

The NIH Record

Making Science Real

High School Teachers, Sponsored by FAES, Join NIH Labs

By Kathy Kranzfelder

Carl Eugene Keels asked his class, "How many of you see a parent leave the house every morning in a business suit?" No one raised a hand.

"How many of you have a parent who goes to work every day?" Again, no hands.

"How many of you know someone who is dead because of drugs?" Every hand in the room went up.

This is the surreal environment in which Keels, biology teacher at Ballou Senior High School in the Anacostia area of Washington, D.C., tries to teach science. It's hard to make science real to these students, he says, and harder still to demonstrate the rewards of studying science.

It's hard, but not impossible.

Keels and 16 other science teachers from D.C. and its surrounding counties are devoting this summer to "making science real" to themselves and ultimately to their students. They are this year's recipients of fellowships from the Foundation for Advanced Education in the Sciences (FAES), NIDDK and NCI.

"FAES set aside funds to support 10 teachers this year," says Dr. Alan Schechter,



Charlotte Hutton, a biology teacher at Spingarn High School in Washington, is one of 17 area high school science teachers working at NIH this summer. FAES and several institutes sponsored their fellowships.

chief of NIDDK's Laboratory of Chemical Biology, who worked with Dr. Michael Gottesman, chief of NCI's molecular cell genetics section, in organizing the summer program for teachers. "But we had 17 worthy candidates." Rather than limit the program to 10, Schechter and Gottesman scrambled for additional funds and found them through their respective institutes.

The teachers are from Montgomery, Howard, Arlington and Fairfax counties, and the District. They are in labs at NIDDK, NCI, NIAID, NHLBI, NIMH and NIDR; one teacher is at FDA.

The first fellowship program sponsored by FAES brought students to NIH labs for the summer 4 years ago. Two years later, the FAES program organizers decided to establish a fellowship program for high school teachers as well. "Through the teachers, an even greater number of students can be influenced to pursue science careers," said Schechter.

"The more I learn, the more I can transmit," is how Keels explains it. Keels is

(See TEACHERS, Page 2)

Six Decades Later

CC Nurse Follows in Grandmother's Footsteps

By Anne Barber

What does nurse Jill Lietzau of the Clinical Center's 12 East patient care unit in 1989 have in common with public health nurse Doris Burchard from the 1920's?

First of all they are family — Burchard is Lietzau's grandmother.

Secondly, both have worked without qualm on disease epidemics sweeping the country; Burchard fought influenza six decades ago and Lietzau is fighting AIDS today.

It was only recently that Lietzau became aware that she and her grandmother shared a common vocation. It happened when a family in Easton, Md., was cleaning up the attic of a late relative and found letters written by Burchard and old papers describing her work as a public health nurse.

Burchard had served as superintendent of the infirmary for the "government hotels" that housed approximately 2,000 women working in Washington, D.C., during the influenza epidemic of 1919 and 1920. The hotels were actually dormitories established by the federal government in 1918 due to a housing shortage and later abolished in 1930.

The foremost question asked then by Burchard was: "How can we prevent an epidemic of astounding proportions in a community where the individuals come in such close contact and where their daily work necessitates constant exposure?" Her granddaughter asks similar questions today.

Burchard believed that a system of checking and quarantining a suspicious case (the most infectious stage of the disease) should be carried out. She also anticipated the problem of caring for the definite cases that would inevitably come.

Every precaution needed to be taken to prevent the spread of the disease throughout the government hotels because, in 1919, 4 million people had died of influenza. According to a diary Burchard kept, two facts were plain—local hospitals could not or would not take patients suffering from influenza and, due to health department rules, patients sick with the flu could not be confined to their rooms.

Burchard developed and put into action a plan for dealing with contagious patients,

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Before he left NIH on July 31, NIH director Dr. James Wyngaarden bade farewell to employees at a gathering July 25 in Masur Auditorium. A day earlier he received tributes on the floor of the House of Representatives from eight members of Congress, including Reps. Doug Walgren, Henry Waxman, Steny Hoyer, Silvio Conte, John Dingell, Louis Stokes and Connie Morella. Said Conte, "Tireless in his efforts, unwavering in his devotion to duty and forthright in his compassion for people in need, Dr. Wyngaarden has left his indelible mark as the finest Director of the National Institutes of Health." NIH deputy director Dr. William F. Raub is now acting director of NIH.

TEACHERS

(Continued from Page 1)

learning this summer from Dr. Robert Simpson in NIDDK's Laboratory of Cellular and Developmental Biology.

Trudi Remund, a biology teacher at Dunbar High School in D.C., says she's learning about all kinds of new equipment and techniques that she never even knew existed. She says that even if this equipment is far too sophisticated to be found in her classroom, she can at least tell her students about it. Remund is working with Dr. Peggy Hsieh in the Genetics and Biochemistry Branch, NIDDK.

In addition to taking a crash course in modern research techniques and equipment, most of the high school science teachers are taking this opportunity to establish NIH contacts to pass on to their students.

Remund wants to establish a partnership between Dunbar High and NIH, creating an internship program for a limited number of students and producing a videotape presenta-



Trudi Remund

Photos: Bill Branson

tion on employment opportunities here. She also plans to track the students she places and follow their progress.

Charlotte Hutton, a biology teacher from Spingarn High School in D.C., says that she, too, is discovering the opportunities here for her students. Hutton, who is working with Dr. April Robbins in NIDDK's Laboratory of Biochemistry and Metabolism, also says that she is enjoying the bench work she's been given. "Teachers don't get a chance to dabble and dabble much on their own," she says.

Though the teachers from the tougher areas of D.C. may have more distractions to steer their students clear of, the challenge of bringing students into close contact with the world



Carl Keels, a biology teacher at Ballou Senior High School in the District, works in the laboratory with Dr. Sharon Roth.

of working scientists is the same no matter where the teachers teach.

"NIH is not Mars, though that's the way it may seem to my students," says Carl Keels. "It's just a ride on Metro away." □

Managing Conflict in the Workplace

One of the most stressful experiences in the workplace is being in a constant or continuing state of conflict with someone with whom you work closely.

Positive work relationships play a significant role in how one feels about coming to work each day. Morale and work productivity suffer when members of the same team are in conflict. Time and energy spent in anger and frustration can be effectively re-channeled if people are willing to explore the conflict and attempt a resolution.

The NIH Employee Counseling Services offers conflict mediation to any employee or group of employees experiencing conflict in the workplace. The conflict mediation process is structured and relatively brief. It includes an assessment by the counselor of each party's position, expectations, needs and willingness to attempt new strategies for getting along. Conflict mediation can result in improved communication, appreciation of different work styles, and new understanding about how people can best work together.

If you or members of your group are experiencing conflict at the worksite, and would like to know more about how conflict mediation may be able to help you, call one of the employee counselors for a free confidential appointment to discuss your concerns. Carol Weiss, L.C.S.W. and Michael Bowler, Ph.D. can be reached on 496-3164 between 8 a.m. and 5 p.m. weekdays. The Employee Counseling Service is located in Bldg. 31, Rm. B2B57. □

Cultural Group Holds Open Forum

The NIH Asian/Pacific Islander American advisory committee (A/PIAAC) invites employees to attend its annual open forum. The theme is "Moving Toward the Future: Leadership and Diversity in the Work Force."

Dr. Philip S. Chen, NIH associate director for intramural affairs, will give a presentation on "Factors in Career Progression" and Commissioner Joy Cherian, U.S. Equal Employment Opportunity Commission, will speak on "EEO and Its Impact on Minorities in Government."

Following the presentations, there will be a question and answer period and light refreshments. The forum will be held on Monday, Sept. 18 from 11:30 a.m. to 1 p.m. at the Lister Hill Auditorium (Bldg. 38A). Sign language interpretation will be provided.

For further information, contact, Lucie Chen, 496-6531, or Joan Brogan, 496-2906. □

Farmer's Market at NIH

R&W is once again sponsoring a "Farmer's Market" at NIH, on Tuesdays, in parking lot 41B beginning at 2:30 p.m. Fresh fruits and vegetables from local farmers will be sold. □

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 to nonemployees by subscription only through the Government Printing Office. The content is reprintable without permission. Pictures may be available on request. Use of funds for printing this periodical has been approved by the director of the Office of Management and Budget through September 30, 1989.

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Susceptibility to Arthritis Linked to Brain's Regulation of Inflammation

By Patricia Blessing

A research team from three different branches of biomedical science has provided, for the first time, biologic evidence of a defect in the brain's response to inflammation in an animal model of rheumatoid arthritis. Recent work published by this team in the *Proceedings of the National Academy of Sciences (PNAS)* April 1989) showed that differences in the body's response to stress play a major role in susceptibility and resistance to the development of arthritis in two inbred strains of rats; one strain is susceptible to arthritis, the other is not. In the June issue of *PNAS*, the researchers report that the defect is in the brain's hypothalamus and its ability to produce and release a hormone critical in regulating the body's response to inflammation.

"Having found a defect at this site is consistent with the concept that the brain has a controlling effect on the development of arthritis," said Dr. Ronald L. Wilder, a rheumatologist at the National Institute of Arthritis and Musculoskeletal and Skin Diseases who has spent the last 10 years studying differences between the two strains of rats. "Having shown that regulation is being exerted at the level of the brain, we now have the means to understand this disease at a fundamental, molecular level."

The *PNAS* papers represent a collaboration among intramural scientists of the NIAMS, NIMH and NICHD. Colleague Dr. Esther M. Sternberg, also a rheumatologist with the NIMH and NIAMS, was led by her interest in brain chemical messengers and diseases of inflammation like arthritis to collaborate with Wilder to explore brain mechanisms that may allow the disease to develop in one group of rats and not in another.

The two strains of rats are called Lewis and Fischer rats. Researchers can induce arthritis in Lewis rats by injecting a component of streptococcal bacteria (cell wall material); they cannot induce it in Fischer rats given the same component.

Yet, in a series of experiments, Wilder and Sternberg observed inflammation, including arthritis, in the Fischer rats after treatment with a drug that blocks the effects of powerful anti-inflammatory hormones called corticosteroids. By blocking the action of corticosteroids in the Fischer rats, the researchers found that the animals were no longer protected, and the rats developed inflammatory arthritis. The researchers showed that the Lewis rats had a profound defect in the part of the brain that normally initiates the release of corticosteroids in response to

stressful stimuli.

The brain is equipped with a circuitry system to counteract the effects of inflammation and to respond to other stresses. Both immune and central nervous system components are involved in this loop, now called the hypothalamic-pituitary-adrenal-immune axis, and it releases a cascade of hormones when called into action. For example, when cell wall material is injected into the Fischer rat model, immune system cells alert the brain's hypothalamus to produce corticotropin releasing hormone, or CRH. CRH, in turn, sends a signal to the brain's pituitary gland to send out another hormone, adrenocorticotropic hormone (ACTH). When ACTH reaches the bloodstream, it triggers the adrenal glands in the body to produce corticosteroids that suppress inflammation that is induced by the streptococcal cell walls. This pathway also is a critical component in regulating the body's reaction to stress—increasing heart rate, blood pressure and muscle tension.

Without a stressful event, the axis networks of both the Fischer and Lewis rats work similarly. But with an injection of bacterial cell walls, Fischer rats respond by increasing their production of CRH, (and eventually of corticosteroids) thereby preventing joint inflammation. In the Lewis rats, on the other hand, the brain's circuitry does not respond, no additional hormones are released to curb the inflammation, and arthritis develops. By measuring the amount of different hormones released in this pathway in the two rat strains, the researchers showed that the Lewis rats' arthritis goes unchecked because they do not produce and secrete CRH in the hypothalamus.

Corticosteroids are the most potent anti-inflammatory agents in the body. The importance of corticosteroids in rheumatoid arthritis is not new. A Nobel Prize was awarded in the 1950's for the demonstration of their powerful suppressive effect on inflammation in the joints of arthritis patients.

Over the years, arthritis research generally has focused on local factors at the site of inflammation in the joint rather than on the possible role of other factors, such as brain mechanisms, in arthritis.

"Traditionally, it has been very hard to get scientists to believe that there is a connection between the brain and a disease that appears in the joints," said Wilder. "There has been suspicion and suggestive evidence for nearly 40 years that the hypothalamic-pituitary-adrenal axis may be involved in arthritis, but it has been very hard to prove."

These studies provide the first evidence that inflammatory arthritis in an animal model results from an inadequate regulatory step that involves both the immune system and the brain. Sternberg and Wilder suspect that this mechanism may be relevant to other diseases as well because the Lewis rat is susceptible to a variety of other inflammatory and autoimmune diseases.

The investigators caution that a similar defect in this circuitry has yet to be proven in humans with the disease. The animal model, however, gives researchers a headstart as to where and how to look for these kinds of differences. They will continue their work at the molecular DNA level to explore the connection between the brain's responses to stress and susceptibility to arthritis. □



Outgoing U.S. surgeon general Dr. C. Everett Koop (r) recently made an office visit to NIAID director Dr. Anthony S. Fauci to present him with two awards. Fauci received the Exemplary Service Medal for the "highest degree of leadership and commitment to meeting the initiatives of the Office of the Surgeon General and to the mission of the Public Health Service." He also received the Surgeon General's Medallion for "exemplary contributions to the mission of the PHS and the Office of the Surgeon General."

Workshop on Ethics in Research

A 2-day workshop on "Ethical Issues in Biomedical and Behavioral Research," will be held Sept. 18-19 at the Uniformed Services University of the Health Sciences auditorium (Bldg. B, Rm. B2014).

Sponsored by the NIH Office for Protection from Research Risks, the program begins at 8:30 a.m. and ends at 4:30 p.m. each day. It is open to anyone interested in research, but advance registration is required. To register, call Agnes Richardson, 496-8101. □

Fellowships Prompt Career Changes

MARC Program Helps Students Put Research in Their Curriculum

By Kathy Kranzfelder

"All my life I wanted to get my medical degree—go straight M.D. I said, 'I'm not going to do research. What's research?'" said Angela Overstreet, a senior at Bennett College in Greensboro, N.C. "But then I got into the MARC program and the program director straightened it out for me. He said, 'Hey, you can do both.'"

"That's right," chimed in Avril Geneve Holt, a senior at Stillman College in Tuscaloosa, Ala. "I know a lot of us would never have thought of research if it weren't for the MARC programs on our campuses."

Stacy Copeland, another Bennett College senior, nodded in agreement.

Angela, Geneve and Stacy all had similar ideas about research at first: "Sounds fine—but not for me."

MARC has changed all that.

MARC, which stands for Minority Access to Research Careers, is the NIH-sponsored fellowship program that prompts undergraduate science students to give early, earnest consideration to a research career and offers financial support to those making the commitment.

Overstreet explained how she reconciled a research interest with her original plans for a strictly medical-practice career. "You think of being a doctor and giving medicine to patients," she said. "Well, that medicine comes from somewhere, but you never think where."

Now Overstreet and 20 other MARC students from across the country are in NIH laboratories, honing their research skills, focusing in on their research interests and making contacts for future research projects.

Spending summers in laboratories is one of the requirements of the MARC program. During the school year, MARC students are also expected to attend seminars and make presentations not required of other students. The aspiring researchers say that the MARC program is more demanding than the standard curricula for science majors, but the added opportunities make it worth the sacrifices.

"The program requires a big commitment from the students," Overstreet said. "But in return, the MARC program makes a big commitment to the students." Overstreet is working with Dr. John Foulds in NIDDK's Laboratory of Structural Biology this summer to determine the *in vitro* interactions between acetaminophen (Tylenol) and antibiotics.

Geneve Holt, under the tutelage of Dr. Anthony Basile in NIDDK's Laboratory of Neuroscience, is studying the coma stage of



Angela Overstreet

hepatic encephalopathy, an often fatal brain disorder that may accompany liver diseases such as hepatitis. Holt and many of the MARC students express an interest in following an M.D.-Ph.D. track in their graduate studies. Holt said she was ambivalent about this prospect until she talked to Dr. Pierre Renault, deputy director of NIDDK.

"I came here last summer and talked to Dr. Renault, and he really talked to me," said Holt. "He told me about all the opportunities he wished he had when he was going to the University of Chicago and all the opportunities I have now. He just really talked to me, and what he was saying made a lot of sense. That's how I decided to go for it [the dual degree]."

Richard Kelsey, a senior at Morehouse Col-

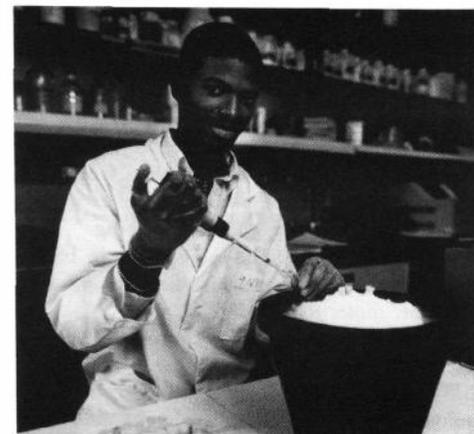


Geneve Holt hopes to learn how to prevent patients with hepatic encephalopathy from lapsing into coma.

lege in Atlanta, is another student who plans to go for an M.D. and a Ph.D. simultaneously. He cites several role models who have achieved M.D.s and Ph.D.s and are now researchers as his motivation for doing the same.

"Equally important is working with Dr. [Griffin] Rodgers, who is black," says Kelsey. "He is a mentor, someone you can relate with, someone you have commonalities with."

Rodgers, in NIDDK's Laboratory of Chemical Biology, is teaching Kelsey about the regulation of human globin gene expression



Richard Kelsey

Photos: Bill Branson

and its relevance in sickle cell anemia and thalassemia, two types of blood disorders.

Nkie Forsac, a senior at California State University in Dominguez Hills, is working with Drs. Alice Fisher and Hiroshi Taniuchi in NIDDK's Laboratory of Chemical Biology. Forsac, a native of Cameroon, says the laboratory work she is doing is very interesting, "but it's a lot of work. I thought I would breeze through it." Forsac is also considering taking the M.D.-Ph.D. path in graduate school.

Janet Caceres, a senior from the University of Puerto Rico in Rio Piedras, said she didn't want to come to NIH at first because she liked what she was doing in an organic chemistry lab at home. Now she says, "Coming here wasn't quite what I expected. It has been much better. Now I don't want to go home."

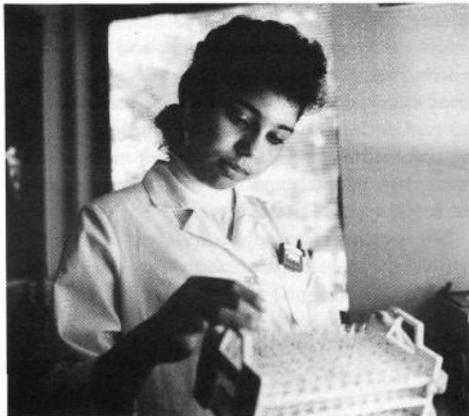
Caceres is working with Dr. Fabian Gusovsky in NIDDK's Laboratory of Bioorganic



Stacy Copeland is teamed with Dr. Esther Fride in the Laboratory of Chemistry, NIDDK. She is performing tests involving mice to see how stress on the central nervous system affects the immune system.

Chemistry where they are trying to identify the active compounds in skins of certain South American frogs. Some South American Indians use the secretions from the frogs' skin in folk medicine.

Michael Sayegh, a senior at Fordham University in New York City, is working with



Janet Caceres

Dr. Clifton Bogardus at NIDDK's Phoenix Epidemiology and Clinical Research Branch in Arizona. Sayegh, who is studying enzyme activity in muscles to see how well the body is using insulin, summed it up: "I'm excited about the MARC program. It is probably the best backing you could ever have. It is really the best advantage I'll ever have." □

Balding Men Needed

Investigations at NICHD require volunteers for a study of male pattern baldness. Balding men between the ages of 18 and 40 will be considered for the study. Interested persons should contact Dr. Katia Karalis, 496-4686. □

Dickler Named Chief of NIAID's Clinical Immunology Branch

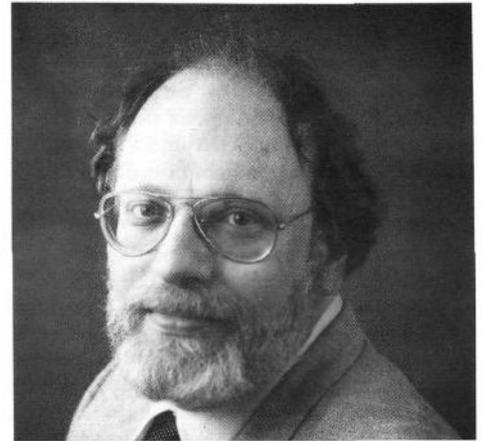
An authority on immunology, Dr. Howard B. Dickler has been named chief of the Clinical Immunology Branch in NIAID's Division of Allergy, Immunology, and Transplantation.

The branch plans, implements and directs a wide range of domestic and international research activities relating to the epidemiology, pathogenesis, diagnosis, pathology, prevention and treatment of immunologic diseases. In addition, the branch administers investigator-initiated research grants in this area.

Before joining NIAID, Dickler had worked since 1974 as a senior investigator in NCI's Immunology Branch.

After earning his medical degree in 1968 from George Washington University, and ranking first in his class, Dickler completed both his internship and residency at New York Hospital/Cornell University Medical College in New York City.

From 1976 to 1979, Dickler served as associate editor of the *Journal of Immunology*. He has published extensively in his field of interest—receptors and gene control of immune responses. A captain in the U.S. Commissioned Corps, he received the U.S. Public Health Service Commendation Medal in 1985



Dr. Howard B. Dickler

for "major contributions to understanding the role of cell surface receptors in regulating cell activation."

Board certified in internal medicine, Dickler is a member of the American Association of Immunologists, the American Federation of Clinical Research and the American Society for Clinical Investigation. □

Nursing Training Brings Unique Perspective to Basic Research

When Dr. Sue Donaldson presented her research on the mechanisms of skeletal muscle contraction at NIH recently, she was demonstrating that clinical training can bring a unique and important perspective to basic research. As a senior basic scientist who chairs the DRG physiology study section, and a professional nurse, Donaldson has a perspective on both worlds. "Basic scientists who also are clinicians can bridge the gap between basic science and health and disease-related questions," she says.

Donaldson's basic research addresses an unknown link in the steps from muscle cell stimulation to its contraction. Her talk addressed the hypothesized role of the chemical inositol 1,4,5-trisphosphate as a signal in this process.

"Once this mechanism is understood," she says, "many elusive phenomena may be explained such as skeletal muscle fatigue and mechanisms of disease such as malignant hyperthermia, a serious genetic disorder found in both humans and pigs." Donaldson noted that a study of malignant hyperthermia evolved from her research as a result of her clinical background and perspective.

Donaldson received her Ph.D. in physiology and biophysics in 1973 from the University of



Sue K. Donaldson

Washington Medical School. She holds the Cora Meidl Siehl chair for nursing research and is associate dean for research in the University of Minnesota school of nursing and professor of physiology in the school of medicine. The lecture was the second National Center for Nursing Research Distinguished Scholar Seminar and was cosponsored by the National Institute of Arthritis and Musculoskeletal and Skin Diseases.—Esther McBride □

NURSE

(Continued from Page 1)

those not yet seriously ill, and those still healthy. For confirmed cases, patients were hospitalized. As more beds were needed, Burchard turned a recreation hall into a hospital. For suspicious cases, a system of quarantining patients in their rooms was immediately adopted.

The health department was not able to put up an official card of quarantine, but authorized Burchard to place a bright printed card on the doors of suspicious cases with the inscription—"Room in Quarantine, No Admittance, Authorized by the Board of Health."

Harlean James, general manager of the 52 government hotels during that time, stated in a report, "Miss Doris Burchard deserves great credit for her foresight and energy which made it possible to organize preventive and curative measures promptly. The cordial and effective cooperation of all the other divisions contrib-



Nurses Lietzau (r) and Dee Campbell check the medical supplies on hand for their unit.

uted materially to the successful care of influenza patients."

Lietzau works on the Oncology AIDS unit for the National Cancer Institute, where she has been since February 1988. Previously she worked at the Washington Hospital Center, but it was at a hospital in New Jersey that she first began working with AIDS patients. When NCI instituted phase I clinical drug trials for AIDS patients, she applied here in order to fulfill her continuing interest in working with this population.

Lietzau also volunteers after duty hours to help people living with AIDS in the Washington, D.C., metropolitan area; she is part of the extensive AIDS program and services at

the Whitman-Walker Clinic in Northwest Washington.

NIH has spent almost \$1 billion so far on AIDS and plans to spend \$588 million in 1989. The money will be spent on caring for those already ill, counseling those infected but not yet sick, educating people about how to prevent AIDS, discovering how the AIDS virus works and funding basic research that can lead to clues in fighting human disease. Burchard expressed these same concerns back in the 1920's and tried to do something about them.

After the influenza epidemic, Burchard went to the Eastern Shore of Maryland to work for the Talbot County chapter of the American Red Cross as a public health nurse. When she arrived she found that no school-children had ever been physically examined in the county. Furthermore, there was no active nursing representative, members of the Red Cross executive chapter committee were divided among themselves, and, perhaps most painful, her salary had been cut \$50 a month from what her employers had contracted to pay.

In a letter to a friend describing her new job, Burchard said: "Of course, this radical reduction (in pay) meant a good deal to me and for a few days I wasn't sure I could afford to accept it. But, after consideration, I decided that I would rather fight this year out, and accomplish what I had become desirous of doing for Talbot County.

"The schools are in dreadful condition, and not fit for children to spend their days in. The state rules for quarantines, etc. are not enforced and the primary school seems to be a 'hot bed' for contagious diseases. There is so much to be done, that sometimes I feel a bit overwhelmed."

Often Lietzau feels the same way. Persons living with AIDS (adults and children) have many physical and emotional needs requiring an attitude of understanding, caring and acceptance.

"Nurses play a vital role in providing this support, which often requires an aggressive approach," Lietzau says. "Many frustrations can arise, but the rewards of caring for these persons outweigh the struggles we often experience."

Burchard established a small health center in Talbot County with a model nursery that could be made at home—wooden crib, wooden box made into a carriage, window screen for baths, and a low table suitable for bath tub and tray as well as wash cloths and bath articles. She toured the county, stopping at every school, and set up her exhibition of posters and literature. She displayed her model nursery, gave talks and hoped some good would come of it.



Burchard (l) prepares for the next influenza patient in a hospital. Following the flu epidemic of 1919-20, Eastern Shore.

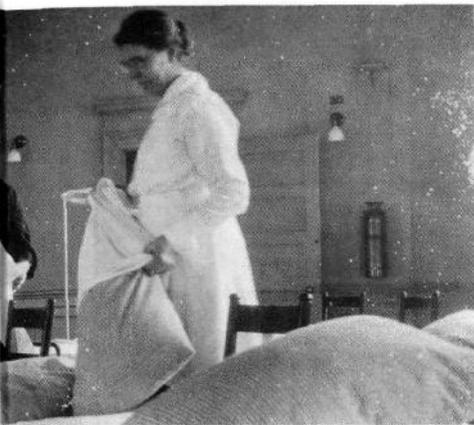
Burchard worked more than 12 hours a day to get her plans initiated into the schools. But, she emphatically stated in one of her letters, "I am determined that I will not let a few more narrow-minded biased people influence me. There are many people in Easton and the county who are really interested in the nursing work."

After reading these old letters and diaries kept by her grandmother, Lietzau says, "She raised issues that are still being raised today. She was definitely a woman before her time. She stood firm, and probably made more waves than people expected from a woman. She loved a good challenge.

"She was an extremely intelligent woman with a variety of talents. She was a singer and painter. She designed and supervised the building of a house (still standing in Georgetown, D.C.) and set her own progressive fashion in clothes at a time when it was very



Doris Burchard poses (center front in white) with colleagues in front of one of the government hotels. Even in this portrait, she stands out as an individual.



...ing admitted to the recreation hall annexed for use as
...the helped improve health services on Maryland's

unfashionable to be different. She was her own person.

"My father says I am the spitting image of my grandmother and have many of her characteristics," Lietzau continues. "I guess I have to admit to being stubborn and will pursue what I wish to accomplish no matter what obstacles might be in the way.

"I take pride in that I am like my grandmother — I am also a people-caring person."

Lietzau says, "My grandmother died when my father was 9 years old; I only wish I could have known her—we apparently shared a lot in common."

Within the family, Lietzau is the only relative to follow Doris Burchard's example and become a nurse. "I am very pleased to be working with AIDS patients and mighty proud to be following in my grandmother's footsteps," Lietzau says. "Maybe one day we can compare notes!"



Jill Lietzau primes an intravenous tube for a patient on the 12 East Oncology AIDS unit.

Regulated By 'Homeobox Office?'

Fruit Fly Gene Offers Clue to Genetic Control

By Doris Brody

Since the genetic code was first "cracked" in the early 1960's, scientists have discovered many unexpected complexities in the way DNA and other components of the cell interact to sustain life. Just understanding how genes—stretches of DNA that generally code for specific proteins—are regulated (turned on and off) is extremely difficult. Recent studies of proteins encoded by genes that control embryo development in the fruit fly *Drosophila melanogaster*, conducted by two NIGMS grantees, Dr. Michael S. Levine at Columbia University, Dr. Patrick H. O'Farrell at the University of California, San Francisco, and their colleagues, provide an important step toward understanding gene regulation.

Biologists who study the early stages of development in various creatures, from fertilized egg to embryo or larva, are among those leading the way toward understanding genetic control. These scientists are interested in how cells that are, at first, undifferentiated know when and how to turn into specialized cells that eventually form parts of the body, such as the skin, skeleton or nervous system. Many studies of development in normal and mutant fruit flies, conducted long before the discovery of the genetic code, provide today's researchers with a firm base of knowledge of developmental patterns in *Drosophila*. This knowledge is now paying off by helping scientists trace the genetic control of development.

In recent years, researchers have been able to locate specific genes, called homeotic genes, that control fruit fly development by regulating groups of other genes. They have sequenced (determined the order of subunits of) these genes and compared these sequences with other *Drosophila* sequences as well as sequences from other animals.

The purpose of such comparisons, which are made possible by computerized databases such as the NIGMS-supported GenBank, is to look for homologies—sequences that are the same or similar. Researchers believe that homologous sequences that appear in the DNA of various organisms are especially critical to life. It was in fruit fly homeotic genes that a highly conserved DNA sequence, called the homeobox, was found about 5 years ago. Homeobox sequences have now been found in creatures ranging from yeast to humans. Although not yet proved, homeobox sequences may perform regulatory functions in all animals in which they are found, scientists believe.

Of course, biologists studying DNA regulation want to know exactly how the homeobox

regulates gene expression. Because the homeobox sequence is homologous to a sequence in yeast known to code for a DNA-binding protein, they suspected that the homeobox proteins in fruit flies might also regulate gene expression by binding to specific DNA sequences. Recently, Levine and O'Farrell and their associates conducted experiments that proved that *Drosophila* homeobox proteins do initiate gene expression by binding directly to DNA. Moreover, both of these researchers and their colleagues have shown that different homeobox proteins can bind to the same stretch of DNA and that, in some cases, combinations of these proteins can increase or decrease expression of that gene. This observation helps explain how regulatory genes provide control over early developmental events. The researchers suggest that the activity of the target gene depends on exactly what combination of homeobox proteins is bound.

So far, the experiments have been conducted only in cultured *Drosophila* cells. The next step in understanding this type of genetic control will require studying the embryos themselves. □



Dr. Louise A. Brinton, chief of NCI's environmental studies section, Environmental Epidemiology Branch, has been named president-elect of the Society for Epidemiologic Research. Founded in 1967, the society, which is made up of about 2,200 members, promotes the exchange of information and stimulates scientific interest in epidemiologic research. She will begin her presidency in June 1990. Brinton's research interests focus on environmental factors related to cancer and cancers affecting women, particularly breast and cervical cancers.

NINDS and Wallace Laboratories Team Up To Offer Neuroscience Training

When the NIH observed its centennial in 1987, an important objective was to stimulate the interest of young people in biomedical research careers. The NINDS has long pursued that goal, particularly through its successful Summer Program in the Neurosciences. This year, however, in a partnership unique to NIH, Wallace Laboratories has joined forces with NINDS to attract and train another cadre of potential neuroscientists for the next century.

When the pharmaceutical company learned that the institute lacked funds to support many of the talented high school students eager to train in NINDS labs, it responded by offering to establish the Wallace Laboratories Summer Research Fellowship Program for High School Students. "We find that exposing students to the excitement of research early-on is the best way to stimulate their desire to become investigators," says NINDS director Dr. Murray Goldstein.

In all, seven high school students are being trained in NINDS labs—six supported by donations from Wallace Laboratories. "The possibilities for achievement in brain research and the implications this work has for

relieving the suffering millions of families coping with the results of nervous system disorders are virtually limitless," continues Goldstein. "It is up to us to spread the word that there is a host of opportunities available in the neurosciences, especially for students who pursue math and science studies. When I see teenagers such as those in our laboratories this summer, I know that if we just give them the ball, these young people have the talent and determination to run with it."

If their comments below are any indication, these "junior" scientists are finding life at the bench stimulating and exciting.—Carol Rowan

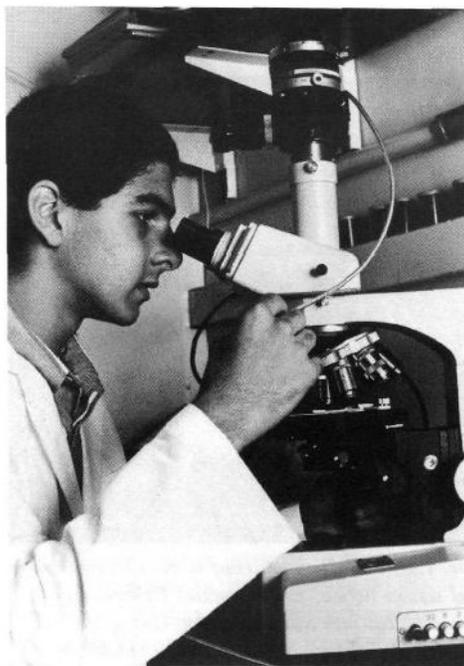


Marc Brescia (Developmental and Metabolic Neurology Branch) prepares new synthetic substances for analysis of possible use in diagnostic and biomedical applications: "When I came to NINDS, I was worried about how well I, as a teenager among scientists, would adapt. But everyone here treats me like an adult. I feel really privileged to be in this program. If you want a career in science or medicine, as I do, this is the place to be."

Photos: Ernie Branson



Myrna Jung (Laboratory of Molecular Biology) studies the genetic expression of proteins involved in neurological function: "The atmosphere is intellectually stimulating. It's a good opportunity to see if research is what you really want to do."



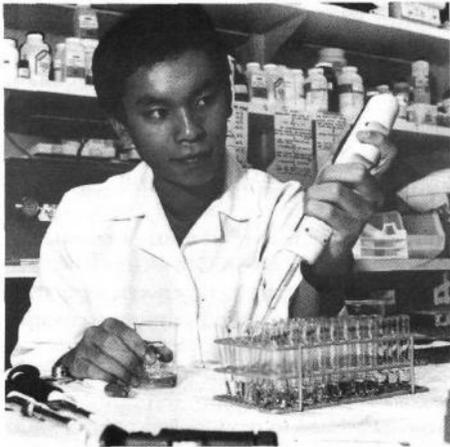
Basil Eldadah (Laboratory of Neural Control) investigates mechanisms controlling walking movements in cats and maps the 3-dimensional architecture of their spinal cord neurons: "In school, you learn things that have already been proven. Here, you have a chance to discover new knowledge that may one day be put in the textbooks—with your name as credit!"



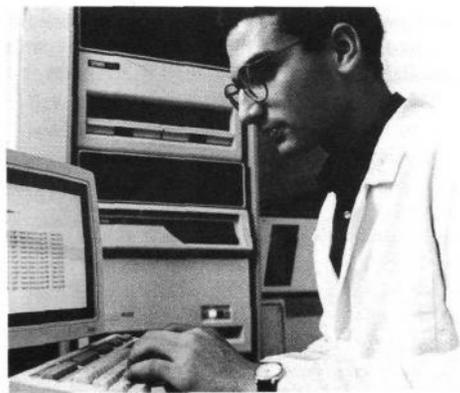
Jonathan Glass (Experimental Therapeutics Branch) is studying pharmacologic treatments for Parkinson's disease: "I have always enjoyed science, and this program has allowed me to use my training and make a serious contribution to science. I can't overemphasize how positive an experience this has been."



Dionne Burnett (Animal Health and Care Section) is involved in the scientific study and use of many different species of laboratory animals: "At first it was a little intimidating working among all these brilliant scientists. But everyone here has been extremely cordial. I think the NINDS summer program is one of the best opportunities available to a high school student with an interest in science."



Hoang Le (Medical Neurology Branch) is learning about the role of glutamate and GABA in epilepsy. "The NINDS program has given me a chance to actually use what I've learned in school. There's a lot you don't really understand until you use it in the lab. And I've gotten to do many things I never expected, like work with lab animals and see the inside of a brain. It's exciting."



Amir Moynfar (Office of Clinical Director) performs computer analyses of tremor and medications used to treat it. "This is my second year with the NINDS summer program, which has given me a good feeling for how projects advance year to year. Scientists have to be very patient and willing to bypass short-term results to achieve long-term goals that may be more significant. Research isn't for people looking for a quick route to glory—you need a genuine interest and must be willing to put in a good deal of time. I hope to come back next year."

Healthy Women Needed

Healthy women ages 23 to 45 are needed for a study of brain activity at NIMH. Study involves a PET scan. Must be a high school graduate with no more than 4 years of college education and available for 2 full days. No history of psychiatric illness. Volunteers will be compensated. Call David, 496-7962. □

AIX Can Take Away Computer Pains

Because of the popularity of the Unix operating system and its acceptance in the scientific and engineering communities, the NIH Computer Center, DCRT, is looking into providing Unix services on an IBM 3090 processor to support NIH research.

The particular use of Unix being evaluated is called AIX/370, Advanced Interactive Executive/370, which becomes publicly available later this year. The Computer Center wants input and participation from members of the NIH research community.

Unix is now found on small desktop personal computers, laboratory workstations, mainframes and supercomputers. This wide use of Unix means that a common set of standard interfaces and tools can be used to attack problems of widely varying size.

The very large computing power (six IBM 3090 computers with vector facilities and almost a trillion bytes of online storage) available on the NIH Computer Utility can provide a major resource to NIH researchers only if its services are easily accessible as they would be in the familiar Unix environment.

AIX is designed to be compatible with both the System V version of Unix from AT&T and the 4.3 version of Berkeley Unix, and has been accepted as the standard Unix version of the Open Software Foundation (a consortium of vendors including IBM, Digital Equipment Corporation and others). In addition to full compliance with these two major Unix standards, AIX provides additional features that further enhance its usefulness to NIH. AIX

supports and is fully compatible with NFS, the Network File System, a set of protocols for storage and movement of data among electronically connected systems. Data can be stored at one or many sites of a network and appear to each user as a single, unified data storage system.

AIX also provides a facility called TCF—transparent computing facility—that performs a function similar to NFS, but in this case the transparent resources are the actual computing engines of each of the connected workstations, micros or mainframe computers (referred to as a TCF cluster).

Even though AIX was implemented by IBM on the PS/2, RT/PC and 370 architectures, any workstation or computer capable of supporting NFS or TCP/IP may be electronically connected (dial-up or network) to any member of the AIX family and participate in the shared file system and TCF support provided by AIX.

AIX provides the two most popular languages generally found in Unix—C and FORTRAN—as well as assembly language. The Fortran compiler supports the vector facility of the IBM 3090, a feature that is capable of supercomputer performance for scientific computations.

The DCRT evaluation team would like any NIH researcher who needs extensive computation power and is interested in evaluating AIX to contact the Computer Center, 496-5181. Comments and questions from the NIH community regarding Unix are welcome. □

DRG Develops Phone Line

The Division of Research Grants has begun "News from DRG," a telephone information line that provides biweekly messages on items pertaining to the division or to peer review at NIH in general.

Included are extramural program or policy changes, statistics on extramural programs or peer review, special events, new or revised publications, personnel changes, and any other items of interest to the biomedical research community or general public. The messages will change every other Monday.

To use this system, just dial 496-3115. You will hear a recorded message. At the end of the message, you will have the opportunity to make any comments or suggestions for future items; this is the main way DRG can determine if the information line is meeting the needs of its constituents.

For more information, contact Dr. Samuel Joseloff, 496-7441. □

Cancer Prevention and Control Classes

The Division of Cancer Prevention and Control, NCI, is accepting limited registration of NIH professional staff for the cancer prevention and control academic course to be held September through December 1989 at Executive Plaza South. The course is divided into eight modules consisting of a few days to 3 weeks each in length and lasting 4 hours daily.

Modules open for registration include principles of epidemiology; biostatistics and study design; genetics in cancer prevention; detection, natural history and treatment of major cancers; cancer epidemiology; grants, contracts and administration; behavior and cancer; cancer prevention and control programs.

To obtain detailed course information and a registration form, contact Barbara Redding, 496-8640 or 8641. □

Dubner Receives Bristol-Myers Award and Japanese Fellowship

Dr. Ronald Dubner, chief of the Neurobiology and Anesthesiology Branch, NIDR, has been chosen as the second recipient of the Bristol-Myers Award for Distinguished Achievement in Pain Research. He also has been awarded a fellowship from the Japan Society for the Promotion of Science.

The Bristol-Myers Award, which includes a silver medallion and a \$50,000 prize, is given to a scientist who has made major contributions to progress in pain research. Dubner's selection was made by an independent peer review committee. The award thus represents the recognition and appreciation of his professional colleagues for leadership in pain research. The award will be presented to him in October during the annual meeting of the American Pain Society.

The fellowship from the Japan Society for the Promotion of Science will enable Dubner to conduct research in Japan for 1 month. In January 1990, he will divide his time between Tohoku University in Sendai and Hiroshima University, where he will conduct research on pain pathways and the role of natural pain-suppressing chemicals in the brain.

Dubner is internationally recognized as an authority on pain research. His studies have led to new knowledge about how pain messages are relayed and encoded in the brain and how these messages can be modulated by descending control systems originating at other sites. These findings have been the basis for clinical studies on pain control that are conducted at the NIH Pain Research Clinic, a collaborative pain research program started by the Neurobiology and Anesthesiology Branch



Dr. Ronald Dubner

in 1983 under Dubner's leadership.

Dubner has been affiliated with NIDR since 1959, and has headed the Neurobiology and Anesthesiology Branch since 1973. He has a D.D.S. degree from Columbia University and a Ph.D. degree in neurophysiology from the University of Michigan. He received the Carl A. Schlack Award from the Association of Military Surgeons of the United States in 1985, the Frederick Birnberg Research Award from Columbia University in 1981 and a PHS Meritorious Service Medal in 1975.

Dubner is treasurer of the International Association for the Study of Pain and a past president of the American Pain Society. He serves on the editorial boards of four scientific journals, has coedited and coauthored five books and published more than 150 scientific papers.—Kristen Kennedy □

Coping With Job Stress

Deadlines, bosses, coworkers, presentations, meetings, EPMS evaluations, and even traffic can contribute to the stress we feel in the workplace. It is difficult to juggle the demands of the workplace and still maintain an even balance in our personal lives.

Employees can suffer from stress overload regardless of their occupation—clerical workers who can see no correlation between what they do and their organization's mission; secretaries whose schedules and work pace are at the mercy of their bosses; mid-level supervisors caught between those above and below them; scientists pressed to produce and publish while enduring long tedious hours with no immediate sense of reward; physicians and nurses who deal with illness and death daily in high-pressure work situations, and executives who may be expected to accomplish more than seems realistic. These are just a few examples.

Mental and emotional stress on the job can cause irritability, anxiety, depression and social withdrawal, as well as various physical illnesses. Although some stress is good and helps people to be motivated and achievement-oriented, an overload of stress at work is unhealthy.

The Employee Counseling Services is available to help you learn to handle stress in the workplace. If stress at work is beginning to take control of your life by interfering with daily routines, job performance, health, or work relationships, help is available through the NIH employee counselors, Carol Weiss, L.C.S.W. and Michael Bowler, Ph.D. Please call for a free confidential assessment to help you identify stress sources and solutions for "de-stressing" your work life. The Employee Counseling Service is located in Bldg. 31, Rm. B2B57. You may call 496-3164 between 8 a.m. and 5 p.m., weekdays. □

Country Bike Tour, Sept. 23

R&W has teamed up with Open Road Bicycle Tours to offer a 1-day bicycle tour Saturday, Sept. 23, through the horse and wine country of Middleburg, Va. Throughout the tour you'll cycle amid huge horse farms and estates on rolling terrain; tour offers choice of 18, 28 or 44-mile rides. The trip also includes a stop at Piedmont Vineyards for a tour and wine tasting. Cost is \$17, including tour leaders and written directions. Sign up at R&W Activities Desk or call 496-4600. □



Clinical Center nurses Betty Curtis (l) and Beth Price (r) congratulate three new nurses who recently completed a 9-month neuroscience nurse internship program on the 5 East patient care unit. They are (from l) Amy Larson, Janice Davis and Julieann Kobylski. Constituting the program's first graduating class, the nurses will continue to work at the CC.

TRAINING TIPS

The NIH Training Center of the Division of Personnel Management offers the following:

Courses and Programs *Dates*

Management and Supervisory 496-6371

Transition Planning	9/15
Introduction to Supervision	9/18
Managing Stress, Maximizing Effectiveness	9/27

Office Operations Training 496-6211

Introduction to Working at NIH for New Support Staff	9/11
Basic Time and Attendance	9/7
Delegated Acquisition	9/11

Training and Development Services 496-6211

Personal Computer training is available through User Resource Center (URC) self study courses. There is no cost to NIH employees for these hands-on sessions. The URC hours are:

Monday	8:30 a.m.-4:30 p.m.
Tues. Wed. Thurs.	8:30 a.m.-7:00 p.m.
Friday	8:30 a.m.-4:30 p.m.
Saturday	9:00 a.m.-1:00 p.m.

NOW AVAILABLE ON SHARE TRAINING FY 89 Training Center courses. Access Wylbur and enter SHARE TRAINING. First time users only, enter:
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Shafer To Head NIGMS Programs

Dr. W. Sue Shafer has been named associate director for program activities at NIGMS, where she will manage a \$639 million research and research training grant program in the basic biomedical sciences.

Shafer came to NIH in 1974 as a health scientist administrator in the Cellular and Molecular Basis of Disease Program, NIGMS. In 1978, she became chief of the instrumentation section of the NIGMS Physiology and Biomedical Engineering Program. Her section's mission was enlarged in 1980 to include biomedical engineering.

In 1983, Shafer joined DRR as chief of the Office of Program Planning and Evaluation. Since 1987, she has been with NIAAA, first as deputy director of its division of basic research and more recently as the division's acting director. Among her major achievements at NIAAA were development and management of a new initiative on the genetics of alcoholism and reorganization of the institute's research grant program to allow creation of a new division to handle clinical and prevention research.

Shafer received a B.S. in zoology from the University of Wisconsin and a Ph.D. in



Dr. W. Sue Shafer

developmental biology from the University of Florida. Her postdoctoral work included serving as a research associate in the department of zoology at the University of Florida and as a lecturer at Kalamazoo College in Michigan.

Shafer is a member of the American Society for Cell Biology and the Society for Developmental Biology. Among her honors is the 1986 NIH Director's Award. □

NIH Bowling Night at Navy

R&W and the Naval Bowling Center (across the street from NIH) invite NIH employees and their guests to an evening of bowling on Tuesday, Aug. 22 from 5:30 to 7:30. Cost is only \$1 and includes 2 hours of bowling and shoe rental. Sign up at the R&W Activities Desk or any R&W gift shop. For more information, call 496-4600. □



Harvey W. Rogers, chief of the Environmental Protection Branch, DS, since 1986 and an NIH environmental engineer since 1974, is transferring to the Agency for Toxic Substances and Disease Registry in Atlanta. He will help the newly formed PHS agency assess hazardous waste combustion technology.



Jobanna Grodzicki, a budget analyst in NIDR's Office of Administrative Management, is the first graduate of the new NIH Stride program. She graduated this spring from the University of Maryland with a B.S. in business. Stride provides a combination of on-the-job experience, academic course work and selected training courses to prepare employees for positions at NIH. The new Stride program requires employees to work full time while pursuing their education and training.



Randy Schools (l) accepts a check for \$270 for the Friends of the Clinical Center, presented by Dr. Carl Frasch and Cindy Walczak of the NIH Bicycle Club. The money was raised by means of a bicycle repair course sponsored by the club and taught by Frasch. The Friends of the Clinical Center is a nonprofit charitable group concerned with the well being of patients and their families during their caring affiliation with NIH.

NIAAA Seeks Volunteers

The NIAAA seeks normal controls ages 25-60 to participate in biological studies. Participants need to be in good health, on no medication, not alcoholic and have no alcoholism in their family. Participants will be remunerated for their time. For further information, call Dr. Ted George, 496-0983. □

Funding Available for Intramural Genome Research

A new phase in the effort to map and sequence every gene in the human body is under way: applications for funding for intramural human genome research projects are now being accepted by the Office of Human Genome Research, which will as of Oct. 1 become the National Center for Human Genome Research (NCHGR).

With center status, NCHGR will be able to grant funds as an independent unit of the National Institutes of Health.

For the first time since its establishment last year, the NIH genome program will offer monetary support to intramural research projects deemed worthy by a peer review panel. At present, no limit has been set on the amount of money to be awarded to the intramural program; support for up to 3 years may be requested.

"We have not set aside any specific amount of funds," said Dr. Jane L. Peterson, chief of the Research Center Branch and coordinator of funding for the intramural program. "We will fund the excellent proposals we receive."

Dr. James Watson, NIH associate director for human genome research, has estimated that the entire human genome (approximately 3 billion base pairs of DNA containing tens of thousands of genes that may affect the treatment, prevention or understanding of more than 3,500 human diseases of genetic origin) could be mapped and sequenced in 15 years at a cost of \$200 million per year.

The intramural funding, which will be

available as early as February 1990, will come from the budget appropriated by Congress to the NIH human genome initiative.

According to the application instruction guide distributed to scientific directors July 24, the intention of this funding is to encourage the development of new programs, or significant expansion of appropriate existing programs within the intramural laboratories of interested institutes.

Peterson said that any intramural laboratory scientist is eligible to apply pending the approval of the laboratory or branch chief, the scientific director and the BID director. Funding requests for pilot projects (those not fully conceived) and feasibility studies will be accepted for consideration as well.

The decision to support an intramural project will be based on both scientific merit and adherence to the goals of the human genome initiative.

Peterson said: "Our mission is not focused on studying specific disease genes, but the research supported by the program to map and sequence large chromosomal regions will be of enormous benefit to the study of the genetics of disease."

For more information about applying, contact Dr. Jane L. Peterson, Bldg. 38A, Rm. 613, 496-7531. Application deadline is Oct. 16; peer review begins mid-November. —Carla Garnett □



NIH director Dr. James B. Wyngaarden (r) accepts a flag and salute from E. M. Brightwell, chief of the NIH police section, at a recent ceremony on the steps of Bldg. 1. The flag was presented on behalf of the NIH community as a memento of Wyngaarden's tenure at NIH. Standing behind the director, whose last day at NIH was July 31, is O. W. Jim Sweat, chief of NIH's Security Branch. At a reception later, Sweat presented the director with a plaque from members of the branch. The plaque, containing an honorary U.S. police badge, read: "In grateful appreciation for your leadership and support."

FAES Offers Stipends

FAES is administering special funds known as Wellcome Stipends to augment the stipends of postdoctoral level guest workers at NIH. Depending on the total funds that are available and the number of eligible applicants, a maximum of \$3,600/year (\$300/month) may be granted to each approved individual as an income supplement to a maximum total family income of \$15,000/year plus \$1,000 for each dependent including spouse.

The selection committee will consider the scientific merit of the research to be conducted as well as need and professional qualifications of the applicant.

Awards will be made twice a year, Mar. 31 and Sept. 30 for the 12-month periods beginning Apr. 1 and Oct. 1, respectively. Applications for 1989 must be received in the FAES office on or before Feb. 25 for the March awards or Aug. 25 for the September awards. Applications are being accepted now for the awards to be made on Sept. 30.

Additional application forms are available at the FAES business office, Bldg. 10, Rm. B1C18 or by calling 496-7976. □



As a part of the NIH Summer Jobs Program, 11 students are gaining exposure to biomedical research techniques and training firsthand under the supervision of scientists at NIAID's Rocky Mountain Laboratories in Hamilton, Mont. The students are (rear, from l) Martin Balish, Michael Jasumback, Bradley Berry, Anne Arvish, David Stokesberry and Karen Kime; in the front row are (from l) Sadie Honey, Kathryn Wells, Tracy Goetz, Kristina Hurley and Denise Provost.