



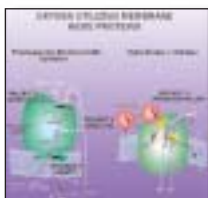
BIOCHEMISTRY 2000



Sally Camper-Boezi Awardee for 2000



Phil Felgner-Making Waves in Business



Biochemistry Receives 4.4 Million Dollar Grant

MICHIGAN STATE
UNIVERSITY

BIOCHEMISTRY 2000



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A Message From the Chairperson

Everyday there are more and more Things To Do with someone out there wanting you to get them done Faster and Faster and The Pile gets Higher and Higher. Been there, right? On a larger scale, the same thing happens to institutions, and the MSU Department of Biochemistry, now embarking along with you on the 21st century, is no exception. Well, what do you do? Just try to pick out those things that you think are the most critical and those things that you are the best suited to do and try to do them exceptionally well. With this in mind the departmental faculty developed a mission statement to help us focus our efforts: The goal of the Biochemistry Department is to improve the research stature of the department while maintaining quality instruction in our undergraduate, graduate, and medical school programs. What I hope to do in this message is to highlight some of our recent individual and collective accomplishments and to provide you with a sense of our direction over the next several years.

You may be aware that in terms of both number of faculty and number of undergraduate, graduate, postdocs, and medical students, the Biochemistry Department at MSU is among the two or three largest in the country. More importantly, I believe that the Department continues to be among the most collegial and most dedicated to teaching. The Biochem-

istry Building, now 35 years old, is beginning a major renovation phase which will likely include upgrading the ventilation and lighting systems and repairing and repainting the cabinetry in the laboratories. Nonetheless, the present structure continues to be an outstanding research facility and is among the best equipped for performing modern biochemical and molecular biological research. A new Biomedical and Physical Sciences Building, now under construction, will link the Biochemistry and Chemistry Buildings and will house the Departments of Microbiology, Physiology, and Physics and Astronomy. We anticipate that this physical proximity will further enhance interactions with others in the MSU scientific community, with benefit to both research and teaching programs.

Faculty hiring that was done from the inception of the Department of Biochemistry in the late 1950s up until the mid 1990s was always aimed at finding the best young biochemist available. Relatively little emphasis was placed on the research area of the new faculty member. In many ways, this was a very successful approach that yielded many excellent research faculty and a strong teaching ethic. Indeed, in terms of extramural grant support, by the mid-1990s the Biochemistry Department had become the best funded academic department on the MSU campus. However, during the early 1990s it



William L. Smith, Professor and Chair
Web Site: <http://www.bch.msu.edu>
Email: bchalumn@msu.edu

“The goal of the Biochemistry Department is to improve the research stature of the department while maintaining quality instruction in our undergraduate, graduate, and medical school programs.”

was becoming increasingly clear that the department had not achieved a national stature reflecting its actual level of productivity. In part, this was because we were and still are a relatively “young” department, but it was also because we had neither developed well-recognized research niches nor advertised ourselves very effectively. Accordingly, the departmental faculty decided to address this issue of stature by committing to do future hiring around three emerging research strengths in the department: Structural Biology, Plant Biochemistry and Biochemistry of the Cell Nucleus. We have recently added three or four new faculty members in each of these areas. Moreover, we have also

Continued on page 2

A Message From the Chairperson *Continued from page 1*

improved the research infrastructure by establishing a first rate computer graphics/bioinformatics facility, continually upgrading an already strong Macromolecular Structure Facility, obtaining NSF funding for a new high field NMR and purchasing state-of-the-art equipment for the crystallography, mass spectrometry, and flow cytometry facilities. Additionally, five of our faculty members and two faculty members from the Chemistry Department succeeded in getting the first NIH Program Project at MSU to study the structural biology of membrane proteins. Several of our faculty have retired to Emeritus status in recent years including Dick Anderson, Bill Deal, Jack Holland, Dave McConnell, Clarence Suelter, and Bill Wells. As many of you are aware, Ed Tolbert passed away last December and is sorely missed. Another sad happening was visited upon us with the death of Peter Steck this past fall. Peter was our Boezi Award Winner

in 1999. On a happier note, during the past several years a number of our faculty members have been recognized for their accomplishments. David Arnosti, Shelagh Ferguson-Miller, Pam Fraker, Bob Hausinger, Ken Keegstra, Jack Preiss, Natasha Raikhel, Steve Triezenberg, John Wang and John Wilson have each received teaching or research awards during the past two years.

On the next page are some statistics that provide a snapshot of the department at the beginning of the Year 2000. Please also take some time to visit our web site (<http://www.bch.msu.edu>) which we update frequently. This site provides many additional details about the department.

While we are proud of our accomplishments, there is obviously much to be done. The MSU Biochemistry Department remains dedicated to developing our research programs while at the same time making sure that we

provide the best possible training for our students. We hope that you will enjoy looking through this year's publication, catching up on the "goings on" of the department and stirring past memories of your time at Michigan State University.

Best personal regards,



William L. Smith

P.S. By the time you read this, the name of our department will officially have been changed to "Department of Biochemistry and Molecular Biology". This will be reflected in future issues of this newsletter.

An Overview

Department of Biochemistry, Michigan State University

| | |
|------------------------------------|--|
| Administration (% funding): | College of Natural Science (Lead dean; 52%), College of Human Medicine (19%), Michigan Agricultural Experiment Station (18%), College of Osteopathic Medicine (15%) |
| Faculty: | 39 faculty members, including 14 with joint appointments (8 of whom have their academic home in Biochemistry); 5 University Distinguished Professors; 9 MSU Distinguished Faculty Awardees |
| Specialists: | 3 (Laboratory, Bioinformatics and Structure Facilities) |
| Staff: | 14 (secretarial, accounting, Instrument Shop, Biochemistry Stores, Animal Room) |
| Undergraduate Majors: | 225 |
| Graduate Students: | 45 |
| Postdoctoral Fellows: | 30 |
| University Facilities: | Macromolecular Structure, Mass Spectrometry, Bioinformatics/Computer Graphics, High-Throughput DNA Sequencing, Microarray, Flow Cytometry |
| Research Emphases: | Structural Biology; Plant Biochemistry; Biochemistry of the Cell Nucleus |
| '99 Grant Support (66): | 23 National Institutes of Health, 8 National Science Foundation, 3 United States Department of Agriculture, 3 Department of Energy, 2 American Cancer Society, 3 American Heart Association, 24 Other; Currently about \$7.5 million in yearly extramural support. |
| Teaching: | Undergraduates (lectures, labs, independent study); Graduate students (core Biochemistry and Molecular Biology; Specialized courses); Medical Schools (BCH521, Problem Based Learning (PBL), Systems) |
| Areas of Concern: | Recruiting quality graduate students and postdocs; Increasing the per FTE level of extramural grants; Increasing departmental visibility nationally; Development of endowment support. |

Sally Camper, Boezi Awardee for Year 2000

Dr. Sally Camper, Associate Professor of Human Genetics at the University of Michigan, will receive the John A. Boezi Memorial Alumnus Award at the annual Awards Banquet to be held in April, 2000. Dr. Camper received her Ph.D. from this department in 1983, with Professor Fritz Rottman as her major professor, and subsequently did postdoctoral work with Dr. Shirley Tilghman at the Institute for Cancer Research in Philadelphia. Since 1988, Dr. Camper has been a faculty member in the Department of Human Genetics at UM, with research interests in mammalian development, genetics, and genome mapping, and in the use of transgenic animal models in addressing questions in these areas. In one aspect of her work, Dr. Camper and her colleagues have focused on development of the multiple cell types comprising the pituitary gland, and this is described in her



Photo by Bill Wood, UM Photo Services

recent review (Burrows *et al.*, *Trends in Endocrinology and Metabolism* **10**, 343-352, 1999). In other recent work, Dr. Camper and her collaborators have linked mutations in an unconventional myosin gene to a human genetic disorder leading to deafness (Wang *et al.*, *Science* **280**, 1447-1451, 1998) and have shown that an animal model of this disorder can be corrected by the corresponding transgene (Probst *et al.*, *Science* **280**, 1444-1447, 1998). Dr. Camper is Director of the UM Transgenic Animal Core Facility, which provides support to other investigators using transgenic methodology in their

research, and she currently serves on several editorial boards, peer review panels, and advisory committees for professional organizations.

Professor John A. Boezi joined the newly formed Department of Biochemistry in 1963. Together with colleagues like Fritz Rottman and Allen 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.

Past Recipients of the Boezi Award

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. William L. Smith, Chairperson, Department of Biochemistry or e-mail us at bchalumn@msu.edu.

| | | | |
|------|-----------------------|-------|------|
| 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 |

Biochemistry Gets New Neighbors

The landscape has been drastically and permanently changed on the north and west sides of the Biochemistry Building. The old Biology Research Building, and lots of parking spaces, are no more. In their place, at the moment, are the foundations and skeletal outline of the new Biomedical and Physical Sciences Building. Slated for completion in Spring, 2002, this seven-story, 200,000 net square foot structure will be the largest academic facility on campus and will become the new home for the Departments of Physiology, Microbiology, and Physics and Astron-

The new Biomedical and Physical Sciences Building slated for completion in Spring, 2002, will be the largest academic facility on campus.

omy. The new building will be connected to the existing Biochemistry and Chemistry Buildings via both underground and above-ground tunnels, and will house a central science library as well as state-of-the-art teaching and research space. You can learn more about the new building, see artist's renditions of its final appearance,

and follow the progress of construction through live camera shots by clicking to the College of Natural Science web site: <http://www.ns.msu.edu>. Alternatively, this site is accessed by clicking on the "Departmental Information and Contacts" option available at our department web site (<http://www.bch.msu.edu>).



Past Boezi Recipient Makes Waves in Biotechnology and Business World!

Phillip L. Felgner, originally from Frankenmuth, MI, is a Spartan through-and-through. He received his B.S. in Biochemistry in 1972, after an undergraduate career that included extensive involvement in undergraduate research. Phil stayed on at MSU for his graduate work, receiving an M.S. in 1975 and the Ph.D. degree in 1978. Following postdoctoral work at the University of Virginia, Phil joined Syntex

findings have led to development of a new class of infectious disease vaccines

Research (Palo Alto, CA) as a Staff Scientist. It was here that he developed the first cationic lipid reagent for gene transfer (Felgner *et al.*, *Proc. Natl. Acad. Sci. USA* **84**, 7413-7417, 1987). This reagent, now marketed as Lipofectin, and similar reagents are widely used for molecular biology and gene therapy applications. In 1988, Phil became Director of Product Development for a start-up company, Vical, Inc., which had interests in development of gene therapeutics, ultimately becoming Chief Scientific Officer. In 1989, with

colleagues at Vical and at the Univ. of Wisconsin, Phil made a landmark discovery, showing that functional reporter gene sequences ("naked DNA") could be introduced directly into skeletal muscle without the use of viral vectors (Wolff *et al.*, *Science* **247**, 1465-1468, 1990). He and his collaborators were also the first to demonstrate that potent antiviral immune responses could be generated following intramuscular injection of plasmids encoding viral antigens (Ulmer *et al.*, *Science* **259**, 1745-1749, 1993). These findings have led to development of a new class of infectious disease vaccines referred to as "DNA vaccines." DNA vaccine technology is currently being evaluated in human clinical trials, and further development of cationic lipid-mediated gene delivery technology is also continuing. Phil currently holds 12 domestic patents in areas related to gene transfer vectors. For his numerous biotechnology innovations, he received the Southern California Inventor of the Year Award in 1996. In 1998, Phil founded a new company, Gene Therapy Systems (GTS), having the mission of providing more innovative tools to academic scientists and pharma-



Phil Felgner

ceutical companies interested in gene therapy research and pharmaceutical development. In recognition of his distinguished accomplishments and many contributions to both basic science and development of gene therapies, Phil was named recipient of the John A. Boezi Memorial Alumnus Award in 1996.

Plant Biochemistry—Still Going Strong

N. Edward Tolbert Lectureship Established in Memory of Dr. Ed Tolbert

The plant sciences have traditionally been a strength at MSU. After coming to Michigan State in 1958, Ed Tolbert became part of that tradition. A member of the National Academy of Sciences and internationally renowned for his work in several areas of plant biochemistry, Ed consistently set an example of enthusiasm and dedication to research, which he described as "my only work and hobby." This continued after Ed became *Professor Emeritus*, and he was here in his office, working on a manuscript, just two days before his

passing on Dec. 13, 1998. Many of Ed's family, friends, past students, and colleagues gathered in MSU's Alumni Chapel for a memorial service at which Ed's brother, Bert, and former students recalled the highlights of a life that began in 1919, on a farm in Twin Falls, Idaho, and ended after 40 years of service to Michigan State University. In Ed's memory, the N. Edward Tolbert Endowed Lectureship in Plant Biochemistry has been established. Contributions designated for this fund can be made by filling out the form on page 33



Dr. Ed Tolbert

and using the return envelope provided.

Continuing the Tradition - New Initiatives in Plant Sciences

Recognizing the proud heritage of MSU as a leader in the plant sciences, and to ensure continuation of that leadership, plant biochemistry has been formally established as a focus area in the Department of Biochemistry. Recent additions to the Biochemistry faculty who reflect that commitment are Christoph Benning (see article by Dr Benning on p. 10) and Gregg Howe. Further information about these new faculty members and their research inter-

ests can be found at the Department web site (<http://www.bch.msu.edu>). The importance of plant sciences at MSU has also been recognized at the higher levels of administration, and with support from the Provost, six new faculty positions have been established in this area. Searches are, or soon will be, underway to identify faculty for several of these positions. One of these search processes has already been completed and will bring Dr. Dean DellaPenna (see



Gregg Howe

<http://www.ag.unr.edu/biochemistry/faculty/dellapenna/default.asp>) as a new faculty member in the Department of Biochemistry in Spring, 2000.

Plant Biochemistry—Still Going Strong

Development of Plants As A Source of New and Commercially Important Products - Christoph Benning, Assistant Professor

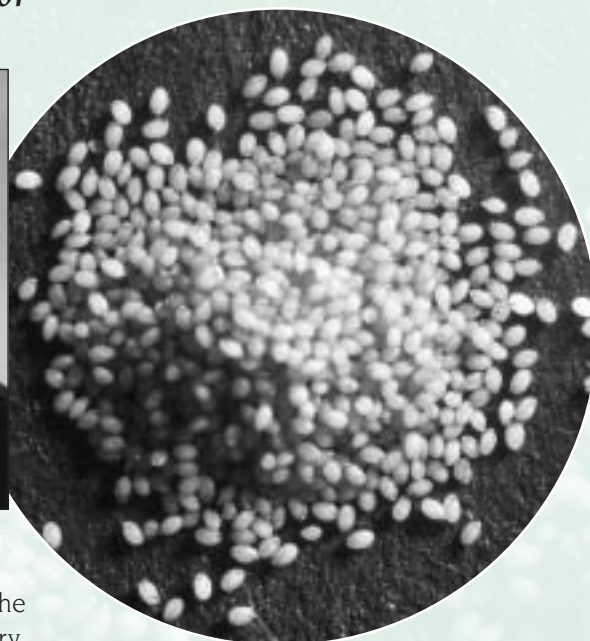
Regulatory Networks Governing Seed Metabolism in *Arabidopsis*: A Functional Genomics Approach to Increase Plant Oil Yield

The recent completion of the genomic DNA sequences of bacteria, yeast and multicellular organisms such as the worm *C. elegans*, as well as the impending completion of the human genome and the first plant genome have led to new experimental avenues which can be explored by the biochemist. A new field has arisen, "Functional Genomics", which encompasses novel techniques to mine and interpret the available data on a genome wide scale. The ultimate goal is to understand the function of every gene product of a given genome at the biochemical and molecular level.

Until now biochemists and molecular biologists have been pursuing this goal gene by gene or protein by protein. The difference between the traditional approach and functional genomics is the enormity of scale on which experiments are conducted. Thus, robotic "high-through-put" techniques recruited from different industrial processes such as computer chip fabrication are at the core of functional genomics. Through collaborative efforts between individual researchers of the Department of



Christoph Benning, Assistant Professor



Botany and Plant Pathology, the DOE-Plant Research Laboratory, and the Department of Biochemistry, the first functional genomics projects at MSU were recently initiated. Several of these focus on *Arabidopsis thaliana*. This small herbaceous plant is a genetic model organism which is also closely related to the third most important oil crop species, *Brassica napus* (canola). *A. thaliana* is the first plant for which the entire genome will be sequenced, presumably by the end of 2000. The "Arabidopsis Functional Genomics Consortium" headed by Pam Green (DOE- Plant Research Laboratory and Dept. of Biochemistry) here at MSU is spearheading efforts to interpret this vast amount of genomic information through functional genomics.

In a collaborative effort, the two research groups headed by John Ohlrogge (Dept. of Botany and Plant Pathology) and Christoph Benning (Biochemistry) use a functional genomics approach to study the metabolism of developing seeds in *Arabidopsis thaliana*. The metabolism of developing seeds is adapted to the conversion of imported photosynthate (mainly sucrose) into storage compounds such as starch, oil or proteins. For many crop species, seeds and their storage compounds are the plant products of commercial value. Although many details about the involved metabolic pathways are known from experiments with different plant tissues or non-plant



organisms, we are only beginning to understand the underlying developmental regulation of plant seed metabolism. While we do now have the ability to metabolically engineer the composition of plant seeds, the potential of this technology cannot be fully realized until much more is known about seed metabolism and its regulation. For example, in most cases we do not yet understand which genes will be most useful to modify the quantity of seed-based products. The goal of this project is

to identify regulatory factors that specifically control processes involved in storage compound (seed oil) accumulation. Such specific factors would provide ideal targets for genetic engineering of seed metabolism. As a first step, more than 10,000 cDNAs derived from developing seeds of *A. thaliana* were sequenced from one end. Subsequent “*in silico*” analysis (bioinformatics) of this large data set led to the identification of potential

The goal of this project is to identify regulatory factors that specifically control processes involved in storage compound (seed oil) accumulation.

regulatory genes and revealed the possible organization of genes with similar metabolic function in “regulons.” To determine which of the genes represented by these cDNAs are specifically expressed in developing seeds, 5,000 cDNAs were selected and spotted by a robot onto glass slides which were probed with bulk cDNA derived from seed and leaf tissues, each labeled with a different fluorescent dye. The hybridization of the two different fluorescent probes to each cDNA spot is determined by confocal laser scanning microscopy. This differential hybridization procedure is referred to as cDNA microarray analysis. It permits the simultaneous monitoring of the expression

of, in this case, the 5,000 genes on the microarray in different tissues, mutant strains, or growth conditions. This technology generates a vast amount of data and requires extensive computational and bioinformatics resources for data analysis. The preliminary analysis of this 5,000 cDNA seed microarray suggests that approximately 10% of the genes represented by the cDNAs on the array are specifically expressed in developing seeds.

Among these are putative transcription factor-encoding genes, which are currently targeted for further analysis.

This technology is, of course, not restricted to plants and several projects at MSU are in preparation which will employ microarrays containing human or animal cDNAs. MSU has recognized the importance of this technology and is currently implementing a state-of-the-art high-throughput sequencing and microarray facility.

Biochemistry Receives 4.4 Million Dollar

Structural Biology of Membrane Proteins

Human cells contain 46 chromosomes carrying the genes for approximately 80,000 different proteins. As a result of remarkable advances in x-ray crystallography over the last several years, the three dimensional structures of well over 11,000 proteins are now known. However, almost all of these proteins are “soluble”

Prostaglandin endoperoxide synthase and cytochrome c oxidase play critical roles in human health and disease.

proteins. Indeed, the structures of only about twenty of the roughly 15,000 different proteins that are embedded in cellular membranes have been solved. Membrane proteins present formidable technical challenges. First, it is necessary to purify them from biological membranes, a process requiring the judicious use of complex, highly specialized detergents. And second, once these proteins are purified, they must be crystallized in the presence of these detergents in a stable form amenable to the diffraction of x-rays — yet, another major obstacle.

Researchers in the Departments of Biochemistry and Chemistry

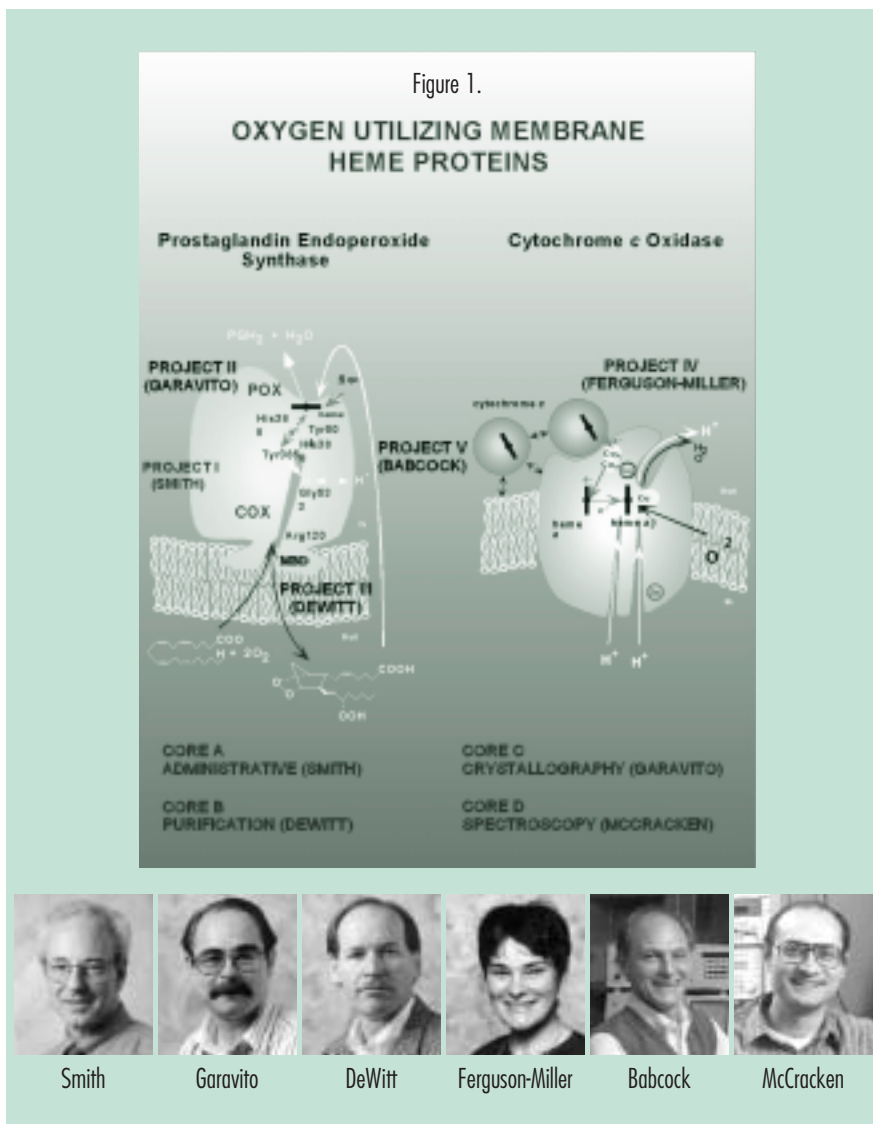
were recently awarded a large, multi-investigator Program Project Grant from the National Institutes of Health (NIH) to study structure-function relationships in two membrane proteins - prostaglandin endoperoxide synthase and cytochrome c oxidase (Fig. 1). These two enzymes play critical roles in human health and disease. The Program Project entitled “Oxygen Utilizing Membrane Heme Proteins” will be funded for five years with a total budget of about \$4.4 million. There are five scientific Subprojects and three technical service cores comprising the program project. Each of the Subprojects is directed by an MSU faculty member including Drs. Bill Smith, Mike Garavito, Dave DeWitt and Shelagh Ferguson-Miller from the Biochemistry Department and Drs. Jerry Babcock and John McCracken from Chemistry. Drs. Leslie Kuhn (MSU Biochemistry), Vicki Roberts (Scripps Institute, LaJolla), Frank Millett (University of Arkansas) and Shinya Yoshikawa (Himeji Institute, Tokyo) are collaborators.

Cytochrome c oxidase is a protein that spans the inner mitochondrial membrane, and is the terminal oxidase of the mitochondrial electron transport chain. Electrons are funneled from cytochrome c through two copper and two heme centers in the cytochrome oxidase and used to reduce oxygen to water (Fig. 1). The energy released is used to trans-

port hydrogen ions through cytochrome oxidase, across the inner mitochondrial membrane; this produces a hydrogen ion energy gradient that is used to form ATP. Subproject IV will employ a combination of x-ray crystallography and computer modeling to determine how cytochrome c docks on cytochrome c oxidase and how this docking is influenced by the membrane so that electron transfer between cytochrome c and cytochrome c oxidase is optimized. Subproject V will use sophisticated time-resolved Raman spectroscopy to identify the chemical structures of the various heme-oxygen intermediates that occur during the reduction of oxygen to water.

In contrast to cytochrome oxidase, prostaglandin synthases are anchored to only one face of the membrane bilayer through a novel structural domain (MBD in Fig. 1). Prostaglandin synthases catalyze the first step in the biosynthesis of prostaglandins, a family of hormones involved in a variety of physiologically important processes. Prostaglandin synthases are of considerable clinical importance because they are the targets of aspirin, ibuprofen and related drugs known as nonsteroidal anti-inflammatory drugs (NSAIDs). NSAIDs have been used for many years as pain relievers. More recently these compounds have been found to reduce mortality from chronic diseases including coronary thrombosis and colon cancer. Overall,

Program Project Grant from NIH



PGH₂. Subproject I will employ a combination of x-ray crystallography and molecular biological techniques to determine the structure of the COX site and how arachidonic acid and oxygen bind to this site. Subproject II will investigate the structure of the POX site and the basis for the ability of the POX to bind PGG₂ specifically. Subproject III will focus on how the interaction of the membrane binding domain (MBD) with the membrane determines features such as the depth and orientation of the MBD in the membrane. Also included as part of Subproject V is identification of the heme-oxygen and amino acid radical intermediates formed at the POX site during the conversion of PGG₂ to PGH₂.

To accomplish the scientific aims of the Subprojects, it is essential to produce and purify large amounts of cytochrome c oxidase and prostaglandin synthase and to use x-ray, electron paramagnetic resonance and resonance Raman spectroscopy to determine the structures of the proteins and the chemistry of the reaction intermediates. The three technical service cores support these various functions. It is expected that the Program Project will be of clinical importance in the context of developing new NSAIDs. Equally importantly, the Program Project will contribute new insight into unique structural and catalytic features of membrane proteins.

prostaglandin synthases convert an essential fatty acid called arachidonic acid to PGH₂ (Fig. 1). However, this process involves two separate steps that occur at two different sites on the protein. The first step is the incorporation of two oxygen molecules into arachidonic acid to produce PGG₂. This

reaction occurs at the cyclooxygenase (COX) active site; NSAIDs work by binding to the COX site thereby blocking the entry of arachidonic acid. The product, PGG₂, exits the COX site and travels to a second site, the peroxidase (POX) site. Here PGG₂ binds to a heme group and is reduced to

New Group Links Development, Disease Studies

As noted elsewhere, the “biochemistry of the cell nucleus” has been defined as a research emphasis in the Department, and recent faculty hires have reflected that emphasis as Drs. David Arnosti, Bill Henry, and Min-Hao Kuo joined the Department. Their research interests have much in common with their senior colleagues, Professors Burton, Kroos, and Triezenberg. And reflecting the interdepartmental interactions that are commonplace at MSU, these Biochemistry faculty members have joined with Professor Michele Fluck (Department of Microbiology) and Asst. Professor Jim Geiger (Department of Chemistry) to form a “Focus Group” on “Gene Expression in Development and Disease.” Group members and their students and postdoctoral associates gather on a regular basis for a journal club and a research forum, and have collaborated in offering a graduate level course on transcriptional regulatory mechanisms.

Four “affinity groups” have been identified: chromatin structure, transcriptional activation and repression, interaction of basal transcription factors (with DNA and with each other), and structure of

proteins involved in transcription. The various faculty members are associated with one or more of these groups, and the complementary expertise represented is beneficial for both research and teaching activities. Several collaborative projects are already underway. For example, Drs. Arnosti and Henry are involved in a study of

...the complementary expertise represented is beneficial for both research and teaching activities.

regulation of gene expression by the retinoblastoma tumor suppressor protein. This collaboration takes advantage of Dr. Arnosti’s expertise in *in vivo* analysis of gene expression and Dr. Henry’s experience with *in vitro* studies of RNA polymerase regulation by the retinoblastoma protein. Similarly, Drs. Henry and Triezenberg have extensive experience in the study of DNA-transcription factor interactions, and are developing collaboration with their x-ray crystallographer colleague, Dr. Jim Geiger in the Department of Chemistry, in

work aimed at defining these interactions at the level of atomic resolution. In another example, Dr. Min-Hao Kuo will bring his knowledge of chromatin structural modification as a factor regulating gene expression, and Dr. Zach Burton will bring his extensive experience with *in vitro* transcriptional systems, to a collaborative study with Dr. Michele Fluck, who has a distinguished record of studies on polyoma virus gene expression. It is expected that this collaborative study will allow the correlation of specific histone modifications and the recruitment of enhancer-binding factors with transcription of viral late genes.

While the individual faculty members derive their current research support from various sources, they are seeking support from sources within the University that would enhance collaborative research endeavors, and ultimately lead to success in securing funding from extramural sources (e.g., an NIH Program Project, analogous to the recently funded project on membrane proteins, described previously on pages 12 and 13).



Arnosti



Burton



Fluck



Geiger



Henry



Kroos



Kuo



Triezenberg

PROFILES
560



Clarence Suelter is a product of the American heartland. Born and formally educated in his native Kansas and neighboring Iowa, Clarence made his way to Michigan State in 1961, assuming his position as Assistant Professor in the then newly-established Department of Biochemistry. Clarence had a major influence on the development of this department. For many years, he pursued his research on monovalent cation-activated enzymes, but a developing concern for science education came to be central to his professional interests. This was particularly true for science education at the K-12 level, and together with other MSU colleagues, Clarence established an NSF-funded "Workshop in Molecular Biology for High School Teachers" as well as other

Clarence Suelter, Scientist/Educator

programs aimed at enhancing teacher capabilities in science education. He actively worked on behalf of the Impressions Five Science Museum in Lansing, and within the University, sought to improve undergraduate science education and science teacher preparation. Formal recognition of the importance of Clarence Suelter's work was provided by establishment in 1989 of a Division of Science Education, with Clarence as its first Director, within the College of Natural Science. Several years later, Clarence formally retired from this position and became *Professor Emeritus*. However, an indication of the value placed on his experience is that he has continued to serve as an advisor to the Division of Science Education and various teacher education bodies in the subsequent years. Clarence and his wife, Loretta, are now enjoying retirement in their new condominium home here in East Lansing.

Bill Wells, Professor Emeritus

To be treasured are biochemists with the breadth of knowledge and interests of Bill Wells. His more than 100 contributions to the scientific literature include seminal work on cholesterol metabolism, and pioneering applications of gas chromatography (in collaboration with another *Professor Emeritus* of this department, Chuck Sweeley) to studies of carbohydrate and lipid metabolism. Subsequent work dealt with galactose toxicity and galactosemia, phenylketonuria, *myo*-inositol and phosphoinositide metabolism, ascorbic acid function, thioltransferase, and many other areas of biochemistry. Bill began his academic career at the University of Pittsburgh, but came to Michigan State as Professor of Biochemistry in 1966, as part of the expansion of the recently established Department of Biochemistry. For more than 30 years, Bill Wells contributed to the growth



of Biochemistry at Michigan State and has been respected for his calm thoughtful approach as well as his encyclopedic knowledge of the field. Now in *emeritus* status, Bill and his wife, Helen, currently enjoy the beauties of Lake Michigan from their new home in Northport, MI. In recognition of Bill Wells' many contributions to this department, friends and colleagues have established the William W. Wells Lectureship in Biochemistry. Contributions designated for this fund can be made by filling out the form on page 33 and using the return envelope provided.

2nd Annual Chili Cook Off Successful

The 2nd Annual Chili Cook Off raised \$365 which was donated to the MSU Safe Place! Everyone is invited to enter their favorite chili which is then taste tested by a panel of judges from the Department. This year's judges were Joyce Robinson, Loran Bieber, Bill Trzos, Byron Wingerd, and Bill Smith Sr. (father of our Chair!). There were eleven chili entries along with many excellent side dishes. First prize for the best tasting chili went to Kim Binderup, Graduate



Student, who won a Chili's Restaurant gift certificate. Second prize went to Julie Oesterle, Graduate Secretary, and third prize to Pat Ungren, Accountant. Second and third place prizes were T-shirts. Hottest Chili went to Lee Kroos, Professor, and we understand the chili's were home-grown in wife Mary's garden. Thanks to everyone who contributed and to Carl Schmuhl who organized the event and procured the great prizes!



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Visit Our Web Site

Point your browser to <http://www.bch.msu.edu> and you will find information about many aspects of the department. Get current information about faculty members you may remember, and meet faculty members who have joined the department since your time with us. Find out about on-going research activities, and about departmental support facilities such as the computer graphics facility, transgenic *Drosophila* facility, and others. Information about current graduate and undergraduate programs is available through the web site. Should you have a specific question, you may e-mail the Department at bchalum@msu.edu, which will quickly provide the answer to your question.



<http://www.bch.msu.edu>

News from Past Graduates

Several months ago, we made an initial effort to contact many past graduates of this department. In response, several sent back information about their activities since leaving MSU and their present positions, and we thank them for that. These responses are collated below. Look them over and you might find a familiar name, and perhaps the opportunity to renew contact with a friend from your own MSU days. You might also be amazed at the career paths that many have followed after leaving the Department of Biochemistry.

If you don't find your own name included below (or even if you do), we invite you to use the form attached to this publication and bring us up-to-date on your post-graduation activities and current position. Please use the postage paid envelope to return the form to us or feel free to use our e-mail address to update us bchalcumn@msu.edu. We look forward to hearing from you!



Adah, Steven A.—B.S'86; *IRTA Fellow, National Institutes of Health, Bethesda, MD*

Amey, Roxane, L.—BS'98; *Assistant Research Associate, Instrumentation Laboratory, Ann Arbor, MI*

Armstrong, Robert—PhD'66; *Professor, Department of Chemistry, Albion College, Albion, MI*

From 1966-1968 I did a Postdoc at Princeton University. I then became an Assistant Professor at the University of Michigan from 1968-1974 and then took a position at Albion College as a Professor of Chemistry in 1974-present. I have done sabbatical research with Drs. John Wilson and Bill Smith.

Army (formerly McIntyre), Nicole—BS'92; *DO'96; Flight Physician, U.S. Navy, Virginia Beach, VA*

Graduated from MSU College of Osteopathic Medicine in May 1996 and continued on to an internship

at Naval Hospital, Virginia. I then attended Naval Flight School from October 1997 to March 1998 and graduated as a naval flight surgeon after flying T-34C's. I am currently working as a flight physician at Oceana, VA. I recently married on 6/20/98 to a naval flight officer in Annapolis, MD (U.S. Naval Academy). Attached to the U.S.S. Enterprise, 6 month Mediterranean cruise beginning 11/6/98.

Ashendel, Curtis, L.—BS'77; *Associate Professor, Department of Medicinal Chemistry & Molecular Pharmacology, Purdue University, West Lafayette, IN*

I received a Ph.D. in 1982 from the University of Wisconsin-Madison in oncology. My research focused on tumor promotion and signal transduction. I then moved on as an Assistant Professor and then to Associate Professor at Purdue University. Our research is currently focused on oncogenes, PKC, and signal transduction in cancer.

Bariola, Pauline—PhD'96; *Postdoc, Universite de Lausanne, Switzerland*

Barton, Brian K.—BS'85; *Optometrist, Barton Eye Associates, Colleyville, TX*

Just recently opened my own independent optometric practice.

Baum, Michael E.—BS'81; *President, Surgical Associates of Putnam, Putnam, CT*

After graduation I attended St. Louis University School of Medicine, graduating in 1985 with an M.D. degree. I then did a surgical residency in Albany, NY and since 1990 have been in private practice in Putnam, CT as a general surgeon. I live in Brooklyn, CT with my wife and 3 children ages 10, 12 and 15.

Baxter, Jeffrey—PhD'84; *Senior Research Scientist, Ross Products Division - Abbott Laboratories, Columbus, OH.*

Since Graduation - Did a 2 year postdoctoral study at UC Boulder, then 2 years as Assistant Professor

“...truth be told, my life has taken many “unusual” twists...”

of Chemistry at Eastern Kentucky University, then settled down at RPD Abbott, where I've been for a bit over 10 years. Work now centers on bioactive nutritional components. We've issued a growing number of patents in this area (6 at last count) and I'm finally publishing again (submitted 2 manuscripts last month). We're focusing on prevention of infections, as well as more insidious diseases such as hypertension and diabetes. Hopefully, several new nutritional products which help people fight these problems will result from the current effort. It's interesting, since the work spans the gamut from bench through pilot production scale of these novel active ingredients. I am also the head of the Proteins Discovery Team here at Ross, and am currently reporting in the Medical Nutritional business unit.

Bennett, Joseph—BS'68; *Quality Assurance Coordinator, Commonwealth Technology, Inc., Lexington, KY*

Betts, Eric—BS'94; *Resident, Fort Wayne Medical Education Program, Fort Wayne, IN*

I graduated from Medical School at Ohio State University in 1998. I am currently doing a family practice residency. I have two children, Alison Mary-Alexa born on 2/17/98 and Cayden Theron born on 1/14/96.

Bezek, David M.—BS'84; *Principal Investigator, The BVOV Institute, Portland, MI*

Received a Ph.D. in virology from Cornell in 1992. I then did a large animal residency at Ohio State University in 1994. I am currently in private practice (relief vet), and virology services planned. In 1998 I received a CVM Young Achiever Award.

Birkmeier, Jill M.—BS'89; *Senior Medical Writer, Vysis, Inc., Downers Grove, IL*

In 1991 I received an M.S. in Medicinal Chemistry from the University of Michigan.

Blakkan, Kenneth P.—BS'73; *Principal Engineer, MicroModule Systems, Inc., Cupertino, CA*

Blosser, James—PhD'72; *Section Head, Research Planning & Support, Astra Arcus, Worcester, MA*

Employed with Astra since 1995 in Astra CNS research group which recently relocated to Boston area. Responsibilities: external collaborations and project leader.

Boak, W. Bryan—BS'82; *Dentist, Pittsburgh, PA*

Attended dental school following graduation and am now in general practice.

Borders, Jeffrey S.—BS'92; *Medical Student, Wayne State University, MI*

I earned an M.S. in Basic Medical Science in 1995 from Wayne State University. I am

currently attending Medical School at Wayne State University. My M.D. degree will be conferred 06/99 and will graduate with Alpha Omega Alpha National Honors. I will begin residency training in general surgery thereafter.

Bradford, James R.—BS'75; *Anesthesiologist, Kalamazoo Anesthesiology, P.C., Kalamazoo, MI*

Received my M.D. at Stanford University. I then did a residency in Anesthesiology at Massachusetts General Hospital. I returned home to West Michigan in 1982. Julie and I have three children - Christopher, 20, and Catharine and Elizabeth, both 17 (and considering M.S.U.).

Brody, Mark—PhD'78; *Investment Advisor & Portfolio Manager, Financial Planning Analysts, Melville, NY*

Hi! Well, it's only been 20 years or so since I've had the chance to “talk” to anyone at MSU Dept. of Biochem. and, truth be told, my life has taken many “unusual” twists....so, here goes: I'm an investment advisor and portfolio manager for my own firm. I've been in the investment business since 1986 - started 3 years after receiving my D.O. degree (YES, that's right!!) from the NY College of Osteopathic Medicine. Additionally, I operate a small broker/dealer in securities, Planned Financial Programs, Inc. from the same office. My career in Biochemistry was limited to two one-year positions primarily as a lecturer - one year at the University

"I have, with my wife, Colleen, a beautiful family of five children, all of whom are avid Spartan fans."

of California, Riverside and one year at Portland State University, before moving back to NY (my home state) to attend medical school. My wife Alanna (a former secretary in the department) lives with me along with our two daughters, Rebecca, 16, and Elizabeth, 15. My stepdaughter Jennifer, 27, lives nearby and works for Bell Atlantic. I'd love to hear about the lives of some of my fellow grad students from the early and mid 70's. Greetings to all!!!

Carlson, Todd A.—'86; Associate Professor, Department of Chemistry, Grand Valley State University, Allendale, MI

Cedergren, Robert A.—PhD'96; Research Analytical Chemist, Abbott Laboratories, Abbott Park, IL

Chang, Wei-Hsien—MS'63; PhD'68; Professor Emeritus, National Taiwan University, Taiwan, Republic of China

Professor of Department of Agriculture Chemistry at the National Taiwan University, Taipei, Taiwan and also Director, Graduate Institute of Food Science & Technology, National Taiwan University.

Chen, Chun-Nan—PhD'87; Senior Staff Scientist II, Celera Genomics, Foster City, CA

Christeller, John T.—PhD'74; Scientist, Horticulture & Food Research Institute of New Zealand, Palmerston North, New Zealand

My lab has a major focus on

novel insect management technology. We carry out research on transgenic plants, baculovirus and entomopathogenic fungi.

Cieslik, Joseph D.—BS'83; Chief Chemist, Essroc Cement, Frederick, MD

Cook-Mills, Joan M.—PhD'87; Assistant Professor, Pathology Department, University of Cincinnati, Cincinnati, OH

Currently working on two research projects: (1) High endothelial venule cell phagocytosis of HIV-infected apoptotic lymphocytes, and (2) Vascular cell adhesion molecule-1 signal transduction. I married in 1987 and have a baby son, Alexander, born in 1998.

Dana, Bruce W.—BS'71; Northwest Cancer Specialists, Portland, OR

I'm a medical oncologist in private practice in Portland.

Daube, David C.—BS'95; Pharmaceutical Sales Rep., Bayer Corp.

I received an M.B.A. (marketing) from the Katz School of Business at the University of Pittsburgh in 1996. I also was married on August 9, 1997.

Degenhardt, Ted L.—BS'75; Dentist, Troy, MI

It is hard to believe that it has been 25 years since graduation. I live in Troy, where I grew up. I have, with my wife, Colleen, a beautiful family of five children, all of whom are avid Spartan fans. My family along with my dental practice, also

in Troy, keep me very fulfilled and busy all year long.

Desrosiers, Ronald C.—PhD'75;

Professor of Microbiology & Molecular Genetics, Harvard Medical School, Southborough, MA; Chairman, Division of Microbiology, New England Regional Primate Research Center

Deupree, Jean D.—PhD'70; Associate Professor, Department of Pharmacology, University of Nebraska Health Center, Omaha, NE

I have become a neuropharmacologist and am very interested in adrenergic receptors, G-proteins, and signal transduction pathways. I am currently trying to set up a tutorial on the web to teach people how to do receptor binding studies. When I am not in the lab or on the computer I am involved in teaching pharmacology to medical, pharmacy, and physician assistant students. I am amazed at how much technology has changed since I was a graduate student.

Dorsam, Glenn—BS'90; Postdoctoral Scholar, Department of Immunology, Univ. of California, San Francisco, CA

I received my Ph.D. in May 1998. I am currently doing a postdoc at the University of California-San Francisco with Dr. Ed Goetzl. I was recently married to Sheri Tinnell from Farmville, VA. For fun I am studying chess and martial arts.

"I wonder if Dr. Bieber still smokes duck and salmon, and ferments bubbly plum wine/champagne?"

English, David G.—BS'91;

Dining Manager, Princeton University, Princeton, NJ.

I graduated from MSU in '91, with the goal of becoming a biophysicist in the pharmaceutical industry. Since then I've worked as a biophysicist, a molecular biologist, a dinner cook, a camp food service director, and a hospital dietetic intern. Earlier this year, I lectured on "Biotechnology and Food" for nutrition students at Benedictine College, Illinois. Within the next month I expect to complete certification as a Registered Dietitian. I am presently employed at Princeton University, as a dining manager feeding nearly 850 students. Over the next year I'd like to develop a series of classes which combine nutrition information and outdoor recreation, as a model for healthy living. Over the next ten years I'd like to establish my own wilderness health spa. Obviously these are not the same goals I had in '91, fresh out of college. I'm curious to hear about the activities of my former classmates.

Emaus, Ron—BS'75; PhD'82; *Senior Systems Developer, Parke-Davis, Ann Arbor, MI*

Mostly I've programmed computers and developed systems; no surprise there. I've worked at the Environmental Institute of Michigan, the University of Michigan, and now Parke-Davis in Bioinformatics. I'm very excited by this new oppor-

tunity. I have two children who live in Okemos, MI with their mother. I live in Ann Arbor and visit East Lansing every week. My hobbies include native gardening, watershed council volunteer, and running. I gave up soccer - too physical for my aging frame. I wonder if Dr. Bieber still smokes duck and salmon, and ferments bubbly plum wine/champagne?

Everdeen, Dan S.—BS'86; *Biochemist III, Pharmacia & Upjohn, Kalamazoo, MI*

Following my graduation from M.S.U. I spent 5 1/2 years at Regeneron Pharmaceutical where my focus was on recombinant production, mostly neurotrophic factors/receptors. From there I spent 2 1/2 years at Boehringer Ingelheim Pharmaceuticals in immunology research - CD40/CD40 ligand binding and signal transduction. For the last 2 years I have been at Pharmacia & Upjohn in genomic research - identifying new ion channels in the CNS.

Fauth, Gregory, L.—BS'69; *Periodontist, G.L. Fauth, D.D.S., P.C., Aurora, IL*

Federspiel, Mark J.—PhD'87; *Senior Associate Consultant, Mayo Foundation, Rochester, MN*

Following graduation I took a position with the USDA in East Lansing, MI as a Research Associate until 1989. I then accepted a position as Scientist Associate at the National Cancer Institute, Frederick MD until 1995. Since 1995 I

have been with the Mayo Clinic in the Molecular Medicine Program as an Assistant Professor. My research is focused on molecular virology. We have one child, Michael Federspiel, born 7/27/92.

Foley, Kevin P.—BS'86; *Staff Scientist, ZymoGenetics, Inc., Seattle, WA*

Foxall, Susan—BS'83; *Marketing Manager, Davis Instruments, Hayward, CA*

Fruchey, Isaac R.—BS'98; *Graduate Student, University of Minnesota, Minneapolis, MN*

Garcia-Perez, Arlyn—PhD'84; *Section Chief, National Institutes of Health, Bethesda, MD*

Ghiardi, Greg J.—BS'97; *Student, University of Chicago, Pritzker School of Medicine, Chicago, IL*

Ginger, Gregory L.—BS'80; *Area Manager, Kewaunee Scientific Corp., IL*

Goodman, Gary E.—BS'70; *Physician, Swedish Hospital Institute, Seattle, WA*
Received M.D. degree and an M.S. in Pharmacology at the University of Illinois in 1974. In 1981 I went to the University of Arizona for a Medical Oncology Fellowship. I have been funded through NCI research grant since 1985 in the field of cancer prevention working with retinoids and carotinoids.

“News since graduation: Well 23 years worth of stuff has happened.”

Granett, Sandra—PhD’72; Davis, CA

I have two daughters and one son. Since graduation, I worked at Yale University, University of Maine and University of California-Davis in various areas of research. After living abroad from 1986-1987, I “retired” from Biochemistry, followed other interests and transformed myself into a piano teacher. I now run a busy piano studio from my home.

Graham, Jon F.—BS’74; Chief,

Neurosurgery Service, Kaiser Permanente, Honolulu, HI

Gregory, Linda C.—PhD’89; Rochester,

MN

From 1989-1992 I was a Clinical Chemistry Fellow at the University of Maryland Medical System. I then accepted a position of Assistant Professor at the University of Maryland Medical School until 1995. We have one child, Michael Federspiel, born 7/27/92. Currently I am a full time Mom and free-lance writer.

Gustine, David—PhD’69; USDA-ARS,

PSWMRL, US Pasture Lab Bldg., University Park, PA

Current research: Population genetics and demographic of white clover grazed dairy pastures; beneficial natural secondary products of pasture species. Enjoy Penn State - Michigan State sport events, because my team always wins!

Halberg, Richard B.—PhD’93;

Postdoctoral Fellow, Department of Oncology, University of Wisconsin, Madison, WI

My research is focused on identifying the genes controlling homeostasis in the intestinal epithelium and is funded by grants from ACS and NIH.

Hannah-White, Cynthia M.—BS’84; Law

Clerk, New York Supreme Court, Cortland, NY

I attended Cornell Law School from 1989-1992; graduated Magna Cum Laude in 1992. I was admitted to practice before U.S. Patent & Trademark Office in 1991 and admitted to New York Bar in January 1993. Since 1992 I have served as law clerk to Hon. Paul J. Yesawich, Jr., New York State Supreme Court, Appellate Division. I married Guy White in 1986 and have a son, Quinn Ashby Hannah-White, born July 1996.

Harper, Kristine D.—BS’75; MD’80;

Research Physician, Eli Lilly, Indianapolis, IN.

News since graduation: Well 23 years worth of stuff has happened. Let’s see, after graduation I worked in Quality Control at a major company in Michigan. I returned to MSU and pursued a degree in Chemical Engineering, but was admitted to medical school prior to obtaining that degree. I received my MD in 1980. I did an Internal Medicine residency training at Beaumont Hospital in Royal Oak,

Michigan. I did a fellowship in Endocrinology at University of Pennsylvania - primarily doing basic research in skeletal biology and vitamin D metabolism. I completed this in 1987. I joined the University of Rochester (NY) faculty (Department of Medicine) in 1988. In 1990 I joined the Duke University Department of Medicine faculty where I was the Medical Director of the Duke Bone and Metabolic Diseases Clinic. My job description was enormous and included a busy patient practice, clinic research in skeletal fragility and predictors of fracture risk and the use of newer agents to manage osteoporosis. I also had a busy teaching schedule. In 1994, given the myriad responsibilities of running a free standing clinic within the confines of an academic institution with Health Care Reform all around, I went back to school (while still working 60-70 hours a week) and obtained my MBA with Health Services Management at Duke University’s Fuqua School of Business. For two years I set an alarm clock to sleep 3 hours a night. This was far more grueling than call during internship and residency. Given my need to continue to learn and grow, I left Duke in 1998 and came to Lilly to work as a research physician in women’s health and specifically on a compound which I had studied extensively, raloxifene HCl. I am still just getting my feet wet in my new role. I do indeed miss academia and to that end have secured a

“Recently traveled to Ethiopia, Egypt, and Israel/Palestine...”

teaching position at the Indiana University School of Medicine in the Endocrine Division. Well, that's all for now.

Harris, Midori A.—BS'90; *Scientific Curator, Saccharomyces Genome Database, Department of Genetics, Stanford University School of Medicine, Stanford, CA.*

After receiving my B.S. from M.S.U., I pursued a Ph.D. from Cornell University.

Haselow, William C.—BS'79; *Medical Director, Infinity Healthcare, Inc., Mequon, WI*

Heyser, Jim—MS'68 ; *Environmental Scientist, ICF Kaiser Engineers, New Hampshire*

In 1975 received an MA in communications and then obtained a Ph.D. in 1979 in Botany from Colorado State University under the guidance of Prof. Murray Nubour. From 1982-1990 I worked at Los Alamos National Laboratory in the Life Sciences Division and in 1991 began work as an environmental scientist at ICF Kaiser Engineers, an environmental engineering firm.

Hickman, Janet G.—BS'67; *Physician, Dermatology Consultants, Inc., Lynchburg, VA*

I received my MD from Harvard Medical School and did residencies in Internal Medicine and Dermatology at Duke University. I've been in the private practice of dermatology

in Lynchburg, VA for 19 years. I am Associate - Medical Director and Clinical Investigator with the Education and Research Foundation, Lynchburg, VA. Robert and I have three sons ages 15, 19 and 23.

Hill, Scott D.—BS'82; *Associate Pastor, First Presbyterian Church of Ithaca, Ithaca, NY*

I've spent three years teaching English and science in Arab countries - Egypt and Morocco plus extended travels in Israel/Palestine. Graduated from San Francisco Theological Seminary in 1990. Recently traveled to Ethiopia, Egypt, and Israel/Palestine to build church relations. After six years as Associate Pastor here, recently spent three months sabbatical in Middle East and Pittsburgh.

Hill, Stacie L.—BS'92; *Embryologist, Michigan Reproductive & IVF Center of Spectrum Health, Grand Rapids, MI*

I've worked at Spectrum Health (formerly Butterworth Hospital) in Grand Rapids in the Reproductive Medicine Lab.

Hinds, Sherrie A.—BS'98; *Chemist, Holland, MI*

Working as a chemist at a pharmaceutical company in Holland and was married on June 12, 1999.

Hiser, Carrie—PhD'91; *Research Associate, Department of Biochemistry, Michigan State University, East Lansing, MI.*

Ho, Tuan-Hua David—PhD'76; *Professor, Department of Biology, Washington University, St. Louis, MO*

I am still in the field of plant biochemistry/molecular biology after >20 years. Currently working on plant responses to environmental stresses and hormone signal transduction and gene regulation. My wife, Berlin H. Ho (Ph.D. 1975) was a student of Dr. N.E. Tolbert, but now is in computer science working at a French company.

Hollenbeck, Cynthia A.—PhD'96; *Cardiovascular Clinical Scientist, Parke-Davis, Ann Arbor, MI*

The year following completion of my doctoral degree I taught the biochemistry class for the ABLE program at MSU's College of Human Medicine. I was also a tennis professional at the Michigan Athletic Club in East Lansing, MI. I am now working at Parke-Davis in the Clinical Cardiovascular Department as a Clinical Scientist. I am the study manager for one of the Lipitor (atorvastatin) clinical trials addressing patients with accelerated coronary heart disease. Specifically, looking at myocardial ischemia reduction using atorvastatin in patients with unstable angina or non-Q wave myocardial infarction. I still find time to teach tennis at the Michigan Athletic Club as an avocational activity and reside in Okemos, MI.

"I would like to see more Biochemistry Alumni become acquainted with this fund and to consider contributing to it."

Holmes, Robert J.—BS'74; MD;
Cardiothoracic Surgeon, Pontiac, MI

I'm a Cardiothoracic Surgeon in Pontiac. A few years ago I joined the President's Club and helped initiate with Dean LeRoi, Susan Lilly of Natural Science Fund Development, and Chairman Bill Smith of Biochemistry, an endowed scholarship fund to benefit Biochemistry undergraduates. I would like to see more Biochemistry Alumni become acquainted with this fund and to consider contributing to it. My main hobbies are distance running and Spartan football.

Hope, Constance L.—BS'88; MD'98;
Okemos, MI

In 1991 I received an M.S. in biochemistry from Wayne State University. In 1998 I received an M.D. from the College of Human Medicine at Michigan State University.

Hummel, Ben D.—PhD'98; *Scientist,*
Pharmacia and Upjohn, Kalamazoo, MI

Hunsley, James R.—PhD'64; *Assistant Professor, Department of Chemistry, SIU Edwardsville, Edwardsville, IL*

Currently involved in synthesis of materials for boron neutron capture therapy of tumors.

Husic, H. David—PhD'82; *Associate Professor and Head of Chemistry, Department of Chemistry, Lafayette College, Easton, PA.*

Since the Ph.D. (with Suelter) and postdoc (with Tolbert) at MSU, have been a member of the faculty

in the Chemistry Department at Lafayette College where I teach the biochemistry courses in the department. I continue to carry out research on inorganic carbon acquisition and carbonic anhydrase in *Chlamydomonas reinhardtii* (see Web page for details (<http://www.lafayette.edu/chem/staff/husic.html>)). My wife Diane (Ph.D. Biochemistry at MSU - 1986, now Professor of Chemistry at East Stroudsburg University) and I have two young children, Corey Christopher (born 2/95) and Joren David (born 5/98), and live on a farm in the Pocono Mountains with our horse, 2 goats, 3 dogs, 3 cats and 2 rabbits.

Hyman, Joel—BS'95; *Graduate Student, Yale University, New Haven, CT*

Attending graduate school at Yale University.

Jackanicz, Theodore M.—PhD'65; *Senior Scientist, Population Council, New York, NY;*

I work in an international contraceptive development program. Two of my contraceptive vaginal ring projects (1. norethindrone acetate + ethinyl estradiol. 2. progesterone) progressed to the point that Phase 3 clinical testing and marketing have been assumed by industry, and these devices will be on the market in the next few years. A third project with a new progestin, NESTORONE (R) plus ethinyl estradiol is well on the way to Phase 3 clinical testing.

Jagger, Richard E.—PhD'71; *Professor of Chemistry, Western State College, Gunnison, CO*

Johnson, Jim C.—MS'68; PhD'71;
Professor, Department of Microbiology/Virology, University of Osteopathic Medicine Health Sciences, Des Moines, IA

Currently my research focus is (1) HPV expression in transfected, differentiating keratinocytes and (2) cold temperature function of testudine melanomacrophages. Awards: I was honored by UOMHS by being named "University Distinguished Researcher" during the centennial celebrations of my school.

Joswick, James J.—BS'91; *Student, The Southern Baptist Theological Seminary*

Served as a lieutenant in the Army Corps of Engineers from 1991-1995. I am currently studying for a Master of Divinity at The Southern Baptist Theological Seminary since 1995. I expect to graduate May 1999.

Kayne, Fred J.—PhD'66; *Associate Professor, MCP-Hahnemann School of Medicine, Philadelphia, PA*

Keller, Brian D.—BS'70; *Marine Ecologist, The Nature Conservancy, Florida Marine Research Institute, Marathon, FL*

Kingsbury, Linda—BS'89; *Postdoc, Department of Molecular & Cell Biology, University of California - Berkeley, CA*

I received a Ph.D. from the Department of Molecular & Cell

*"I think about the Department a lot. It is one of the best anywhere!
I miss everybody. Go Green!"*

Biology, University of California - Berkeley in 1996.

Kirshnaswamy, Rajashree—MS; *Senior Scientific Associate, Biocon India Ltd. Bangalore.*

Koenig, Mark A.—BS'74; *Physician, Children's Community Care, Pittsburgh, PA*

Attended Medical School at The University of Michigan from 1974-1978. My internship and residency was spent at the Children's Hospital of Pittsburgh from 1978-1981. I then went on to private practice in pediatrics from 1981-1996. In 1996 I joined the Children's Community Care which is a primary care network affiliated with Children's Hospital of Pittsburgh as a pediatrician.

Kuipers, Paul J.—BS'73; MS'82; *Senior Associate Scientist, Immunopathology Dept., Parke-Davis/Warner Lambert, Ann Arbor, MI*

After leaving in 1982 I went to the University of Florida where I worked on metallothionein with Bob Cousins. I moved to Ann Arbor in 1984 and after a brief time at the U of M Hospital in the Internal Medicine Department. I moved to Parke-Davis where I joined the pre-clinical drug discovery group in the Immunopathology Department. I have worked with human neutrophils and biochemical aspects of inflammation. I discovered a compound that is doing very well in phase II clinical trials. I divorced Kate and am now married to Diane Erickson who

is a ceramic artist and runs a business out of our home studio. My daughter Laura is 12 years old and is a superb student at Emerson School. She looks forward to attending M.S.U. I think about the Department a lot. It is one of the best anywhere! I miss everybody. Go Green!

Lacika, John M.—BS; *Physician, Regional Diagnostic Radiology, Saint Cloud, MN*
I left science for medicine.

Larue, John N.—PhD'69; *Chemistry Teacher, Cherry Creek High School, Englewood, CO*

I received the ACS Edward W.D. Huffman Award as the Outstanding Chemistry Teacher in the state of Colorado for 1998.

Lewis, Douglas S.—PhD'78; *Associate Professor, Department of Food Science & Human Nutrition, Iowa State University, Ames, IA*

Currently working on the developmental regulation of lipid metabolism and potential link to a diet chronic disease. Have received several teaching awards.

Lewis, Geoffrey T.—BS'87; *Technical Sales Representative, Ensco, Inc., Charleston, SC*

Following graduation I took a position as an Analytical Chemist with Solvay Pharmaceuticals in Atlanta, GA from June 1988 to November 1990. I then moved to the position of Compliance Coordinator for Solvay Pharmaceuticals

until August 1993 at which point I moved to Law and Co. Environmental Lab as the Business Development Manager until March 1996. In March 1996 I began my current position as a Technical Sales Representative for Ensco Environmental Disposal, Charleston, SC.

Lichtstein, Daniel M.—BS'70; *Associate Professor of Medicine, University of Miami, School of Medicine, Miami, FL*

Danny and Shirley Lichtstein, both M.S.U. graduates (1970) have been married 28 years. Their youngest child, Micki, is now a junior at M.S.U. I am presently an Associate Professor of Medicine at the University of Miami School of Medicine, and Director of Ambulatory Education there. My first book, "Preparation for Medical Practice, Made Ridiculously Simple" was published in 1998.

Litchfield, William J.—PhD'76; *Global Analytical Methods Manager, E.I. du Pont de Nemours & Company, Wilmington, DE*

News to share (written in the third person): After graduating in 1976, Bill took a brief postdoc at the Johnson Foundation in Philadelphia before joining the DuPont Company in Wilmington, DE. Over the past 21 years with DuPont, he has enjoyed a number of different positions and projects ranging from developing clinical diagnostic tests and immunoassays for medical and agricultural uses to supervising various groups involved in research,

"It's good to see familiar names and faces on the MSU Biochem Department Web Page (<http://www.bch.msu.edu>). My best wishes to all."

product development and quality assurance. Currently, Bill is responsible for coordinating the development and use of analytical methods across eighteen plant sites in the US, Europe and Asia, as well as implementing a LIMS system to be used world-wide. His research interests include trace level analysis by immunoassay, HPLC and MS. Bill lives in Newark, Delaware with wife Marilyn and two sons, David a junior in high school and Brian a sophomore at the U.S. Naval Academy. He says "It's good to see familiar names and faces on the MSU Biochem Department Web Page. My best wishes to all."

Liu, Edwin H.—PhD'71; *Environmental Scientist, Environmental Protection Agency, Washington D.C.*

Long, William P.—BS'94; *Graduate Student, Pennsylvania State University, State College, PA*

I received an M.S. in Biochemistry at the Pennsylvania State University in 1996 and am currently continuing work on my doctorate degree.

Maino II, John C.—BS'75; *Medical Director, Foote Memorial Hospital, University of Michigan Health System, Department of Surgery, Section of Emergency Medicine, Jackson, MI*

Matanhire, David N.—BS'86; *Medical Research Officer in the Ministry of Health, Blair Research Laboratory, Ministry of Health & Child Welfare,*

Causeway, Harare, Zimbabwe.

Since graduation I have been doing research in Public health in schistosomiasis at the National Centre for Health Research. I have a Masters in Public Health (MPH) which I completed in 1994. I plan to undertake Ph.D. studies in public health when opportunities permit very soon.

Mayo, Joseph W.—PhD'68; *Private Practice - Pediatrics, Columbia, MO*

I did a Postdoc from 1968-1970 followed by a position at Case Western Reserve University as an Assistant Professor of Biochemistry from 1970-1972. I then returned to medical school and received an M.D. degree in 1976 from Case Western Reserve University. My internship and residency were done at the University of Montana from 1976-1979. In 1979 I took a position as Assistant Professor of Child Health until 1985. Since 1985 I have been in private practice - pediatrics. Personal regards to Dr. Dick Anderson.

McCoy (Titlow), Andrea—BS'95; *Research Assistant, Texas Health Science Center, San Antonio, TX*

After graduation I left for the University of Carolina's program in Medicinal Chemistry. After a year in the program I took a position in the Biochemistry/Biophysics Department. In February 1998, I married Tom McCoy, Lieutenant, US Navy. Shortly after, we were moved to San Antonio which brings me to the present.

McCroskey, Mark C.—BS'82; *Senior Research Biochemist, Pharmacia & Upjohn, Protein Science, Kalamazoo, MI*

Member of Board of Directors of MSU CNS Alumni Association.

Mehlhorn, Gary L.—BS'70;

Ophthalmologist, Eye Surgeons of Springfield, Inc., Springfield, MO

Since graduation I first attended Medical School at the University of Tennessee and received an M.D. degree in 1973. From 1975-1978 I was a Flight Surgeon in the U.S. Navy. I then did an ophthalmology residency at the University of Tennessee from 1978-1981. I continued my interest with a Fellowship at the Vitreo-Retinal Foundation in Memphis from 1981-1982. Presently I am an Ophthalmologist — specializing in vitreo-retinal surgery.

Melcher, Ulrich K.—PhD'70;

Professor of Biochemistry & Molecular Biology, Oklahoma State University, Stillwater, OK

Primary interest: Virus Evolution. Organized first discussion of the subject at the annual meeting of the American Phytopathological Society. I also direct the Oklahoma State University Recombinant DNA/Protein Resource Facility. On a family note, we expect a Ph.D. for a third generation biochemist as daughter, Sonya, is about to finish at the University of Wisconsin, Madison.

"Of all the many aspects of my daily work, I enjoy the continuous learning process the most."

Melkerson-Watson, Lyla J.—PhD'91;

Research Associate II, Department of Pediatrics, University of Michigan Medical Center, Ann Arbor, MI

Menson, Robert C.—PhD'76; Principal, Menson & Associates, Inc., Newport, RI

Michaelis, Charles S.—BS'89;

President, Rocky Fork Formulas, Inc., Westerville, OH

From 1989-1990 I served as Lab Manager for the Department of Horticulture, Viticulture & Enology at M.S.U. and published an article "The Content of Phenolic Acid and Aldehyde Flavor Components of White Oak as Affected by Site and Species." American Journal of Enology & Viticulture, vol. 43, no. 4, 1992. In 1990 took a position as Lab Technician, QA Department, Wyeth-Ayeist Labs, Inc., Mason, MI until 1993. From 1993-1995 moved to Thermal Processing Technologist (Associate) in Nutritional Development Department at Wyeth-Ayeist Labs, Inc. In 1995 -1996 - Head Thermal Processing Scientist in Nutritional Product and Process Development Department at Wyeth-Ayeist Labs, Inc. I then moved to Ross Laboratories as Project Leader of Sterilization Technology in Columbus, OH. Since 1997 to present, President of Rocky Fork Formulas, Inc. in Westerville, OH.

Mikols, Mark R.—BS'91; Medical Student, Michigan State University

Finishing my M.A. in IPHH from M.S.U. in December 1998 and will complete my D.O. (osteopathic medicine) degree in June 2001.

Miley, William H.—BS'75; Senior Process Specialty Engineer, Fluor Daniel Engineering, Inc.

Miller, Stewart F.—BS'70; President, Ocean Pathology, P.A., Toms River, NJ

Since graduation I became a physician specialized in pathology and have spent the last 20 years practicing diagnostic human pathology in the community hospital setting. Of all the many aspects of my daily work, I enjoy the continuous learning process the most.

Mort, Andrew J.—PhD'78; Regents Professor, Department of Biochemistry and Molecular Biology, Oklahoma State University, Stillwater, OK

Joined Oklahoma State University in 1981 and tenured in 1985. In 1989 I became Professor, and Regents Professor in 1996. We work on structure of pectin in plant cell walls, and enzymes degrading pectin.

Mulkins, Mary A.—BS'74; Research Scientist, Roche Bioscience, Palo Alto, CA

I received a Ph.D. in oncology from the University of Wisconsin, Madison. I then did a postdoc at Stanford Medical School in pathology. Since 1984 I have been at Roche Bioscience in pharmaceutical research.

Myers, Terry L.—BS'63; Associate Dean for Clinical Affairs, Texas Tech University Health Sciences Center, Amarillo, TX

In 1969 I earned a Ph.D. in molecular biophysics from Florida State and then an M.D. in 1973 from the University of Virginia. I am board certified in clinical genetics.

Neudahl, Gary—MS'82; Technical Services Manager, Costec, Inc., Palatine, IL

From graduation through mid-April 1995 I worked at Alberto Culver Company as a research chemist, senior research chemist and group leader of toiletries product development for the U.S. and Canada. Since then at Costec, Inc., as a technical services manager, acting in education, formulation development and communications capacities. I recently had a review published in Drug & Cosmetic Industry. I have been married for 20 years with children ages 12, 10, 7, 4 and 1.

Neumann, John A.—BS; Quality Assurance Manager, Sun Chemical, Frankfort, IN

Presently Quality Assurance Manager for two divisional manufacturing locations. Patented low shear rheometer. Senior member American Society for Quality. Completing work towards Ph.D. - developing instrumentation calibration mechanisms.

"Since 1984, I have had my own business which provides consultation service to the pharmaceutical industry..."

Neville, Sandy O.—BS'77;

Senior Programmer/Analyst, Amway Corporation, Ada, MI

After graduation I joined the Peace Corps from 1977-1979. I then worked with Amway as a chemist from 1979-1983, moving to Wayne State University as a chemist from 1983-1984, and as a chemist at Everpure from 1984-1986. In 1986 I worked with Gerber Life Insurance as a programmer until I rejoined Amway as a programmer in 1991.

Ober, K. Patrick—BS'70; *Professor of Internal Medicine, Wake Forest University School of Medicine, Section on Endocrinology & Metabolism, Winston-Salem, NC*

O'Rourke, Timothy J.—BS'71; *Physician, Cancer & Hematology Centers of Western Michigan, Grand Rapids, MI*

Patterson, James M.—MS'78;
Medical Recruiter, Ventura, CA

Spent 5 years in R and D at Scripps Clinic and Bio Rad Labs; 9 years in sales and marketing at Eli Lilly and Baxter; 6 years in medical recruiting for senior management in biotech and pharmaceutical companies. I have been married for 22 years. I have two daughters, one at the University of California, San Diego and the other a senior in high school.

Payne, Kenneth J.—PhD'69; *President, Ken Payne and Company, North Stonington, CT*

From 1969-1971 I was an NIH

Postdoctoral Fellow at Duke University, Department of Microbiology & Immunology. In 1971-1982-I worked for Pfizer, Inc., beginning as a staff scientist; 1974-1977 Associate then Assistant Director, Licensing and Development; 197-1978 Analyst then Manager, Product Marketing Research; 1978-1982 Product Manager, Roerig Division. In 1982-1984 I worked for Lavey/Wolff/Swift as an Accountant Supervisor. Since 1984, I have had my own business which provides consultation service to the pharmaceutical industry concerning the development of scientific information for internal use or presentation to the medical community. Clinical trials, analysis and publication. I have two children Kimm and Michael and two grandchildren, Jessica and Sarah.

Peterson, Donna—MS'67; *Senior Scientist, Minnesota Technical Assistance Program, Minneapolis, MN*

For last 13 years worked at MNTAP, a nonregulatory program at the University of Minnesota assisting businesses in Minnesota with environmental compliance and waste reduction. Recently was part of the team that won an award for The Great Printers Project, an innovative collaborative project promoting improved environmental program within the industry.

Petto Scott T.—BS'73; *Paint Department Process Engineer, General Motors Lansing Car Assembly, Lansing, MI*

Mahawili-Poole, Sarah J.; *Process Engineer, Micro C. Technologies, Inc., Grand Rapids, MI*

Prohaska, Joseph R.—PhD'74;
Professor, Department of Biochemistry & Molecular Biology, University of Minnesota, Duluth, MN

Following my Ph.D. degree I did a postdoc at the University of Wisconsin in Nutritional Biochemistry. From there I accepted a position at the University of Minnesota where I am currently. I am also Director of the Chemical Toxicology Research Center and an Associate Editor for the Journal of Nutrition.

Putnam, Mark R.—BS'76; *Owner, Com'put'er Accounting Software Services, Caro, MI*

Reynolds, Judith L.—BS'72;
Homewood, IL

Married and taught high school science for 9 years. Retired on birth of twins, 2nd and 3rd children. I have been a stay at home Mom since then. Plan to go back to work when the last two go to college in two years.

Rezeau, Laurel L.—BS'67;
Developmental Technical Editor, Apple Computer, Palo Alto, CA

I have not worked in biochemistry for many years (since ?1974). I was a full time crafts person for a few years, then got into technical editing. I still do crafts part-time - Ukranian eggs, macramé earrings, greeting cards.

"For the past five years, I have served as editor of a monthly news publication for clinical laboratories..."

Riccelli, Peter V.—BS; *Senior Scientist, Tm Technologies, Inc., Woburn, MA*

I received a Ph.D. degree in 1997 from the University of Illinois at Chicago under the mentorship of Dr. Albert S. Benight (Biochemistry and Biophysics of DNA). Afterwards I moved to the Boston area for research in industry for a company founded by Dr. Benight and co-workers.

Ritter, David P.; *Attending Anesthesiologist, West Boca Medical Center, FL*

Received an M.D. degree from Wayne State University in 1981. I finished anesthesiology residency in 1984 at the University of Miami Jackson Memorial Hospital. I am currently an attending anesthesiologist since 1985 at West Boca Medical Center and Delray Medical Center.

Coon (Ricotta) Melissa R.—BS'96; *Research Assistant, Department of Pediatrics, University of Michigan, Ann Arbor, MI*

I graduated Melissa S. Ricotta from MSU Biochemistry in '96. Since then I got married 8/23/97 to Steven W. Coon, a fellow '96 Biochemistry graduate. I go by Melissa R. Coon now. After graduation I worked for Lab Support, a lab temp. service. Through Lab Support I worked at Heublien in the quality control lab, and at Flint Ink in their quality control facility. As of November '96 up to the present I work as a research assistant at the University of Michigan. I am

doing cancer research in the Department of Pediatrics. It has been a productive couple of years and two papers will be submitted in the very near future.

Rokita (Paquette) Jessica—BS'96; *Osteopathic Medical Student, College of Osteopathic Medicine, Michigan State University, East Lansing, MI*

I am attending medical school in the College of Osteopathic Medicine here at M.S.U. I recently married Scott Rokita on August 22, 1998.

Ruckle, Homer A.—MS'64; *Scrubber Chemist - Retired, Allegheny Power*

From 1964-1966, Nutrition Research Chemist at H.J. Heinz; 1966-1968, Instructor at Geneva College; 1968-1977, Instructor at Penn State University; 1978-1996 Scrubber Chemist at Allegheny Power.

Rumler, Patrick C.—BS'79; *Veterinary Lab Tech III, Animal Health Diagnostic Lab, Michigan State University, East Lansing, MI*

Sabularse, Dario C.—PhD'82; *Deputy Executive, Fertilizer & Pesticide Authority (FPA); Associate Professor of Biochemistry, University of the Philippines, Quezon City, Philippines*

Upon my return to the Philippines after obtaining a Ph.D. degree in Biochemistry at MSU, I resumed my post as Assistant Professor of Biochemistry at UP Los Banos where I am currently an Associate Professor in Biochemistry. Since 1995 I have been on full-time special

detail at the Department of Agriculture serving as the Deputy Executive Director of the Fertilizer and Pesticide Authority.

Sasavage, Nancy—PhD'81; *Editor, Clinical Laboratory News, American Association for Clinical Chemistry (AACC), Washington, D.C.*

After receiving my Ph.D. I began a career with a Maryland biotechnology company - Bethesda Research Labs (now Life Technologies, Inc.) - that produced research products. I moved from the research bench to teaching molecular techniques, especially DNA sequencing. In 1983, I took on responsibility for the Technical Services Department at LTI, where I managed a group of scientific customer support staff. During my ten-year tenure at LTI, I also edited and produced a variety of technical publications for the company, including Focus, a technique journal. After leaving LTI, I did freelance technical writing and editing for biotech companies and publishers. For the past five years, I have served as editor of a monthly news publication for clinical laboratories published by AACC. I also act as the program coordinator for an annual scientific meeting for the association.

Saxe, Stephen A.—MS'78; *Rothwell, Figg, Ernst & Kurz, p.c., Washington, DC*

I have done a number of things since leaving MSU. From MSU I went to work at Schering Plough for a short time. I then continued

"I have decided to take my diverse science background and bring it into the elementary classroom."

my education at Wesleyan University in Connecticut where I received my Ph.D. in Molecular Biology and Biochemistry, having studied gene regulation of collagen genes in chick embryos. I followed that with a postdoctoral stint at the National Institutes of Health in Bethesda, Maryland, where I studied gene regulation in the slime mold *Dictyostelium discoideum*. This was followed by my becoming an Assistant Professor at the Albany College of Pharmacy in Albany, New York where I taught biochemistry (of course). I eventually decided to leave the world of teaching and put my expertise to use in the world of patents. I spent a year as a patent examiner at the U.S. Patent and Trademark Office and then returned to school once again. I attended Georgetown University Law Center from which I received my J.D. degree. I began my patent law practice at the firm of Venable, Baetjer, Howard & Civiletti, L.L.P. in Washington, D.C. and then moved to the firm of Rothwell, Figg, Ernst & Kurz, p.c. also in Washington, D.C. My practice mostly involves the preparation and prosecution of patent applications related to biotechnology. Along the way I got married to Xiaosha Ge who I met at Wesleyan University and who I married while I was a postdoc at NIH. We now have 3 sons, Andrew age 10, Benjamin age 8, and Zachary age 4. We are expecting our fourth (and last) child in January and this one is a girl.

Schilz, Robert—DO/PhD'88; Staff Physician, Cleveland Clinic Foundation, Cleveland, OH

1996-present Staff Physician at the Cleveland Clinic, Department of Pulmonary and Critical Care Medicine. Current Research: Pulmonary Vascular Diseases and Transplantation.

Schneider, Donald L.—PhD'69; National Institutes of Health, Bethesda, MD

Academic positions included Cornell, Ithaca (69-71); Rockefeller (71-73); University of Massachusetts, Amherst (73-76); and Dartmouth (77-90). Notable projects included being involved in discovery of vacuolar proton pump. Since 1990, I have been in review at the NIH.

Schroeter, Bernard M.—BS; 5th Grade Teacher, Waverly School District, Lansing, MI

I have worked at MSU as a Research Assistant in five unique labs. My most recent lab work/research was funded through the Center for Microbial Ecology, and it involved the sequence mapping of the 165 regions of DNA of the LTER strains (from the LTER project). I have decided to take my diverse science background and bring it into the elementary classroom. I am employed presently as a fifth grade teacher at Waverly East Intermediate - teaching math, science, and language arts.

Scopel, Jerry L.—BS'70; Vice President, Alpha Amusements, Madison Heights, MI

I graduated in 1970 - from 1971 to 1980 I worked as an analytical chemist at Difco Laboratories in Detroit. In 1980 I left the scientific field and started my own business.

Sellers, Larry G.—MS'68; Professor of Biological Sciences, Louisiana Tech University, Ruston, LA

Since 1974 to present, I have been teaching biology and entomology at Louisiana Tech University. In the past 10 years I have become interested in medical ethics also. Presently I am Chair of Pre-Medical/Pre-Dental Advisory Committee.

Shea, Robin J.—BS'96; Graduate Assistant, Department of Microbiology, Michigan State University, East Lansing, MI

I am currently a graduate assistant in the Department of Microbiology at M.S.U. pursuing a Ph.D. in microbiology with an interest in pathogenesis and the identification of bacterial genes involved in disease induction.

Sheng, Jun—PhD'97; Postdoctoral Scholar, California Institute of Technology, Pasadena, CA

Sherman, Thomas G.—BS'77; Associate Professor, Georgetown University, Washington, D.C.

"My Mentor was Dr. Shelagh Ferguson-Miller... I periodically think of her and the wonderful days spent working in her lab. Please give her my regards."

Siefker-Radtke, Arlene O.—BS'92;
Oncology Fellow, M.D. Anderson Cancer
Center, Houston, TX

Snyder, Russell H.—BS'70; *Medical Sales
Rep., G.D. Searle, MI*

Received an M.S. in Microbiology from Central Michigan University in 1978.

Smith, Allen D.—PhD'91; *Research
Virologist, USDA/ARS, Beltsville, MD*

I spent six years at Rutgers University conducting research on recombinant human rhinoviruses and AIDS. I am now a Research Virologist for the USDA/ARS studying the effects of nutrition on viral pathogenesis.

Spike, Thomas E.—MS'69; *Senior
Technical Advisor, Dairy Research, Elanco
Animal Health Division of Eli Lilly &
Co., Greenfield, IN*

Swaisgood, Mark H.—PhD'87; *Software
Engineer, Bioinformatics, Molecular
Simulations, Inc., San Diego, CA*

I've moved into software development. Currently I'm working on a product called Gene Explorer, a molecular biologist's tool kit for the computer. We recently had a second son and so I have a full family life out here in lovely San Diego.

Taki, Hiroe—BS'98; *Graduate Assistant,
University of Southern California, Los
Angeles, CA*

I am currently in a Ph.D. program at the USC in Molecular Pharmacology and Toxicology.

Tobin, Ann Marie—BS'95; *Department of
Defense, OPTEC, Alexandria, VA*

I received a B.S. in Biochemistry the year of 1995. I moved to Silver Spring, Maryland and was employed at Genetics and IVF Institute in Fairfax, Virginia. I worked in a research and development lab for two years. After being treated like an assembly line worker, I decided it was time to move on. I took a professional computer training course and managed to land a help desk position on a government contract. I work for a consulting company called MadenTech. My hours are somewhat flexible and the pay is okay. I am able to be self sufficient. I really enjoy the people I work with and love my job. This fall I'm going to start working on my CNE/CNA and take piano lessons. I have no idea what happened to any of my classmates, but it would be interesting to find out. My Mentor was Dr. Shelagh Ferguson-Miller. I have not spoken with her since I left MSU. I periodically think of her and the wonderful days spent working in her lab. Please give her my regards.

Verhoef, Vernon—PhD'78;
*Director, Project Management, Knoll
Pharmaceutical Company, Mt. Olive, NJ*

Voetberg, Bryan J.—BS'90; DVM'94;
*Veterinarian, Puloski Veterinary Clinic,
Puloski, WI*

Married 9/20/97 to Marianne
McKenzie.

Villanueva, Marco A.—MS'84; PhD'88;
*Professor, Instituto de Biotecnologia,
UNAM, Mexico*

After graduation I returned to Mexico where I worked as a researcher at CICY (Center for Scientific Research of Yucatan) on lethal yellowing disease of coconut palms. In the 3 years that I spent there I published 4 scientific papers and directed 1 master's and 1 undergraduate research thesis. I then joined the staff of the National University of Mexico (UNAM) from January 1991 and was granted a leave to do postdoctoral work with Dr. Larry Griffing at Texas A&M University. I spent 2 and a half years there (1991-1993) and published 1 scientific paper, 1 book chapter and 1 proceedings chapter, all of them dealing with confocal microscopy techniques to study endocytosis in soybean cells. I came back to Mexico in January 1994 to my present job at the Institute. My current interests are the study of the cytoskeleton, specifically actin and actin-binding proteins in seeds and during germination of *Phaseolus vulgaris* to understand the role of this fundamental cell organelle in this system. I have directed an undergraduate research thesis and published 1 proceedings paper, 1 book chapter and 1 scientific paper has just been accepted. I am currently supervising 2 undergraduate, 1 M.S. and 1 Ph.D. research thesis.

"I'd enjoy hearing what colleagues from my undergraduate days (1969) are doing with themselves. Thanks for making the effort to keep in touch."

Voige, William H.—BS'69; *Professor of Chemistry, James Madison University, Harrisonburg, VA*

I was pleased to get the recent mailing from your office. I look back fondly on my time at MSU and the superb undergraduate education I received in the Biochemistry Department. I am currently beginning my 24th year as Professor of Chemistry at James Madison University in Harrisonburg, teaching undergraduate biochemistry and general chemistry and supervising undergraduate research. One of the more interesting things I've done is develop a London-based travel-study program for science majors to complement the more traditional programs here (which tend to attract mainly majors in the humanities). Highlights for me are viewing Watson & Crick's model of DNA in the (London) Science Museum, having lunch at The Eagle in Cambridge, the pub where W&C celebrated their discovery of the structure of DNA (according to Crick), and visiting Charles Darwin's home (where he wrote "Origin of Species"). With retirement from full-time teaching on the not-too-distant horizon, I have shifted my interests toward writing and am planning a second career as a technical or medical writer for my post-JMU years. I'd enjoy hearing what colleagues from my undergraduate days (I graduated in 1969) are doing with themselves. Thanks for making the effort to keep in touch.

Vrbanac, John J.—PhD'83; *Senior Research Scientist, Drug Metabolism Research, Pharmacia & Upjohn, Kalamazoo, MI*

From 1983-1988 I was at the Department of Pharmacology at the Medical University of South Carolina as an Assistant Professor. In 1988 I moved to The Upjohn Company as a Research Scientist. My interests include: xenobiotic metabolism, mechanistic toxicology, drug development, all aspects of biomedical mass spectrometry. My current assignment includes 50% laboratory research and 50% acquisitions review.

Walter, Richard, Jr.—PhD'72; *Chief Microbiologist, The Dow Chemical Co., Midland, MI*

My postdoctoral years were spent at the University of Colorado Medical Center from 1972-1974 where my research focus was on mammalian ATPase. Since 1974 I have been with Dow Chemical researching biocatalysis, biopolymer fermentation, pharmaceutical antimicrobials, and antibiotics, industrial antimicrobials, identification, evaluation, and development. Member of SIM, ASM, ACS, ASWPA, and ASTM. Recently received an Award of Merit from ASTM.

Watson, Ronald—PhD'71; *Professor, Public Health, Arizona Prevention Center, University of Arizona School of Medicine, Tucson, AZ.*

Since leaving MSU I did a postdoctoral fellowship at Harvard School of Public Health with another

MSU graduate, A. Bruce MacDonald, and through that experience became an immunologist. I have taught in faculty positions thereafter at the Medical School in Mississippi, Indiana and now Arizona, with a time at Purdue. We use nutrients as immune modulators. So I did research in Colombia, Egypt and Saudi Arabia while working in the USA as a Professor. Currently, we have a 5 year NIH grant to study heart disease due to immune damage in a murine model of AIDS and leukemia. We have developed a treatment for it, which is licensed to be tested in HIV patients. We are continuing a long research study of cofactors that exacerbate immune dysfunction in murine AIDS, alcohol, cocaine, Coxsackie virus. As I train Ph.D. nutrition students we have been doing human trials of antioxidants to promote restoration of immune dysfunction in older people using beta-carotene, extracts of vegetables, DHEA. I have 4 children. One is working and going to school part time as a programmer in East Lansing. We have two grandchildren which are fun, most of the time.

Welton, Ann F.—PhD'74; *Vice President, Biology and Preclinical Sciences, Axys Pharmaceuticals, S. San Francisco, CA*

From 1974-1977 I did a Postdoc with Dr. Martin Rodbell at the NIH. I was then employed at Hoffmann LaRoche, Inc., from 1977 until my retirement in January 1998. The last position I held there was Vice Pres-

"...now back in the Department doing postdoctoral work with Professor Steve Triezenberg."

ident of Preclinical Development. I have been with Axys Pharmaceuticals since January, 1998.

Weston, Matthew—BS; *Technical Service Director, Resinall Corp., Severn, NC*

White, Peter Cooper—BS'77; *General Pediatrics, Beachwood, OH*

I have been practicing general pediatrics on the East Side of Cleveland, OH for the last 11 years. It's been fun and I expect to keep it up for a while.

Wilson, Barbara J.—Ph.D.'87; *Forensic Scientist, Illinois State Police, Chicago, IL*

Worden, Kevin J.—BS'85; MS'99; *Lab Scientist, Michigan Department of Agriculture, East Lansing, MI*

I have been busy with family, work and am earning a masters degree in chemical engineering.

Wright, Terry R.—BS'91; *Development Biologist, US Technology Development, Dow AgroSciences, Garner, NC*

I received a Ph.D. in Crop and Soil Sciences/Biotechnology Training Program in 1997 under the guidance of Dr. Don Penner.

Yang, William C.—BS'91; *Research Associate, Department of Biochemistry, Michigan State*

I completed my Ph.D. degree at Boston University and am now back in the Department doing postdoctoral work with Professor Steve Triezenberg.

Yokoyama, Charles—BS; *Graduate Assistant, University of Washington, Seattle, WA*

Following my graduation from M.S.U. I attended Massachusetts Institute of Technology where I earned my M.S. degree. I am currently pursuing my Ph.D. degree at the University of Washington.

Young, Dave K.—BS'77; *Physician - Pulmonary, Pulmonary, Critical Care Consultants, Lansing, MI*

Ortwine (Zaslona), Kelly—BS'93; *Physician, William Beaumont Hospital - Troy, Sterling Heights, MI*

Graduated from Wayne State University - School of Medicine and I am a second year resident at William Beaumont Hospital.

Zhang, Bin—PhD'97; *Research Associate, Howard Hughes Medical Institute, University of Michigan, Ann Arbor, MI*

Zhang, Wenge—MS'94; *Research Associate, Protein Design Labs, Inc., Fremont, CA*

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