

# The NIH Record

U.S. Department  
of Health  
and  
Human Services

July 21  
1981  
Vol. XXXIII  
No. 15

National  
Institutes  
of  
Health

## Implanted Abdominal Pump Significantly Prolongs Lives Of Liver Cancer Patients

A totally implantable drug delivery system for localized cancer chemotherapy is successfully extending the lives of liver cancer patients. Victims are now surviving for years instead of months.

An infusion pump, originally developed to impart blood-thinning agents, has been adapted for use in liver tumor therapy research by Dr. William D. Ensminger, associate professor of internal medicine and Burroughs Wellcome Scholar in clinical pharmacology, University of Michigan.

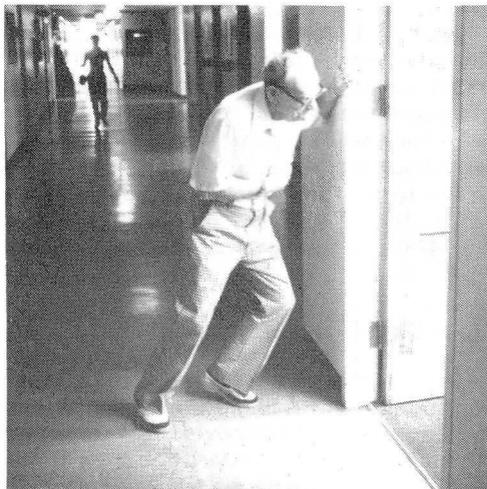
Tested in 50 patients, the system delivers high concentrations of cancer-fighting drugs to tumor sites without causing the toxicity and side effects typical of conventional chemotherapy techniques. Of the first 13 patients treated for hepatic tumors, 11 responded favorably.

The small infusion pump, filled with an anticancer drug, is surgically implanted in a pouch just under the skin of the abdomen. A narrow tube is inserted that leads from the pump into the hepatic artery, which supplies blood directly to the liver.

"The pump steadily releases anticancer drugs directly into the hepatic artery, which continuously exposes the tumor in the liver to very high—and hence more effective—concentrations of the drug," Dr. Ensminger said.

A high concentration of anticancer drug is therefore maintained continuously in the

(See PUMP, Page 9)



A heart attack or other life-threatening conditions can occur at any time at NIH. Information on how to prepare for assisting in such emergencies is on page 3.

## Nobel Laureate C. Anfinsen Retires After 30 Years, Plans to Work in Israel

By Linda Cross

Nobel laureate Dr. Christian B. Anfinsen recently retired from Federal service after a highly productive research career at NIH of more than 30 years.

He left NIH to go to Rehovot, Israel, where he has taken the position of chief scientist of Taglit, a new company formed by Yeda, the corporate arm of the Weizmann Institute of Science, and E.F. Hutton Co.



Dr. Anfinsen (l) and his colleague Dr. Daniel Steinberg worked together in the Heart Institute's Laboratory of Biological Chemistry in 1951. Photo courtesy of National Library of Medicine.

Internationally respected as a leader in chemical biology, Dr. Anfinsen was honored in March by present and former colleagues at the NIH International Symposium on the Contributions of Chemical Biology to the Biomedical Sciences.

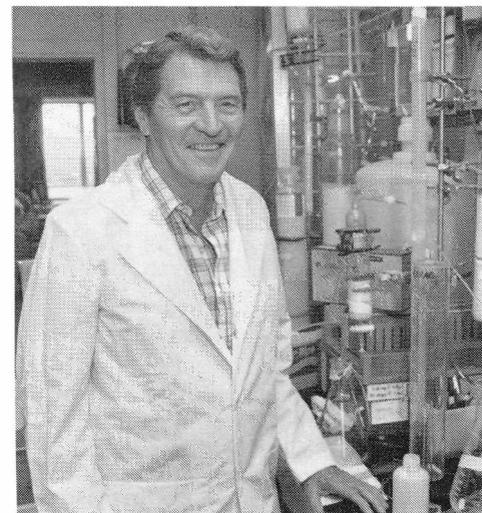
More than 30 experts in protein chemistry, genetics, endocrinology, and metabolism presented research advances and told how he influenced the successful course of their careers.

Former NIH Director Dr. Donald S. Fredrickson, who first worked at NIH in Dr. Anfinsen's National Heart Institute lab, called him a "high gauss" individual—one who attracts bright young individuals and inspires them to develop into well-rounded scientists.

Dr. Anfinsen was awarded the Nobel Prize in Chemistry in 1972 for demonstrat-

ing one of the most important simplifying concepts of molecular biology, that the three-dimensional conformation of a native protein is determined by the chemistry of its amino acid sequence.

He and his wife, Libby Ely Anfinsen, both worked for the National Institute of Arthritis, Diabetes, and Digestive and Kidney Diseases. He had been chief of the Laboratory Chemical Biology since 1963. Mrs. Anfinsen was employed as a clinical social worker



Dr. Anfinsen in his laboratory this year.

and worked in the Clinical Center over the past 15 years.

Dr. Anfinsen was awarded the Nobel prize for his work on the enzyme ribonuclease, which catalyzes the breakdown of ribonucleic acid, an essential component of the machinery by which the living cell utilizes genetic information.

He demonstrated that the enzyme was comprised of a single polypeptide chain and showed that the information required to fold the polypeptide chain into the specific three-dimensional form of the active enzyme resides in its amino acid sequence.

Later, it was demonstrated that this protein could be synthesized by joining the proper amino acids in the correct order and allowing the chain of amino acids to fold spontaneously.

The Laboratory of Chemical Biology is now a leader in the characterization of interferon, an agent potentially valuable

(See ANFINSEN, Page 5)

# The NIH Record

Published biweekly at Bethesda, Md., by the Editorial Operations Branch, Division of Public Information, for the information of employees of the National Institutes of Health, Department of Health and Human Services, and circulated by request to writers and to researchers in biomedical and related fields. The content is reprintable without permission. Pictures may be available on request.

The NIH Record reserves the right to make corrections, changes, or deletions in submitted copy in conformity with the policies of the paper and HHS.

## NIH Record Office

Bldg. 31, Room 2B-03, Phone 496-2125

## Editor

Jerry Gordon

## Staff Writers

William B. Reinckens

Joyce F. McCarthy

## Staff Correspondents

CC, Barbara Smakula; DCRT, Mary Hodges; DPM, Judy Fouche; DRG, Sue Meadows; DRR, Barbara Menick; DRS, Arthur F. Moore; FIC, Susan P. Stark; NCI, Patricia A. Newman; NEI, Marsha Corbett; NHLBI, Bill Sanders; NIA, Ann Dieffenbach; NIAID, Jeanne Winnick; NIAMDD, Linda Cross; NICHD, Pamela Driscoll; NIDR, Sally Wilberding; NIEHS, Hugh J. Lee; NIGMS, Wanda Wardell; NIMH, Paul Sirovatka; NINCDS, Diane Striar; NLM, Roger L. Gilkeson.

## FAES Classes to Begin Sept. 21

The Foundation for Advanced Education in the Sciences Graduate School at NIH has announced the schedule of courses for the fall semester. The evening classes begin Sept. 21 and will be given on the NIH campus.

Tuition is \$32 per credit hour. Courses that qualify for Institute support as training should be cleared with supervisors and administrative officers as soon as possible.

Courses are offered in biochemistry, biology, genetics, chemistry, physics, mathematics, medicine, pharmacology, toxicology, physiology, immunology, microbiology, nursing, psychology, psychiatry, statistics, languages, administration and areas of general interest.

They may be taken for credit or audit, and it is often possible to transfer credits earned to other institutions. Many courses are approved for AMA Category I credit.

Register by mail now through Aug. 21, or in person, from Sept. 10-16. A registration form must accompany the check or training form. Catalogs are available in the graduate School office (bookstore) in the Clinical Center, Rm. B1-L-101, or call 496-5272. □

## Dr. Palay To Edit Proceedings On FIC Neuroanatomy Conference

Dr. Sanford Palay, professor of anatomy at Harvard Medical School, has returned for the third and final term of his Fogarty International Center scholarship. His principal activity will be editing the proceedings of the FIC scholars conference, *Cytochemical Methods of Neuroanatomy*, which took place June 10-12, 1981.

During his first term in 1980, Dr. Palay and his wife, Dr. Victoria Chan-Palay, organized a conference on the cerebellum. The proceedings of that conference will be published in 1981.

While Dr. Palay is in residence this summer, he will continue to gather material for his study on the evolution of ideas about neurons and their function. □

## If English Is Your Second Language . . .

Any HHS employee or other Federal employee for whom English is a second language can now apply for fall semester workshops to improve their English skills.

The classes, restricted to 15 students, are designed for those who are now getting along well with English, but would like to improve their proficiency. The instructors will stress refining and expanding a person's English vocabulary, grammar skills, fluency, and writing techniques.

## No Charge for Course

The registration deadline is Aug. 21—classes will begin the week of Aug. 31 and end the week of Dec. 14. The class time is 5:30 to 7 p.m. once a week. There is no charge for the course.

To register or get further information, contact Kay Bouchard, Bldg. 31, Rm. 4B-03; telephone 496-5025. □



**Helen E. Foster, 17, holds the second place trophy that she won at the regional finals of the Miss National Teenager Pageant, held in Hunt Valley, Md., over the Fourth of July weekend. Ms. Foster, a stay-in-school employee, has worked in NIAID's review unit at the Westwood Bldg. for the last 2 years. She was one of seven finalists competing for the Miss D.C. representation in the nationally televised pageant taking place in August in Atlanta, Ga.**

## Nervous System Aging Study Needs Normal Volunteers

Normal, healthy volunteers are needed for study of changes in the nervous system due to aging. The Clinical Section of the Experimental Therapeutics Branch, NINCDS, would like volunteers of all ages, including NIH employees, to participate in the study.

Certain nervous system chemicals with functions similar to those of vitamins declining in concentration over a time will be examined. This decline appears to be increased in Parkinson's disease, a condition affecting coordination and speed of movement.

Study participants will be paid as normal volunteers under the fee schedule established by NIH. Individuals will be required to spend 2 to 5 days in the hospital on an inpatient basis. During that time, they will receive complete physical and neurological examinations and evaluations, and appropriate laboratory tests.

Study subjects include: the measurement of movement and reaction times in hand movements, and measurements of certain chemical features of the cerebrospinal fluid, which will be taken from the lower back area by lumbar puncture.

For further information about the study, contact the Normal Volunteer Office, 496-4763, or Dr. Peter Le Witt, 496-4605. □

## See 'Skins' Scrimmage

The R&W is planning a trip to the Washington Redskins training camp, Carlisle, Pa., on Aug. 1. A \$10 fee covers bus transportation, refreshments aboard the bus, and admission to a passing scrimmage between the Redskins and the Baltimore Colts. The trip to see this year's rookies and regulars leaves at 10:30 a.m. from Bldg. 31C. □



**On June 25, HHS Secretary Richard S. Schweiker (l) was accompanied by NIH Director Dr. Donald S. Fredrickson on his first visit to NIH since his confirmation to the post.**

## NIH Day Care Center Receives \$1,000 Donation

Sherry Rudick, director of the NIH Day Care Center, was recently presented with a \$1,000 check to help replenish the center's scholarship fund. The check was a gift from Time-Life Books, Inc., for the NIH Office of Communication's assistance over the years in providing information for Time-Life's medical publications. Mary Donovan, assistant chief of the News Branch, presented the check to the Day Care Center.

In addition to 57 preschoolers, the center, begun in 1974, also cares for 36 kindergartners and 75 school-age children before and after school. It is located in Bldg. 35 and is equipped with a playroom, sleeping area, and a garden.

Tuition is based on a sliding scale. The \$1,000 donation will help subsidize children from low-income families who can't normally afford to make contributions to the center. □

# CPR Training Draws Large Following Here

"Help me! Help me!" are the panicky last words that some NIH employees may have uttered during life-threatening situations resulting from a heart attack, chemical exposure, choking, stroke or some other disorder, eventually causing them to stop breathing and lapse into unconsciousness.

Many of us witnessing such an episode, whether it be a coworker, long-time friend, or even a stranger, would want to assist the person.

Unfortunately, however, some NIH employees are not trained to deal with such emergencies because they have not had the practical experience of attending a seminar on CPR—cardiopulmonary resuscitation.

During the last 1½ years, over 1,500 NIH employees have taken CPR training through the Occupational Medical Service. Included in this number are recently assigned physicians and nurses.

Besides the basic heartsaver course, there are courses for personnel who deal directly with patient care, and for those who wish CPR recertification. In addition, a cadre of CPR volunteer instructors has been established at NIH. These are employees from all types of careers who are certified in basic instruction.

"The purpose of CPR training is to prevent biological death," observed Susan Henderson Stewart, NIH's principal CPR in-

structor, who when not working here is a volunteer paramedic with the Wheaton Rescue Squad.

structor, who when not working here is a volunteer paramedic with the Wheaton Rescue Squad. "What do you do? This person may be having a heart attack," Ms. Stewart asks her classes. Using "Resuscie Annies"—specially designed life-size mannequins—two students can practice CPR on a "victim" at one time. Leaning over the mannequins, the students practice the first essential steps of determining what kind of situation they are confronted with. Not every situation requires prolonged CPR.

Amazingly, one of the teaching aids used in the training is a tennis ball. Students learn that it takes approximately 80 pounds of pressure to depress a ball. This is the same amount of pressure that is required by a person performing CPR on a person's chest.

## Proper Techniques Taught

Participants learn how to properly fold their hands over the center of a victim's chest, near where the rib cage joins, to do chest compressions. They also learn how to develop the proper pulsating rhythm that must be maintained when creating an artificial "heart beat."

Carefully, prospective rescuers are shown the proper way to open an unconscious person's mouth to determine if there is any blockage of the airway, or to perform mouth-to-mouth resuscitation.

"There are societal prohibitions that students have to overcome," said Ms. Stewart, adding that they must learn to deal with their own emotions during a crisis situation in order to effectively help someone.

Among societal taboos CPR-trained individuals may deal with is the prohibition of touching members of the opposite sex who are strangers.

Other situations might call for a student to deal with a victim who is of a different race or religion, and may even test the rescuer's ability to deal with a sick person or someone who is drunk. "You never know how former students will react in a crisis," observed Ms. Stewart.

CPR training itself is a physically demanding activity requiring a good set of lungs and the ability to maneuver in uncomfortable positions. It requires a person to doggedly continue the procedure until properly relieved.

"My boss let me come to this class because he thinks he might need me some day," said a new student on the first day of training. "He's over 50, overweight, and smokes."

Besides learning how to deal with injured adults, part of the CPR training is involved with how to handle small children and infants who are not breathing, or are choking.

In August, the following schedule for CPR training will be held in Bldg. 13, Rm. 2W-56:

Mondays	August 3,10	1-4 p.m.
Monday	August 10	8:30 a.m.-12:30 p.m.
Tuesday	August 11	8:30 a.m.-12:30 p.m.
Wednesdays	August 12,19,26	1-4 p.m.
Thursdays	August 13,20	9 a.m.-12 p.m.
Fridays	August 14,21	9 a.m.-12 p.m.
Mondays	August 17,24,31	1-4 p.m.
Tuesday	August 18	8:30 a.m.-12:30 p.m.



Stride program nursing students Pamela A. Barnicoat (l) and Lori M. Swain take turns taking a pulse from a "Resuscie Annie's" carotid artery.

Wednesday August 19 9 a.m.-12 p.m.  
Tuesday August 25 8:30 a.m.-12:30 p.m.

"Everyone should get on the mannequin at least once a year to stay proficient," says Ms. Stewart. For further information about CPR training call 496-4111. □



Ms. Stewart uses a variety of educational materials to teach CPR.

structor, who when not working here is a volunteer paramedic with the Wheaton Rescue Squad.

Even if a victim does not die they can experience irreversible brain damage from the lack of oxygen getting to the brain; usually this occurs after 5 minutes.

Statistically, if an unconscious person, who is not breathing and does not have any pulse, receives CPR within the first minute they have a 90 percent chance of survival. After 5 minutes, the chances diminish to 15 percent.

Currently, the average emergency response time for the NIH Fire Department's ambulance to reach a location here is 5 minutes.

As part of the CPR training, real life situations are presented to the students. Examples, such as the coworker who complains of shortness of breath, has a feeling of weakness, and insists that he or she has a

## Search Committee Appointed To Find New NIH Director

A three-member search committee was established early this month by HHS Secretary Richard S. Schweiker to find a new Director for the National Institutes of Health.

The members include: Dr. Edward N. Brandt, Jr., Assistant Secretary for Health, as chairman; Dr. Robert J. Rubin, Assistant Secretary for Planning and Evaluation; and Dr. Arthur Hull Hayes, Jr., Food and Drug Commissioner.

All nominations for the position should have been received by July 17 by the committee. Candidates for the position, Secretary Schweiker said, should have a record of excellence in research; leadership in the biomedical community; proven ability to administer a complex organization; and talent for choosing and inspiring capable colleagues. □

## Use Care in Taking Drugs

Today's greater use of drugs—both legal and illegal—is one of our most serious health risks. Even some drugs prescribed by your doctor can be dangerous if taken when drinking alcohol or before driving. Excessive or continued use of tranquilizers (or "pep pills") can cause physical and mental problems. Using or experimenting with illicit drugs such as marijuana, heroin, cocaine, and PCP may lead to a number of damaging effects or even death.—*Health Style*—PHS 81-50155 □

## Extramural Associates Program Plans Diverse Assignments

There are now six associates participating in the NIH Extramural Associates Program. During their first 2 weeks at NIH, the extramural associates met every day with high-level science administrators to discuss topics of great impact on the biomedical research community.

The current group here since February, will soon be leaving to return to their respective academic institutions. During their stay, they attended in-depth internal NIH seminars, visited other Federal agencies to become familiar with their staff and programs, and concentrated the rest of their time on individual assignments.

For 1 week, the associates attended sessions of the Congressional Operations Institute on Capitol Hill to learn about the relationship between the legislative process and the executive branch. In this way, when they return to their different schools, the associates will have a better idea of the total picture of government funding process.

The Extramural Associates Program promotes the entry and participation of ethnic minorities and women in NIH-supported research.

Under the program, NIH invites key administrators involved with science, from schools which contribute significantly to the pool of minorities and women in science, to increase their knowledge of research concerns and policies and procedures governing the awarding process.

After completion of the 5-month program, the associates return to their schools to incorporate the knowledge gained at NIH into their university programs to help their students and faculty partake in available Federal programs in a more informed way.

## Dr. Diane Fink To Join American Cancer Society

Dr. Diane J. Fink, associate director for medical applications of cancer research, National Cancer Institute, is joining the American Cancer Society as vice president for service and rehabilitation in August.



**Dr. Fink**

As associate director of that NCI program, Dr. Fink has coordinated cancer-associated consensus development activities and programs on smoking and health, diet and nutrition, in addition to chairing several other committees.

She had previously directed the NCI Division of Cancer Control and Rehabilitation for 5 years. As DCCR director, she developed control programs on cancer prevention, screening, treatment, professional education, and consensus development.

As a pilot project among their many other functions, DCCR set up seven experimental Clinical Oncology Programs in hospitals lacking a major cancer center or university association. COP's promote interdisciplinary cooperation, professional education, and the development of consistent approaches to staging and treatment.

The Breast Cancer Detection Demonstration Program was transferred to DCCR in 1976. Dr. Fink organized the first NIH consensus conference within the next year to evaluate the various methods of breast cancer screening.

"We looked hard at the results of 'breast cancer screening,'" she explained. "Our

evaluation: mammography picked up very small cancers as well as large ones. These very small cancers may require special pathologic interpretation. The main thing is that women should know about the possible difficulties of interpretation so that they can make informed treatment decisions."

Dr. Fink headed two interagency task forces, one on diethylstilbestrol used by pregnant women and asbestos exposure in the workplace. Based on the efforts of the asbestos task force, the Department, primarily through NCI, launched a campaign to inform doctors, workers, and others about the risks of airborne asbestos exposure.

She studied at Stanford University and the University of Wisconsin, earning both her B.S. and medical degrees at Stanford. She continued her training in hematology and medical oncology at the Veterans Administration Hospital in San Francisco, where she became chief of the oncology section.

Dr. Fink served as chairman of the tumor board, principal investigator and executive secretary for the Pacific Veterans Administration cancer chemotherapy group, and as a member of the clinical faculty at the medical school of the University of California at San Francisco.

She joined NCI in 1971 as program director for chemotherapy in the Clinical Investigations Branch. In July 1973 she became chief of the Treatment Branch, Cancer Control Program. □

## Visiting Scientist Program Participants

*Sponsored by Fogarty Internat'l Center*

6/10—**Dr. Susumu Nishinarita**, Japan, Laboratory of Immunology. Sponsor: Dr. Rose M. Lieberman, NIAID, Bg. 10, Rm. 11N322.

6/15—**Dr. Christopher Taylor**, Sierra Leone, Laboratory of Microbial Immunity. Sponsor: Dr. Phillip Baker, NIAID, Bg. 5, Rm. 229.

6/19—**Dr. Beena Bhatia**, India, Laboratory of Experimental Pathology. Sponsor: Dr. Robert Friedman, NIADDK, Bg. 4, Rm. 310.

6/22—**Dr. Wen-Ho Chang**, China, Clinical Psychobiology Branch. Sponsor: Dr. Frederick Goodwin, NIMH, Bg. 10, Rm. 4S239.

6/28—**Dr. Wieslaw Antkowiak**, Poland, Laboratory of Chemistry. Sponsor: Dr. Louis Cohen, NIADDK, Bg. 4, Rm. 328.

6/28—**Dr. Reginald Hanson**, Australia, Liver Diseases Section. Sponsor: Dr. E. A. Jones, NIADDK, Bg. 10, Rm. 4D52.

6/28—**Dr. Stephen C. Pappas**, Canada, Liver Diseases Section. Sponsor: Dr. E. A. Jones, NIADDK, Bg. 10, Rm. 4D52.

6/29—**Dr. Jian-Kang Yu**, China, Laboratory of Molecular Hematology. Sponsor: Dr. W. French Anderson, NHLBI, Bg. 10, Rm. 7D20.

6/30—**Dr. Hector Allende**, Argentina, Digestive Diseases Branch. Sponsor: Dr. Jerry Gardner, NIADDK, Bg. 10, Rm. 9D15.

7/1—**Dr. Gerald Batist**, Canada, NCI-Navy Medical Oncology Branch. Sponsor: Dr. John D. Minna, NCI, VA Medical Center, Washington, D.C.

7/1—**Dr. Michele Beaulieu**, Canada, Experimental Therapeutics Branch. Sponsor: Dr. John W. Keabian, NINCDS, Bg. 10, Rm. 6D16.



The six current associates recently attended a Uniformed Services University of the Health Sciences seminar on its administrative policies, programs, and opportunities available to students. From l to r (top row) are: Jean Oliver, EAP director; Dr. Richard Trumbo, USAF colonel, USUHS; Gerda Crawford, public relations coordinator, USUHS; Dr. Leroy Davis, assistant professor of biology, South Carolina State College. Bottom row (l to r): Drs. Richie D. White, professor and head of mathematics and physics department, Fort Valley State College; Kinney H. Kim, professor and chairman, physics department, North Carolina Central University; and Annie L. Richardson, professor of biology, Norfolk State University. Associates not shown are Drs. Vivian G. Howard, professor of mathematics, Virginia State University, and Charles H. Trottman, professor of chemistry, Jackson State University.

# ANFINSEN

(Continued from Page 1)

against viral disease and possibly cancer.

Although interferon is produced naturally in human cells, it is extremely difficult to obtain in quantity. The laboratory is now involved in research on its characterization and large-scale production.

These current studies on cultivation and induction of human cells, here and elsewhere, together with the use of bacteria containing cloned genes for human interferon, may soon provide the amounts needed for significant clinical trials.

Dr. Alan Schechter, an LBC colleague since 1965, said, "Chris' genius has been, and continues to be, his interest and ability to move into new fields and always remain at the frontiers of science."

Dr. Anfinsen said he left his position as an assistant professor in biological chemistry at Harvard to join the National Heart Institute in 1950 because the position of chief of the Laboratory of Cellular Physiology afforded serious and rewarding research opportunities.

He said that his career as a government scientist spared him the obstacles inherent in the grants process and afforded a feeling of permanence and continuity to his research effort.

He praised NIH in particular as being "vigorous" and "exciting academically," factors he ascribed to the constantly changing pool of young researchers.

Dr. Gilbert Ashwell, colleague, long-time friend and sailing companion, said "Chris is unique because he thinks big. For example, when the rest of the scientific world was talking about how to conduct research with minute quantities of interferon, Chris said, 'I'll synthesize it.'"

Dr. Anfinsen said that from the age of 16, he knew science would be his vocation. "My pop wanted me to be an engineer, but science, which was second best, was as close as I could come."

He will be involved in the development of a number of projects at the Weizmann laboratories.

Taglit, which means "discovery" in Hebrew, will support investigations in the Weizmann laboratories in exchange for the opportunity to advance the commercial development of research. In turn, Weizmann scientists will receive royalties based on Taglit's profits.

Dr. Anfinsen received his B.A. degree from Swarthmore College in 1937 and the M.S. degree in organic chemistry in 1939 from the University of Pennsylvania. He spent the year 1939-40 as a visiting investigator at the Carlsberg Laboratory in Copenhagen. In 1943, he received a Ph.D. degree in biochemistry from Harvard Medical School, where he spent the next 7 years teaching.

During this time, he spent a year (1947-48) as senior fellow of the American Cancer Society working with Dr. Hugo Theorell, 1955 Nobel laureate in chemistry, at the Medical Nobel Institute in Sweden.

Dr. Anfinsen has participated in several international forums to promote human rights and has visited a number of countries to investigate reports of human rights viola-

## Dr. Byrne, Deputy Director Of NIAID, Dies Suddenly



Dr. Robert J. Byrne

Dr. Robert J. Byrne, 58, deputy director (and since September 1980, director/designate) of the Extramural Activities Program of the National Institute of Allergy and Infectious Diseases, died on July 8 at Suburban Hospital of a heart attack. He was a resident of Bethesda.

A veterinarian, Dr. Byrne had served in several administrative posts at the Institute since 1966. He played a key role in collaborative research efforts, particularly hepatitis studies.

Through his initiative, NIAID scientists worked closely with investigators at the Federal Molecular Anatomy Laboratory in Rockville on virus and antibody purification and concentration and on viral vaccines. This cooperative venture led to the development of a candidate vaccine for hepatitis type B.

tions. He is also a participant in a number of activities related to the rights of scientists, including those of the Sakharov Committee, the Committee for Concerned Scientists, and the Sakharov-Orloff-Scharansky (S.O.S) group.

The author of *The Molecular Basis of Evolution*, he is an honorary fellow and a member of the board of governors of the Weizmann Institute and was president of the American Society of Biological Chemists in 1972. Other honors include elections to the National Academy of Sciences, the Royal Danish Academy, and the American Philosophical Society.

Before leaving NIH, he was appointed to the Pontifical Academy of Sciences by Pope John Paul II. He will meet with the Pope in Rome in October. □

### R&W Elects New Board Members

The election results of the R&W Association Board members were announced on June 26. Those elected for the 1981-83 term are: Jerry Stillier, president; Leo Buscher, 2nd vice president; Mark Rotariu, assistant treasurer; and Rowena Ahern, corresponding secretary. □

Also under his leadership, the Institute completed production, testing and processing of standardized research reagents to most viruses and mycoplasmas important to human health research. These products are used by investigators throughout the world. For his efforts, Dr. Byrne received the DHEW Superior Service Award in 1975.

A native of Irvington, N.J., Dr. Byrne received the D.V.M. degree from Cornell University and the M.S. degree in microbiology from George Washington University.

He served in the veterinary corps of the U.S. Army during World War II, and then entered the field of veterinary public health in New York state and assisted in a private practice there.

Dr. Byrne spent a year with the Maryland Board of Agriculture, after which he returned to active military duty during the Korean conflict, engaging in infectious disease research at the Walter Reed Army Institute of Research and in Tokyo. He retired from the Army as a lieutenant colonel.

After an additional year at WRAIR as a civilian, Dr. Byrne spent 9 years as professor of veterinary science at the University of Maryland, moving to the National Institutes of Health in 1963. During his career, his research resulted in numerous publications on equine encephalitis, leptospirosis, and respiratory disease in cattle.

Dr. Byrne served as president of both the Maryland and D.C. Veterinary Medical Associations. He was a member of the American Veterinary Medical Association, representing the District of Columbia in its house of delegates for 5 years and its council on biological and therapeutic agents. He also was a member of the World Health Organization's Board for Comparative Virology.

Survivors include his wife Sara DeWitt Byrne of Bethesda, and three sons, Robert A., James R., and C. Thomas. □



Michaela Richardson was recently named information officer for the National Institute of Child Health and Human Development. With the Institute since August 1977, she was instrumental in creating and directing a Public Information Section in the Office of Research Reporting. Before NIH, Ms. Richardson worked in the information office of the National Institute of Mental Health where she organized and coordinated media relations for the National Center for the Prevention and Control of Rape.

## Ross Holliday, NIH's Engineer and Planner, Retires; Ending Busy 32-Year Career

Ross Holliday, director, Division of Engineering Services, who has been responsible for the master planning and engineering services at NIH and other associated facilities across the country, will end his 32-year NIH career this month.

Mr. Holliday came to NIH in 1949 after receiving his B.S. degree in mechanical engineering at George Washington University. At that time, he recalls, NIH had only just started excavation for the Clinical Center.

Over the years, he says that he has seen the work of the division triple. Engineers,



**Mr. Holliday has been cited many times for his organizational and administrative abilities in keeping NIH operating smoothly.**

architects, and staff have been involved in providing comprehensive engineering and planning for the 5 million square feet of medical research laboratories, hospital, office and administrative areas that are situated on the 306 acres that make up NIH.

Among some of Mr. Holliday's duties was his appearance before subcommittees of

the U.S. House of Representatives and the U.S. Senate where he gave expert testimony on appropriations for capital improvements at NIH and other associated locations.

In June 1979, he was presented with an NIH Director's Award "in recognition of many years of exceptional dedication and exemplary technical and managerial capabilities in administering the diverse activities of the Division of Engineering Services." Mr. Holliday is a registered professional engineer in the District of Columbia.

He has also represented NIH before other Federal, state, and local bodies on matters regarding NIH's master planning, environmental questions, and community concerns.

### Saved Government \$900,000

In 1965, the then NIH Director, Dr. James A. Shannon, praised Mr. Holliday in a letter citing a manpower utilization report that he developed had saved the government \$900,000. "This is a significant achievement and reflects your continuing effort to keep operational costs to a minimum," Dr. Shannon said.

Over the years, he has been active and has served on the board of directors for the Bethesda/Chevy Chase YMCA. In 1976, he received its Service To Youth Award. He has also served on the board of directors for the Damascus chapter of the Izaak Walton League. His hobbies include automotive and boat repair, fishing, hunting, golf, and residential building improvements.

Mr. Holliday has accepted a position with Ellerbe Inc. Engineers, Architects, and Planners. He will be supervising construction on the multimillion dollar renovation project now under way at the National Naval Medical Center. □

## Parasitologist Retires After Long NIH Service

Dr. Kenneth O. Phifer, parasitologist with the National Institute of Allergy and Infectious Diseases, has retired after 22 years of Federal service.



**Eventually, Dr. Phifer plans to work part-time as a librarian and spend some time as an adult basic education volunteer tutor in the local school system.**

Born in Woodbury, N.J., Dr. Phifer obtained his B.A. degree from Rutgers University and Sc.D. degree from Johns Hopkins University in 1959. He entered active duty with the PHS later that year and was assigned to the Epidemiology Section of NIAID's Laboratory of Parasitic Chemotherapy in Columbia, S.C.

When the laboratory closed in 1963, he returned to the Institute's Laboratory of Parasitic Chemotherapy in Bethesda. He joined the Geographic Medicine Branch in 1968 and was named parasitology program officer of the Extramural Programs Branch in 1977. He was also manager of the U.S.-Japan Parasitic Diseases Panel.

An avid cyclist, Dr. Phifer has, over the past 8 years, logged roughly 25,000 miles riding back and forth to work in all kinds of weather. On a recent vacation trip, he and his son pedaled the entire length of the C&O Canal—a 185-mile journey.

Rather than retire to the quiet life, he has returned to college this summer, on a part-time basis, working toward a degree in library science. □



**Seven merit awards—more than any other Federal agency—were awarded to the Medical Arts and Photography Branch, Division of Research Services, at the 32nd Annual Washington Art Directors Show in June. These prestigious awards were presented for illustration, design and art direction to (l to r): Betty Hebb, Sara Danis, Linda Brown, Ron Winterrowd, and Al Laoang.**

## Discount Movie Tickets Offered

The R&W Association has now available two discount movie ticket plans. The Roth Theaters are offering a Celebrity discount plan that has no restrictions as to when participants can use tickets. They are good for each performance and every film, and are valid for 1 year. Each ticket costs \$2.75 and includes a service charge.

General Cinema is offering its VIP plan. These \$2.75 tickets are good for every day of the week, including holidays at: Columbia City Cinema I and II, Columbia, Md.; Springfield Cinema I, II, III, IV, V, and VI, Springfield, Va.; and Jenifer Cinema I and II, Washington, D.C.

Tickets for both theaters may be purchased at the R&W Desk in Bldg. 31, and the Westwood R&W Gift Shop. □

## FIC Scholar Dr. Bernardi To Plan DNA Symposium

Dr. Giorgio Bernardi, professor of molecular biology at the University of Paris, is beginning his first term as a Fogarty International Center scholar-in-residence. He is well recognized for his work on the purification of proteins and nucleic acids, and for his elegant studies on the organization and sequence of DNA in eukaryotes.

During his stay here, Dr. Bernardi will confer with scientists in several NIADDK and NCI laboratories. He and Dr. Maxine F. Singer, NCI, will plan a symposium on repetitive DNA for 1982, when he will come back to NIH for a second term. □

## Farmer's Market Reopens on Tuesdays

The Farmer's Market will resume its operation on Tuesdays from 4 to 6 p.m., in the area to the right of parking lot 41-A. Seasonal fruits and vegetables such as: apples, peaches, squash, tomatoes, and other items including jams, jellies, honey, breads and cakes will be on sale. □

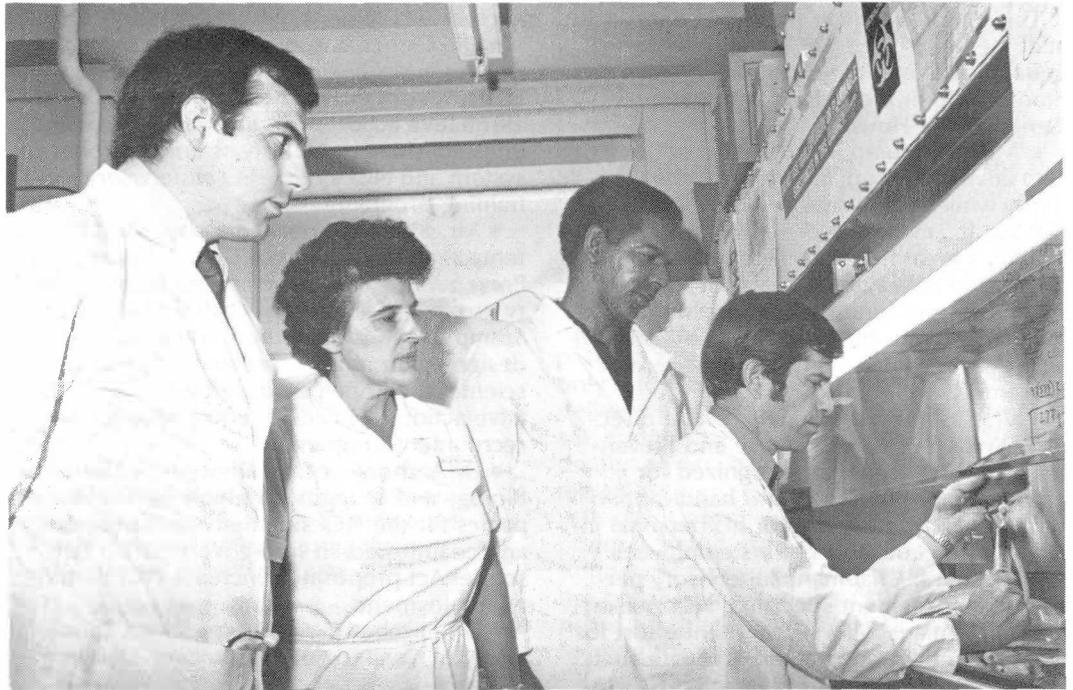
# Bone Marrow Infusion Aids Cancer Research

Autologous bone marrow infusion is a procedure where a cancer patient's healthy bone marrow stem cells are harvested and frozen before the patient receives high doses of chemotherapy and/or radiation therapy that ordinarily would destroy the stem cells in the marrow.

After intensive treatment, the frozen marrow is thawed and reintroduced into the patient's body so that regeneration of the marrow will take place. The procedure was first performed at the National Cancer Institute in 1974 in conjunction with high-dose chemotherapy to treat young lymphoma patients by NCI Pediatric Oncology Branch physicians.

Recently, Dr. Gerald Messerschmidt discussed the branch's experience with the marrow infusion procedure. Although bone marrow transfusions from HLA-matched donors (called allogeneic bone marrow transplantations) have been performed for many years, it was not until the last 7, with the advent of modern cryopreservation techniques, that autologous bone marrow infusion has been studied systematically.

"Our data are still preliminary," said Dr. Messerschmidt, adding that "a higher rate



Dr. Messerschmidt (l) and Nurse Dowling observe the removal of a sample of bone marrow cells before freezing. Laboratory technicians Frank Schaff (seated) and Dan Dean are responsible for the freezing and storage.

therapy, often in combination with radiation therapy.

Such high doses are used in an attempt to kill a larger number of cancer cells. However, the high doses also severely damage bone marrow stem cells that are in the process of growing. As a result, bone marrow function declines and then the patient is prone to infections, bleeding and anemia.

## Healthy Cells Migrate and Grow

At the time of the intensive cancer therapy, the frozen marrow is thawed at the patient's bedside and given intravenously for 30 to 45 minutes. The stem cells migrate to the bone marrow and begin to grow and mature into red and white blood cells and platelets.

It usually takes 3 weeks for the patient's mature white cells to reach the bloodstream in adequate amounts. Normal platelet counts return within approximately one more week.

"Patients are often anxious about the details of what will happen," said Regina Dowling, R.N., a research nurse who works with CC patients and families.

"Preparing the patient mentally as well as physically for the storage, intensive therapy and marrow reinfusion, is the responsibility of myself, the primary nurse, the operating room staff, and the physicians involved."

Even after bone marrow has been reinfused, the patients continue to be very susceptible to bleeding and infection until the reseeded stem cells begin to function. This requires around-the-clock professional nursing care. The nurses of 2B and 2E are an integral part of the bone marrow transplant team.

During this aplastic phase, patients may require support with red and white blood cells and platelet transfusions. Antibiotics

often are given in addition to transfusions to fight infections should they arise.

Since beginning studies of the infusion procedure, Pediatric Oncology Branch physicians have stored the marrow of 150 patients and so far have given it back to 55. The bone marrow has successfully engrafted in the majority of cases.

"Recently, we observed that patients who had received high doses of pelvic irradiation before the marrow collection have more trouble with engraftment subsequently," said Dr. Messerschmidt. "Discovering this fact has helped us define new approaches to these patients."

Today, the autologous marrow regimen can be used only in patients with solid tumors whose marrow is not contaminated with cancer cells at the time of marrow collection.

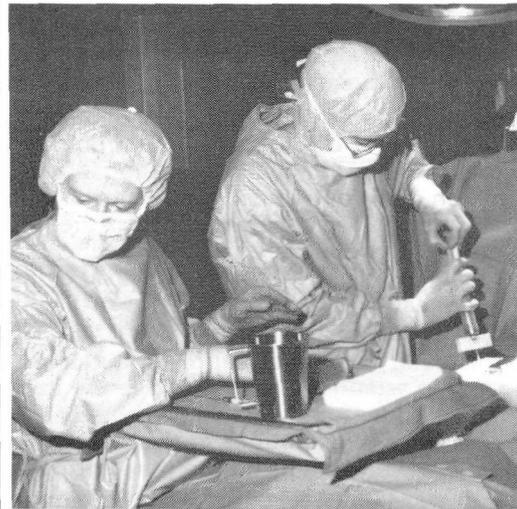
However, research physicians at NCI and other institutions are exploring new methods to bring this mode of support and therapy to leukemia patients.

## Update Now Available

The NCI Office of Cancer Communications recently prepared an "Update" on autologous bone marrow transplantation. For copies write the National Cancer Institute, Office of Cancer Communications, Bldg. 31, Rm. 10A-18, Bethesda, Md. 20205, or call (301) 496-5583. □

## NIH Absorbs PHS Personnel

In a report made to the B/I/D Directors on July 2nd, Calvin B. Baldwin, NIH Associate Director for Administration, pointed out that NIH has already made offers to over 300 employees at other PHS agencies where they face the threat of possible RIF. A total of 160 thus far has already been transferred filling existing vacancies at NIH. □



A large syringe is used during the surgical procedure that removes healthy bone marrow stem cells from a patient.

of complete remissions and a longer duration of remission in poor prognosis patients is the goal of this approach.

"However, it will take 2 to 5 years to test intensive chemoradiotherapy combined with autologous marrow infusion in a wide variety of cancers and to define its usefulness."

Among the cancers now being treated in this way at NCI and at other cancer centers in the U.S. are: soft tissue sarcoma, Ewing's sarcoma, Burkitt's lymphoma, testicular carcinoma, small cell lung cancer, melanoma and selected brain tumors.

Bone marrow cells are collected from the patient's pelvic bones with a needle and syringe. This procedure is performed in the operating room under general anesthesia and takes about 2 hours.

The stem cells are carefully frozen in liquid nitrogen to minus 248° F, and stored. Some time after the marrow collection the patient receives very high doses of chemo-

## EEO Awards Presented to NCI Staff Members

The National Cancer Institute honored 16 staff members June 5 at the second annual Equal Employment Opportunity awards ceremony held in the Fogarty International Center Stone House.

J. Michael Stump, chairperson of the NCI EEO advisory group, officiated at the ceremony while NCI Director, Dr. Vincent T. DeVita, Jr., made the presentations.

"It is a great honor to recognize my distinguished colleagues today, not for their scientific contributions, but for their humanitarian contributions," Dr. DeVita said. Six Special Achievements Awards were presented to:

- Dr. Richard H. Adamson, acting director, Division of Cancer Cause and Prevention. Dr. Adamson was recognized for hiring women, minority, and handicapped staff and associates, and for his personal interest in the education of his employees.

- Dreama J. Chapman, supervisory personnel management specialist, NCI personnel office, managed a recruitment effort for the 1980 undergraduate and graduate summer programs. Her efforts enabled NCI to

exceed NIH minority hiring goals.

- Dr. Clarice E. Gaylord, formerly the organizer and vice chairperson of the NCI EEO advisory group, helped write NCI's first affirmative action plan. Dr. Gaylord assisted in establishing a minority scientist referral system and NCI's new EEO supervisory training programs.

- Mr. Stump, supervisory computer systems analyst, Division of Cancer Cause and Prevention, is a member of the EEO advisory group and its current chairperson. Mr. Stump used his computer background to design an automated registry for minority scientists, and helped develop NCI's affirmative action and Federal equal opportunity recruitment programs.

- Dr. Anthony Torres, Division of Cancer Biology and Diagnosis, helped recruit Hispanics for the NCI summer intern program and coauthored an Intergovernmental Personnel Act proposal to increase NCI minority employment.

- Dr. Elizabeth Weisburger, chief, Laboratory of Carcinogen Metabolism, Division of Cancer Cause and Prevention, has at-

tracted visiting scientists from Asia and the Middle East, and encouraged stay-in-school and summer minority students to reach for careers in research and administration.

Each Special Achievement Award winner received a \$500 prize and plaque, except Dr. Weisburger, who is a member of the PHS commissioned corps and not eligible for civil service cash awards.

Nine NCI employees from the Division of Cancer Treatment were presented with Honorable Recognition certificates. Dr. Bruce A. Chabner, Michael T. Goldrich, Kim R. Horgan, Mark F. Kochevar, Dr. John S. Macdonald, William G. New, Dr. Vincent T. Oliverio, Hillel Soclof, and Dr. Peter H. Wiernik received awards. Dr. Alan S. Rabson, director, Division of Cancer Biology and Diagnosis, received an Honorable Recognition Award for his help with EEO programs.

The last award surprised its recipient, Dr. DeVita, who received a 3-minute standing ovation. "Dr. DeVita is highly respected in the NCI EEO community for his continuing support of the entire EEO program," said Maxine Richardson, NCI EEO coordinator. "We feel he has done a fine job." □

## Rev. Brown Retires to Preach Full Time



Over the years, Rev. Brown spread his own particular kind of congeniality in Bldg. 1. Upon retirement, he plans to spend more time visiting people in hospitals and prisons as part of his ministry.

Rev. Paul W. Brown, "the most well-loved man" in Bldg. 1, recently retired after 17½ years in the Administrative Services Section of the Office Services Branch, OD. Although his days as an office machine operator are over, this energetic, personable man hasn't quit working. He plans to devote himself full time to his ministry at Thomas Memorial Baptist Church in Washington, D.C.

While at NIH, his theology and peaceful attitude were evident, from the well-used Bible on his desk and his expressions of concern and helpfulness toward others. His fellow employees praised him highly, saying he always went out of his way to get the job done and never complained about rush jobs.

For Rev. Brown, the ministry had appealed to him from childhood. However, it was after serving as a technician corporal in the U.S. Army from 1942-46 that his religious inclination became evident. He says he saw so much suffering that he felt it was his mission to "help people become more friendly toward each other."

Since then, he has been pastor at Rehobeth Baptist Church, Washington, D.C.; Zion Baptist Church, Berryville, Va.; Laurel Grove Baptist Church, Alexandria, Va.; and Thomas Memorial Baptist Church.

Rev. Brown received his training at Washington Baptist Seminary, 1957-60, and attended additional religious classes at Catholic University and Howard University School of Religion.

He succeeded in his goal of spreading friendliness while at NIH. At his retirement party, June 30, his many friends expressed appreciation with gifts of a book and \$250 they had collected among themselves. He was also presented with a \$300 cash award for superior service by NIH Director Dr. Donald S. Fredrickson who said, "Rev. Brown is the kind of employee that has made NIH the quality institution it is."

Previous awards given to Rev. Brown include recognition in 1974 for outstanding performance, and two special achievement cash awards in 1978 and 1980. □

## R&W Sponsors Financial Seminar

A free seminar on the Merrill Lynch Cash Management Account will be held Wednesday, July 22, at 7:30 p.m. in the Bethesda Marriott. Explanation on how to increase your investments and privileges of the account will be provided. The CMA is open to anyone with securities and/or cash of \$20,000 or more. For more information, call 986-4954. □

## Dr. S. E. Mergenhagen Receives Dental Award

Dr. Stephen E. Mergenhagen, National Institute of Dental Research, was honored with the Senior U.S. Scientist Award of the Alexander von Humboldt Foundation in recognition of his outstanding achievements in oral biology research. The award was presented in Bonn by the Chancellor of the Federal Republic of Germany on behalf of the foundation on July 6.

This award was established in 1972 by Germany to honor internationally acclaimed American scientists and encourage the exchange of ideas between researchers and their affiliated institutions in the two countries. Program administration was entrusted to the Alexander von Humboldt Foundation.

### Received Award for Study

Dr. Mergenhagen received a medal and cash award to be used for an extended period of study on research of his choice at the University of Heidelberg.

While at the university, he plans to collaborate with German scientists on studying the impact of soluble mediators of immunity on the enhancement of host resistance to infectious diseases.

Dr. Mergenhagen, chief, Laboratory of Microbiology and Immunology, joined NIDR in 1958 as a research microbiologist. His research interests include the pathogenesis of experimental infections, particularly the relationship of the mechanism of bacterial action and their products on host tissue to systemic and oral diseases; antibody and nonantibody mechanisms of host resistance; and immunochemistry of bacterial antigens. □

The brain is a wonderful organ; it starts working the moment you get up in the morning, and does not stop until you get into the office.—Robert Frost □

# PUMP

(Continued from Page 1)

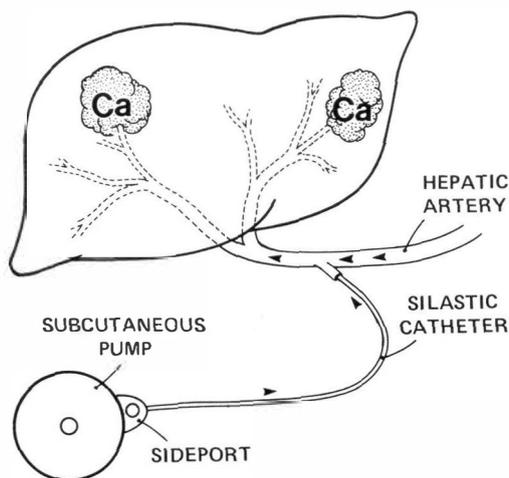
tumor tissue, so that the level of fluorodeoxyuridine in the liver is 100 to 400 times greater than levels obtainable through conventional chemotherapy, such as intravenous infusion, or in the levels of the drug found in other tissues.

More of the pumps have been implanted at the University of Michigan than anywhere else in the world. Treatment is administered in the Clinical Research Center of the university hospital, which is funded by the Division of Research Resources. Dr. Ensminger is associate director of the center. The U-M research efforts were funded by the National Cancer Institute and the Burroughs Wellcome Foundation.

"The high response rate of 85 percent in the first study was gratifying," Dr. Ensminger said. Since then, he and Dr. John Niederhuber, an oncologic surgeon, have treated another 20 patients with a similar rate of success. The maximum response rate for conventional systemic chemotherapy is about 15 to 20 percent.

"In about 85 percent of the cases, tumors are significantly reduced. This method enables us to extend life expectancy from about 4 to 6 months to beyond 2 years," he said, noting that untreated cancer grows rapidly in the liver. "The pump has performed very reliably in the liver cancer treatment study, with only one malfunction in over 5,000 cumulative days of use," Dr. Ensminger added.

Liver cancer afflicts approximately 50,000 people each year. It either starts in the liver or spreads to it from the colon or rectum. In only about one-third to one-half of the cases does the cancer remain confined to the liver.



**The route of drug delivery in a liver cancer patient flows from the Infusaid pump through a catheter to the entire tumor-bearing organ. The life expectancy of patients using the pump has increased from months to years.**

The implantable device, known as the Infusaid pump, is shaped like a hockey puck. It is made of titanium, stainless steel, and silicone rubber. Titanium is used for the case because of the metal's low reactivity with body tissue and fluids. Dr. Ensminger predicted that in 5 years the pump technique, coupled with radiation and other therapies, may possibly represent a true "cure" for cancer confined to the liver.

## Easy To Refill

Unlike some chemotherapy techniques that require periodic hospitalization, the pump is easily refilled with drugs during brief, biweekly outpatient visits. Physicians inject the drug through the rubber septum of the pump, in position just below the skin over the liver.

The procedure is so simple that it can be

done by physicians who have never seen the device. The pump has a capacity of 50 ml and a set flow rate of 3 to 6 ml per day. Refills are usually necessary once every 2 weeks.

The greatest success with the infusion pump to date has been in the treatment of colorectal cancer that has spread to the liver. "The main reason," Dr. Ensminger said, "is correct placement of the catheter in the hepatic artery so that the entire liver and the tumor within the liver receive the drug infusion."

Since cancer grows rapidly in the liver—patients have an average life expectancy of only 4 to 6 months after diagnosis—drug delivery must be very efficient from the outset. Colorectal cancer causes about 50,000 deaths a year, half of which are due to liver metastases.

In other promising research, the Infusaid pump is being used for treatment of brain tumors. The device is implanted just below the collar bone, and the catheter is tunneled up the side of the neck to the artery feeding the tumor.

In another application, the catheter is placed behind the ear under the scalp and connected to another tube passing through the skull into the cerebrospinal fluid bathing the brain.

"Results with five patients receiving treatment into the cerebrospinal fluid showed the tumors steadily received drug concentrations 400 to 3,000 times greater than levels in the bloodstream, again affording better control of the cancer while simultaneously reducing negative side effects," Dr. Ensminger said.

Also investigating the application of the Infusaid pump to these forms of brain cancer were Drs. Harry Greenberg, Glenn Kindt, and William Chandler. □

## Biomarkers Could Be Clues for Intervening in Aging Process

As a first step toward assessing interventions—dietary, exercise and other manipulations—that might alter the rate of human aging, the National Institute on Aging held a conference June 19–20 to evaluate the biological markers of aging.

"Biomarkers" of aging are those physical and behavioral changes occurring at predictable times during the aging process. The biomarkers will be used to measure and evaluate the effectiveness of interventions which may extend the vigorous and productive years of life.

### Dietary Restrictions Intervene

During the past decade, an impressive surge in research has been directed at understanding the processes of aging. The knowledge gained offers hope that techniques may be developed to help people achieve a longer and healthier maturity.

Thus far, dietary restriction is the only intervention which repeatedly alters the rate of aging in mammals. Other methods of intervention have been tested, including exercise and manipulations of the immune system.

Biomarkers will be used first in animal, and then in human studies to determine

their effectiveness. If a specific manipulation proves to delay the onset or progression of a biomarker, that manipulation may be a potential tool for extending the healthy years of life.

Conferees discussed more than 20 possible biomarkers in animals and humans. To be useful, a biomarker must be reproducible, consistently present in several species, change significantly with age, be inexpensive, and the changes should take place within a short time frame.

In animals, one marker which meets these criteria is a change in the rat tail tendon. Collagen in the rat tail shows specific biological alterations that correlate with the animal's lifespan. Certain age-related changes in the cardiovascular system, such as left ventricular hypertrophy, an enlargement of the left side of the heart, is also seen with regularity in rats.

Other examples are a measurable decline in immune function correlating to the animal's age and a loss of memory function evidenced by passive shock avoidance trails.

In humans, some predictable aging markers include loss of specific hearing, vision, cardiovascular changes, bone loss, sleep

variations, and alterations in glucose tolerance and immune function.

A marker which could be especially useful in human studies is forced vital capacity, a measurement of lung capacity and chest wall musculature. This test is an exceptionally good indicator of general health and vigor. Investigations have shown that forced vital capacity values fall in men at a rate of 3.8 deciliters per decade, and 3.1 deciliters per decade in women.

### Pupil Size is Marker

Senile miosis, a reduction in pupil size with increasing age, is another marker in humans. The reduction means less light reaches the retina so that vision is adversely affected. In one study, pupil diameter was measured in 120 volunteers aged 21 through 81. Seventy percent of those 55 or older had 3 mm pupils, while all those under 55 had pupils of at least 4 mm in diameter.

These and other markers discussed at the conference were found to be good indicators of aging, as well as practical for use in intervention studies. Other markers must be eliminated for reasons such as unreliability, expense, and time factors. Conference proceedings will be published later this year. □

## PHS Association's Clinical Society Award Given to NICHD Researchers

Three NICHD scientists have won the 1981 Clinical Society Award of the U.S. Public Health Service Professional Association. Drs. Anil Mukherjee, Rodney Ulane, and Arun Agrawal received the award for their paper, Possible Role of Uteroglobulin, Transglutaminase, and Progesterone in the Success of a Natural Allograft: Mammalian Pregnancy.

In the paper, the scientists described a possible mechanism by which the embryo is protected against rejection by the mother's immune system during its first days in the uterus.

Transplants of tissue from one individual to an unrelated individual, or allografts, are invariably rejected, because the recipient's immune system recognizes the transplanted tissue as genetically foreign and mounts an attack against it.

The embryo is for all practical purposes an allograft. On its surface are proteins inherited from the father which are foreign to the mother. Theoretically, the mother's immune system should recognize the paternal proteins on the embryo and reject it. This does not normally happen, of course.

Many explanations for the success of this natural allograft have been proposed over the past 30 years, but none has been conclusively proven.

The NICHD investigators have discovered that two proteins produced by the mother may protect the mammalian embryo from immunological rejection before and during implantation in the womb.

Uteroglobulin, a protein synthesized by the uterus, cross-links with the proteins on the embryonic surface, thereby hiding them from the mother's immune system. The cross-linking is catalyzed by the enzyme transglutaminase, a blood clotting factor. In the absence of transglutaminase, uteroglobulin cannot attach to the embryo.

The levels of both uteroglobulin and transglutaminase in the uterus rise during early pregnancy. A deficiency of transglutaminase in the mother may result in spon-



**Drs. Agrawal, Mukherjee, and Ulane (l to r) have won an award for their research on how the embryo escapes rejection by the mother's immune system.**

taneous abortion, or rejection of the embryo, some experimental data suggest.

Using the rabbit as a model, the NICHD scientists incubated embryonic cells with maternal lymphocytes, the cells responsible for the immune response which leads to allograft rejection. As expected, the embryonic cells stimulated an immune response.

When the embryonic cells were pretreated with uteroglobulin and transglutaminase, however, the maternal immune response was suppressed.

Pretreatment with uteroglobulin alone partially inhibited the immune response, but the scientists believe that trace amounts of transglutaminase in the incubation medium catalyzed the reaction. Pretreatment with transglutaminase alone did not suppress the maternal immune response.

This mechanism appears to protect the rabbit embryo up to about 9 days after conception, when the embryo is implanted in the womb. Only trace amounts of uteroglobulin are detectable in the rabbit

uterus after 9 days.

It is possible that other proteins or increased hormone levels in the uterus protect the embryo after this point. Also, the embryo is by then developing anatomical barriers, such as the placenta, between itself and the mother.

Further studies are needed to determine if uteroglobulin plays an important part in establishing and maintaining human pregnancy, say the NICHD investigators. In addition, the experimental results obtained in their study must be reconciled with the fact that the embryo sometimes develops outside the uterus, as in the case of tubal or abdominal implantation.

Discovery of a mechanism by which the embryo is protected from immunological rejection by the mother may contribute to an understanding of allograft tolerance in general. More specifically, it may help researchers understand how cancerous cells escape rejection by the host's immune system. □



**Last month, a group award was presented to animal facility staffers of the Division of Cancer Biology and Diagnosis in the Clinical Center for their work in establishing a centralized animal facility in Bldg. 10 over the last 2 years. As animal caretakers and technicians, they were cited for their efforts in maintaining "a cleaner environment resulting in improved research experimentation and working conditions for investigators. Each individual contributed toward making this project a success and striving for excellence in laboratory animal care."**

### Harvard Hematologist Begins First Term as FIC Scholar

Dr. Franklin Bunn, professor of medicine at Harvard Medical School, is beginning his first term as a Fogarty International Center scholar. He is well-known for his research in hematology and in particular for his studies on hemoglobin.

His work on the glycosylation of hemoglobin has led to important improvements in the control of glucose levels in diabetes. Much of what scientists know about the biochemical behavior of hemoglobin mixtures derives from his work on subunit and heme exchange.

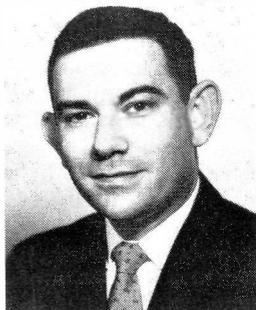
Dr. Bunn will collaborate principally with investigators in NIADDK, NHLBI, the Clinical Center, and NCI laboratories. □

It takes less time to do a thing right than to explain why you did it wrong.—Henry Wadsworth Longfellow □

## Cell Duplication, Aging Theory Discussed By Dr. L. Hayflick at Recent GRC Meeting

Within 10 years, we will probably know the location and identity of the mechanism which seems to control the amount of times human and animal cells duplicate in culture.

This finding could ultimately lead to a better understanding of human aging, according to cell biologist Dr. Leonard Hayflick, who presented his observations at a recent NIA Gerontology Research Center meeting in Baltimore.



Dr. Hayflick

Dr. Hayflick of the Children's Hospital Medical Center of Northern California, Oakland, is credited with demonstrating the now widely accepted fact that normal cells grown in tissue culture lose their ability to replicate after a specific number of doublings.

A general overview of cell subcultivation techniques opened the meeting, followed by his explanation of the differences observed between normal and abnormal cell replication. When normal cells divide in culture, he said, they do so within a few days, eventually covering the entire surface area of the culture vessel. "Then an important thing happens—they stop dividing."

When normal cells receive signals upon contact with their neighbors, the division ceases, he explained. "To oversimplify, when cancer cells touch their neighbors they simply avoid these cues and continue to replicate to some extent."

Dr. Hayflick discussed research on

human fibroblasts, which are cells scientists believe reproduce themselves for longer periods of time than any other normal cells *in vitro*. His experiments using normal human embryo fibroblasts have shown these cells have finite limits of 50 population doublings, even when subcultivation techniques are applied.

Initially, cell senescence was attributed to laboratory error. However, in the course of growing the human embryo cells, in repeated experiments done by the same technician with the same methodology, the dying cells were the ones that had been in culture the longest, he recalled.

Another experimental result contributing to his aging theory is the observation that when human embryonic fibroblasts are preserved at subzero temperatures in liquid nitrogen, they display extraordinary memory powers. These cells remember what doubling level they were at when frozen, and resume duplication at that point, finally dying out when they attain 50 doublings.

In an ongoing study, Dr. Hayflick has frozen WI-38 cells at the eighth population doubling for about 1,000 weeks, or for the last 19 years, representing the longest period of time human cells have been preserved in liquid nitrogen. Though the final results are not yet in, he expects these cells to complete 50 doublings.

Additional research in his lab centers on determining the existence, location, and characteristics of the "biological clock." Trying to locate such a clock is a difficult task, yet someone will probably do so within the next 5 to 10 years, he believes.

Presently, Dr. Hayflick is working on isolating the nucleus from the cell cytoplasm since it is believed that the biological clock—if it exists—is located somewhere in the nucleus. □

## Former Hodgkin's Disease Patients Can Bear Children

Young men and women treated for Hodgkin's disease have a good chance of having children, and their children will probably be normal in growth and development. These were the results of a study performed by National Cancer Institute researchers presented recently at the 17th annual meeting of the American Society of Clinical Oncology.

Dr. Philip H. Konits, oncologist, Division of Cancer Treatment, said 50 percent was the overall fertility rate among the 81 male and female patients tested who wanted children. "This is less than the 80 to 85 percent rate for the general population, but much higher than had been thought possible for these patients," he said. In addition, he said it is not known whether the lower than normal fertility rate among Hodgkin's disease patients is due to the disease or the therapy.

Dr. Konits and his associates identified the 81 Hodgkin's disease patients who

wanted children out of 209 such patients aged 18 through 45. Thirty-eight patients were women and 43 were men.

A total of 40 patients—23 of the 38 women and the wives of 17 of the 43 men—had 60 pregnancies—resulting in 42 full-term infants, 6 pregnancies at the time the report was written, 2 spontaneous abortions, 10 elective abortions, and 1 set of twins still-born at 6½ months gestation.

Birth weight, growth, and development were normal. There was one instance of congenital hip displacement, one of pes planus (a foot deformity), and one heart murmur.

However, there were no differences in the rate of either spontaneous abortions or congenital anomalies as compared with the normal population, Dr. Konits said.

More than half the patients—20 women, 22 men—received both chemotherapy and radiation therapy. Thirteen of these 20 women had pregnancies for a fertility rate

## 14 Stride Positions Available

Fourteen training positions for the 1981 Stride Program were announced in the July 20 NIH Merit Promotion Plan vacancy listing. Interested employees should consult the listing for information about specific positions, eligibility requirements and application procedures. Additional information concerning a particular position may also be obtained from the personnel representative named on the listing.

All nonprofessional employees, GS-4 through GS-9 and wage grade equivalents who have worked in a career or career-conditional position at NIH or NIMH-IRP for at least 1 year immediately prior to Aug. 10, 1981, are eligible to apply. They must have high school degrees, or GED certificates but have not secured bachelor's degrees. Additionally, applicants must be working full-time or willing to accept full-time positions if selected for the program.

Applications should include an SF 171 and either an unofficial transcript showing all college level work completed, a high school transcript or GED certificate, or an OPM Form 1170, List of College Courses and Certificate of Scholastic Achievement. These should be forwarded to the personnel office of the B/I/D offering the training opportunity.

Two information sessions will be given by the Career Development Branch, DPM, to answer individual questions on July 24, Bldg. 31, Conf. Rm. 6, 11:45 a.m.—1:15 p.m.; and July 30, Bldg. 31, Conf. Rm. 4A, 3:30–5 p.m. □



Dr. William G. Cooper (l) recently received the National Library of Medicine Director's Award from NLM Director Dr. Martin M. Cummings, for his outstanding service to the Library. Dr. Cooper, associate director for planning, was cited for his leadership as acting director of the National Medical Audiovisual Center last year during the time of the Center's move from Atlanta.

of 65 percent, while the spouses of only 5 of these 22 men became pregnant, for a rate of 19 percent. Thirty patients received only radiation therapy, and nine received only chemotherapy.

During laparotomy, an exploratory abdominal operation performed in Hodgkin's disease patients, all the women patients slated to receive radiation therapy had oophoropexy performed on them. In this procedure, the ovaries are lifted and tied to the abdominal wall to remove them from the radiation field. □

## Workshop Summary Issued on Relationship Between Low Blood Cholesterol and Cancer

A recently issued summary of the jointly sponsored Workshop on Cholesterol and Non-Cardiovascular Disease Mortality held May 11-12 by the National Heart, Lung, and Blood Institute and the National Cancer Institute indicated that "the data reviewed did not substantiate any direct cause and effect relationship between low blood cholesterol and cancer."

This workshop was a followup to an earlier one held at the NIH in February 1980 at which eight epidemiological studies were reviewed to examine the statistical relationship, if present, between low serum cholesterol and increased risk from cancer, particularly cancer of the colon.

From the 17 studies reviewed at the 1981 workshop, 8 found an inverse association of serum cholesterol and mortality from malignant neoplasms in men. None of the studies having data on women found a significant association between cholesterol and cancer incidence or mortality.

In four studies, a significant inverse association with colon cancer in men was found. No other specific sites of cancer showed a significant association in more than one study.

In those studies suggesting a relationship in men, excess cancer risk seemed to be most pronounced at the lowest end of the cholesterol range (usually at values below 190 mg/dl), the risk curve then falling rapidly and flattening out over the middle and higher levels.

In the studies reviewed, cholesterol levels of all subjects were "naturally occurring." None of the population groups considered was on any sort of cholesterol-lowering diet or medication.

Nine of the studies disclosed no significant increase in cancer risk whatever the subjects' cholesterol level.

In the studies that did find a relationship, however, the relative risk ranged to slightly higher than about fourfold, with the average risk about 1.7 times higher.

During the discussion the panelists ad-

ressed the question, "If the increase in risk is real (and this is as yet uncertain), what, if anything is responsible for the increase?"

The correlations observed may reflect features or traits, possibly genetic, and affecting only small members of individuals at either extreme of the cholesterol range.

Moreover, given the long latency period of many forms of cancer, changes in lipid metabolism that may be reflected in serum cholesterol levels might long antedate any clinically detectable symptoms of the disease.

Some of the research approaches suggested at the workshop as being potentially useful toward exploring any cause and effect relationship between serum cholesterol and cancer risk included:

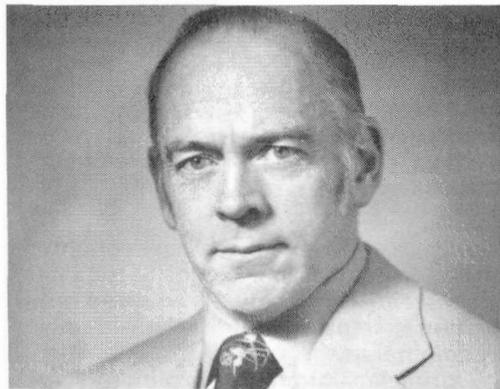
- Studies on bile acids and dietary lipids in relation to the absorption of dietary vitamin A.
- Studies on the effect of plasma cholesterol levels on the cholesterol of cell membranes.
- Continued research on genetic determinants of cholesterol metabolism, plasma cholesterol levels, and bile acid turnover, particularly in individuals with a natural very low cholesterol level.

The data reviewed did not substantiate any direct cause and effect relationship between low blood cholesterol and cancer, and provided no basis to modify the position that elevated blood cholesterol poses a definite risk from premature arteriosclerosis and its complications.

The panel concluded that the findings provide a scientific challenge to determine the possible etiological relationship between cholesterol and cancer. At present, it does not appear to pose a public health problem, nor should current recommendations be changed that persons with elevated levels of cholesterol seek to reduce their levels by hygienic means. □



**Dr. Norman A. Krasnegor, health scientist administrator, NICHD, was recently elected to the College of Distinguished Alumni of Boston University. He received this recognition for his outstanding contributions to the fields of physiological psychology, neurobiology, and behavioral pharmacology. Formerly an intramural scientist at the Walter Reed Army Institute of Research, he joined NIH in 1980 in the Human Learning and Behavior Branch of the Center for Research for Mothers and Children. He directs the extramural research program on developmental behavioral biology.**



**Dr. Roscoe O. Brady, chief, Developmental and Metabolic Neurology Branch, NINCDS, has received the Distinguished Alumni Award from the Pennsylvania State University. The award was presented to Dr. Brady for "revolutionizing medicine with the results of his scholarly research, for focusing his considerable knowledge and talent on eradicating disease, and for achieving worldwide recognition as a pioneer in biochemistry."**

## Dr. Sullivan's Speech Inspires Youth

"The 'new conservatism' sweeping across the Nation can and will be overcome," said Dr. Leon H. Sullivan, in explaining the action needed to continue to improve the lot of black America. He spoke at the June 25 NIH Black Cultural Committee's summer program, Save Our Children: Strategies for the '80's.

Speaking to a capacity audience in the Masur Auditorium, Dr. Sullivan discussed the ingredients for eliminating economic, political, spiritual, and social barriers.

Dr. Sullivan is founder and chairman of Opportunities Industrialization Centers, a self-help vocational training program with 150 centers in American cities and abroad.

He is also pastor of Philadelphia's Zion Baptist Church, and the first black to serve on the board of directors of General Motors.



**Dr. Sullivan's work has also taken him to Africa and South America.**

Dr. William F. Raub, NIH Associate Director for Extramural Research and Training, introduced Dr. Sullivan as "a great humanitarian and role model for today's youth."

Dr. Sullivan said there have been significant, positive changes in the U.S. over the past 25 years, and noted that the civil rights movement was a success. However, he warned, "we are not going back to the old days."

In a 25-minute speech, Dr. Sullivan urged the audience to "spread confidence across the length of this Nation, and touch the lives of every black and brown boy and girl. Who knows what is in store for them to create, for who knows that the ultimate solution to cancer may be found in a black youth's mind.

"We must teach our youth that they are somebody; somebody with a history of greatness and achievement and fame: somebody who has attained in this world: from Aesop, the black fable writer, to Hannibal the great black general, to Pushkin, the great black poet, to Dr. Drew, the great black medical scholar. We must teach our youth to have confidence and believe in themselves." □

☆U.S. GOVERNMENT PRINTING OFFICE: 1981-341-134/122