHEMISTRY & Molecular Biology 2004



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BIOCHEMISTRY & *Molecular* BIOLOGY

2004

MICHIGAN STATE
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From The Chairperson

Dear Friends and Alumni,

It has been a challenging year! The renovation of the ventilation system for the building has been underway for the entire year, involving the disruption of laboratories and functions, moving out and back into labs and offices, with much noise and dust for all. Our saving grace has been having Loran Bieber, Joyce Robinson, and Ron Norris to mediate with the construction people and physical plant, and help us deal with the irritations and adjustment. The good news is that it is almost over (will be over by the time you read this) and the newly renovated labs look very good with new ceilings, lights, and hoods.

Meanwhile, we have been carrying on against all odds and great things have been accomplished. The hiring of several excellent new faculty members, jointly with the Plant Research Laboratory and with Chemistry; substantial progress in infrastructure development in NMR and X-ray facilities through the Michigan Life Science Corridor; awards received by faculty and students; inception of a new lectureship to honor Professor Emeritus Charles Sweeley; a Boezi Award banquet celebrating the

accomplishments of Paul Rosevear and hearing about the exciting imaging research of Jim Potchen of Radiology; the awarding of a new Strategic Partnership grant to further interdisciplinary efforts in Quantitative Biology and Modeling by Leslie Kuhn and colleagues, and major funding to Dean DellaPenna, a principal investigator in an international program HarvestPlus (see article p. 18). There is also a plan under consideration to expand the College of Human Medicine to Grand Rapids; and a new President of the University was announced, Lou Anna K. Simon, former Provost.

A very sad note is the loss of a highly valued colleague, Lee McIntosh, who recently died of leukemia. His scientific achievements and his contributions to the department and to the University had been honored two years ago with a Distinguished Faculty Award. Lee was one of our several joint appointees with the Plant Research Laboratory and contributed with unfailing good will and excellence to the



Shelagh Ferguson-Miller
Web Site: <http://www.bch.msu.edu>
Email: fergus20@msu.edu

departmental teaching and committee efforts, while maintaining an internationally recognized research program involving pioneering work on the biochemistry and regulation of the plant alternative oxidase.

The Michigan Life Science Corridor Center for Structural Biology at MSU has continued to receive funding from the State for infrastructure development, with additional substantial support from MSU. A new building to house a 900 MHz NMR instrument is essentially complete, and delivery of the instrument promised in October. With the new Director, Professor Aizhuo Liu, helping finalize the building construction and ready to get the instrument in operation, we expect to be in business by early 2005. The NMR facility will be available to all investigators in Michigan, as well as our own strong NMR



Lee McIntosh

A Message From

*Mission Statement of the
Department of Biochemistry and
Molecular Biology:*

*To enhance the research
stature of the department,
maintain a collegial atmosphere
and quality teaching, and
promote synergistic
interactions with other
departments and programs.*

contingent, Charles Hoogstraten and Honggao Yan. Similarly, construction of the new beamline at Argonne National Laboratories is proceeding on schedule, under the direction of Michael Garavito at MSU and Martha Ludwig at U of M. Already MSU researchers have expanded time at the synchrotron that is very valuable to their research progress.

We are pleased to welcome Dr. Beronda Montgomery-Kaguri, a new

appointment in the Plant Research Lab with her academic home in BMB. Dr. Montgomery-Kaguri has a PhD in Plant Biology from Davis, and was an NSF Post-doctoral Fellow at Indiana University. Her research interests are in photobiological responses in plants. She fits well in the Plant Biochemistry and Genes and Signaling areas of emphasis in BMB.

Another joint hire is Kevin Walker, with 80% of his appointment in Chemistry. Dr. Walker received his PhD in Chemistry at the University of Washington, Seattle, followed by postdoctoral studies at Washington State University, Pullman. He uses many different tools, including synthetic organic chemistry, enzymology, molecular biology, and genetics,

to elucidate biosynthetic pathways of plant-derived products with potential as pharmaceuticals, such as Taxol.

An article in last year's *BMB Magazine* featured the work of Leslie Kuhn and the Center for Biological Modeling which she founded in 2000. As a follow-up and expansion of the goals of this Center, Leslie and colleagues have succeeded in obtaining MSU Foundation support for an Initiative in Quantitative Biology and Modeling, which includes computational and experimental scientists from many departments and colleges across campus. This multidisciplinary group aims to bridge the gap between biologists and mathematical and physical scientists, with seminars, courses, interdisciplinary research projects, and a Graduate Program in Quantitative Biology and Modeling.

Dean DellaPenna is a major player in another initiative, HarvestPlus, an international consortium of scientists with the goal of developing foods that can provide better nutrition to the people of the



Kevin Walker



Beronda Montgomery-Kaguri



Dean DellaPenna

the Chairperson

world. Some of the funding is provided by the Bill Gates Foundation. The scope of this project is described in more detail on page 18.

As always, the Awards Banquet, honoring the achievements of our undergraduates, graduates, and faculty, as well as an outstanding alumnus, was a most enjoyable occasion with a record attendance of more than 120, including a number of our retired faculty.

Paul Rosevear, former student of Robert Barker, was the winner of the Boezi Award, in recognition of his achievements in the area of NMR and physical chemical studies of enzyme mechanisms. Our dinner speaker, Professor James Potchen, was



James Potchen

both entertaining and awe-inspiring in his description of how the field of medical imaging is advancing at an amazing pace. Also attending the banquet was our former chair, Bill Smith, who has added a number of honors to his already outstanding CV (see article on p. 13). This annual Awards Banquet



Charles Sweeley

is supported to a considerable extent by the generous donations of alumni, as are the annual lectureships in honor of William Wells and N. Edward Tolbert. We are looking forward to an additional yearly event supported by the new lectureship established to honor Charles Sweeley (see p. 12).

And before closing I would like to note John Wilson's retirement this year. This leaves us bereft of his talents as an excellent scientist and teacher and colleague, and perhaps worse, as the producer of this publication. I am sure we cannot even begin to replace him.



John Wilson

Finally, please keep in touch and keep us informed. Best wishes for the coming year.

A handwritten signature in green ink that reads "Shelagh".

Shelagh Ferguson-Miller

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2004 Boezi Award Recipient

Dr. Paul R. Rosevear, Associate Professor in the Department of Molecular Genetics, Biochemistry & Microbiology, University of Cincinnati Medical Center (http://www.molgen.uc.edu/logic/index.php?page=dept_faculty-CVs&faculty=65), is the recipient of the 2004 Boezi Award. Dr. Rosevear presented the Boezi Lecture, entitled Mechanisms of Phosphorylation-Induced Modulation of Cardiac Muscle Contraction, on April 29, and the award was presented at the annual departmental Awards Banquet that evening (see article on page 8).

Paul Rosevear received his BS in Chemistry in 1975 from Old Dominion University, Norfolk, VA, and an MS in Chemistry, also from Old Dominion University, the following year. He then came to Michigan State where he earned his PhD degree in 1980, with Dr. Robert Barker as his major professor. Dr. Rosevear's thesis work was directed at enzyme-mediated synthesis of the antigenic portion of the blood group O substance, with specific enrichment in ^{13}C that allowed structural studies on this oligosaccharide using ^{13}C -NMR. This work resulted in several research papers and a methodological review.

Paul's synthetic skills in organic chemistry had impact beyond his thesis work and were productively applied in other laboratories in this department. He devised a simple synthetic route for the alkyl glycoside detergents (e.g., dodecyl-maltoside). This allowed



Paul R. Rosevear

the Ferguson-Miller lab to study the effects of these detergents on the kinetic and physical properties of cytochrome c oxidase, and opened the way for the current extensive use of alkyl glycoside detergents in the purification and crystallization of membrane proteins. In addition, the oligosaccharide-hexanolamine compounds that he synthesized were coupled to polyacrylamide beads and used as affinity resins for the purification of specific carbohydrate-binding proteins in the Wang laboratory.

After completion of his PhD, Dr. Rosevear received a fellowship from the American Cancer Society for postdoctoral work in the laboratory of Dr. Albert Mildvan, first at the Fox Chase Institute for Cancer Research (Philadelphia, PA) and then at the Department of Physiological Chemistry, Johns Hopkins University School of Medicine (Baltimore, MD). It was here that he acquired expertise in the application of NMR to the study of conformational dynamics in proteins. He introduced the quantitative nuclear Overhauser effect (NOE) method for determining the conformation and

location of enzyme-bound substrates, and applied it to several important enzymes: creatine kinase, cAMP-dependent protein kinase (PKA), glyoxalase I, and pyruvate kinase. All of the insights on the solution structures of these enzymes, derived from his work in the 1980s, have since been confirmed by X-ray crystallographic studies in other laboratories. For example, in 1984, Dr. Rosevear deduced the relative locations of ATP and the enzyme-bound heptapeptide substrate on PKA, and the extended coil conformation of the heptapeptide substrate. This was subsequently confirmed by the crystallographic analysis of an enzyme-substrate complex by Dr. Susan Taylor and her co-workers.

Dr. Rosevear joined the faculty in the Department of Biochemistry and Molecular Biology at the University of Texas Medical School in Houston in 1985. In 1996, he was recruited to the Department of Molecular Genetics, Biochemistry & Microbiology at the University of Cincinnati College of Medicine, with the opportunity to establish a state-of-the-art NMR facility. He and his colleagues have elucidated the active site structures and mechanisms of three enzymes: dihydrofolate reductase, methionyl-tRNA synthetase, and isoleucyl-tRNA synthetase, and have also studied the cardiac troponin complex, involving troponins C, I, and T. The latter work has defined the solution structure of the ternary troponin C-troponin I-troponin

T complex and how it is altered upon calcium binding. This has led to a better understanding of the role of troponin in muscle contraction.

More recently, Dr. Rosevear has embarked on two new research initiatives. He is using paramagnetic techniques to more rapidly obtain global fold structures of proteins, which will facilitate structural studies on

larger proteins. In other research, he is using nanotechnology to produce synthetic flexible membranes containing specific transport proteins for the selective uptake, concentration, and release of ions and molecules.

The professional achievements of Dr. Rosevear have been widely recognized. He has been appointed to two terms (1991-1995; 1997-2002) on the Editorial Board of

the *Journal of Biological Chemistry*, and has also served on grant review panels for the National Institutes of Health and the American Cancer Society.

Dr. Rosevear is truly a distinguished alumnus of this department, and his accomplishments are appropriately honored with the 2004 Boezi Award.



John A. Boezi

Remembered & Honored

Professor John A. Boezi joined the newly formed Department of Biochemistry in 1963. Together with

colleagues like Fritz Rottman and Allan Morris, John represented the emerging field of "molecular biology" and played a major role in shaping the research and teaching program in the early days of the Department. John's sudden death in 1980 was deeply felt by his students and faculty colleagues alike. In his memory, they established an award to be given annually to a recipient of a B.S., M.S., or Ph.D. degree from this department who had gone on to a distinguished career that reflects the qualities personified by John Boezi.

In the many years that have passed since establishment of this award, the number of degree recipients from this department has continued to grow steadily. Communications being imperfect, the Department recognizes that it may not be aware of some graduates whose accomplishments since leaving MSU would make them worthy candidates for the Boezi Award. We thus solicit your assistance in identifying past graduates of this department, undergraduate or graduate, who would merit consideration. Please send suggestions and pertinent information to Dr. Shelagh Ferguson-Miller, Chairperson, Department of Biochemistry and Molecular Biology or e-mail us at bchalumn@msu.edu.

Past Recipients of the Boezi Award

1983	Donald W. Carlson	Ph.D.	1961
1984	Allen T. Philips	Ph.D.	1964
1985	John A. Gerlt	B.S.	1969
1986	George H. Lorimer	Ph.D.	1972
1987	Lawrence B. Dumas	B.S.	1963
1988	Douglas D. Randall	Ph.D.	1970
1989	Ronald C. Desrosiers	Ph.D.	1975
1990	George M. Stancel	Ph.D.	1970
1991	Raymond J. Dingleline	B.S.	1971
1992	Howard C. Towle	Ph.D.	1974
1993	A. Stephen Dahms	Ph.D.	1969
1994	Sherwood R. Casjens	M.S.	1967
1995	Friedhelm Schroeder	Ph.D.	1973
1996	Philip L. Felgner	Ph.D.	1978
1997	Arlyn Garcia-Perez	Ph.D.	1984
1998	Ann E. Aust	Ph.D.	1975
1999	Peter Steck	Ph.D.	1981
2000	Sally Camper	Ph.D.	1983
2001	Tony Serianni	Ph.D.	1980
2002	John Blenis	Ph.D.	1983
2003	Marcia Kieliszewski	Ph.D.	1989

Students and Faculty Honored at Annual Departmental Awards Banquet

The annual Awards Banquet was held on April 29, 2004. It was a special pleasure that several Emeritus faculty were able to join in the occasion. Present were: Emeritus Professor and Dean Dick Byerrum and his wife, Claire; Emeritus Professor Jack Holland; Emeritus Professor Paul Kindel and his wife, Judy; Emeritus Professor Clarence Suelter and his wife, Loretta. And Bill Smith, and his wife, Andrea, made the trip from Ann Arbor to join their former colleagues on this occasion. While Bill does hold rank as an MSU Emeritus Professor, he remains active in his current role as Professor and Chair of the Department of Biological Chemistry at the University of Michigan.

In her introductory remarks, Chairperson Shelagh Ferguson-Miller noted the establishment of an endowed lectureship to honor Professor Emeritus and former departmental Chair Charles Sweeley (see p. 12), and reminded the audience that it was Dr. Sweeley who initiated the annual Awards Banquet as a forum for honoring the accomplishments of faculty and students. After her welcoming comments, Chairperson Shelagh Ferguson-Miller continued the after-dinner program by reviewing the awards that had been received by several faculty members during the past year:

- ❖ Associate Professor David Arnosti was designated a

Mercator Visiting Professor during his sabbatical in Cologne, Germany. David had come back to East Lansing for a brief visit, which allowed his attendance at the Awards Banquet, but he and his family completed their stay in Germany and returned to their home in East Lansing in August, 2004.

- ❖ Professor Emeritus Loran Bieber received the 2004 Lester J. Evans, MD, Distinguished Service Award from MSU's College of Human Medicine.
- ❖ Professor Zachary Burton, Undergraduate Program Director in BMB, had been recognized with the College of Natural Science Outstanding Academic Advisor Award.
- ❖ Professor Laurie Kaguni was the recipient of the College of Natural Science Distinguished Faculty Award.
- ❖ Emeritus Professor Bill Smith had received several honors (see article elsewhere in this magazine).
- ❖ Professor John Wang was honored with the College of Osteopathic Medicine's Award for Outstanding Curriculum Contributions.

Dr. Ferguson-Miller introduced Professor Steve Triezenberg, who presented his student, Francisco Herrera, as a recipient of the 2004 Outstanding Graduate Student Award. Dr. Triezenberg remarked

about the pleasure he had in watching Francisco mature from student into an effective professional scientist. Also honored with a 2004 Outstanding Graduate Student Award was Wayne Riekhof, who was introduced by his mentor, Christoph Benning. Dr. Benning commented on Wayne's broad scientific interests and familiarity with the scientific literature. The relationship between major professor and student can become a close one over the course of a graduate program, and it was clearly evident that Drs. Triezenberg and Benning highly valued their interactions with Francisco and Wayne.

Undergraduate Program Director, Zach Burton, acknowledged the graduating seniors, commenting on their special accomplishments and future plans. Professor Burton then announced the recipients of the 2004 Undergraduate Research Awards. These awards are supported by contributions to the Department (see p. 38) and provide a stipend which enables undergraduates to pursue laboratory research in lieu of alternative employment that might be required to meet financial needs. Receiving a \$2000 award was Sze-Ling Ng, who is working with Dr. Min-Hao Kuo. Additional awards carrying a \$1000 stipend were presented to Adewale Adeboya (Justin

McCormick's laboratory), Matt Ankney (Pam Fraker's laboratory), Stephen Bowman (Jack Watson's laboratory), Katherine Ruby (John Wang's laboratory), and Kartik Viswanathan (Lee Kroos' laboratory). Dr. Burton then introduced Professor Bob Hausinger, who in turn introduced Greta Monterosso as a recipient of the 2004 Outstanding Undergraduate Student Award. Dr. Hausinger had glowing comments about Greta's accomplishments as an undergraduate researcher in his laboratory. Dr. Burton returned to the podium to express his pleasure in announcing that David Taggart, who had done undergraduate research in the Burton laboratory, was also being recognized with a 2004 Outstanding Undergraduate Student Award.

Chairperson Ferguson-Miller then made the formal presentation of the Boezi Award to Dr. Paul Rosevear, and Paul expressed his appreciation for the award as well as for the excellent graduate experience he had at Michigan State. Dr. Rosevear also remarked that he had a special appreciation for Dr. John Boezi because it was, in fact, Dr. Boezi who was responsible for Paul's coming to MSU. Paul noted that he met Dr. Boezi when the latter came to present a seminar at Paul's undergraduate institution, Old Dominion University (Norfolk, VA). At the time, Paul had been considering medical school for his future work, but after discussions with John Boezi, Paul opted for graduate work at Michigan State. His subsequent

success, now recognized with the Boezi Award, attests to the wisdom of that decision.

Dr. Ferguson-Miller then introduced Dr. James Potchen, who had been invited to present after-dinner remarks at this event. Dr. Potchen graduated from MSU



Dr. James Potchen discusses the development of molecular imaging techniques and their medical applications.

in 1954, and went on to an extraordinary and most distinguished career. In addition to his MD degree (Wayne State, 1958), Dr. Potchen holds a degree in management from MIT and a law degree from U of M. Dr. Potchen serves as Chairperson of the Department of Radiology at Michigan State, and also holds rank as a Professor of Management in MSU's College of Business, Professor in Lyman Briggs College, and Professor of Physiology. In 1990, Dr. Potchen was designated a University Distinguished Professor. A major interest for Dr. Potchen has been in imaging techniques, including magnetic resonance imaging (MRI) and positron emission tomography (PET), and he has made seminal contributions in these and other areas of imaging

technology. He gave several examples of how advanced imaging techniques have provided unprecedented access to visualizing both normal and abnormal bodily functions. Dr. Potchen showed some remarkable images of the cerebral vasculature

obtained by MRI imaging of living human subjects (specifically, himself and his wife!). And those who recalled the movie *Fantastic Voyage* of many years ago were reminded of it again when Dr. Potchen provided a journey through the vasculature made possible by modern imaging methodology. In the latter part of his remarks, Dr. Potchen focused on the impact that developments in genomics are having on medicine. For example, he

noted that breast cancer cannot be considered as a single disease, but is, in fact, a variety of disorders with different genetic bases (i.e., which genes are altered with resulting cancer), some receptive to particular drugs like tamoxiphen, others not. As advances in genomics provide a basis for distinguishing various subtypes of breast cancer, more precise targeting of therapy becomes possible.

Dr. Ferguson-Miller concluded the evening by thanking Dr. Potchen for his remarks, and expressing her appreciation to all who had attended this Awards Banquet, once again a notable event on the departmental calendar.

Professor Lee McIntosh



Lee McIntosh

“Lee McIntosh, age 54, beloved son, father, brother and friend, lived tenaciously and died with courage on June 28, 2004, in Lansing, MI. He loved his family, the land he farmed, and the scientific research that he pursued with colleagues... He was devoted to his son, Angus, whom he believed to be a precious gift, and he cherished the support and love from his family and friends.”



Lee McIntosh was an inspiring mentor to his students, and valued faculty colleague.

These words are taken from a tribute (<http://www.prl.msu.edu/mcintosh.shtml>) to Lee written by his sister, Jean McIntosh. After many years of battling chronic lymphocytic leukemia, Lee succumbed to this disease. Together with his family members, many of Lee's friends and colleagues attended a memorial celebration of Lee's

life that was held in the MSU Horticultural Gardens on July 2. Comments made at this occasion attested to Lee's many contributions as a scientist, his devotion to his son, Angus, his remarkable intellect and sense of humor, and his qualities as a warm and loyal friend. There is no doubt that Lee McIntosh will be deeply missed here at MSU – his science was superb, and one could not wish for a finer person to call colleague and friend.

Lee joined the faculty at MSU as an Assistant Professor in 1981, after receiving his PhD (1977) in Botany from the University of Washington, followed by postdoctoral work at Harvard University. He was jointly appointed in the MSU-DOE Plant Research Laboratory and the Department of Biochemistry (now Biochemistry and Molecular Biology), and also was a faculty member in the interdepartmental Genetics Program. He was promoted to Associate Professor in 1986, and to Full Professor in 1990. Together with Barry Chelm (another faculty colleague now deceased), who joined the MSU faculty at about this same time, Lee brought a new dimension to plant biochemistry research on campus, namely, the application of the concepts and methodology of “molecular biology” to the plant sciences.

As he described it on his faculty web page (<http://www.prl.msu.edu/mcintosh.shtml>), Lee's

There is no doubt that Lee McIntosh will be deeply missed here at MSU – his science was superb, and one could not wish for a finer person to call colleague and friend

research interests were in the “molecular biology of energy transduction” in plants. He and his coworkers studied the genes, and the corresponding proteins, that were involved in energy producing processes in plant mitochondria and chloroplasts. He also was known internationally for his work on the so-called “alternate oxidase,” an electron transport system unique to plant mitochondria in which electron transport is *not* coupled to ATP synthesis (ATP is the chemical form in which energy provided by electron transport is “captured” for use in driving energy requiring processes in the cell); rather, the

energy is released in the form of heat. Lee and his students focused on understanding the molecular basis and physiological role for the “alternate oxidase” activity in plants.

Lee was highly regarded by the scientific community, and very active in service to the profession. At the time of his death, he served on the editorial boards of the journals *Planta* and *Protein Expression and Purification* and was guest editor for *Plant Molecular Biology*. He had served on panels reviewing research proposals submitted to several funding agencies, including NIH, NSF, USDA, and DOE, and on the

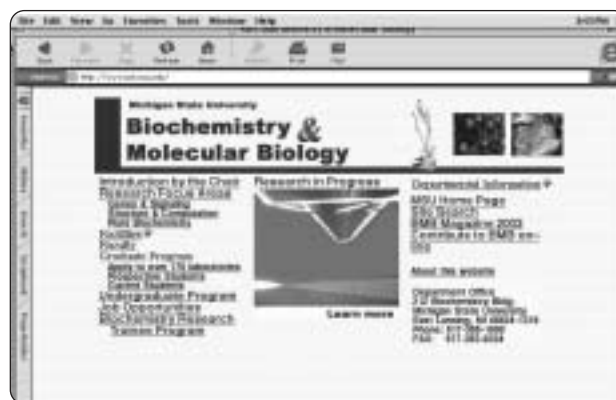
International Steering Committee for the Human Frontiers in Science Program. He was an organizer for several major symposia and international meetings in the area of plant - biochemistry and molecular biology. His outstanding contributions were recognized with MSU’s Distinguished Faculty Award in 2002.

For those who may wish to honor Lee’s memory with a donation, the family has suggested that these may be made to the Chronic Lymphocytic Leukemia Foundation, 1415 Louisiana, Suite 3625, Houston, TX 77002 (<http://www.clfFoundation.org/>).

Visit Our Web Site

Information about many aspects of the department is available on our web site at <http://www.bch.msu.edu>. Faculty and their research interests? Information about graduate and undergraduate programs? The “Biochem Weekly?” Current and past issues of this departmental magazine? These and more are available with a few clicks of the mouse. If you don’t find what you are looking for, contact us at bchalumn@msu.edu and we will be happy to provide additional information.

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Establishment of an Endowed Lectureship to Honor Professor Emeritus Charles C. Sweeley

In the early 1960s, Charles C. Sweeley and William W. Wells were faculty colleagues at the University of Pittsburgh, and shared an interest in the application of gas chromatography and mass spectrometry to biochemical research. Indeed, they were responsible for development of several of the methodologies that made these methods such fruitful tools for identification and quantitation of biochemically important compounds. R. Gaurth Hansen, the first Chairperson of the newly formed Department of Biochemistry at Michigan State University and a man with an excellent eye for scientific talent, was successful in attracting Bill Wells to join the growing departmental faculty in 1966. Subsequently, Dr. Hansen induced Chuck Sweeley to follow Bill to MSU. Shortly after his arrival at MSU in 1968, Professor Sweeley spearheaded the founding of the MSU Mass Spectrometry Facility, which continues to serve not only the University community but also the nation as an NIH-sponsored Regional Facility.

Chuck Sweeley had a distinguished career at MSU. He was recognized nationally and internationally for his pioneering research, much of which involved the application of mass spectrometry to structural determinations. His discovery of the structure of the insect juvenile hormone, his



work on structure and metabolism of glycosphingolipids in Fabry's disease, and studies on glycolipid metabolism in normal and transformed (cancer) cells and on glycolipid antigens in tumors - these were but a few examples in which the power of mass spectrometric techniques were fruitfully applied to important biological questions. Professor Sweeley was also a pioneer in development of mass spectrometric methods for metabolic profiling, i.e., rapid determination of the complex array of metabolites present in biological fluids such as urine, the analysis of which can provide important diagnostic information. He was the author or co-author of 182 reviewed publications in scientific journals, and numerous abstracts and presentations at national and international conferences.

Reflecting his prominence as a scientist, Chuck Sweeley served on the editorial boards of several major journals and on NIH grant review panels, and as a member of the American Cancer Society Advisory Council. In 2001, his many scientific contributions were recognized with the Anachem Award from the Federation of Analytical Chemistry and Spectroscopy Societies. In addition to his scientific accomplishments and other contributions as a faculty member, Chuck Sweeley served as Chairperson of the department from 1979-1985 and also as Assistant Dean for Research in the College of Human Medicine from 1973-1977. Professor Sweeley was among the first MSU faculty members designated a University Distinguished Professor when this honorific rank was established to recognize the University's most eminent faculty members.

Since retirement in 1992, Chuck and his wife, Marilyn, have continued to maintain their principal residence in the East Lansing area (1884 Creek Landing, Haslett, MI 48840; Phone: 517-339-7551) while, until recently, spending winters in Florida.

Professor Sweeley's long-time faculty colleague, Bill Wells, together with departmental Chairperson, Shelagh Ferguson-Miller, have led the effort to establish an endowed lectureship

Continued on next page

to honor Professor Sweeley's many contributions to MSU and its Department of Biochemistry and Molecular Biology. Like other endowed lectureships established to honor distinguished former members of the department's faculty, this endowment will provide support for an annual lecture to be presented by an outstanding scientist from outside MSU. In addition to the obvious

benefit in providing MSU students and faculty with the opportunity to interact with a prominent scientist from outside the University, such occasions serve to remind us, once again, of the contributions of former faculty that have been so important in establishing the excellence of this department.

We encourage all, but particularly former students and

colleagues of Chuck Sweeley, to consider making a gift to the Sweeley Lecture Endowment Fund. For further information, please contact either Chairperson Ferguson-Miller or Suzette Hittner, Director of Development for the College of Natural Science [Phone: (517) 353-9855].

Former Chairperson Bill Smith Receives Further Honors

Bill Smith left MSU in 2003 to take the position as Chair of the Department of Biological Chemistry at the University of Michigan. However, most of Bill's academic career has been at MSU, where he joined the faculty in 1975 and served as this department's Chairperson from 1994-2003. It was during his time at MSU that much of Bill's outstanding work on prostaglandin synthesis and function was conducted. His scientific accomplishments have brought national and international recognition and resulted in numerous honors and awards, including two NIH MERIT awards, the Treadwell Award and Abraham White Distinguished Scientific Achievement Award (both from George Washington University), and the Senior Aspirin Award from the Bayer Corporation.

The American Society for Biochemistry and Molecular Biology (ASBMB) added to this list with the announcement that Bill Smith was the recipient of the 2004 ASBMB Avanti Award in Lipids. This award recognizes outstanding contributions in the area of lipid biochemistry. The award includes a plaque and a stipend, as well as transportation and other costs associated with attendance at the 2004 ASBMB Annual Meeting (June 2004, in Boston) at which Bill presented a lecture on his work, entitled "Structure, Function, and Regulation of Cyclooxygenases."

Another honor came to Bill during this past year when he was elected a Fellow of the American

Association for the Advancement of Science (AAAS). Selection as an AAAS Fellow requires support of the nomination by several prominent American scientists, and is another indication of the high regard that his peers have for Bill's scientific accomplishments.

In March 2004, Bill was recognized as the "Michigan Scientist of the Year" by the Impression 5 Science Center in Lansing. Many readers will know that the Impression 5 Science Center is home for a hands-on science museum but also provides other programs that enhance science and mathematics education in the Lansing area and elsewhere. Professor Emeritus Clarence Suelter has had a long-term involvement with the Impression 5 Science Center, and continues to serve on its Board of Directors. Each year the Science Center recognizes the accomplishments of an outstanding Michigan Scientist. Other faculty members from this department who were previously recognized with this award are Professor Jack Preiss and the now-departed Professor Ed Tolbert.



William L. Smith

Outstanding Support Staff Serves the Department

As any faculty member will attest, the teaching and research functions of the department would be virtually unmanageable without the men and women “behind the scenes,” the able support staff who play such a vital role in the life of the department. Here we feature two of these support staff members and briefly describe their contributions to the activities of this department.

Neil Bowlby

Neil Bowlby received both the BS (1980) and MA (1983) degrees in Biology from Western Michigan University, followed by graduate work leading to the PhD in Biology from the University of Michigan in 1989. Dr. Bowlby came to MSU as an NSF Postdoctoral Fellow in 1989, working initially with Professor Lee McIntosh, then later with both Professor McIntosh and Professor Jerry Babcock (both now deceased) on a collaborative research project between the McIntosh and Babcock laboratories. In addition to the good science, Dr. Bowlby's postdoctoral experience in the McIntosh lab had a further benefit. It was there that he met his future wife, Carrie Hiser, then a graduate student with Professor McIntosh. Dr. Hiser continues her association with the department as a postdoctoral research associate working with Dr. Shelagh Ferguson-Miller.

Throughout both his graduate and postdoctoral research work, Dr. Bowlby had a continuing interest in the photosynthetic proteins of Photosystem II. He is



Neil Bowlby

a member of the American Society of Plant Physiologists, the American Society for Photobiology, and the International Society for Plant Molecular Biology.

In the early 1990s, the growing enrollment in the undergraduate biochemistry courses led to a reassessment of how these courses were managed. This was particularly a concern for the laboratory courses where much effort was required to handle the “logistics,” e.g., ensuring that all reagents were prepared, all protocols had been thoroughly checked out, and that course

content was updated to reflect technological developments in biochemistry. As an outcome of this reassessment, it was decided to hire someone who would take primary responsibility for day-to-day operations of the undergraduate laboratories, and work with faculty in upgrading the laboratory courses to ensure that students had experience with important new techniques in the field. In 1994, Dr. Neil Bowlby was hired as an “educational specialist” to fulfill that function.

Dr. Bowlby has been a marvelous addition to the department, winning accolades from both students and faculty members for his commitment to the undergraduate laboratory courses. He is a “hands on” kind of guy, always in the laboratory with the students to help them as necessary. He checks out proposed experiments beforehand, ensures that all necessary reagents and equipment are available to the students, and initiates and evaluates proposed changes to the laboratory exercises. Dr. Bowlby also has been very active in support of the

activities of the Undergraduate Biochemistry Club, a student-run organization that arranges various activities throughout the year that are of benefit for biochemistry majors.

Professor Michael Garavito, who has been an instructor in one of the undergraduate laboratory courses, BMB 471, for the past several years, notes that there has been a diminishing number of biochemistry laboratory courses taught at universities throughout the country. These laboratory courses have been abolished for a number of reasons, including the cost of operating labs and upgrading equipment, conversion of teaching laboratory space to serve other needs, and demands on the faculty who teach such courses. Laboratory courses are quite labor intensive, and maintaining them at a level that is relevant to modern research methodologies is costly. Even if a laboratory course is not abolished, one trend is to revamp courses to minimize costs, such as to make them "demonstration" lab courses with cookbook experiments. Professor Garavito notes that the MSU undergraduate laboratory courses have not followed this trend, and retain much more of a "real-life experimental feel," e.g., students are required to maintain a laboratory notebook and think about how to interpret their results. Professor Garavito emphasizes that it has been the commitment of this department to a quality undergraduate program, together with Dr. Bowlby's dedication to the

undergraduate laboratory courses, that has made it possible for these courses to continue introducing students to major methods important in contemporary biochemical research and providing students with an experience based on how experimental biochemistry is really done.

Kaillathe Padmanabhan *"Pappan"*



Kaillathe Padmanabhan "Pappan"

Kaillathe Padmanabhan, called Pappan by one and all, received his BS (1979) and MSc (1981) degrees in Chemistry from Calicut University in India, followed by the PhD in 1987 from the Indian Institute of Science in Bangalore. He came to Michigan State University in 1988 as a post-doctoral research associate working with the eminent x-ray crystallographer, Professor Alex Tulinsky, in MSU's Department

of Chemistry. While Pappan continued his x-ray crystallographic studies in Chemistry, other developments were taking place in the Department of Biochemistry and Molecular Biology that would soon impact on the career path of Dr. Padmanabhan.

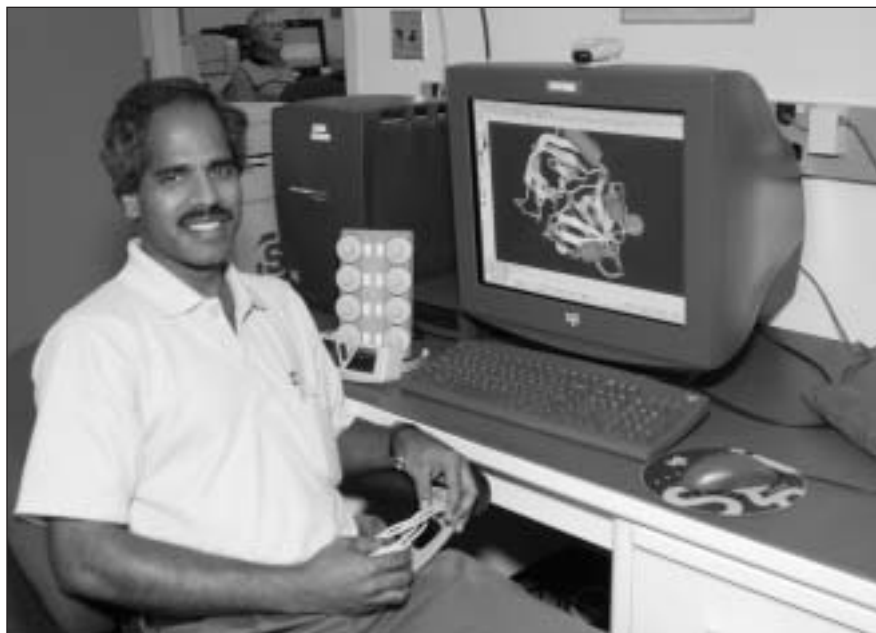
It is surely well known that computers have come to play a critical role in modern biological research. Indeed, it is impossible to imagine contemporary biochemistry and molecular biology without the powerful methodologies made possible by advances in computer technology, both hardware and software. Thus, around 1990, MSU's Department of Biochemistry and Molecular Biology (then simply the "Department of Biochemistry"), like comparable departments everywhere, was rapidly expanding its computer capabilities. It was during this time that the first "big" computer, i.e., not just a "desktop," was purchased along with software that provided for displaying and manipulating three dimensional representations of biomolecules such as proteins. Shortly after, Dr. Leslie Kuhn was hired and she became the first faculty member whose major research interests were in computational biology and development of computer algorithms for analysis of such things as the flexibility of protein structures and for predicting location of binding sites for ligands on proteins (see editor's note, next page).

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Outstanding Support Staff

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Editor's note: Since I was serving as Chairperson at the time of these events, I can recall the "learning curve" required as a conventional biochemist like me entered into the world of high powered computers and software. Despite having the advice of an ad hoc committee of computer-wise faculty members, there were still some surprises. For example, the first "big" computer purchased was from a company which, to avoid possible legal actions, I will refer to as Company A. Along with it, software to allow for display and manipulation of biomolecular structures was purchased from Company B. Imagine my dismay to learn that because of a dispute (never previously revealed to us) between Companies A and B, the software from Company B could not be run on the hardware from Company A. Fortunately, after prolonged argument, refunds were arranged and the department could move on to purchase of compatible hardware and software. It was also a surprise to learn that purchase of hardware and software was but the first step, with substantial continued funding required for updates and maintenance. Ah, how naive I was!! And I can recall how novel it was, when Leslie Kuhn was hired, to provide for setup of a lab for a new faculty member that did not include standard biochemistry lab instrumentation like a pH meter or centrifuge but rather a battery of computers and supporting software.



Dr. Kaillathe Padmanabhan (Pappan) manages the departmental Computer Graphics Facility and provides critical support to computer operations in departmental research, teaching, and administrative functions.

Together with the increasing use of computer methodologies by other faculty members, such forces led to development of a central departmental Computer Facility, the management of which required a substantial time commitment by a knowledgeable person. To support the major development of computer technology, both in the central departmental facility as well as in the labs and offices of individual faculty members, the decision was made by Chairperson Bill Smith to hire a full-time computer guru. The search process ultimately led to the hiring of Pappan, and subsequent events have confirmed the wisdom of that choice.

Under Pappan's supervision, the services available in the

departmental computer facility have been greatly expanded and it makes state-of-the-art computer technologies available to students and faculty of this department and others on campus. However, Pappan's services are not confined to the central facility as he provides invaluable support in addressing specific computer needs of staff, students, and faculty of the department. He has, on more than one occasion, "saved the bacon" (not to mention, data) of those less familiar with the vagaries of computers. As an expert crystallographer, Pappan has contributed significantly to departmental efforts in Structural Biology by establishing and maintaining the necessary workstations and software, and by



Dr. Neil Bowlby checks out equipment in the undergraduate teaching laboratory. Dr. Bowlby supervises this facility and plays an integral role in conduct of the undergraduate laboratory courses.

providing hands-on help to faculty and students doing crystallographic analysis and molecular modeling. Pappan is also class coordinator for a yearly graduate level course in protein modeling.

His ever-present smile and unfailingly helpful attitude have made Pappan a friend to all who

know him, and his expertise has contributed immensely to development of computer methodologies in the department. MSU is indeed fortunate that Pappan traveled the road from Bangalore to East Lansing.

Dr. Bowlby has been a marvelous addition to the department, winning accolades from both students and faculty members for his commitment to the undergraduate laboratory courses.

His ever-present smile and unfailingly helpful attitude have made Pappan a friend to all who know him, and his expertise has contributed immensely to development of computer methodologies in the department.

Dave Dewitt's Avocation

Associate Professor Dave Dewitt originates from California, but he has spent many of his years here at MSU, first as a graduate student with Bill Smith and more recently as a BMB faculty member. Among Dave's interests, other than biochemistry, is the enjoyment of good wines. The latter has led Dave and some associates to a new venture in his native California. The first vines have been planted in a vineyard that will be developed over the next

several years. At this early stage, we presume that Dave does not plan to forsake his science for production of vintage wine in the near future. But a few years hence? Who knows? Will the labels be green and white?



Dave Dewitt

MSU's *Dean DellaPenna* Involved in International Program to Develop More Nutritious Staple Food Crops

“**M**icronutrient” is the general term used for vitamins and minerals that are essential for normal human health and growth but, in quantitative terms, required in relatively low amounts. It is common knowledge that various types of food differ in their micronutrient content, and thus one of the most reliable ways to ensure an adequate supply of micronutrients is a diverse diet which includes sources of the various micronutrients. In addition, it is common practice in developed countries to “fortify” certain foods with micronutrients. For example, vitamins A and D are commonly added to milk, and various other vitamins and minerals are incorporated into such things as prepared breakfast cereals (check out that box of corn flakes in your pantry!), flour, and other commercially obtained food products.

Dietary diversity, together with fortification, generally make micronutrient malnutrition an uncommon problem in developed countries. In developing countries, however, this is not the case as reliance on relatively few major food sources (i.e., little dietary diversity) together with economic

and social factors that result in virtual absence of fortified foods make micronutrient malnutrition a major concern. The United Nations has estimated that nearly one-third of the world's population suffers from severe deficiency in one or more micronutrients. The human toll is tragic. For example, iron deficiency is thought to be responsible for about 100,000 maternal deaths during childbirth

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each year. Deficiency in vitamin A causes blindness in 500,000 children each year, and is a leading cause of childhood mortality. Even moderate micronutrient malnutrition can damage cognitive and physical development and increase susceptibility to various diseases. Thus, strategies that reduce micronutrient malnutrition, particularly those that are feasible in developing countries, can have a profound effect in improving the human condition.

BMB Professor Dean DellaPenna is involved in a new initiative, called the HarvestPlus program

(<http://www.harvestplus.org>), to combat this problem by first dissecting and understanding the metabolism of micronutrient synthesis and accumulation in model organisms, and then using this knowledge to breed and/or engineer major developing world staple food crops to contain adequate micronutrients in a daily diet. Professor DellaPenna points out that, in the past, a major and quite successful emphasis of agricultural plant science has been development of plant varieties that provide increased yield and/or resistance to pests and pathogens. While this has benefits in terms of

increasing the amount of staple crops available to support caloric needs in the diet, it has given rise to another problem, i.e., increased reliance on a limited number of staple crops decreases dietary diversity with the result that micronutrient malnutrition may become even more of a concern. Worldwide, deficiencies in iron, zinc, and vitamin A are most common. Thus, the objective of the new initiative is to develop staple food crops that are enriched in these three micronutrients. Professor DellaPenna notes that the HarvestPlus program will be a



Professor Dean DellaPenna inspects stocks of *Arabidopsis* plants.

classic example of the collaborative nature of modern science, with scientists from a wide range of disciplines working together to address a specific problem. Nutritionists working in developing countries will identify and quantify specific nutritional needs (and the impact of plant breeding and engineering efforts in the future), while basic scientists will elucidate the underlying biochemistry pertaining to synthesis (of vitamins) or accumulation (of minerals) of the target micronutrients, and identify the genes involved in these processes. Using

recent breakthroughs in genomics, the staple crop will be genetically engineered, and developed by plant breeders to provide new varieties that will yield increased dietary levels of the pertinent micronutrient(s).

Dr. DellaPenna points to the development of Golden Rice as a prime example of the success of this approach. DellaPenna notes that you can eat all the rice you want and you still won't get your daily requirement of provitamin A (beta carotene). Beta carotene is produced in rice leaves but is not accumulated in rice seed. As a

result, vitamin A deficiency is a serious problem in countries in which rice (the seed being what is eaten) represents a major component of the diet. Dr. Peter Beyer, of the University of Freiburg in Germany and a collaborator with Dr. DellaPenna and others in the HarvestPlus initiative, was a leader in the work that led to development of a genetically modified rice variety in which beta carotene was accumulated in the seed; this was called Golden Rice since the beta carotene gave a distinct golden color to the seed. As part of HarvestPlus, the Golden Rice trait is being introduced by breeding into local varieties and its wide-scale propagation will have a major impact in decreasing vitamin A deficiency in countries in which rice is a dietary staple. Recently, similar strategies have been successful in increasing vitamin E levels in corn and soybeans, and beta carotene levels in oilseed rape. Thus, the feasibility of engineering plants with enhanced micronutrient levels is now well established.

Drs. DellaPenna and Beyer, together with Dr. Michael Grusak of the USDA/ARS Children's Research Center in Houston, TX, will head the Nutritional Genomics Team of the HarvestPlus initiative. Dr. Grusak's particular expertise is in the molecular and physiological processes involved in uptake and transport of iron and zinc in plants.

Food crops that have been selected and/or bred for increased vitamin and mineral content are said to be "biofortified." Cultivation of biofortified crops has several

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MSU's *Dean DellaPenna*

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advantages as an approach to addressing micronutrient deficiency. For example, it does not necessarily require any change in the behavior of either farmers or consumers, i.e., the biofortified crop can generally be grown and subsequently treated by the same methods used for that staple crop. Moreover, changes in micronutrient content do not adversely affect the appearance, taste, texture, or cooking properties of the staple. Research has also shown that an added, and unan-

ticipated, benefit of increased mineral content in seeds is enhanced plant growth, suggesting that biofortification may increase agricultural productivity as well as enhancing nutrition of the consumer.

HarvestPlus is an international effort involving scientists from around the world. It is spearheaded by the International Center for Tropical Agricultural Research in Cali, Colombia, and the International Food Policy Research Institute in Washington,

DC. The budget for the initial four years of the project is \$50 million, with a grant from the Bill & Melinda Gates Foundation providing \$25 million, and the remainder funded by grants from the World Bank, the U.S. Agency for International Development (USAID), the Danish International Development Assistance (DANIDA), and the Asian Development Bank.

Spartans Meet

George Stancel (PhD from MSU in 1970; Boezi Award recipient, 1990) has had an outstanding career as a scientist, teacher, and administrator, and is currently Dean of the Graduate School of Life Sciences at M.D. Anderson Cancer Center and the University of Texas Health Science Center in Houston. The Second International Conference on Ubiquitin, Ubiquitin-like Proteins, and Cancer was hosted by the M.D. Anderson Cancer Center in February, 2004. One of the distinguished speakers at the conference was Dr. Hsing-Jien Kung, a BMB faculty member for several years (1978-1984) prior to his move to Case Western Reserve University in 1984. Hsing-Jien rose through the ranks at CWRU, ultimately becoming Goodman-Blum Professor of Cancer Research. In 1998, Hsing-Jien moved to University of California-Davis, where he is Professor of Biochemistry & Molecular Medicine as well as Director of Basic Science at the



Professors George Stancel and Hsing-Jien Kung reminisce about their days at MSU.

UC-Davis Cancer Center. George Stancel provided the adjacent photo of these former Spartans, taken at the conference banquet. George (**George.M.Stancel@uth.tmc.edu**) said that he and Hsing-Jien (**hkung@ucdavis.edu**) had a great time recalling their days at MSU.

Dr. John E. Wilson Retires



John Wilson has written and edited the BMB magazine since its inception in 2000.

Preserving the Custom

Over the past several years of editing this magazine, I have written obituaries or retirement notices for several colleagues. While the precipitating event is (happily) quite different, obituaries and retirement notices do have at least two things in common. First, they generally provide a positive account of the accomplishments and contributions of the subject. Secondly, with rare exception, they are not written by the subject himself/herself. As my own retirement comes, it seemed to me that custom dictated that some notice be included but writing it myself did not seem appropriate. Thus I turned to some long-time colleagues who could be counted on to overlook, or at least minimize, my failings. My thanks to Bill, Shelagh, and Loran for providing the following.

Contributed by Bill Smith, Shelagh Ferguson-Miller, and Loran Bieber

Dr. John E. Wilson is retiring this year after a distinguished academic career at MSU. John did his undergraduate training in Chemistry at the University of Notre Dame, and his graduate and postdoctoral training in Biochemistry at the University of Illinois. Following service in the U.S. Army Medical Service Corps, John was appointed as an Assistant Professor of Biochemistry in 1967. He rose through the academic ranks rapidly to the level of Professor in 1975, and served as Associate Chairperson

of the Department from 1985-1989 and as Chairperson from 1989-1994.

John is an internationally recognized scholar in the field of brain energy metabolism. In particular, he has focused on the structure and regulation of hexokinase, the enzyme that catalyzes the first step in metabolism of glucose, which is the major substrate for generation of metabolic energy in the central nervous system. His wide-ranging work has included studies on the structure and

enzymology, and cell and molecular biology, of the isozymes of hexokinase found in brain and other mammalian tissues. John is also well-known for his initial recognition and enunciation of the concept of "ambiquitous enzymes," a term referring to enzymes, including hexokinase I in brain, that reversibly associate with membranes of subcellular organelles in response to changes in cellular metabolism. This functionally important association/dissociation process is now an established principle

Dr. John E. Wilson Retires

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that applies to many other proteins involved in both energy metabolism and intracellular signaling. John is the author or co-author of more than 130 refereed publications.

John is widely recognized for his meticulous, high quality research, as evidenced by his being a recipient of the Distinguished Faculty Award from MSU, appointments on two different study sections at the National Institutes of Health, and election as a Fellow of the American Association for the Advancement of Science. John was awarded two consecutive Jacob Javits Neuroscience Investigatorships from the National Institutes of Health, of seven years each. These highly prestigious awards are given only to individuals that have peer review priority scores on their National Institutes of Health grant applications in the top 1-2% and have long-standing records of scientific achievement. To receive even one of these awards is remarkable and to receive a second is truly exceptional.



After 37 years as a BMB faculty member, John Wilson bids adieu.

Many alumni will recall that John Wilson taught protein chemistry to a generation of biological and chemical scientists at MSU in BMB803 (formerly BCH812 and BCH801) during the 1970s, 1980s and 1990s. A few years ago, he took on the fairly thankless task of teaching and administering the one semester undergraduate general biochem-

istry course, BMB401. John is known as a demanding instructor but also noted for the clarity and organization of his lectures. He is respected for his dedicated and masterful efforts in teaching.

During his illustrious career, John Wilson has reached a level of recognition and achievement in teaching, administration and research that is matched by few others. His friends and colleagues look forward to his continued participation in departmental activities, including his enthusiastic participation in the "Turf Management Conferences" held at local golf courses.

John and his wife, Sandy, have been pillars of the

Department of Biochemistry and Molecular Biology for almost four decades. We wish them health and happiness in their retirement years, juggling grandchildren and relaxation in East Lansing, the family cottage in Indiana, and their new winter home in Tucson. From all of us, **Thank You, John.**

Memories

by Dr. John E. Wilson

Thirty-seven years is a long time to be at one place but, looking back, it is hard to believe that it has really been that long since I joined this faculty, the last active faculty member to have been recruited by the founding Chairperson of this department, Professor R. Gaurth Hansen. I still remember arriving for my interview visit, landing at the Lansing airport on a snowy winter day and being met by Paul Kindel, the first MSU faculty member with whom I had personal contact.

According to the recruiting protocol that was operational at the time, the faculty candidate met with all the faculty (smaller in those days) for lunch at Kellogg Center. After lunch, I was to be off on a schedule of meetings with individual faculty members but first, Chairperson Hansen wanted to make sure that things were set for the next meal. Thus, while standing in the lobby at Kellogg Center, Gaurth asked me if I had any preference for the kind of food we might have for dinner. Nope, anything was fine. Gaurth then asked, "Would you like a drink before dinner?" This question was pertinent since, at the time, East Lansing was dry and hence an affirmative response would dictate that we would be outside the city limits for dinner. "Well," I lightheartedly responded, "I never turn

one of *those* down." Gaurth seemed to take that response in stride. Later that day, I learned that Gaurth was a dedicated Mormon, and in accord with the tenets of that faith, a non-drinker. At that point, I figured my flippant response and confessed nonabstinence might have torpedoed any job opportunity. Fortunately, Gaurth was also a tolerant man (those who attended functions in his home, for visiting seminar speakers or faculty candidates, will know what I mean), and I was relieved to see that several faculty members who joined us for dinner that evening shared in a pre-dinner libation. (Dinner was at Warren's Poplars - old timers will recall that this was east of East Lansing, just beyond the infamous Coral Gables, the student watering hole in those days.) Clearly there was room for non-teetotalers on the faculty, and I slept better that night.

In addition to faculty candidates, it was also customary in those days for the entire faculty (or as many as could make it - and some were famous for never missing a free lunch) to join visiting seminar speakers for lunch at Kellogg Center. However, as the size of the faculty increased, and the cost of such affairs became excessive, the practice was abolished in favor of smaller luncheon



Perhaps nostalgia is not for everyone, but some of us like to indulge in it. Thus it is that I invoke editorial privilege and provide some reminiscences about my 37 years at MSU in this, the last issue of the departmental magazine to be assembled prior to my retirement.

gatherings, just a few faculty along with the visitor. At the departmental Christmas (Holiday) Parties that were being held in those days, the graduate students would present a series of clever, and frequently provocative, skits based on various personalities and events in the department. At the first party after the abolishment of the "entire-faculty luncheon" gatherings, the graduate students presented "The Last Luncheon." Based on Da Vinci's famous "Last

Memories

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Supper,” this featured graduate student faculty impersonators gathered around a long table and silhouetted by subtle background lighting. Like the faculty lunches, the party skits have now gone their way, but those old enough to remember will recall them fondly.

The “preliminary examination,” an integral part of the graduate program, has changed in many ways over the course of this department’s history. However, since the early days of the department, the preliminary exam has generally been regarded as a critical factor in evaluation of graduate student progress. Failure to satisfactorily complete the preliminary exam led to termination, or to transfer to the MS program, in which the student might have further chance to prove their worthiness to progress to the PhD. Perhaps my memory fails me, but to the best of my recollection, there had been no exceptions to this policy until a particular student, a real dynamo in the lab, had the misfortune to not do well on the prelim. Dismissal loomed. Would the faculty make an exception based on other demonstrated qualities of that student? They did, by a vote of 13 in favor of granting the exception to 12 against. A close call at an emotional faculty meeting that still sticks in my memory. Subsequent to that decision, the student went on to successfully complete the PhD, and to a distinguished career

that, some years later, resulted in recognition with this department’s Boezi Award. While my general tendency is to believe that good order requires adherence to established policy, I will never forget this incident as a reminder that inflexible interpretation of rules is not always the best option.

In 1975, life changed dramatically. Our second son, Jason, was diagnosed with lymphoma. His predicted survival was one to two years. Two surgeries, followed by an extended period of chemotherapy, ensued. Sandy and I will never forget the many kindnesses of departmental colleagues during this ordeal. Within days of the diagnosis, Andrea Smith and Nina Ronzio showed up at our front door, with casseroles in hand and kind words and offers of help on their lips. As Jason was in ICU after his first surgery, Pat and Dave McConnell arranged for delivery of a stuffed lion with the inspirational message: “Be a lion, Jason.” Loretta Suelter took care of our older son, John, while Sandy and I took Jason for consultations at U of M Medical Center. I was co-teaching a course with Willis Wood (Woody) but when I had to take Jason to Houston for several months of chemotherapy, Woody graciously took over my part of the course in addition to his own. I mention these few incidents but there were many more that Sandy and I will always treasure as memories of the support and kindness of faculty and spouses of this

department. Many of them will read this, and so I take this opportunity to say once again, thank you, dear friends. (The story does have a happy ending, as Jason went on to do well and, at the age of 32, is currently working in New York City.)

In the 1970-1980 years, ours was still a young department, with many of the faculty members having received their PhDs in the 1960s and then being recruited to the growing department. In such a youthful environment, the sudden death of a vigorous young faculty member, John A. Boezi, in 1980, was a stunning blow. Those of us who were friends and colleagues of John will remember his dedication to high standards of performance, both for himself and his students. We will also remember his love for his family, his good humor, and his interest in things non-scientific, such as golf, good wine, and gourmet cooking. Established by his many friends and colleagues, the Boezi Award is given annually to an outstanding alum of this department and serves as an enduring tribute to John’s memory.

Shortly after joining the department in 1967, I was enticed into a regular poker game that included fellow faculty members Steve Aust, Loran Bieber, and Al Morris. (I shudder to recall that these usually broke up at the crack of dawn, and now feeling my age, I wonder how we ever did that!) It turned out that we also shared an

interest in fishing, and each fall for several years, the four of us would take a “fly-in” fishing trip into the Ontario wilderness. It is rumored that beer sales would spike in Canada when we laid in supplies for the trip. Those were times of pure fun, lots of laughs, and wonderful memories of that special feeling that comes from sharing time with good friends.

Doug Randall was a grad student with Ed Tolbert when I came to MSU. Doug was also an avid fisherman. While this was typically done with the classic rod and reel, Doug, Loran Bieber, and some others from the department also used “dip nets” when the annual smelt run was on. They would head north and, after a night’s work, return with garbage cans full of fresh smelt. These would become the main dish at what was, for several years, a wonderful departmental tradition - the smelt fry. I’ll bet many of you reading this will remember enjoying those crispy fried little fish, along with the other good things that people would bring to supplement the main menu item. Good food? Yes. But more importantly, good times, when the departmental “family” got together to enjoy each other’s company.

I have four sisters, three of whom married ardent golfers. Sandy and I have three sons, two of whom are ardent golfers (and the third is now taking up the game). Several years ago, I noticed what had become a disturbing

routine. At summer family gatherings, the two sons would go off with their uncles to play golf while I, dedicated scientist and non-golfer, would remain at home, reading *JBC* or *Science*. There seemed to be something wrong with this picture. Perhaps there was something to this game of golf after all? So at about 50 years of age (too late to develop a good

“The Department” is, ultimately, people. As my years as an active MSU faculty member come to an end, I take great pleasure in recalling the many people – some still here, some now gone – that I have called friends and colleagues.

swing, according to one brother-in-law - and I guess he was right), I decided to give it a try. Dick Anderson proved to be a willing companion during my initial forays onto the golf course. Dick once had been an active golfer but had tapered off. My interest re-ignited the flame, and Dick and I became regulars at some of the less challenging courses in the area. When I finally got up the courage to venture out on a “real” golf course, MSU Forest Aker’s East, Bill Smith and Jon Kaguni, along with Dick, were kind enough to overlook my dubbed drives and hopeless iron shots. Thus the four of us began a more-or-less regular schedule of Friday afternoon “Turf Management Conferences” at Forest Akers East. This is now in the past, Timber Ridge Golf Course has become the favored venue, and

faculty colleague Dean DellaPenna has been my most reliable companion (along with Bill Smith, prior to his move to Ann Arbor). Based on experience thus far, I have solid evidence for the conclusion that the quality of one’s golf game does *not* improve in proportion to the number of rounds played. Nevertheless, I keep hoping, and plan to further test this

conclusion after retirement.

In 37 years, there are a lot of memories. The above are just a few, some bitter, some sweet. I hope I have not bored you with this highly personal account. When we think of “The Department,” things like courses, research grants and publications, and academic and professional honors earned by students and faculty naturally come to mind. Certainly important, but “The Department” is, ultimately, people. As my years as an active MSU faculty member come to an end, I take great pleasure in recalling the many *people* – some still here, some now gone – that I have called friends and colleagues.

A Research Program Evolves: Interaction and Activation

Steve Triezenberg joined the BMB faculty as an Assistant Professor in 1987. He recalls that he was attracted to MSU in large measure because of what he discerned to be a very cooperative and collegial atmosphere, where departmental walls were low and boundaries easily crossed. Subsequent events have proved that perception correct, resulting in collaborative interactions that have fostered new and highly productive directions in Dr. Triezenberg's research program.

Dr. Triezenberg came to MSU fresh from his postdoctoral work with Dr. Steve McKnight at the Carnegie Institute of Washington. His postdoctoral research was focused on regulation of viral transcription, and with the encouragement of Dr. McKnight, Steve has continued that line of research since his arrival at MSU. Specifically, he and some of his associates study a protein called VP16 that stimulates transcription of genes in the human pathogen, herpes simplex virus. VP16 is an exceptionally potent and versatile transcriptional activator, functioning in mammalian, yeast, insect and plant cells. This versatility and potency has made VP16 an important model in many studies on the mechanism of transcriptional activation.

VP16 contains two "structural domains" (semi-independent structural units within the protein) that serve different functions. One domain recognizes a specific target DNA sequence in the viral genes normally activated by VP16. A second domain, termed the activation domain, interacts with other proteins required for transcription, leading to enhanced expression of the viral genes. Using recombinant DNA methodology, the activation domain of VP16 can be combined with DNA-binding domains recognizing other target sequences, with



Steve Triezenberg
(<http://www.bch.msu.edu/faculty/stz/triezen.htm>)

the resulting chimeric proteins then able to activate the transcription of other genes containing the alternative target DNA sequence. In other words, the activation domain of VP16 is generally effective as an activator, and which genes are activated depends solely on which target sequence is recognized by the DNA-binding domain with which the VP16 activation domain is combined. In his initial efforts, Dr. Triezenberg and his students explored the effect of mutating specific amino acid residues in the protein on its efficacy as an activator. These studies were aimed

at defining the structural features in the activation domain of VP16 that were critical for this promiscuity as a transcriptional activator.

During his early years at MSU, Dr. Triezenberg collaborated with a laboratory at the Massachusetts Institute of Technology, using yeast genetics to test particular hypotheses about how transcriptional activator proteins work. Yeast has many virtues as an experimental system since its rapid growth and susceptibility to manipulation of its genome make it feasible to address questions that are difficult to address in other eukaryotic systems. This research direction led to the PhD project of John Stebbins, a graduate student in the Genetics Program, an interdepartmental program in which Dr. Triezenberg and other faculty from BMB and several other departments are involved. John explored the difference between transcription factors that require so-called "coactivator" proteins and other transcription factors that do not have this requirement.

One of the faculty members on John Stebbins' thesis advisory committee was Professor Mike Thomashow (then jointly appointed in the Department of Crop and Soil Sciences and the Department

of Microbiology and Molecular Genetics, and now affiliated with the MSU-DOE Plant Biology Laboratory). At this same time, Dr. Thomashow's laboratory had used yeast genetics as a tool in cloning a cold-regulated transcription factor from *Arapidopsis*, which is widely used as a model in studies of plant biochemistry and genetics. The Triezenberg lab tested whether the cold-regulated *Arabidopsis* transcription factor identified by the Thomashow lab required coactivator proteins when working in yeast. The answer was "yes," leading to the question of whether similar coactivators might also be required for the activity of the cold-regulated transcription factor in plants.

At about this time, Dr. Triezenberg was seeking to add a new research project in his laboratory. He took advantage of a sabbatical leave (in 1996-97) to increase his knowledge of gene regulation in plants by working with Dr. Peter Quail at the USDA Gene Expression Center in Albany, CA. This interest blossomed after the sabbatical, and the study of plant transcriptional regulation is now a major topic of research in the Triezenberg laboratory.

Dr. Triezenberg and Dr. Thomashow are Co-Principal Investigators on an NSF grant, now renewed, funding their work on plant coactivator proteins, particularly those involved in cold-regulated gene expression.

Virus to yeast to plants – the experimental system and methods may change but understanding transcriptional regulation remains a common theme in the research of Dr. Triezenberg and his associates. This research has been facilitated by collaborative interactions with faculty at MSU and elsewhere, who have provided particular expertise that has added breadth and new directions to the Triezenberg research program.

Dr. Triezenberg notes that the spirit of collegiality and cooperation that first attracted him to MSU endures in the campus scientific community. One indication of this is the existence of interdepartmental graduate programs such as the Genetics

Program and the Cell and Molecular Biology (CMB) Program. Dr. Triezenberg is a faculty member in both programs and is an active participant in the courses, seminars and workshops organized under the aegis of these programs, which involve faculty, postdoctoral associates, and graduate students from several different departments. He has served as Associate Director of the CMB program since 1999.

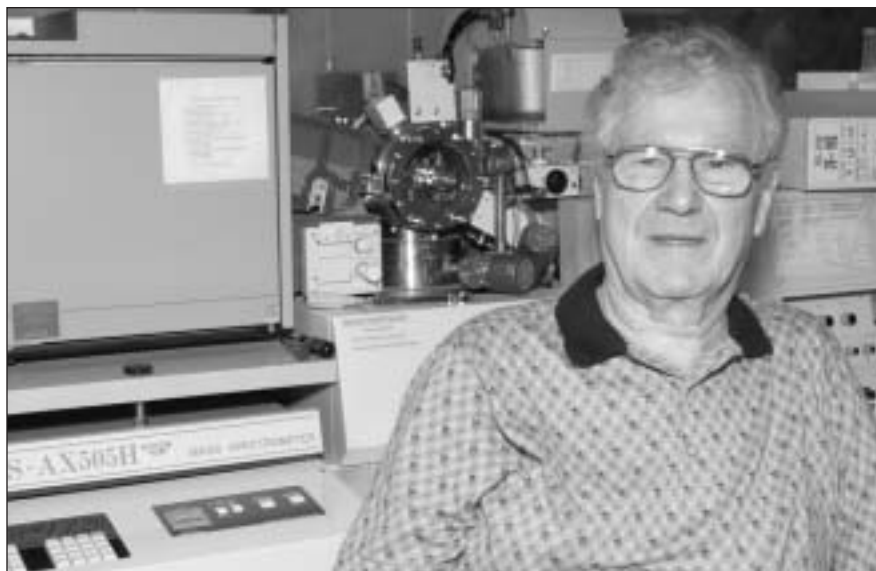
In addition, Dr. Triezenberg is involved in the Gene Expression in Development and Disease (GEDD) Focus Group (see article in last year's issue of this magazine, available at the departmental website, <http://www.bch.msu.edu>). This is comprised of eight faculty members and their research groups, from three different departments, who share an interest in transcriptional regulation. Faculty involved in GEDD work together to teach seminar courses, conduct journal clubs and research forums, hold joint lab meetings, and advise each other in preparation of manuscripts and research proposals. The GEDD Focus Group has funding from the MSU Foundation to support interlaboratory collaborative research projects, each spearheaded by a postdoctoral associate. This has led to several joint publications and to joint grant applications by various combinations of the GEDD Focus Group faculty members.

For administrative purposes, MSU is organized into departmental structures. But as Dr. Triezenberg perceptively noted when he first considered coming to MSU, departmental structure is not a barrier to interaction between members of the MSU scientific community, and research and graduate education at MSU are all the stronger because of that.

Whatever Happened to Jack?

Many readers of this page will recall Jack Holland, one of the more colorful and unconventional faculty members ever claimed by this department. While we knew that Jack was still alive and kicking in the East Lansing area, we had not actually seen him for quite some time. Thus we decided to look him up, and pass along some news about Jack to those of you out there who, like this writer, enjoy recalling the days when Jack roamed the halls of the Biochemistry Building. A phone call served to arrange a luncheon meeting and, one fine day in April, Jack picked me up and we headed off to a place that will be familiar to many of you former Spartans, Dagwood's. Over an olive burger and beer, Jack reminisced about his days in the Department and updated me on his recent activities. But first, a little history.

Jack Holland was drafted into the U.S. Army after high school, and his two years of service right after WW II included a tour of duty in Japan. He returned to the US and began his undergraduate studies, leading to a BA in Chemistry from Macalester College (St. Paul, MN) in 1951. However, Jack decided that he wanted to teach and coach, and his BA degree did not include the education courses that were required for certification as a teacher. So he did further undergraduate work, including



Professor Emeritus Jack Holland recently paid a visit to the Mass Spectrometry Facility. Dr. Holland played a major role in establishing and nurturing this important research support facility.

the requisite education courses, leading to a BS degree in Mathematics from St. Cloud (MN) State University in 1952. Jack was a high school teacher and coach in western Minnesota for three years, but then enrolled in the PhD program in chemistry at the University of Wisconsin. After he had completed course work and preliminary examinations for the degree, he decided to take a break from graduate work and become involved in the real world of instrumentation, to develop expertise and gain practical experience with scientific optics and electronics. Jack became a Technical Supervisor with E.H. Sargent Co., a prominent scientific equipment supplier in those days. With this distraction

from graduate work, the MS in Chemistry was awarded, *in absentia*, by the University of Wisconsin in 1958, in recognition of Jack's successful, yet incomplete, progress in the PhD program and as an enticement to return to Madison to finish his PhD. Jack worked for Sargent for about six years, but recognized that his major role was becoming the wining-and-dining of clients rather than involvement in development of scientific instrumentation. Those of you who know Jack can well imagine how his bubbly personality and endless reservoir of jokes might make him a popular choice as an entertainer of business clients, but Jack's interests were primarily in serious science. Thus he

resolved to return to his graduate studies in chemistry, but this time at MSU.

Jack came to East Lansing in 1964, enrolled in the graduate program in Chemistry. Gaurth Hansen, the founding Chairperson of the Biochemistry Department, recognized Jack's talents and quickly hired him, initially as an Assistant Instructor (1964-1965), and then as an Instructor (1966-1972). However, Jack's responsibilities were not primarily in teaching but rather, in the creation of the Biochemistry Instrument Shop. Gaurth Hansen foresaw that an in-house instrumentation design and repair facility would be a wonderful asset for the developing department. Under Jack's leadership, this facility was established and staffed, and Jack played a major role in training the new personnel in the Shop. The wisdom and foresight of Gaurth Hansen, and the efforts of Jack Holland, were critical for developing the Biochemistry Instrument Shop, which has an established tradition of excellent service in support of the research and teaching activities of faculty and students in BMB and other departments on campus.

While employed in Biochemistry, Jack was also engaged in his graduate studies in Chemistry. As any grad student would tell you, trying to combine graduate work with a full-time job

would make for one very busy person, and that certainly describes Jack during that time. While he is intrinsically rather rapid in his movements, a "Type A personality," this was exacerbated by the triple demands on his time of job, grad studies, and campus wide involvement in the burgeoning applications of computers to science and engineering. Anyone who watched his fast-paced "walk" down the hall could see this was truly a man in a hurry. He was also famous for his quick and not always accurate approaches to a parking space, followed by a fevered dash from his car into the building. Many of you will recall that, until construction began on the new Biomedical and Physical Sciences Building, there used to be a small parking lot beside Biochemistry. On more than one occasion, a blue Buick was seen somewhat randomly parked in that lot, sometimes one wheel up on the curb or some part of the vehicle extended into adjacent spaces, hastily parked by Dr. Holland as he made one of his famed rapid arrivals at the Biochemistry Building, slightly tardy for a meeting or other commitment.

Pressing the 8 year limit imposed on PhD programs by MSU policy, Jack completed his PhD in 1972. Many of his friends and colleagues here at the time received invitations to what was,

by any measure, one of the most memorable parties ever given by a new PhD. Well over a hundred of Jack's friends joined the party which was complete with the services of two bartenders, ensuring a ready supply of drinks to go with a lavish display of eats. No one ever said that Jack Holland didn't know how to party!

With PhD in hand, Jack became an Assistant Professor of Biochemistry, and moved steadily up the ranks to Full Professor in 1980. During his academic career, Jack pursued his interests in mass spectrometry and fluorescence instrumentation. Together with Chuck Sweeley, Jack established and served as Co-Director of the Mass Spectrometry Facility, which continues to this day to provide mass spectrometric services to researchers at MSU and elsewhere. Jack and Chuck developed innovative mass spectrometric instrumentation, such as the computerization of rapid scanning mass spectrometers, and developed several novel procedures, such as automated metabolic profiling by gas chromatography-mass spectrometry. A major development was the resurrection of "time-of-flight" (TOF) mass spectrometry as an effective analytical tool by serving as a rapid detector for gas or liquid chromatographs. Together with Mel Schindler, Jack developed a computerized fluorescence workstation, the ACAS (**A**nchored **C**ell

Continued on next page

Whatever Happened to Jack?

Continued from page 29.

Analysis and Sorting), which was manufactured and marketed by Meridian Instruments, a company co-founded by Jack, Mel, and Chuck Sweeley. Meridian Instruments also manufactured and marketed TOF mass spectrometry instrumentation, developed by Chuck and Jack. Numerous patents were awarded based on concepts developed by Jack, either alone or working with Mel, Chuck, or others.

Throughout his academic career, Jack served as a consultant for several companies, including Dow Chemical, LKB Instruments, Upjohn, and Detroit Edison, and government agencies including the US Army and the Center for Disease Control (CDC). In some cases, these represented an extension of industrial contacts

that Jack first made during his days with E.H. Sargent Co. Jack was widely known for his expertise in mass spectrometry and fluorescence, and in computerization of methodology using this instrumentation. He authored or co-authored over 70 publications in the scientific literature, most dealing with instrumentation or computational methods. His accomplishments were recognized with numerous honors, including the Vaalaer Award for Chemical Instrumentation (1973), the Arnold O. Beckman Award (1975), and the Senior Scientist Award presented by the MSU Chapter of Sigma Xi in 1989.

Though Jack "officially" retired in 1997, he continues to be actively involved as a consultant on projects involving scientific

instrumentation. The patent rights on TOF mass spectrometry methodology and instrumentation were purchased from Meridian Instruments by the Laboratory Equipment Company (LECO) and are being marketed under university license. Jack still consults with LECO as well as a few other instrument companies.

Jack and his wife, Rosemary, have two daughters who live with their families, including seven grandchildren, in North Carolina and Georgia. Jack can be contacted by e-mail at holland@msu.edu. Jack was, in fact, closely involved in establishing the computer systems and networks that first made e-mail available on the MSU campus.



New Surroundings for Professor Emeritus Hans Lillevik

After their many years in East Lansing, Professor Emeritus Hans Lillevik and his wife, Connie, have returned to their native Minnesota. They have an apartment in a retirement community located in Maplewood, MN, which is near Minneapolis-St. Paul. According to Hans, their apartment has a wonderful view, looking out on a nearby lake. They are enjoying the amenities offered by their new home, including the convenience of access to meal service and enjoying the company of other retirees living there. Hans and Connie seem very happy with their move, which has taken them back into closer proximity with other family members in that area. In fact, their

daughter is Director of Nursing in the retirement community in which they reside, so they can visit with a frequency that was never possible when the many miles separated them while Hans and Connie were in East Lansing. Hans and Connie would be happy to hear from old friends by phone (651) 773-7201 or mail (1200 N. Lakewood Drive, Apt. 201, Maplewood, MN 55119).

On Feb. 24, 2004, Hans was a special guest of the 3M Company at a reception for the 2003 Nobel Laureate in Chemistry, Professor Peter Agre of Johns Hopkins University School of Medicine. Professor Agre's father, Dr. Courtland Agre, and Dr. Lillevik were graduate students together at the University of Minnesota and colleagues at 3M in the 1940s, and remained lifelong friends.

An Overview

Department of Biochemistry and Molecular Biology Michigan State University

- Administration (% Funding):** College of Natural Science (Lead Dean; 50%), College of Human Medicine (14%), Michigan Agricultural Experiment Station (23%), College of Osteopathic Medicine (13%)
- Faculty:** 25 wholly appointed in Biochemistry & Molecular Biology, 15 jointly appointed in other units, and 8 Adjunct appointments
5 University Distinguished Professors
8 MSU Distinguished Faculty Awardees
1 NIH MERIT Awardee
- Specialists:** 3 (Undergraduate Laboratory, Bioinformatics Facility, and Macromolecular Structure Facility)
- Staff:** 16 (secretarial, accounting, Biochemistry Instrument Shop, Biochemistry Stores, Animal Room)
- Undergraduate Majors:** 305
- Graduate Students:** 59
- Postdoctoral Fellows and Visiting Scientists:** 81
- Support Facilities:** Macromolecular Structure, Mass Spectrometry, Genomics, Bioinformatics, Computer Graphics, Proteomics, Flow Cytometry, NMR, X-ray Crystallography, Transgenic *Drosophila*
- Centers:** REF Center for Biological Modeling
MLSC Center for Structural Biology
- Research Emphases:** Macromolecular Structure & Modeling
Plant Biochemistry
Genes & Signaling
- 2003-2004 Grant Support:** Approximately \$10 million in extramural support for faculty wholly appointed in BMB.
- Teaching:** Undergraduates (lectures, labs, independent study)
Graduate students (core Biochemistry and Molecular Biology)
Medical Schools (BMB 514, BMB 526, Problem-based Learning, Systems Biology)



CONSTRUCTION UPDATE



Left, gutted laboratory undergoing renovation. Air handling ducts, light fixtures and ceilings were totally removed. Right, postdoctoral research associate Katarzyna Hupert-Kocurek works in the renovated laboratory of Professor Jon Kaguni.

Photographs by Lynne Brown, Media Graphics, Inc.

Phase 4! Yippee!

In mid-May, the fourth and final phase of the extensive building renovation was underway, with completion expected by August, 2004. This multi-million dollar project includes complete replacement of the ventilation system in the building, replacement of vented hoods in the laboratories, replacement of ceilings and light fixtures, and various other improvements that are being done in the course of this project.

Despite the turmoil, no major problems have been encountered and the work has proceeded smoothly. Special thanks are due to Loran Bieber, Ron Norris, and Joyce Robinson, who handled the logistics of moves to temporary space and then back when renovation was complete. Occupants of laboratories and offices that were done during the first three phases are now enjoying their renovated quarters.

New Faculty Hire Bolsters Plant Sciences

Michigan State University has a long and proud tradition of leadership in the plant sciences. Determined to continue and further enhance that tradition of excellence, Provost (and designated next President of MSU) Lou Anna K. Simon provided funding for several new faculty positions as part of the Plant Science Initiative. Dr. Robert (Rob) L. Last has been appointed to one of these positions, with a joint appointment between the Department of Biochemistry and Molecular Biology (60%) and the Department of Plant Biology (40%). Professor Last's laboratory will be located in the Biochemistry Building, but he will be interacting widely with other members of the very active plant science community on campus.

Professor Last has had a varied and distinguished career. He received his BA in Chemistry and Biology from Ohio Wesleyan University. His graduate work was done in the Department of Biological Sciences at Carnegie-Mellon University, from which he received the PhD in 1986. After a postdoctoral experience at the Whitehead Institute for Biomedical Research in Cambridge, MA, he became a faculty member at



Professor Robert Last

Cornell University in 1989, rising through the ranks to Tenured Senior Plant Molecular Geneticist (equivalent to tenured Full Professor) in the Boyce Thompson Institute for Plant Research in Ithaca, NY. In 1998, he left Cornell for a position in the biotech industry. He was Director of Enterprise-Wide Model Organism Functional Genomics at Monsanto, and a founding Director and Director of Discovery Genomics at Cereon Genomics LLC, an off-shoot of Monsanto that was located in Cambridge, MA. In this position, he had overall technical responsibility for model organism-based functional genomics at both Cereon and Monsanto, and led the research efforts of a large

group of scientists affiliated with Cereon and Monsanto. In October, 2002, he began a five month sabbatical at the Max Planck Institute for Chemical Ecology in Jena, Germany, where he focused on the evolutionary and population genomics of *Arabidopsis* and related species. In March, 2003, he returned to the US and became Program Director for the Plant Genomics Research Program at the National Science Foundation, in which capacity he served until joining the MSU faculty.

Shortly after his arrival at Cornell, Dr. Last received an NSF Presidential Young Investigator Award, a five year grant that recognizes outstanding and promising young scientists. In his subsequent career, he has played a prominent role in professional activities, including his current service as a member of the Keystone Symposia Scientific Advisory Board. He is Associate Editor for the journal *Plant Physiology*, and also serves on the Editorial Board for *Current Opinion in Plant Biology*.

Graduates during the 2003-2004 Academic Year

Graduate Degrees

Mary Chao	MS
Phillip Kiefer	MS
Wayne Riekhof	PhD
Atima Sharma	MS

BS Undergraduate Degrees

Fall, 2003

Mustika Tanojo	BMB/BT
Christopher Burton	BMB
Angela Taylor	BMB
Rut Wattanasak	BMB

Spring, 2004

Irene Flick	BMB/BT
Aaron Kosinski	BMB/BT
Timothy McFarland	BMB/BT
Tushar Menon	BMB/BT
E-Ching Ong	BMB/BT
Katherine Strong	BMB/BTBF

BS Undergraduate Degrees

Spring, 2004 continued

Johnathan Barkham	BMB
Kelly Burnett	BMB
Cassandra Campbell	BMB
Heather Gibson	BMB
Kurtis Haas	BMB
Justin Keeler	BMB
Timothy Lavens	BMB
Vishal Malhotra	BMB
Michelle Manente	BMB
William Nobis	BMB
James Paarlberg	BMB
Erica Scheller	BMB
Travis Sportel	BMB
Jason Young	BMB
Nicholas Brideau	LBS/BMB
Christi Hemming	LBS/BMB
Kelason Jens	LBS/BMB
Greta Monterosso	LBS/BMB
Andrew Park	LBS/BMB
Jay Sage	LBS/BMB
Ankoor Soni	LBS/BMB
David Taggert	LBS/BMB
Daniel Wood	LBS/BMB

Summer, 2004

Justin Simm	BMB/BT
Laura Miller	BMB
John Mistalskii	BMB
Nakaiya Okan-Mensah	BMB

2003
2004
Congratulations
Graduates

Alumni News

ALUMNI!

Send your updates to

bchalum@msu.edu

We look forward to hearing from you!

In the Alumni News section of this magazine, we provide updates on alums who have contacted us about what life has brought them since their days at MSU. For the 2003 issue of this magazine, we had a rather extensive number of responses. I guess almost everyone who wanted to respond did it last year, with the result that the input has been rather meager this year. Hey out there! We'd love to hear from you! Please use the form attached to this publication to let us know about happenings in your life – graduate or medical school, jobs, marriages, births, interesting activities, whatever. We'll be glad to pass them along, and it just might result in former MSU friends giving you a call or sending a note that will renew old friendships. If you prefer, you can send the information by e-mail to bchalum@msu.edu. We look forward to hearing from you.



Jerusalem, Israel, that developed and manufactured medical diagnostic kits. Subsequently, he received an MD degree from University of Miami in 1973, and currently has an obstetrics/ gynecology practice in Astoria, NY. A highlight of Dr. Steinman's medical career occurred approximately seven years ago, when he delivered of a set of identical quadruplets (only 26 sets in the world), resulting in appearances on *Dateline* and on the Today Show. He indicates that his current research interest is monozygotic twinning. He can be contacted by mail to 46-01 Broadway, Astoria, NY 11103, or e-mail to dav4601@aol.com.

Weems, Charles N. - BS '73

Charles writes that he is "somewhat retired" from a position with Stauffer Chemical Co. He can be contacted by mail to 337 Lemon St., Apt. 6, Marietta, GA 30060.

Beitz, Donald C. - PhD '67

Don Beitz told us how much he enjoyed the article about his old mentor, Willis Wood ("Woody"), in last year's issue of the magazine. Don continues in his position as Charles F. Curtiss Distinguished Professor of Agriculture at Iowa State University, and noted that, in Fall, 2003, he was teaching a biochemistry class to veterinary medical students for the 37th time. Don did not mention the "R" word, but after 37 years of teaching the same course...well, Don?? Don can be contacted by e-mail to dcbeitz@iastate.edu.

LaRue, John N. - PhD '69

John retired after 28 years of teaching advanced placement chemistry at Cherry Creek High School in Englewood, CO. He said that teaching the brightest kids in a suburban high school of 3600 students was a great job, and he considered himself fortunate to have ended up in that position. In 1998, John was selected as the American Chemical Society Outstanding

Chemistry Teacher in Colorado. John pointed out that it took 28 years for it to happen, but finally he had a student who was an offspring of a former student. "Certainly it was time to retire." Beginning in 1986, John had used his summers off to construct a log home in Townsend, MT, and now John and Roxann, his wife of forty years, are enjoying that home after his retirement in 2001. John's days are filled with lots of fishing, hunting, and woodworking. He adds that their older son is a registered fly fishing guide on the Missouri River - sounds like a good guy to know for any fishermen headed that way. John can be contacted by mail to 50 Antelope Road, Townsend, MT 59644, by phone (406) 266-3985, or by e-mail to (what else?) bigskyjohn@earthlink.net.

Steinman, Gary D. - BS (Chemistry), '63

Gary received the PhD in Biophysics from University of California, Berkeley, in 1965. From 1968-1972, he was Managing Director of Amesysium, Ltd., a company in

Thank You!

Thank You!

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Contributions from past students and other supporters of the Department of Biochemistry and Molecular Biology provide funding for several departmental awards and developmental activities. Endowment funds have been established to provide support for the William W. Wells, N. Edward Tolbert and Charles C Sweeley Lectureships, and the John A. Boezi Memorial Alumnus Award. Additional endowment funds are the Biochemistry Undergraduate Endowed Scholarship Fund and the Biochemistry Enrichment Fund. Unrestricted financial gifts to the Department are also used for these activities.

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Provides funding, awarded on a competitive basis each year, to support excellent undergraduate students pursuing research in the department.

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An award given annually to a recipient of a B.S., M.S., or Ph.D. degree from this department who has continued on to a distinguished career that reflects the qualities personified by John Boezi.

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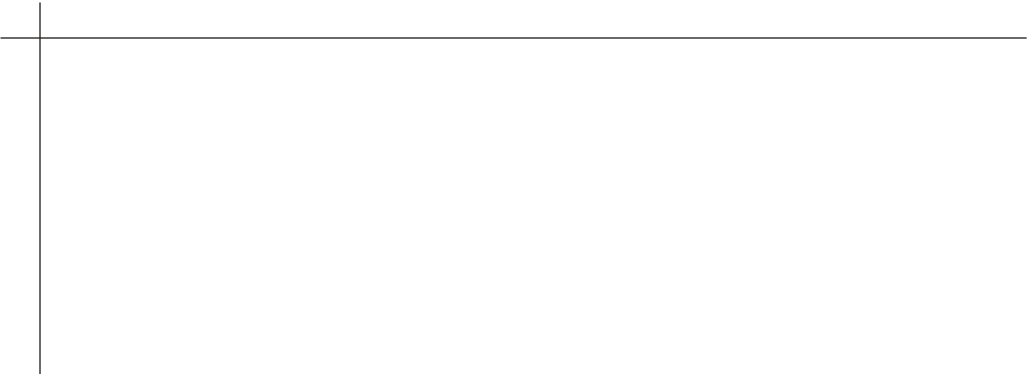
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What have you been up to since graduation? Please include any information about research projects, awards, personal events, etc., that you would like to share with fellow alumni and former classmates.

Be sure to browse our web page at <http://www.bch.msu.edu>.

All information can be sent via e-mail to bchalumn@msu.edu, return this form by mail using the attached envelope, or simply remove at perforation, fold, seal and mail.



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Left: The new Biomedical and Physical Sciences (BPS) Building is in the foreground. The Biochemistry Building, at the right, is connected to BPS by walkways at the basement and fifth floor levels of Biochemistry. Not seen, but at the left in this view, is the Chemistry Building, to which BPS is also connected by walkways.

Below: Looking northeast from the walkway connecting the Biomedical and Physical Sciences Building with the Biochemistry Building. At top left is the Chemistry Building, at the right is the Cyclotron. The area surrounded by these buildings was recently landscaped. At lower right are trailers used as office and storage space by the construction companies doing the renovation on the Biochemistry Building.



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