ON THE COVER

MSU immunologist/microbiologist Harold C. Miller works at the Cytofluorograft, a sophisticated cell sorter tied to a computer. Dr. Miller's work with lymphocytes is in the vanguard of a field that portends to revolutionize medical science. See pages 3 and 4.

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ROCKING THE LYMPHOCYTE CRADLE

Some of them eat the enemy. Others kill and run. Still others seize their foes' arsenals, rendering them helpless.

The warriors are the billions of cells which comprise the immune system, the battleground is the body, the enemy is any substance that is "nonsel". Tracking the growth and training of immature "soldiers" in the system is the work of Michigan State University immunologist Harold C. Miller.

A professor of microbiology and public health, Miller is conducting research funded under a $116,910 grant from the National Institutes of Health. He recently completed work under the American Cancer Society's prestigious five-year Faculty Research Career Development Award.

He finds it difficult to be less than exuberant about the strides that are being taken in his field.

"I believe in the next few years most medical texts will have to be rewritten, primarily on the basis of the exciting new developments in immunology," he says. "The possibilities are enormous."

A broadening appreciation of the importance of the immune system in both scientific and medical circles would support this view. Traditionally it was studied only for its defensive action against infectious disease. Now allergy, viral invasions, aging, cancer, and the body's reaction to toxic substances, to stress and to transplant tissue all are recognized to involve the immune system.

(more)

Computer graphics of sorted cells (L to R): RCBs, mature lymphocytes, immature lymphocytes.
In addition, a number of afflictions of humankind are being identified as "autoimmune" diseases, in which our defense system goes awry and turns on the body itself. These include rheumatoid arthritis, thyroditis, systemic lupus erythematosus, and, Miller suggests, will likely be extended to heart disease and diabetes.

Miller's current area of interest involves the lymphocytes, which comprise 20 to 40 percent of our white blood cells. These are the cells programmed to deal one-on-one with specific invaders such as bacteria. These lymphocytes come in two varieties.

T cells go after fungi, viruses, parasites, and a few bacteria that fully immerse themselves in a host cell. They are also involved in the destruction of cancer cells and the rejection of solid-tissue transplants. There are more than 10,000 different kinds of T cells, Miller says, and they have about a 10-year life span.

B cells, on the other hand, are the lymphocytes which produce antibodies, special proteins which neutralize a body's invader (or "antigen") by fitting "lock-and-key" chemically with the invader's weaponry. Locked together, the antibody and the antigen then stimulate reactions which further enhance the efficiency of other "killing" and "eating" cells.

Miller noted that as many as 100 million kinds of B cells may exist, each type "trained" to react with a specific kind of invader. Because these cells live only about four days, they are constantly being regenerated.

B cells, T cells, red blood cells, and several other blood components all develop from the same source -- delicate stem cells in the bone marrow.

"Until now, research has focused on the mature T and B cells, how they interact, and how they develop their products," Miller said. "We, on the other hand, are looking at the processes which change a stem cell into a B or T cell, and the molecular basis for cell-cell communication which could affect the development."

Miller noted that some of the factors already known to inhibit development of immune cells include aging, disease, heavy smoking, and alcohol consumption.

The researchers, using cell cultures, find these immature cells by using a complex sorter tied to a computer. Cells in a sample are moved single-file past a laser beam, and those with specified light-scattering properties are given a small electrical charge. They are then collected when passing by a metal plate of opposite charge and result in a purified, homogenous sample.

So far, Miller has identified three steps in the development of the B cells and four steps in the development of T cells he has studied.

DEPOSITS IN THE BANK

Seeking to meet a need more basic than education, Michigan State University is sponsoring a drive for donations of canned goods to support the Lansing Community Food Bank.

Dates for the drive are Friday, November 5, when collection boxes will be located in campus buildings, and Saturday, November 6, when collection sites will be designated around Spartan Stadium during the MSU/Northwestern football game.
Both high blood pressure and a preference for salt may have a common cause in the body's response to stress, according to research being done by physiologist Rudy Bernard, Ph.D.

Bernard's research is particularly relevant in the United States, where Americans consume more than five times the salt physiologically necessary, and where both stress and the incidence of high blood pressure are perceived as increasing.

His work, done under a grant from the Michigan Heart Association, may demonstrate a new pathway in which stress can affect "essential hypertension" -- high blood pressure of unknown origin.

High blood pressure is often called the "silent killer," because it can cause tragic conditions such as stroke, kidney failure and heart failure without producing any symptoms of its own.

Bernard is investigating the effects of ACTH (adrenocorticotropic hormone), a substance well known to be involved in the body's adaptation to stress. His hypothesis is that ACTH causes both elevated blood pressure and elevated salt appetite and that the associated increase in salt intake occurs because of changes in taste receptors and nerve fibers.

"Although reduction of salt intake has been proclaimed a national health goal by the Surgeon General of the United States, there is very little agreement on the exact causal role that salt plays in high blood pressure," Bernard said. "It may be that high salt intake, instead of causing hypertension, is itself a consequence of the same process that produced the disease."

Using rats that have normal blood pressures, Bernard found that by infusing them with ACTH he could both raise their blood pressures and cause them to spontaneously drink large quantities of salt water in preference to plain water. In another strain of rats, called "spontaneously hypertensive," Bernard found more than twice the levels of ACTH in the blood as normal rats, along with an abnormally high appetite for salt.

"I think these experiments will lead us to think in new ways about hypertensive disease," Bernard said. "It may well be that high blood pressure is not an indication of a defective body that requires lifetime medication, but rather that the body's natural ability to cope with stress has been exceeded.

"Attention and resources could then be shifted from medication to changing human behavior, which could be very cost effective both for the individual as well as society," he said.
Presentations that ranged from the use of birthing centers to the psychiatric implications of celibacy were all part of the 1982 scientific seminar and football weekend sponsored by the MSU College of Osteopathic Medicine Alumni Association.

The speakers, almost all MSU-COM alumni, included Rosemary J. Havey, D.O., ('74), resident in psychiatry at Michigan Osteopathic Medical Center, Inc.; Lon A. Hoover, D.O., associate professor of family medicine; Jasper Lillie, D.O., ('73), assistant professor of family medicine; William McDevitt, D.O., ('78), resident in urologic surgery, Detroit Osteopathic Hospital; and Seldon Nelson ('77), assistant professor of biomechanics.

Other speakers included Anne M. Pawlak, D.O., ('79), resident in neurology, Botsford General Hospital; Owen Piekus, D.O., ('74), oncologist/hematologist from Portland, Maine; Ronald Rhule, D.O., ('73), senior staff emergency room physician, Henry Ford Hospital, West Bloomfield, and Lt. Commander, U.S. Navy Medical Corps; and Carole Rizzo, D.O., ('79), resident in obstetrics and gynecology, Providence Hospital, Southfield.

The weekend included a reception, banquet, box luncheon, and the football game.

(It was rumored that MSU lost the game, 31-10, to Ohio State.)
Development officer Patricia Soutas-Little, biomechanics chairman Robert Soutas-Little, and '74 alumn Owen Pickus

Ronald Rhule ('73)

Penny Mahrle Cook ('75), Gordon Spink ('75), and Grand Rapids physician Charles Vogler
BIRTH DEFECTS AND ROLE OF PLACENTA STUDIED AT MSU

Links between birth defects in newborns and abnormal placentas are under investigation in a one-of-a-kind registry at Michigan State University. The placenta is the endocrine organ which surrounds the unborn infant and serves as a lifeline from mother to child.

Pathologists at the Michigan Placental Tissue Registry are studying the connection between an abnormal process which destroys fetal red blood cells and blood vessels within the placenta, and stillborn infants or those born with birth defects.

Charles H. Sander, M.D. pathology professor and director of the registry, says that analysis of registry data reveals a significant association between an abnormal process known as hemorrhagic endovasculitis (HEV) and otherwise unexplained stillborn infants.

HEV has been observed in more than 500 placental specimens sent to the registry by Michigan physicians, Dr. Sander reports. Placentas affected by HEV have been found in successive pregnancies of several patients delivering infants in distress or small for their gestational age.

Follow-up studies are underway on infants whose placenta have shown evidence of HEV to determine any long range effects and possibility of recurrence. Involved is linkage of data from neonatal intensive care units in hospitals across the state to that collected and analyzed by Placental Tissue Registry researchers.

Funding for the work is provided by the United Cerebral Palsy Association of Michigan, the Michigan Department of Public Health through the Michigan State Medical Society, and the Michigan State Planning Council for Developmental Disabilities through the Michigan Department of Mental Health.

Their support also enables in-depth investigation of abnormal placental specimens referred to the registry by physicians in some 85 hospitals across the state. This investigation includes examination of specimens by electron microscopy and development of techniques to pinpoint abnormal immunologic responses within the placenta.

Unique in the U.S., the Michigan Placental Tissue Registry was founded as a diagnostic referral center to receive placental specimens associated with any abnormality in pregnancy. More than 1,000 placental specimens are received annually from Michigan physicians concerned with care of the pregnant patient.

OTC, PRESCRIPTION AND SOCIAL DRUGS

Most young adults in America use prescription, over-the-counter or social drugs, reports a group of Michigan State University researchers in a study of drugs and the young adult.

In addition, say the investigators, most young people are unaware of the possible harmful effects of familiar drugs like aspirin and the social drugs caffeine, nicotine and alcohol, and show little concern with the potential hazardous interactions resulting from ingesting a variety of drugs.

The report, "Drugs (Prescription, Over-The-Counter, Social) and the Young Adult: Use and Attitudes," appeared recently in The International Journal of the Addictions.
In a survey of 600 college undergraduates (310 male, 290 female), 17 percent of the respondents said they had used a prescription drug during the week prior to the interview, 59 percent said they used one or more over-the-counter drugs, and 97 percent said they ingested one or more social drugs.

Aside from birth control pills, antibiotics (particularly tetracycline) and antihistamines were the major prescription drugs used by both sexes, the study showed. Painkillers (especially aspirin), vitamins, antihistamines and cold remedies were the major over-the-counter drugs used.

The most-used social drug was caffeine (the majority from cola). Alcohol ranked second, marijuana third, and nicotine from cigarettes ranked fourth.

Only one percent of the men and two percent of the women reported that they hadn't taken any drug during the week prior to the interview.

Arthur Vener, professor of social science, Lawrence Krupka, professor of natural science, and Jacob Climo, associate professor of social science, the principal researchers of the study, concluded that drug education programs have not sufficiently emphasized the hazards associated with the use of over-the-counter and social drugs.

They suggest that such programs should begin during the formative years, e.g., early elementary school.

One of a series of 13 drug use articles published by the researchers over the past four years, the MSU study was one of only a few to examine total drug use.

Most respondents said they were reluctant to use prescription or over-the-counter medicines unless absolutely necessary, and a substantial number believed the drugs they had ingested caused some harmful side-effects (drowsiness, inability to think clearly, stomach distress, etc.).

In order to compare students' perceptions of the most harmful drugs with those of experts, two panels were selected from the MSU faculty — one of 25 social scientists, the other of 25 biological scientists.

While a majority of the social scientists perceived alcohol as having the most harmful effect on society, only 20 percent of the students indicated this to be the case. About 90 percent of the students said heroin had the most harmful biological effects, though only a little more than half of the biological scientists agreed. Forty percent of the biological scientists said alcohol was the most physically harmful.

The researchers also found that:

— More women than men used prescription, over-the-counter and social drugs.
— More men than women reported they drank alcohol, and more men said they used marijuana, while more women smoked cigarettes.
— Potential hazardous drug interactions are "a real possibility in our sample of young adults due to multiple drug use."
— Incomplete or inaccurate information on the safety of prescribed, over-the-counter and social drugs contributes significantly to the "positive values and attitudes which predispose individuals to use a great variety of drugs."

— Alan Steinberg
CONVOCATION FEATURES PROJECT HOPE PRESIDENT

William B. Walsh, M.D., the president of Project HOPE, will be the keynote speaker at the MSU College of Osteopathic Medicine's twelfth annual convocation 3 p.m., Friday, October 29.

The ceremonies, to be held in MSU's Erickson Kiva, are held each year to honor the entering class at the medical school.

Dr. Walsh, founder of the famous hospital ship that travelled to developing coastal nations to train local medical personnel, has a distinguished career in medicine and human service. He and others will be honored with the Walter F. Patenge Medals of Public Service.

A reception for the entering class will immediately follow the ceremonies.

GRADUATES NATIONWIDE FACE MASSIVE EDUCATIONAL DEBTS

Nearly half the osteopathic medical students in the United States enter medical school owing less that $1,000, but more than half the students must expect to graduate more than $40,000 in debt.

These data were released recently in a study conducted by the American Association of Colleges of Osteopathic Medicine, who polled students at all 15 osteopathic schools.

The study indicated that the average debt upon admission was $7,400, but that this figure swelled to more than $45,000 on the average for expected debt at graduation. Seventy percent of the students responding considered themselves financially independent from their parents, 40% were married, and 37% reported dependents.

The students expected to earn approximately $22,000 gross income practicing osteopathic medicine during the first year following graduation.

More than eight percent of the students expected to owe more than $90,000 upon graduation.

MSU TO HOST INTERNATIONAL CONF.

An international conference on "Empirical Approaches to the Validation of Manipulation" will be hosted at MSU on April 30 and May 1 at Kellogg Center.

Faculty for the conference will include internationally recognized experts in the field, who will discuss manipulative techniques, particularly as they relate to acute back pain.

ALUMS TAKING RESIDENCIES IN LANSING HOSPITALS

Seven persons from the MSU College of Osteopathic Medicine are taking residencies in Lansing area hospitals under the auspices of Graduate Medical Education, Inc.

They include Douglas Marciniak, D.O., '79 alumnus, who holds a cardiology fellowship from Ingham Medical Center; psychiatry residents Paul Yan Liu, D.O., '81, Jill Hendra, D.O. '81, David Riddle, D.O. '78, and John McNeil, D.O., '78, and associate professor of family medicine; and emergency medicine residents Oliver Hayes, D.O. '81 and Ronald Maio, D.O. '76.
ADVANCED MUSCLE ENERGY TUTORIAL (ABOVE DIAPHRAGM) NOVEMBER 1-5

This course presents examination, analysis and treatment, using advanced muscle energy techniques, of the upper extremities, cervico-thoracic spine, thoracic cage, throat and jaw. Postural/structural concepts are expanded into functional and integrative analysis in terms of respiratory, circulatory, neurologic and fascial models.

Faculty include Fred L. Mitchell, D.O., professor of family medicine at MSU-COM, and Paul Kimberly, D.O., former Steunenburg Professor and chairman of the Department of Osteopathic Theory and Methods at the Kirkville College of Osteopathic Medicine.

The program, to be held at Kellogg Center, is approved for 40 hours Category I credit for M.D.s and D.O.s. Training in basic muscle energy techniques is a prerequisite.

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PEDIATRIC GASTROENTEROLOGY NOVEMBER 7

The annual seminar of MSU-COM’s Department of Pediatrics, this course will include pediatric gastrointestinal physiology, gastroesophageal reflux, inflammatory bowel disease, chronic diarrhea, hepatitis in children, and behavioral manifestations of chronic gastrointestinal dysfunction in children.

Faculty include Joseph F. Fitzgerald, M.D., professor of pediatrics and chief of the Division of Pediatric Gastroenterology at Indiana University; and MSU-COM’s Gerard Breitzer, D.O., Howard Dean, D.O., Jacob Krion, Ph.D., Beverly Roberts, M.A., and Frank Schneiderman, D.O.

The course is approved for seven hours of Category I credit for D.O.s.

SEMINAR IN THE SUN: FEBRUARY 21-MARCH 2

Reservations are still being taken for the 1983 Seminar in the Sun in Ocho Rios, Jamaica. The 20-hour CME program will include the latest concepts and issues in medicine with an osteopathic emphasis, with featured presentations in nephrology and neurology. The program, sponsored by the MSU-COM Alumni Association, is open to all.

* * * *

MANUAL MEDICINE TO THE EXTREMITIES: NOVEMBER 8-10 AT KELLOGG CENTER

A three-day intensive course in the principles of manual medicine as applied to both the upper and lower extremities will emphasize both diagnosis and manipulative management.

The course will be held at MSU’s Kellogg Center.

Faculty for the program include Myron C. Beal, D.O., professor of family medicine; John Mennell, M.D., past president of the North American Academy of Manipulative Medicine and a noted author and lecturer; and Lon Hoover, D.O., associate professor of family medicine.

The course has been accredited for 24 Category I hours for both D.O.s and M.D.s.

* * * *

PLEASE MARK YOUR CALENDARS!

12/13 Basic Principles: Manual Medicine
1/17 Basic Muscle Energy Tutorial
3/12 Principles of Rehabilitation
3/31 Preventing Chronic Pain
4/15 Myofascial Release Technique

For further information on these programs, contact CME coordinator Sandy Kilbourn, A329 E. Fee, MSU-COM, East Lansing, Michigan, 48824; 517/353-8822.
Adalbert Koestner, D.V.M., Ph.D., chairperson of the Department of Pathology, attended the IX International Congress on Neuropathology in Vienna, Austria, from September 5 - 10. He chaired a session on neuropathology and presented a paper entitled "Prospective Host Factors Leading to Cancer Regression."

Gaston E. Blom, M.D., professor of psychiatry and education, and research associate in the University Center for International Rehabilitation, presented "Coping with Physical Disability" at the annual meeting of the National Rehabilitation Association in Anaheim, California, September 20. He also presented "Childhood Sexuality - the Handicapped Child," as the 10th Annual Arthur L. Tuuri Interdisciplinary Seminar at Mott Children's Health Center in Flint on October 13.

Philip E. Greenman, D.O., associate dean, will be the author of a monthly series entitled "Osteopathic Update" in the Michigan Osteopathic Journal. The column will provide an update of the "state of the art" of elements of structural diagnosis and OMT. Dr. Greenman also presented a paper on "Physiological and Aberrant Motions of the Vertebral Column" at the annual meeting of the American Academy of Osteopathy, held in Chicago October 3-7.

Felipe Kierszenbaum, Ph.D., professor of microbiology and public health, is the coauthor (with Asadour Zienian, research associate) of "Inhibition of Macrophage-Trypansoma cruzi interaction by Concanavalin A and Differential Binding of Bloodstream and Culture Forms to the Macrophage Surface." The article was published in the Journal of Parasitology 68:408-415, 1982.

William W. Wells, Ph.D., professor of biochemistry, presented a paper on "Isolation of a Low Molecular Weight Phosphorylated Component of Rat Liver Lysosomal Membranes" at the 12th International Congress of Biochemistry, held in Perth, Australia August 14-21. After presenting six lectures in Japan on the metabolic regulation of lysosomal function, he gave a paper entitled "A Model System for Studying the Effects of Hormones on Lysosomal Polyphosphoinositide Metabolism" at the International Foundation for Biochemical Endocrinology meeting, held September 19-23 in Gello, Norway.

ALUMNI


'80 Paul Ehrmann, D.O., will receive an award for his resident paper from the Osteopathic General Practitioners of Michigan at their midyear convention in Battle Creek October 30. Title of his paper is "Intoeing in Children — Analysis of Treatment." Ehrmann also will be completing his residency in family practice at Detroit Osteopathic and Bi-County Community Hospitals in December. He will enter private practice with J.H. Quarles, D.O., 2033 Crooks Road, Royal Oak.

'81 Lynne Pirie, D.O., medical chairperson of the American Federation of Women Bodybuilders, was featured on the cover of the July 1982 issue of Body and Power, which, in turn, was reprinted in the September 1 issue of Medical World News. Dr. Pirie, who began weight training while a student at MSU-COM, competes in many iron-pumping contests.