MSU Efforts to Unlock Cancer Puzzle

One million new cases of cancer were diagnosed in the United States last year. More than 500,000 people died of the disease in 1990, 18,600 in Michigan, according to the American Cancer Society.

The MSU Carcinogenesis Laboratory is conducting leading research to better understand the causes of cancer and thus, identify more effective ways to prevent and treat the disease.

J. Justin McCormick, Ph.D., and Veronica Maher, Ph.D., co-direct the lab and together, they are working to understand the process that changes a normal human cell into a cancer cell. To unlock this puzzle of cell transformation, each scientist has taken a different research approach.

Maher is investigating how cancer-causing substances, carcinogens, damage the genetic material of a cell and how this damage can lead to cell mutations. McCormick’s research dovetails with the work of his colleague, as he tries to determine how mutated genes turn a normal cell into a tumor cell and exactly which genes play a role in this process.

A Dovetailing Effort

“We want to look at the kinds of mutations (caused by carcinogens), where they are located on the DNA and from this understand how they occurred,” said Maher of her research. In the experiments she conducts to answer these questions, Maher treats human cells with carcinogens prevalent in the everyday world, such as ultraviolet light and 1-nitropyrene, a mutagen found in diesel fuel exhaust and in charcoal-broiled steak. She then examines the genes of the cells to determine the location and extent of any DNA damage.

Maher’s research team of graduate students and post-doctoral associates is also examining the cell’s ability to repair DNA damage. Maher has shown that human cells have the ability to repair damaged portions of their DNA by cutting out the damaged DNA sequence and replacing it with the correct genetic information.

“What we’re finding is that the human cell repairs some parts of the DNA faster than others,” Maher said. “It appears to start repairing the important genes first, and then works on the ones that are not being used in the cell.”

However, Maher further explained, some cells, like skin cells or the cells that line the intestine, replicate so frequently that the DNA may not have enough time to completely repair itself. If the repairs are not made, mutations could result when the cells replicate with the damaged DNA. Thus, cells that replicate often may be at greater risk for being mutated.

“We think that this is one of the reasons why the parts of the body that get cancer are often the parts of the body where cells replicate frequently,” Maher said.

If mutated DNA is passed on to a daughter cell, this mutation could start the series of changes, studied by McCormick, that transform a normal cell into a tumor cell.

Step-By-Step

“What we know is that cells change step-wise,” explained McCormick, who has researched this process in connective tissue skin in the past seven years. "A cell undergoes a single change in one specific gene out of the 100,000 genes in the cell, which makes it move one step in the direction of cancer."

McCormick’s research has discovered that between five and seven changes are required to change a normal cell into a tumor cell. “Now the question is, exactly which changes are needed in which genes out of the 100,000,” McCormick said. “We’ve identified four such genes but there are at least a couple that remain to be identified. There may be more than that since there are some parallel pathways. That’s what we were working on.

Using recombinant DNA technology, McCormick is able to study how normal “human genes carrying specific changes (mutations) function to make a cell malignant.”

“The key to our studies is our ability to take DNA fragments carrying cancer genes from tumor cells and place them in normal human cells to learn how they disrupt normal cell controls,” McCormick said. “Having learned this, continued on page 2

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Soviet Scientist Studies Cancer in U.S.

For most of us, the dramatic changes in the Soviet Union occur at a great distance from our everyday lives. For a Soviet scientist working in MSU Carcinogenesis Laboratory, however, the policies of glasnost and perestroika have given her freedom unimaginable a few years ago.

Lubov Lukash left the Soviet Union last summer and came to America to work in the MSU Carcinogenesis Laboratory as research associate with directors Justin McCormick, Ph.D., and Veronica Maher, Ph.D.

"Gorbachev gave me the opportunity to work here. A few years ago, it would have been impossible," said Lukash, who is a scientist from the Institute of Molecular Biology and Genetics in Kiev, U.S.S.R. Maher and McCormick invited her to MSU to learn the scientific methods used in their cancer research experiments.

"In Kiev, I studied how viruses affected genes but I had no method to study the mutations," Lukash said. With Maher, she is learning a variety of molecular and cellular techniques used to interpret the genetic damage that carcinogens cause in human cells.

Lukash considers the technique of sequencing DNA one of the most important she has learned. "It is a huge advancement in science that we can sequence human genes," commented Lukash, who added that with this process used in the lab, a human gene can be sequenced in a week.

The opportunity to conduct research with human cells is also a great advantage, according to Lukash. "In my country, we mostly work with hamster cells," said Lukash. "While these cells are similar to human cells, one must ultimately determine whether the mechanism of mutations is identical in human cells."

When Lukash returns to the Soviet Union, she will be the head of the human genetics department at the Institute. She plans to teach her staff of 30 the many techniques she has learned at MSU.

"We will all use the methods I have learned here," said Lukash, who hopes that, eventually, her lab and the Carcinogenesis Laboratory can conduct joint research.

"One of my purposes here is to build an exchange," said Lukash. "American scientists are very kind. We can communicate with one another because we share similar problems and we all want to live better and better."

Lukash added that stronger communication would go beyond benefiting the research of American and Soviet scientists, to be an important, encouraging step toward improved understanding around the world.

Unlock Cancer Puzzle

we are able to identify normal cells in which carcinogen damage has changed the same DNA fragment. By repeating this process with various genes, one can convert normal human cells to malignant cells in the laboratory, something that has previously been impossible. Such a model will provide a method for analysis of the various types of human tumors. Instead of knowing only that some genes among the 100,000 are responsible for cancer, it will categorize the important genes.

Creating a Model

The goal of Maher and McCormick is to create a model that describes how the cancer process works.

"We are trying to get an understanding of how cancer starts so that we can then interrupt the cells on their way to the ultimate change," Maher said.

Unlock Cancer Puzzle

If we can work out one series successfully so that we know absolutely that the cancer, or cancer development, is some type of cell, that will provide a model for other types," said McCormick.

Such a model will then provide a method for analysis of the various types of human tumors. It should allow cancer causing genes to be categorized according to the role they play in the cancer process.

One of the practical results of these experiments is that it can help direct drug research aimed at producing new anti-cancer drugs. Such drugs might kill tumor cells as well as tumor cells which would open a new era in cancer prevention.

The team estimates that their first model could be completed within the next two years.

Unlock Cancer Puzzle

"I was very excited about the idea of working on something that is very important," said Lukash. "I was very grateful to be given this opportunity."
Fighting Breast Cancer from Every Angle

The photographs that fill Clifford Welch's office walls, of pre-swimming trout and salmon caught on successful angling expeditions, might lead one to think that perfecting his fly cast has been his lifelong dedication.

However, for more than two decades, this scientist has committed himself to the understanding and prevention of breast cancer, a disease that kills 45,000 American women every year. "It's been my specialty for 25 years," said Welch, a Ph.D., who has been with MSU since 1965 and is currently a professor in the Department of Pharmacology and Toxicology. "The reason I chose to research breast cancer is its prevalence, plus the fact that there are so many good experimental animal models for the disease."

The research Welch has amassed in his work at MSU-COM has brought him national recognition, while it has given the medical world important direction in the fight to stop one of the leading types of cancer in women.

A Three-Pronged Approach

Currently, Welch directs three different research projects, which are funded by the National Cancer Institute as well as by private foundations and institutions.

The first project examines methylnitrosamines and how these compounds influence the development of benign and cancerous breast tissue in experimental animals. "A good example of a methylnitrosamine is caffeine," said Welch who explained that when experimental animals are exposed to this chemical, an increase in precancerous or cancerous lesions of human breast disease is observed in the animals' breast tissue. Welch is using this evidence to determine whether a consistent relationship exists between breast cancer disease and caffeine and if so, he hopes to understand the mechanism that causes it.

"Caffeine, when administered to experimental animals can either increase or decrease the development of breast cancer, depending upon the experimental conditions," Welch said, who is exploring the mechanisms by which caffeine modulates this tumorigenic process.

Next, Welch is examining the role of specific oncogenes (genes which carry the potential for cancer) in the growth of human breast cancers and in the transformation of a normal human breast cell into a cancer cell.

"What we find out is that if we take one oncogene and translate it into non-cancerous normal human breast cells, we are able to transform these cells into cancer cells," said Welch, who explained that the breast cells used in these experiments are "immortalized" or a type of non-cancerous cells with a certain change in growth that allows them to continually replicate in culture.

Having found out how to change these immortalized, non-cancerous human breast cells into cancer cells, Welch said his research is now directed at understanding how the normal cells become immortalized. "We want to see what kind of gene transfer is necessary to get the normal breast cells, right out of the patient, to become immortalized in culture."

Additional studies in this area involve only human breast cancer cells. "Once again, we are doing gene transfer," said Welch who explained that the breast cancer cells used in this research have a very high expression of an enzyme called tyrosine kinase. This enzyme phosphorylates proteins necessary for cancer cell growth.

In his experiments, Welch intends to transfet a gene into these cancer cells which reverses the activity of the tyrosine kinase. The importance of this is that by inhibiting this enzyme, this gene could potentially block cancer growth.

"We feel that we have in our bodies certain genes that block or impede cancer processes and they are called tumor suppressor genes," Welch explained.

"None of these genes have been unequivocally identified in normal or cancerous human breast cells but we feel they are there conceptually. And the gene that we're putting into these cells may be a good candidate."

Welch's final research project examines the role of dietary fat in human breast cancer development. To investigate this relationship, Welch transplants the human breast cancer cells to immune-deficient mice, feeds the mice different types of fats and then studies how the different fat diets affect growth of breast cancers.

"Our first objective was to find out whether the type or amount of fat does indeed affect the growth of these cancers. The answer is clearly yes," said Welch whose research has shown that the rate of cancer growth is affected by both. "Now, we're trying to understand this relationship mechanistically."

"What we have found so far is that the types of fat that stimulate human breast cancer growth most effectively are the typical salad oils - unsaturated vegetable oils," Welch explained. "The animal fats, like butter, are of intermediate stimulatory activity whereas the fish oils are of least stimulatory activity."

"Also, if you double the amount of fat an animal consumes, you will sharply increase the growth rate of these breast cancers," he said.

"In terms of cardiovascular disease, you are advised to substitute unsaturated fats for saturated fats. For cancer, it's appears to be just the reverse. The growing literature indicates that the unsaturated vegetable fats are the greatest culprit (for tumor growth)," Welch said. "The bottom line is you should reduce consumption of both vegetable fats as well as the animal fats."

Cutting Calories Recommended

Welch commented that the dietary fat research points out the most powerful tool a tumor biologist has to prevent all types of cancer in experimental animals - caloric restriction.

"It has such a profound effect," Welch said. "If one simply reduces caloric consumption in experimental animals by a mere 12 percent, breast cancer risk is reduced by about 40 percent. If one reduces caloric consumption by 25 percent, breast cancer risk is reduced by about 75 percent in these animals."

"There is a tremendous amount of interest today to understand how caloric restriction suppresses the development of tumors in virtually all experimental animals and in virtually all organ sites," he said.

Welch added that based on this research, the best nutritional recommendation to suppress the development of breast cancer, and other cancers, is to restrict caloric consumption. "You want to eat a balanced diet but you want to eat it in moderate amounts," he said.

Two or Three Years To Go

Each of the three research areas that Welch and his research team of pre-Ph.D. students, research associates and collaborators are working on, have another two or three years to go before they are completed or renewed. These projects, however, make up part of the more than 150 papers published by Welch on breast cancer in his 25 years at MSU. For him, it is the comprehensiveness of cancer research that makes the field exciting.

"Cancer research forces an individual to have an understanding of many aspects of biology," said Welch who received the MSU Distinguished Faculty Award in February 1991 in recognition of his contributions to cancer research and to the university.

Welch, who has also served as associate editor of the journal Cancer Research for 12 years, made his decision to study cancer at MSU early on. "I took my post-doctorate training here and loved it so much, I stayed," said Welch who added that it was the students and faculty that drew him to the university.

"Collaboration in the pursuit of a solution to an important problem (cancer) with the many superb faculty at MSU has truly been my greatest satisfaction and enjoyment," Welch said.

"And the good trout fishing - that's part of the equation, I have to admit," said Welch. 

Clifford Welch, Ph.D.
Scope of Action Earns MSU Breast Cancer Center New Name

In January 1990, the MSU Comprehensive Breast Cancer Center began its two-fold mission to provide coordinated, interdisciplinary breast cancer care in Michigan, and to engage in research, education and services in all areas of cancer prevention and lifelong care.

After one year, the center's scope of interest and action has broadened so much that the MSU Board of Trustees gave its approval to change the center's name to the MSU Cancer Center.

"Modifying the name to reflect the expertise, established leadership areas and interests of the participating faculty will enable MSU to be more sensitive and responsive to the research, educational and clinical care needs and interests of the community," said center director G. Marie Swanson, a CHM professor of medicine. Swanson and her colleagues, deputy director Nikolay Dimitrov and associate directors, J. Justin McCormick, Janet Osuch, and Barbara Given, have launched an innovative approach to cancer care that taps the knowledge of the MSU faculty and builds on the university's community-based health science efforts.

Sawan said that nearly 200 hundred MSU faculty members from all over the university are involved in participating in the center's initiatives. Many are already involved, working on one of the center's three special programs — clinical care, cancer etiology and public policy.

Each of these programs encompasses developing projects and plans. The clinical care program, for example, directed by Janet Osuch, COM associates director for cancer surgery, is working to establish a Comprehensive Breast Health Clinic.

"This clinic will be a very specialized, interdisciplinary clinic that addresses all disease states of the breast," Swanson said. "It will be unique to the state of Michigan as there are no other clinics focused solely on breast health.

Housed on the second floor of the MSU Clinical Center, the breast health clinic will use the technology available in adjacent clinics to provide important cancer control services and treatments including mammography, mammest and chemotherapy knowledge.

The clinic also will also serve as a teaching tool. "We will emphasize the educational components of care for patients and families, in addition to providing educational programs on state-of-the-art breast care for undergraduate, graduate and practicing medical students and physicians," said Swanson.

Citing that only 30 percent of primary care physicians refer their patients for mammograms, Swanson added that special efforts will be made to involve these physicians on breast cancer screening and prevention. "We will work with primary care physicians in their offices or have them rotate through the clinic," said Swanson.

Coordinating the MSU cancer research front is COM researcher J. Justin McCormick, director of the center's cancer etiology program. His efforts are directed toward unifying the many MSU researchers working on cancer issues. One project, already underway, is a coordinated effort to study prostate cancer.

Other programs currently underway include holding seminars to bring the researchers together, organizing joint research projects and providing seed money to support preliminary research.

The lifelong cancer care program is directed by nursing professor Barbara Given, who has extensively researched home care for the elderly and chronically ill. Given will lead efforts to establish a family-based, health-oriented approach to cancer care that includes prevention, home care and outreach and referral services.

Concurrently with these activities, Given is also investigating the barriers and influences to mammogram screening among working women. A second project, funded by the Michigan division of the American Cancer Society, entails an outreach effort to ensure that more women in rural populations receive mammograms.

This breast health center has an encompassing vision that involves all the center's special programs is the need to improve cancer prevention among all areas of populations. "We are in the process of developing specific interventions in cancer education, including continuing medical education and public education," Swanson said.

The center's new name will bring increased recognition to the Cancer Center's many initiatives. Swanson said that the change will motivate students and young faculty to enter biomedical research. The new name also will give established faculty better positioning to respond to requests from external funding agencies for a wide variety of research, education and service programs. Finally, Swanson said the new recognition will enable the MSU program to compete for $1 million grants provided by the National Cancer Institute to support cancer centers.
Two student-planned-and-organized Healthfests were held this spring to bring free health screening tests and information to people in the Lansing area.

The Association of Black Osteopathic Medical Students coordinated both of the day-long programs which were held at the Cristo Rey Clinic and the Black Child and Family Institute (Genesee Clinic). The student organization’s president Robert Walker described the goal of Healthfest to be both medical and educational.

"Teaching people about the importance of health screening is at the heart of Healthfest," said Walker, COM ’93. "People don’t know the benefits of screening tests. This is our way of trying to emphasize preventive care. Our goal is to give them access to the health care system."

The programs offered the public a range of screening services including tests for cholesterol, glucose and blood pressure, and exams for breast and prostate cancer.

More than 35 COM and CHM students participated in the Healthfests, and bilingual student were on hand to assist Spanish-speaking people attending the programs. Fifteen physicians assisted the students including COM alumni and COM professors including Margaret Agwu, Howard Teiteltbaum, John Thornburg, Chris Milan and Elizabeth Rudenberg. Two residents from the college, Laura Hanselman and David Levine, also pitched in. Contributions to support the Healthfests programs came from the department and offices within the college, as well as outside organizations including the Cristo Rey Community Center, Black Child and Family Institute, American Cancer Society, American Lung Association of Michigan, Lansing General Hospital, Clinical Labs of Lansing, Curtis Drugs, Merck, Sharp and Dohme and several others. Most of the organizations displayed exhibits with free health information materials.

Walker emphasized how important these contributions were to the success of any Healthfest. He pointed out that one woman who came to the program at Cristo Rey was a candidate for a mammogram but because she had no health insurance, was hesitant to have one. To help her and other women who need mammograms, the dean’s office and the Department of Radiology donated funding to supply free mammograms at the MSU Clinical Center.

"Through Healthfest and these contributions, now she can get one," said Walker. "Dean Magen has been right behind us and we thank him for that."

The teamwork between students and faculty was also a crucial element. Walker illustrated this by describing another case involving a pregnant woman who had her cholesterol level tested. The results showed a level of 311. Students informed one of the attending physicians, Dr. Teiteltbaum, and he counseled the woman about her diet and nutrition.

Walker noted that this story shows how screening tests give people much needed access to the health care system.

"Healthfest also serves as excellent educational tools, for the community and for students," said Walker, who added that students, in particular, gained more experience giving and explaining testicular and prostate exams to Healthfest participants. "A lot of men don’t know the importance of these exams, so it’s important that we help to get the word out."

Walker said he hopes to plan more Healthfests next year in an effort to make the programs an ongoing, annual opportunity for students to provide service to the Lansing community.

Cholesterol tests were one of several screening tests provided at the Healthfest programs. Here, Juliet Markham, CHM ’95, takes a blood sample.

COM ’93 students Thane Nguyen and Robert Gross give blood glucose tests to two participants.
Taking AIDS Education to the Streets

Andrew Macri, COM '93, will spend his summer in Flint, educating homeless men and women about AIDS prevention. Macri is one of the 150 students chosen from a pool of 600 applicants to participate in the Public Health Service's nationwide health education program.

The Health Promotion/Disease Prevention Student Project supplies grant support for students in their initiatives to educate communities about preventive health care. Macri chose to focus on AIDS in the homeless community because he said he is fascinated by the disease and because he believes that education is an crucial element to control the spread in the disease in this population.

"A lot of homeless people don't know how the disease is spread and by talking to them one-on-one, I can educate them on about risk behaviors that can transmit the disease," said Macri, who would like to become an HIV specialist after he finishes medical school.

He said that because homeless people are a particularly difficult group to reach, visiting the shelters in Flint and talking to people individually or in small groups will be the most effective education method. "Interpersonal communication will help alleviate the fear and stigma that affects some groups by this disease," said Macri.

The Michigan Department of Public Health reports that 66 people in Genesee County, where Flint is located, have AIDS. There are more than 2,000 cases of AIDS in entire state of Michigan.

COM Student to Lead National Organization

Salvador Renteria, COM '93, is the next national president of the Student Osteopathic Surgical Association. He will take office in September at the organization's annual meeting held in Orlando, Fla.

During his tenure, Renteria plans to compile a resource book of all the surgical osteopathic programs in the country with evaluations of what these programs provide. He said he hopes that this information will help students to know better the opportunities available to them.

"Students are making decisions about residency programs without all the information," said Renteria, who wants to show students that the osteopathic programs are competitive with allopathic programs.
Richard Ferro, assistant professor in the Department of Osteopathic Medicine, received his certification in anesthesiology in April.

Michele Fluck, professor of microbiology and public health, received the MSU Distinguished Faculty Award from the Michigan Association of Governing Boards. Fluck, who was also named a distinguished professor by the university in 1990, is researching the molecular and cellular aspects of viral oncopogenesis. She joined COM in 1979 as an associate professor from Harvard University.

Susan Hendrix, assistant professor in the Department of Osteopathic Medicine, was elected to the Michigan Chapter of the Phi Kappa Phi Honor Society.

Michael Kron, of the Department of Pathology, has received an NIH Physician Award of more than $400,000 to work with the department chairperson, Charles Mackenzie, on the parasitic disease river blindness (onchocerciasis). This five-year project will entail collaborative studies with Dr. Ron Gurney and his colleagues in Ecuador, South America. Kron, a molecular biologist, joined Mackenzie’s lab a year and a half ago from Case Western Reserve University. He is trained in tropical medicine at the London School of Hygiene and Tropical Medicine.

Kusum Kumar, associate professor of pathology, presented two papers at the annual meeting of the U.S. & Canadian Academy of Pathology in Chicago. The first paper, co-authored with Frank Marcoux, Ph.D., is titled “Comparison of Vascular Perfusion in Ischemia-Sensitive and Ischemia-Resistant Regions of Gerbil Brain by an Automated Laser Doppler Image Device.” The second, co-authored with Michele Fluck, COM professor of microbiology and public health, is titled “Expression of Polymyotia Virus in Mouse Brain by Biot Hybridization and In Situ Hybridization.”

Kathryn Lovell, associate professor of pathology, presented a paper entitled “Regional Variation in Lysosomal Enzyme Activities in Goats.” The paper was coauthored with Robert Kcinich and Kevin Cavanagh and was presented at the annual meeting of the American Society for Neurochemistry in March.

Walter Mill of the Department of Osteopathic Medicine was named a distinguished fellow of the American College of Obstetrics and Gynecology at the organization’s annual convention in Palm Springs, California. Mill was also recently elected to the 1991 governing board of the Phi Beta Delta Honor Society for International Scholars.

Maureen Sander, of the Department of Pathology, is co-author of a poster titled “Non-immune Hydrops Fetales in Association with Hemorrhagic Endovascularitis of the Placenta: Report of 14 Cases.” Sander and her colleague Patricia Novak, COM ’88, Sam Yang and P.T. Von Olyen, all of Beaumont Hospital in Detroit, presented this poster at the 11th annual meeting of the Society of Perinatal Obstetricians in January.

Ronald Simons of the Department of Psychiatry, was an invited discussant for a symposium on “Theoretical and Methodological Issues in the Study of Latino Folk Illness.” The symposium was held at the annual meeting of the Society for Applied Anthropology in March.

Kenneth Stringer, COM ’74 and associate professor in the Department of Pediatrics, received the State of Michigan “Special Tribute Award” from the Michigan State Senate. Stringer was given the award in recognition of his outstanding service to MSU and the local community.

John Thornburg, acting chairperson of the Department of Family Medicine, is wearing several different hats inside and outside the College. Within COM, he chairs the curriculum revision committee and the pharmacology text committee. Outside he serves as director of osteopathic internship at St. Lawrence Community Medical Center and a member of the Board of Examiners. Thornburg has also authored two chapters in Human Pharmacology: Molecular-to-Clinical.

Edward Conley, COM ’82, has been selected to join the Midwest Center in a multi-center study on patients with neurological changes. Conley will be contributing to a study conducted by John Martin, M.D., Ph.D., a professor at the University of Southern California and head of pathology at USC Medical School Department of Pathology. Martin is working on a new test, called the Polymers Chain Reaction (PCR) test, which uses cerebrospinal fluid to determine neurological problems and viral infections. The test uses chromatography—projecting bands on to graphs in a definite pattern to indicate chronic fatigue syndrome, multiple sclerosis and chronic viral infections. Conley, who treats patients with chronic fatigue syndrome, will submit cerebral spinal fluid for testing in this study.

Gary Doublestein, COM ’83, has completed his three-year commitment to the Air Force, has opened a new obstetrics and gynecology practice with Tony Butto, COM ’82, in Grand Haven.

David Mendelson, COM ’86, will complete his Cleveland residency in otorhinolaryngology and oro-facial plastic surgery in July 1991. He then plans to move to Cincinnati with his new wife Laura to join a practice with Mark Grossinger, D.O.

Thomas Naegle, COM ’83, gave lectures and workshops on “Computer Science and Practical Guidelines” at several recent conferences including the International Conference on the Computerization of Medical Records, the Arkansas Osteopathic Medical Association Spring Seminar, the Western States Osteopathic Convention and at the annual meeting of the Texas Osteopathic Medical Association.

Charles Perakis, COM ’73, has been elected a Fellow of the Center for Literature, Medicine and Health Care Professions. This center is a joint project of Hiram College and Northeastern Ohio University’s College of Medicine. For the next two years, Perakis will participate in programs to apply literature to understanding the physician’s role, the symptoms, the conflicts and the resolution in the art of healing. The study will range from ancient writers, such as Aeschylus, to modern authors, such as Walker Percy. Perakis also serves as co-chairperson of the Medical Humanities and Behavioral Medicine Department in the College of Osteopathic Medicine at the University of New England. He teaches clinical practice and general medicine at the college, as well as writing for physicians, journal writing and literature in medicine.

Debra Roggow, COM ’88, will be the chief resident at the Department of Rehabilitation Medicine at Emory University in Atlanta, Georgia beginning July 1. She will complete her residency there in physical medicine and rehabilitation in June 1992.

Henry Szegal, COM ’87, began two practices outside of Mt. Pleasant after completing his residency in 1989 at Garden City Hospital. He and his wife Carla have three children, Freddie, 13, Benji, 9, and Lee Ann, almost two. Szegal published an article in the February 1990 the Journal of Osteopathic Medicine titled “Giardia Lambia: A Preventable Parasite.”

Matthew Terry, COM ’75, has been named dean of the Southeastern University College of Osteopathic Medicine. Terry, who also earned his master’s degree in medical education from MSU, joined Southeastern University in 1981 and has served as deputy dean for the college for the past year.
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Tutorial on Level II Manual Medicine Techniques (Below Diaphragm)
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This course is designed to review and expand previous training in manual medicine. This includes supervised practice of the hands-on skills of palpatory diagnosis and manipulative treatment; discussion of anatomical and/or physiological characteristics which increase the capability of dealing with complex problems, often of traumatic origin; consideration of the connective tissues; an expanded list of illustrative manipulative procedures. This course has a limited enrollment due to the heavy clinical orientation. Faculty includes Edward G. Stiles, D.O., F.A.A.O., chairperson. Previous training required in “Principles of Manual Medicine,” “Level I Muscle Energy” and “Direct Action Thrust.” 40 hours Category I credit. Sponsored by MSU College of Osteopathic Medicine and College of Human Medicine. Cost is $1,200; Physicians in training, $600. Includes continental breakfast and lunch daily.

Principles of Manual Medicine
June 17-21, 1991

Principles of Manual Medicine is a combination of didactic lectures and hands-on experience sufficient to understand the principles involved in the diagnosis and treatment of musculoskeletal disorders amenable to manual medicine methods. Emphasis will be placed on the integration of manual medicine into total health care. Faculty includes John Boudillon, F.R.C.S.; Mark Borkhout, M.S., P.T.; Allen Jacobs, D.O., Ph.D., chairperson; Edward Isaacs, M.D. The class is restricted to 40 participants. “Principles of Manual Medicine” is the prerequisite conference for all other postgraduate manual medicine courses offered by Michigan State University. Registrations will be taken on a first come, first served basis. No phone reservations accepted. 40 hours Category I credit. Sponsored by MSU College of Osteopathic Medicine and College of Human Medicine. Cost is $1,000; physicians in training, $500. Includes continental breakfast, lunch, and course materials.

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