

The Oregon Health Sciences University includes the schools of Dentistry, Medicine and Nursing; Vollum Institute for Advanced Biomedical Research; Center for Occupational Disease Research; University Hospital; University Clinics (medical and dental); Doernbecher Children's Hospital; and Crippled Children's Division.

The Oregon Health Sciences University OHSU NEWS

OHSU joins front ranks of biomedical revolution

The Oregon Health Sciences University has quietly joined the front ranks of the revolution in biomedical research.

Rather than staging a formal dedication ceremony, two mid-April events marked the opening of the Vollum Institute for Advanced Biomedical Research, two years and six months after construction began in November 1984.

On April 14, Senator Mark O. Hatfield and Oregon Governor Neil Goldschmidt spoke before a packed auditorium on "Research and Public Policy: Views from Washington, D.C., and Salem, Oregon." Hatfield credited Laster with having the vision to position the university as one of the preeminent scientific research institutions in the country.

Then on April 24, Dr. James Wyngaarden, director of the National Institutes of Health, presented the lecture "New Sciences, New Frontiers" to a near-capacity crowd.

Opening festivities also included building tours provided by the Marquam Hill Steering Committee's campus tour office. A dinner was held both nights in the institute, honoring special guests including those who have made major contributions to the institute's success.

A center of excellence

"We have, first and foremost, a center of excellence created by a public/private partnership," said Dr. Leonard Laster, OHSU president. "The institute offers an unprecedented opportunity to work in an area that is bursting forth with new discoveries. It has brought young investigators to Oregon from some of the finest institutions in the country, all of whom were attracted by the institute's first director, Ed Herbert. Dr. Herbert's tragic death will not impair the growth of the institute, because these people are committed to

continuing the research — both for its own sake and as a tribute to Dr. Herbert."

The Vollum Institute holds the promise of being among the first centers in the country to use molecular biology in exploring the brain and nervous system. Scientists believe that when they better understand how the brain functions at the fundamental level of genes and proteins, there will be greater hope in fighting Alzheimer's and Parkinson's diseases, schizophrenia and other disorders of the brain and nervous system.

Joining the revolution

Although scientists have seen it coming, the "biomedical revolution" has been noted recently in journals and the general media. For instance, *Fortune* Magazine says biomedical research is expected to yield more major advances in science than any other field of inquiry in the next decade. In other words, cures and treatments for such devastating illnesses or abnormalities as cancer and stroke may be within reach — possibly in our lifetime.

The Vollum Institute does not house an elite group of molecular biologists doing cloistered research. Spacious labs and common areas encourage scientists to exchange ideas; and, the institute is not only a physical link between the Basic Science and Research buildings, it's also a place where researchers and

clinicians can collaborate.

The \$20.4 million institute began with a gift of \$5 million from Jean and Howard Vollum to support its research,

and the building was funded by a \$20 million federal appropriation attributable to the statesmanship of Sen.

(continued on next page)



Just days after receiving a new heart on April 27, Jeremy Koertje enjoys a brownie at Doernbecher Children's Hospital. Treated for cardiomyopathy and congestive heart failure, 23-month-old Jeremy is Oregon's first child to receive a heart transplant and among only 50 recipients worldwide under age 10. The Doernbecher Children's Hospital Guild is helping more miracles happen at Doernbecher. Guild donations are received through events such as the Children's Miracle Network Telethon, which raised more than \$710,000 for Doernbecher on May 30 and 31. This support will help the hospital purchase state of the art pediatric equipment and improve Doernbecher facilities.

Tribute to Dr. Edward Herbert: a brave adventurer

Comments by President Leonard Laster before the Oregon State Board of Higher Education on February 20, 1987, the day after Ed Herbert died.

Some years ago, Dr. Aaron Novick, from the University of Oregon, told me that his institution was about to lose one of the outstanding members of the faculty to an Eastern university. Out of that conversation came a landmark decision by the Oregon Health Sciences University and Dr. Edward Herbert that Herbert would become the first director of the OHSU's Vollum Institute for Advanced Biomedical Research.

Ed Herbert should be a source of infinite pride to all who are concerned with higher education in Oregon because his outstanding professional career flourished and blossomed in the state's system. He became one of the country's leading researchers on the use of the new science of molecular biology to study the workings of the brain and nervous system. He was one of perhaps four or five of his professional ilk and skill in the country, but in my judgment this achievement pales in relation to his other attributes. He was a talented and devoted teacher who inspired and encouraged young students. When re-



Dr. Edward Herbert

search trainees leave their first laboratory, some mentor scientists insist that the trainees not take their notebooks with them and that the project should stay behind. These mentors argue that the work belongs to the laboratory. In sharp contrast, Ed Herbert would say, "Take the ideas and the work and go out and flourish. If you ever need my help, I will always be there for you; all I want is that you become another

good scientist." No wonder then, that his students loved and respected him in the extreme.

He was a brave adventurer. Thanks to the opportunity created by the university, by Howard and Jean Vollum, and by Sen. Mark O. Hatfield, he was able to begin a new research enterprise that is virtually one of a kind in the country. The institute is a center where bold new explorations of the human mind will take place. In the short time that the institute had been open, Ed Herbert recruited talented scientists from many first-rate institutions who all remain to continue the directions that he set in place. They are committed to the traditions he established and to the quality of science which was his hallmark. The institute is taking its place nationally as an outstanding center and it will continue to thrive and nurture great achievements in the decades to come.

Several years ago, Harvard University made Ed Herbert an offer he *could* refuse. He did so and came instead to the Oregon Health Sciences University. Yesterday, he received an offer he *could* not refuse. After months of struggling against cancer, Ed died, and we are all infinitely diminished by his loss.



At press time . . .

On Aug. 12, Dr. Leonard Laster announced his resignation as president of the Oregon Health Sciences University, effective Nov. 1. He will be accepting an appointment as chancellor of the University of Massachusetts Medical Center in Worcester, Mass. A future issue of the OHSU News will highlight Laster's nine-year leadership of the university.

Morris donates artwork

Four acrylic paintings, a surprise gift to the university, trumpet brilliant hues of red, blue and yellow across the quiet surroundings of the university's Auditorium. Grandiose in size, concept and color, Carl Morris' latest contributions to the OHSU shout their existence to those seated in the lecture hall.

They are an extension of a family of paintings called "Intersecting Light" permanently hung in the recently opened Vollum Institute for Advanced

Biomedical Research. All paintings echo a similar theme: the companion spirit between art and science.

When Morris is asked why art and science parallel one another, he says "they are not too far apart. It is a question of what medium you use to search for the unknown." He compares the start of each of his paintings with the start of a scientist's research project. "If a scientist thinks he knows what he is looking for and then sees something not expected, he may have made a great discovery." Morris says he thinks he knows his direction when he first

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Institute

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Mark O. Hatfield. Since then, the M.J. Murdock Charitable Trust has given \$1.8 million for startup funds, and some private industries are also considering investments in research programs. To help with operating costs, Howard Vollum bequeathed stock valued at \$14.2 million (see story, below). Significant research funding also comes from the National Institutes of Health.

Currently about 60 scientists work in the 67,000-square-foot institute. At full capacity, there will be 140 (including other staff members). To understand more about the work of these scientists, please see the special research section in this issue.



Vollum's final IABR legacy

When Howard Vollum died in February 1986, he left the OHSU a final legacy: 398,960 shares of Tektronix stock. Vollum and M.J. Murdock co-founded the Beaverton electronics firm in 1946. The stock, which accrued \$76,000 in earnings while Vollum's estate was in probate, recently sold for \$14.2 million.

Vollum stipulated that the money be used to help defray the expenses of the OHSU's new Vollum Institute for Advanced Biomedical Research. These expenses may include endowed chairs for distinguished professors, research equipment and other purposes deemed

appropriate by the university president.

During Vollum's life, he and his wife Jean contributed gifts of \$6.25 million to the institute to cover initial planning and for the related atrium.

"The Vollums have ensured an extraordinary opportunity for Oregon," said OHSU President Leonard Laster in announcing the final contribution. "For decades to come, the institute will serve as a site of research on the workings of the human brain. It is a sad moment that Howard Vollum is not with us to share the excitement of what is happening, but his spirit and memory will live with us through the ages."



Guests at opening ceremonies for the Vollum Institute for Advanced Biomedical Research include (clockwise from bottom): OHSU President Laster with NIH Director Dr. James Wyngaarden (left) and Dr. James Shannon, former NIH director; Oregon Gov. Neil Goldschmidt, in panel discussion; OHSU Director of Facilities Planning Gordon Ranta, artist Carl Morris and Assistant Vice President for Facilities Management Ralph Tuomi; and principal designer for the institute, Bob Frasca of Zimmer, Frasca Partnership.

Witter, hospital director, focuses on long-range strategy

David Witter assumed the reigns of University Hospital in January with his eye toward a well-planned future.

He sees a future equipped to meet the rapidly changing demands of the health care industry and the OHSU's growth in research and education.

The new director brings a strong background in hospital management, financial and long-range planning to the position. He's been quietly but steadily building these strengths since arriving 14 years ago as University Hospital's first fiscal officer. And, as interim hospital director since July 1985, he began with a head start on the job.

Witter has two top priorities as hospital director: continue planning and implementing long-range strategies to revitalize the hospital complex; and, review the efficiency of the hospital's organization and structure. "We need to look at the mix of our programs as a full-service tertiary care hospital," Witter says. "And, we need to ensure that the hospital not only supports university programs, but also serves as a modern health care resource for people in the entire region," he says.

As interim hospital director, Witter was instrumental in several major accomplishments. These include finalization of the 10-year master plan for University Hospital and Clinics; the Capital Development Plan (the initial portion of the master plan currently under way to improve patient care facilities over the next two years);



David Witter

increased hospital census; and, cost containment efforts to reduce hospital operating expenses.

Witter came to the OHSU in 1972 after working as a private consultant, assistant business manager and economics instructor at Portland State University. A 1964 PSU graduate, he received his master's degree in economics from Washington State University in 1970.

"When I came to the OHSU, we had four separate accounting systems — for three hospitals and an outpatient clinic," says Witter, who quickly went to work

consolidating these systems and streamlining other budgeting procedures.

Before becoming deputy hospital director in 1980, Witter served as director of fiscal services from 1976 to 1979. He consolidated accounting systems, installed an itemized billing procedure and began monthly management reporting of statistical and financial data.

"A decade ago, two-thirds of our hospital space was devoted to beds and rooms, the rest to diagnostic and therapeutic services," he says. "Today, the ratio is reversed because with better diagnosis and therapy, patients are spending less time in the hospital. Improvements in the Capital Development Plan, which include increased patient parking space and an off-campus warehouse, are geared to this shift."

Witter also noted that within the next two years, outpatient care will be expanded in University Hospital North and tertiary care will be consolidated in University Hospital South.

Helping the OHSU usher its research developments from the lab to the hospital is especially rewarding for Witter. "We've been at the leading edge of several medical advancements," he says, noting that since the 1970s at least one research lab per year has been converting findings into new patient care procedures or treatments.

Keeping an important tradition alive is also critical to the hospital's future, Witter says. "Being caring to all people — rich or poor — is a tradition for which this hospital is known. And it will be known for this in the decades to come."

Nursing school gets highest rating

The OHSU School of Nursing has been awarded the highest accreditation possible from the National League for Nursing.

The 18-member NLN panel unanimously voted to accredit the school for eight years. Headed by Dr. Dorothy Block, University of Colorado professor, the NLN site review team visited the school in March to verify progress made since the last accreditation was granted in October 1980.

"The top accreditation is a culmination of hard work among many people here," says Dr. Carol Lindeman, nursing school dean. "We have made significant progress in faculty development, research programs and graduate level education." Lindeman also credited university administration and faculty members who pulled together to strengthen the master's degree curriculum and develop the doctoral program in 1985.

Biomedical research has a thousand faces at the Oregon Health Sciences University.

It is the young scientist who uses the computer to scan the contours of a gene, or the assistant professor who analyzes blood samples.

It is the faculty member who explains quantitative methodology to a group of medical students, or the physician who pulls away from her busy practice for a couple of hours to work on a pet project.

It is the retired department chairman who returns as an emeritus faculty to doggedly pursue his interests or the medical student who is puzzled about a cancer cell.

Biomedical research is also a field exploding with progress in the lab and at the bedside. This special insert of "OHSU News" focuses on research activities at the OHSU. The following stories shed light on research being conducted here, why a vigorous research program is important to a university and its community, and how research affects the economy.



The Oregon Health Sciences University

NEWS



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Research essential to education, patient care

Jacob Bronowski, mathematician and author of "The Ascent of Man," once wrote that "the most remarkable discovery made by scientists is science itself." What they discovered was a process, the process of scientific research — an organized way of exploring nature.

By asking a question, thinking of possible answers then running experiments to see which answer comes closest, scientists establish facts and analyze their significance. Without research, health care advances would be impossible. Imagine a society without vaccines, or surgery without anesthesia. These and thousands of other health basics were products of research.

A vigorous research program is also essential to the top-notch educational program. "Research is not an added luxury in an academic health center," says Dr. Leonard Laster, OHSU president, "but an essential component in the training of the physicians, nurses, dentists and allied health professionals who are going to be taking care of your children in the years to come."

Research improves patient care by keeping university practitioners in touch with the latest developments in the fields it serves; research imbues its students with a love of learning needed to help choose the worthwhile from the worthless in today's blur of new developments in diagnosis, prevention and treatment; and, it raises the stature of the institution, making it an exciting place to be for everyone associated with it.

Research is also a major contributor to Oregon's economy (see boxes below). Last year, the OHSU received funding from 23 federal agencies including the National Institutes of Health, National Aeronautics and Space Administration, Bonneville Power Administration and the Office of Naval Research.

Thirty-six private sources — associations, foundations and industry — provided about \$4.4 million. OHSU scientists also receive funds from Maryland, Montana, North Dakota, Washington

and the province of Alberta, Canada. OHSU research encompasses all three forms of research: basic, clinical and applied. Basic researchers seek the fundamental causes of things — for instance, what biochemical changes occur in cells when the body goes into shock? Or, what factors allow a bacterium to survive and grow in the human blood stream? Most basic research occurs in the laboratory and does not involve use of human subjects.

Clinical research often follows basic research. It investigates the course, cure and control of human disease by observation and treatment of patients. Many patients who volunteer for clinical studies do so to receive treatment unavailable elsewhere. All new drugs or therapies are accepted for medical use only after first being tested on human volunteers.

Applied research focuses on meeting a specific need, using both clinical and basic research findings. Development of a vaccine to treat AIDS is a good example.

Research is conducted in each of the OHSU's three schools — dentistry, medicine and nursing — and in the new Vollum Institute for Advanced Biomedical Research. Stories elsewhere in this supplement detail the various research programs.

Collaborative research, which can be some of the most productive because it brings together researchers of different talents, is nurtured on the Hill. "Interdisciplinary research doesn't just happen, it must be created deliberately," says Laster. Collaboration is gaining more and more attention, Laster says, because "labels we're giving to science are becoming meaningless. For instance, molecular mechanisms and genetic control affect every organ of the body and relate to every disease imaginable. As an example, neurotransmitters, which carry messages from one brain cell to another, have been discovered in the heart. What are they doing there? The barriers among disciplines are diminishing, so therefore it's impor-

tant for a molecular biologist to talk to a neurologist."

Cooperative studies are frequent among researchers in the various schools, Vollum Institute, Veterans Administration Medical Center, Oregon Regional Primate Research Center, Neurological Sciences Institute at Good Samaritan Hospital and Medical Center, and the Shriners Hospital for Crippled Children.

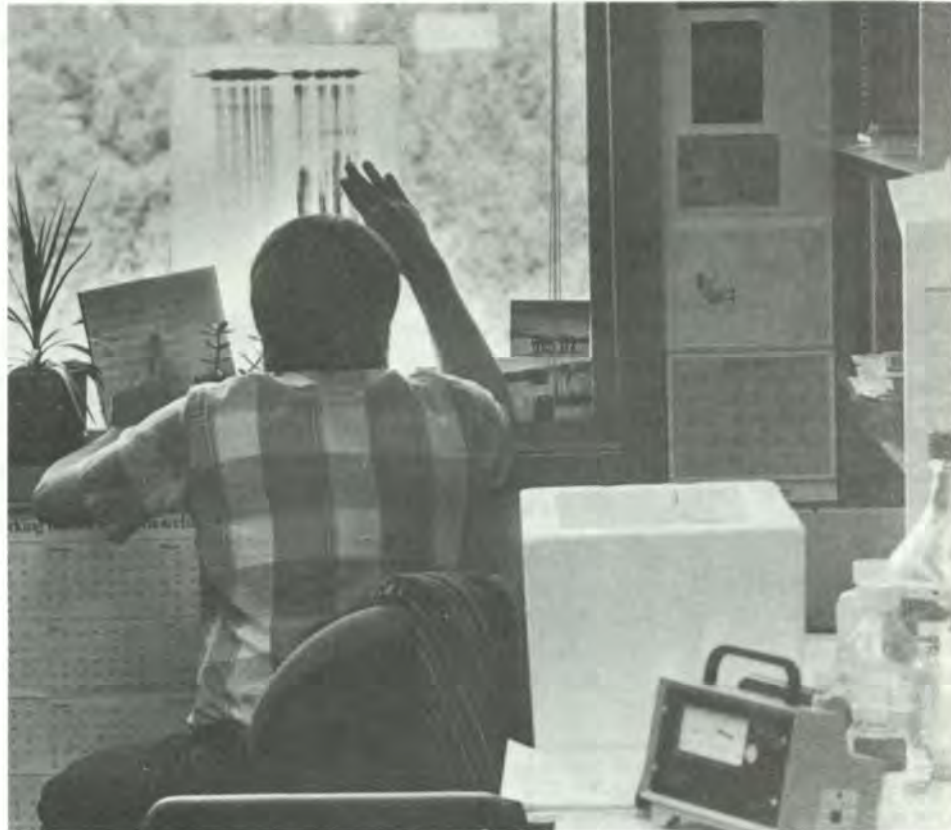
Research at the OHSU also enriches

only to the knowledge in the community, but they bring people here, people of outstanding calibre who will replenish the cream of the crop in the region."

The commitment continues

The OHSU commitment to research will continue in the future. Two of the major projects underway include:

- The computer-based Biomedical Information and Communications Center will make the latest infor-



Biomedical research is part of life in dozens of labs and offices throughout the OHSU campus. In a candid scene above, Dr. Michael Ubler uses his office window in the IABR to check an autoradiogram showing a sequence of DNA.

the community in general. The annual Marquam Hill Lectures give OHSU scientists an opportunity to explain the latest research and health care advances to the community. Other programs that bring the latest in research information into the community include the Research Convocation, and the medical and nursing student research forums. To reach the health care community, the OHSU provides such services as Continuing Medical Education programs and weekly grand rounds.

"You create a tide of excellence flowing into the community that but ultimately better laboratory work but ultimately better clinical care," Laster says. "For instance, we have people working at the fundamental levels of cancer and heart disease, and they contribute not

mation available to researchers. Users of the BICC might range from the OHSU's basic researchers, to practitioners throughout the region.

- \$18.4 million Regional Eye Center, the first of its kind to house state, local and Veteran's Administration eye treatment programs under one roof. The center will focus on developing new techniques to prevent and treat eye disease.

Ground-breaking is scheduled for next spring.

Through its expanded research program, the OHSU promises to remain a vibrant place to work, a place that will provide the latest in health care, and attract students and world-class scientists alike.

Research grants exceeding \$1 million

• Essentiality of Dietary Omega-3 Fatty Acids	\$1.1 million
• Respiration During Development	2.9
• A Model of Acute and Reactive Airway Disease	1.2
• Calcium and Hypertensive-Cardiovascular Disease Research	1.1
• Epidemiology of Mental Disorder in American Indian Children.	1.5
• Mechanism of Injury and Repair in Ischemic Stroke	2.8
• Dietary Lipids	2.8
• Cardiac Arrhythmia Treatment Study	1.2
• Molecular Studies on Opioid Peptides	1.1
• Vasopressin Pathways and the Pituitary-Adrenal System	1.1

Funds boost economy; increase 72 percent since 1985

The economic benefits of a vigorous biomedical research program on Marquam Hill follow a path as winding as Sam Jackson Park Road, paying dividends at every turn.

Laboratory research at the OHSU pays off in a variety of ways: It attracts students to the university, improves patient care, and brings millions of dollars into Oregon.

In 1987, research proposed by scientists will bring in \$22.3 million, an increase of 72 percent over 1985. From each of these dollars, 85 cents went toward salaries that, in turn, were used to purchase goods and housing, and pay taxes. A conservative estimate of the multiplier effect means that the OHSU returns about \$10 into Oregon's economy for every \$1 in state taxes it receives.

In addition, due largely to the proximity of the OHSU, the Veterans Administration Medical Center has a research program that brings an additional \$12-13 million a year in outside money. Sim-

ilarly, the Shriners have devoted the top floor of their hospital to research and bring in approximately \$1.5 million to support their institution.

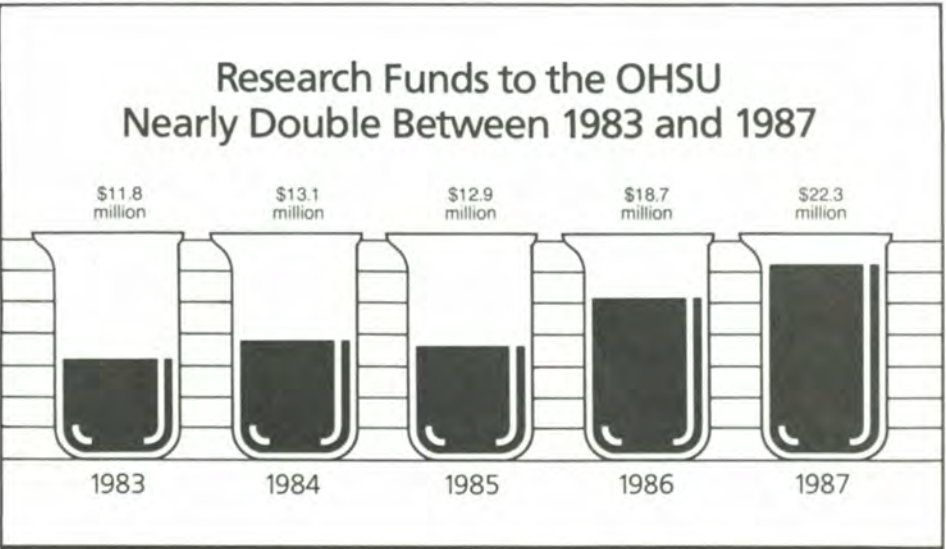
An investment in top-quality research establishes a standard of excellence that

attracts students to its classrooms and world-class researchers to its laboratories. And when researchers transfer a laboratory from one institution to another they are often accompanied by a coterie of laboratory personnel that

may include graduate and post-doctoral students and research assistants. Last year, the OHSU's 2,000 students and residents spent nearly \$3.8 million in educational expenses (not including housing, rent and other necessities).

The economic benefits of research also extend to the home, to the examining room of the family physician, and to the bedside of the hospital patient. The goal of biomedical research is to prevent illness, says Dr. Leonard Laster, OHSU President, "and if we can't prevent, to cure. And if we're going to cure, to cure definitively." But does this drive the cost of medical care up or down? While new technology sometimes seems to increase the cost of medical care, the ability to diagnose earlier and more definitely reduces both hospital and recovery time.

Other advances in research unquestionably reduce medical costs. The technique of angioplasty, using catheters to clear clogged arteries, was devel-



Vollum Institute explores brain at molecular level



The Vollum Institute for Advanced Biomedical Research holds the bright promise of unlocking some of the brain's mysteries.

The brain is a marvelous collection of 10 billion neurons that together hold all the potential — the learning, memory, creativity, thought and coordination — of which a person is capable. When it works well, humans can write a symphony, build a cathedral or dance a ballet. When it fails, it can break the spirit, destroy a life, shatter a family.

Treating the brain has been one of medicine's most complex challenges because knowledge of the brain's subtle machinery has been difficult to achieve. Today, however, researchers such as those at the OHSU's new Vollum Institute for Advanced Biomedical Research are using advanced techniques — and working with colleagues across the OHSU campus — to gain a fundamental understanding of how and why neurons behave the way they do.

On each of its four laboratory floors, the Vollum Institute is a research center devoted to studying the neuron at the

molecular level. In routine use are the latest and most sophisticated equipment and methods including recombinant DNA and gene transfer techniques; isolation, sequencing and mapping of genes and proteins; and use of monoclonal antibodies to determine with great accuracy whether particular molecules are present within a cell.

Equipment and methods are only half the story, however. Research is conducted by people. And top-notch research is conducted by people who possess an unbridled enthusiasm for science, an enthusiasm nurtured by an atmosphere of collaboration, free inquiry and the open exchange of information. Such an atmosphere has been established by Drs. Leonard Laster, president of OHSU, and Edward Herbert, the first director of the institute. Herbert, who died in February, shared Dr. Laster's visionary outlook of the field of neurobiology, commitment to interdis-

ciplinary research, and desire to bring together the clinician and the scientist doing basic research.

Cooperation is the watchword at the Vollum Institute. Research teams there coordinate their attention to understand the synapse, the site at which an impulse shoots from one nerve cell to another. The synapse is one of the most important areas of the nervous system. It is the site at which drugs act and where breakdowns in nerve action occur. At the synapse, one neuron releases a specific chemical messenger — a neurotransmitter — that bridges a minute gap and triggers an electrical response in a second neuron.

A fundamental understanding of neurotransmitters holds enormous promise. It will reveal how the brain works and how it is affected by such conditions as schizophrenia, depression, and drug addiction. It is critical to understanding such diseases as Alzheimer's, Parkinson's and Huntington's.

Vollum Institute research teams are tracking neurotransmitters from gene to synapse and beyond: how they are produced, modified and released by the first neuron; how they are detected and initiate an impulse in the second neuron.

The Vollum Institute's emphasis on molecular biology is fostering new collaboration — joint experiments and shared lab space — among scientists in various departments of the School of Medicine, including:

— **Biochemistry:** Biochemists study the chemistry and molecular structure of proteins, sugars, fats and nucleic acids. Several research projects in conjunction with work at the Vollum Institute are already under way. For example, Dr. Daniel Shih, research assistant professor of biochemistry, uses segments of DNA that correspond to part of the hemoglobin gene. These segments, tailor-made by colleagues at the institute, are used to make mutations of the hemoglobin molecule to study how hemoglobin binds oxygen. The institute also has a machine, a protein microsequencer, that automatically determines the amino acid structure of proteins. These analyses are provided as a service to biochemistry and several other departments.

— **Microbiology and Immunology:** Molecular biology is an outgrowth of microbiology. Microbiology studies how bacteria and viruses grow, develop and cause infection; immunology focuses on how the immune system develops, how antibodies are made, and how cells of the immune system provide protection against disease. Both areas frequently work at the molecular level, and every lab in the department employs molecular biological techniques. Three new faculty, a molecular immunologist, a molecular parasitologist and a molecular virologist, will have joint appointments in the Vollum Institute and in microbiology and immunology.

— **Medical Genetics:** Developments in molecular biology will find some of their most exciting applications here. The molecular basis for such inherited and incurable conditions as Alzheimer's disease and muscle wasting due to defective mitochondria will be explored. Already, specific strands of DNA, called DNA probes, are used to locate particular genes on a chromosome. A DNA probe that matches a defective gene can be used to determine if that defect is carried by a prospective parent. University cytogeneticists — who specialize in chromosome behavior — are using cloned genes and DNA probes provided by colleagues in the Vollum Institute.

— **Cell Biology and Anatomy:** The interactions by researchers here with those at the institute are "numerous and daily," says department chairman Dr. Bruce Magun. "We use them as a general resource for recombinant DNA

technology." They also obtain from them a variety of DNA probes. Drs. Felix Eckenstein and Rae Nishi are looking at the effects and regulation of nerve cell growth factors on neurons in cell culture. They, in turn, provide cultured cells and tissue culture techniques to Vollum Institute researchers.

— **Physiology:** Several faculty in the Department of Physiology are collaborating with colleagues in the institute. Drs. Oline Ronnekleiv and Martin Kelly, assistant professors of physiology, are collaborating with Drs. Jim Douglass and John Adelman at the Vollum Institute to study the influence of gonadal steroids on the processing of gonadotropin-releasing hormone, a neuropeptide in mammals.

— **Neurology:** OHSU neurologists are involved in studies of stroke, Parkinson's disease, epilepsy, spinal cord regeneration and Alzheimer's disease — interests that parallel those of Vollum Institute scientists.

Closely tied to both the institute and the neurology department will be a research program on brain imaging — a goal of President Laster's. With the recent appointment of Dr. John Howieson as head of diagnostic radiology and the addition of a new magnetic resonance imaging machine, the OHSU has taken the first steps in meeting this goal.

The nucleus of neuroscience research in Portland also includes such university-affiliated programs as the Veterans Administration Medical Center and the Oregon Regional Primate Research Center, and the Neurosciences Institute at Good Samaritan Hospital.

The primate center plans to establish a division of neurobiology and has recruited five scientists, including a developmental neurobiologist to head the group. The new division will form a key link between neuroscientists doing basic research and those involved in human studies. Dr. Vaughn Critchlow, ORPRC director, says that very little work is being done in the U.S. on primate neurology, and that the new division will enhance current knowledge of primate reproductive biology by increasing the understanding of how the brain regulates reproduction.

At the VAMC, some 10 scientists will make use of the resources available at the Vollum Institute. Among them are Dr. Fredrick Seil, director of the VA's Office of Regeneration Research Programs and professor of neurology at the OHSU. Seil and his research team are examining mechanisms by which certain nerve cells in the brain establish new synaptic connections to compensate for missing neurons. This work may someday have clinical application for trauma victims suffering nervous system damage.

Opportunity, a chance for surprising new insights and fresh approaches to all manner of vexing medical problems, that is the real promise of the Vollum Institute for Advanced Biomedical Research. And all of medicine will benefit.

Each dollar yields \$10-\$16 return (continued from page 2)

oped at the OHSU and has provided thousands of patients with an alternative to heart surgery; the Starr-Edwards heart valve, also developed at the OHSU, has returned thousands of others to the workforce who otherwise would have been permanently debilitated. In addition, the development of new drugs and technology creates both jobs and products for export.

It leads to jobs right here at home, also. Despite the downturn in construction in Oregon during the past few years, the OHSU's expanding research and patient care programs have over the last five years created more than \$200 million in new construction projects that have employed some 700 construction workers. Projects include the \$20.4 million Vollum Institute for Advanced Biomedical Research and the \$137 million Veterans Administration Medical Center. The OHSU and the VAMC were both instrumental in attracting another major building to Marquam Hill — the recently completed \$20 million Shriner's Hospital.

In addition, funds have been allocated for three other major research-related facilities: the \$18.5 million Regional Eye Center for research on and treatment of eye disease, the \$20.4 million Biomedical Information Communication Center, and the \$4.7 million Oregon Hearing Research Laboratory. Future plans also include construction of a center to help advanced biomedical technology make a timely transition from lab bench to clinical practice. Here, bioengineers will work side-by-side with clinicians.

Overall, an investment in biomedical research yields a good return. According to Dr. Selma J. Mushkin, author of *Biomedical Research: Costs and Benefits*, every dollar invested in biomedical research between 1900 and 1975 returned \$10 to \$16, measured in increased productivity due to longer life and less illness. With such research projects underway as the treatment of depression with light, and an antiseptic artificial skin for burn victims, the OHSU will be doing its part to keep this investment a sound one.

FOCUS ON RESEARCH Supplement to the OHSU News August 1987

THE OREGON HEALTH SCIENCES UNIVERSITY

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Groups protect people, animals, environment

The OHSU has several committees whose sole responsibilities are to protect the rights and safety of people and animals who participate in research projects, and to safeguard the environment from potentially dangerous substances. They also help university researchers meet a multitude of state, federal and institutional regulations. The work of four of these committees is described below and on page 5. They are the Human Research Committee, the Animal Care Committee, the Institutional Biosafety Committee and the Radiation Safety Committee. The memberships include a cross section of the health related disciplines and frequently individuals from the public at large.

Human Research: ethical progress

If you volunteered as a research subject, would your rights be protected? Could you back out? Is there something they don't tell you?

The Human Research Committee is a little-known but important part of research at the OHSU. This 19-member group protects the rights of people who participate in experiments or studies.

With 800 of these research projects currently under way on campus, the OHSU conducts most of the state's research involving humans.

Institutions receiving federal grants for research must comply with federal and state regulations regarding human rights. (The National Institutes of Health and Federal Drug Administration are the major regulatory agencies.) The OHSU goes one step further: All studies involving human subjects, regardless of funding sources, must be reviewed and approved by its Human Research Committee.

Studies range from drug tests for the FDA to new pacemakers and experimental cancer treatments. Even projects using FDA-approved drugs must be endorsed by the committee, if drug usage or dosage is different from its original intent.

The human rights issue came to light after the Nuremberg trials in which evidence of Nazi atrocities during WWII led to the 1949 Nuremberg Code of Ethics for medical research. Subsequent regulations further strengthened human

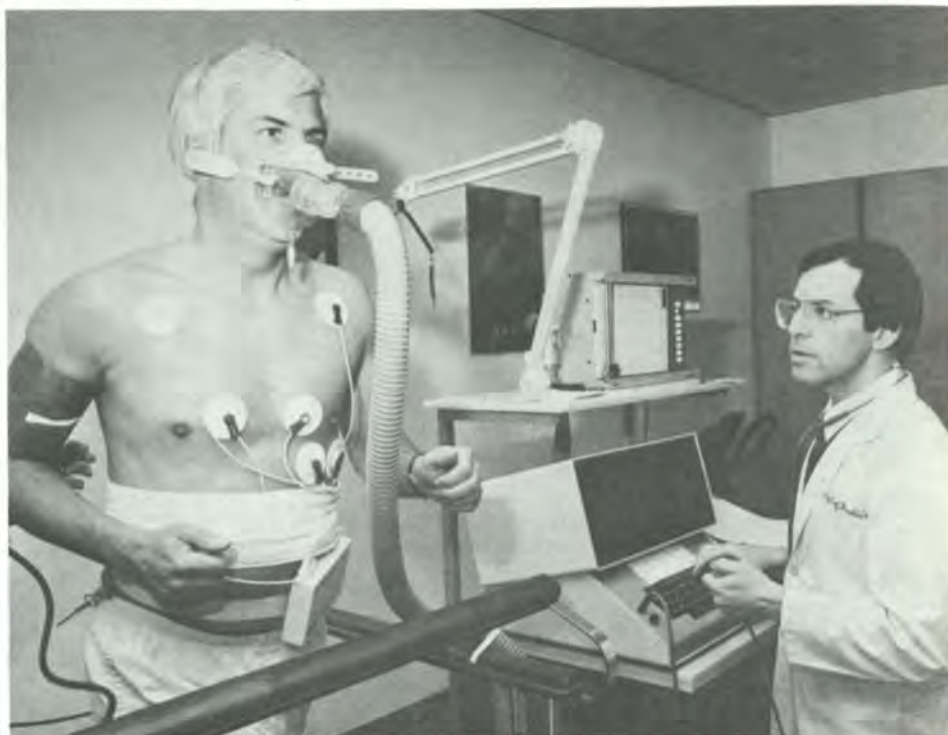
rights and in 1966, local review boards such as the HRC were mandated by the federal government to serve as watchdogs for these regulations.

The OHSU's Human Research Committee is chaired by Dr. Bernard Pirofsky, professor of medicine and microbiology. Committee members serve on a voluntary basis and represent a cross-section of human health disciplines. Public members include a minister and an attorney. The OHSU Office of Research Services handles administrative tasks.

"Our primary responsibility is to ensure the protection of human rights by reviewing proposals and making sure the researchers understand them," says Pirofsky. "Then they can make informed decisions about whether to participate. Our goal is to balance moral and ethical concerns with scientific progress."

A subject's understanding of the process and risks involved is indicated by his or her signature on a form, commonly called the "informed consent." This comprehensive document is given to each subject before research begins. It details the study or experimental treatment, its possible side effects and alternative treatments for the disease. It also explains the subject's legal rights, assures confidentiality and allows the subject to withdraw at any time.

Pirofsky notes that Oregon has some of the most complete and stringent



The OHSU performs a multitude of research projects involving human volunteers. In the Human Performance Lab, Dr. Linn Goldberg (right) uses a computerized expired-gas analyzer to study how well the heart and lungs work during a treadmill test.

human research regulations in the nation, and the OHSU investigators closely adhere to them. "Ethics and science naturally go hand-in-hand at this institution because of its dedication to patient care as well as research," he says.

The HRC has tremendous responsibility because it must review *all* research involving humans, regardless of the project's funding source. "The university's research is so complex, so pervasive that these additional responsibilities have been deemed

essential," says Pirofsky. "That's also why we have 19 members when the requirement is only five. And, we meet more often than required because of the volume of research here."

"Every study is unique," he adds. "The committee discussions are fascinating because we're always testing ourselves morally, ethically, scientifically. We have to constantly ask, 'is it worth the risk?' Although it taxes your capacity, it's tremendously rewarding. After all, we're protecting a simple, but intrinsic ideal — human rights and dignity."

Animal Care: justifies procedures

The OHSU's Animal Care Committee has been revised in scope and purpose to help researchers comply with new federal regulations issued under the Public Health Service Act of 1986.

Since January 1986, a 15-member committee has been reviewing research protocols (proposals) to assure the humane treatment of animals involved in research. Researchers using animals in their studies are required to submit proposals to this committee, which also has the authority to suspend research not being conducted within federal and university guidelines.

Chaired by Dr. Chris Cunningham, associate professor of medical psychology, the group reviews research protocols to make sure procedures will avoid or minimize discomfort, distress and pain to animals, consistent with sound research design. Members include representatives from medicine, dentistry, the OHSU's Animal Care Department and top management staff. A public representative, whose profession is nonscientific, is also a committee member.

"All procedures must be fully described and justified in the research

proposal submitted to the Animal Care Committee," Cunningham says. "For instance if a procedure will cause pain, pain killers must be given to the animal. The only exception would be if the use of pain killers interferes with the scientific aims of the study, and no other research procedures exist other than through the use of animals."

Congress revised the Public Health Service Act in 1986 to require that institutions receiving NIH grants implement stricter controls to guard against animal misuse. "We've had an animal care committee long before this legislation. Members met four times a year to discuss facility maintenance, management and budget," Cunningham says. "Now we meet once or twice a month and last year reviewed about 200 protocols. Since this is all relatively new, a major part of our role is to educate investigators on the new regulations."

Researchers today try to minimize or avoid the use of animals whenever possible. "In the field of human health, it is impossible — at this time — to avoid the use of animals for some research projects," Cunningham says.

Behind the research scene

As she perused the latest issue of "Commerce Business Daily," the wants of the federal government, Linda Gayamat, director of the Office of Research Services, noticed that the National Institute for Dental Research was looking for researchers to test intravenous pain killers given to dental patients.

She knew Dr. Jastak in the School of Dentistry would be interested in that. Anyone else? Gayamat checked the office's computerized "faculty interest file," in which she keeps the research interests of 500 faculty members. Sure that she hadn't overlooked anyone else who might be interested in the project,

"Our number one priority is to look for funding opportunities and then send the information to the faculty."

she sent Jastak a note and a copy of the announcement.

"That's our No. 1 priority: to look for funding opportunities and then send the information to the faculty," says Gayamat, whose office is housed on the second floor of MacKenzie Hall.

Although she refuses to accept any credit for it ("We're low key here"), research funding at the OHSU rose 44 percent last year over 1985, and the services provided by her office may well have contributed to the increase. Over 75 percent of the research at the OHSU is federally funded, about 17 percent comes from private sources, and eight percent is from state and local governments.

With more than 100 possible sources of funding for medical research, no one scientist could possibly keep track of them all. They include such diverse organizations as the federal National Institutes of Health, the Robert Wood Johnson Foundation, the American



Linda Gayamat

Cancer Society and the Procter and Gamble company. Without knowing when and where funds are available, a researcher's work could grind to a halt.

Gayamat, however, keeps a vigilant eye on Commerce Business Daily, The Federal Register and a half dozen other subscription publications that announce research funding. Then there are the dozens of newsletters from foundations,

trusts, nonprofit organizations, pharmaceutical companies and other corporations. "Some organizations send invitations for proposals. If you don't get an invitation you can't apply," she says. The Chicago Community Trust — Searle Scholars Program supports an OHSU researcher studying the use of light to treat depression.

Research funding comes in the form of grants or contracts. Grants support research suggested by the scientist; contracts fund research requested by a sponsor to answer a specific question or solve a specific problem.

There are other differences between grants and contracts as well. Grant

application deadlines are generally known well in advance. NIH, for example, has three deadlines per year. Contracts, on the other hand, can be announced daily by the federal government. When a likely project shows up, the researcher — or Gayamat's office — must send for a "Request for Proposal," or RFP, which describes the project in detail.

A 100-page RFP may have only six or ten pages that describe the research; the remaining pages of single-spaced text contain complicated instructions, restrictions and requirements. For the experienced and uninitiated alike,

(continued on page 8)

Radiation: safe working practices

What do diagnostic radiology, radiation therapy, nuclear medicine and molecular biology have in common? All use various forms of high energy radiation — X-rays or nuclear radiation emitted by radioactive atoms — for research or for the diagnosis and treatment of disease.

X-rays permit diagnosis of such things as bone fractures, joint problems, stomach ulcers, kidney stones

and cancers of the lung or breast. A CT scanner, an X-ray machine teamed up with a computer, can pinpoint soft tissue tumors and notoriously difficult-to-locate brain tumors.

Nuclear medicine traces the movement of a radioactive substance to examine the function of liver, heart, kidneys, brain, lung and thyroid to detect deep abscesses and to follow the recovery of transplant patients.

Radiation therapy uses high-energy radiation to treat cancers. Radioactive cobalt and X-rays many times more intense than those used for the typical chest radiograph are used to kill cancer cells. Some cancers, such as tumors of the cervix, prostate and tongue, may be treated by implanting radioactive sources into the tumor to kill cancerous cells.

Molecular biology — and almost every other area of biology — has benefited from the use of radioactive substances. Today researchers have a basic understanding of how cells, genes, bacteria and viruses work at the molecular level thanks to the use of radioactive forms, or radioisotopes, of carbon, hydrogen and phosphorus. Modern biomedical research laboratories — including those at the OHSU — could not continue to build on this understanding without them.

At the OHSU, the use of instruments and substances that emit high-energy radiation for all these purposes is overseen by Dr. Lawrence Winans, radiation safety officer, and the 10-member Radiation Safety Committee.

Winans administers the university's radiation safety program. He and his staff of two full-time and three half-time people are, in turn, advised by the Radiation Safety Committee. "They are the scientific guiding body for the Radiation Safety Office," says Winans.

The Radiation Safety Committee, chaired by Dr. Robert Koler, professor and chairman of medical genetics, has been a university-wide committee since the 1940s when isotopes were first used on campus. The committee, together with the radiation safety officer, formulates regulations and procedures that

provide effective protection for the staff, the public and the environment. The regulations and procedures meet standards set by state and federal agencies, and by the Joint Commission on the Accreditation of Hospitals.

Any use of radioactive materials must be authorized by the Radiation Safety Committee. "We review every research project that involves the use of radioactive materials," says Winans. "We also review the qualifications of the person who wants to do the project and the training of those who will be handling the radioactive materials."

In addition, the committee reviews reports from the radiation safety officer on such things as the results of annual and surprise inspections by state inspectors and any incidents that occur during use of radioisotopes or X-ray equipment. The committee also advises the university president on matters pertaining to the safe use of radioactive materials on campus and provides technical advice as needed to OHSU administrators. It can revoke authorization to use radioactive materials, if necessary, to stop unsafe practices.

To ensure that sources of radiation are being used safely, Winans and his staff provide training in the proper use and handling of radioactive materials and administer a film badge program that monitors the radiation exposure of some 700 physicians, clinical technologists and laboratory researchers. It also oversees the purchase, delivery, storage and disposal of radioactive materials used on campus, says Winans. "We very closely monitor the handling of radioactive materials with an eye toward the day to day safety of workers, the public and the environment."



Precautions must be taken in the lab when using radioactive materials. Jim Douglass, assistant staff scientist in the Vollum Institute for Advanced Biomedical Research, has a veritable arsenal of protection: coat, gloves, monitoring badge and ring, plexiglass splash shield, eye glasses, disposables receptacle, marked containers, Geiger counter. Although not pictured, a radioisotope log book is nearby.

Biosafety: checks DNA research

Twenty-five years ago the idea of using bacteria to manufacture human growth hormone, necessary to prevent dwarfism in children lacking the natural hormone, would have seemed ridiculous. But recombinant DNA has made it possible.

Recombinant DNA is the name given to the genetic material that results when DNA is removed from one species of plant or animal and is placed into the chromosome of a different species, generally a virus or bacterial. In the case of human growth hormone the process went something like this: First the gene for the hormone had to be located, removed and isolated from the human chromosome and inserted into the bacterial chromosome. Then the bacterium had to be tricked into activating the human gene and producing the hormone. When cultured by the vatful, the bacterium churns out human growth hormone more purely and cheaply than ever before possible. Other drugs, now expensive and hard to obtain, will someday be produced in similar fashion.

In addition, recombinant DNA has hundreds of applications in basic research. At the OHSU, researchers in biochemistry, microbiology, immunology, cell biology, and molecular biology use recombinant DNA technology. University researchers use it to locate defective genes on human chromosomes, and to study the structure and function of genes responsible for certain neurotransmitters. One group uses it to alter the structure of hemoglobin molecules to see how the alteration affects their ability to carry oxygen. Not long ago such work would have been impossible, but recombinant DNA has transformed many research impossibilities into opportunities.

However, an avalanche of opportunity doesn't arrive without some risk. Although no actual, documented hazard has arisen as a result of recombinant DNA research, certain kinds are regarded as potentially hazardous. An example of such research would include the use of recombinant DNA to produce

highly poisonous substances such as botulism, diphtheria or tetanus toxins.

To monitor such research and prevent accidents, the National Institutes of Health, which supports the vast majority of recombinant DNA research in the United States, has developed safeguards and stringent guidelines to which all NIH researchers must adhere or lose their funding.

Safeguards include physical barriers to keep research organisms in, and biological barriers that make it almost im-

possible for any to survive should they get out. For example, the *E. coli* bacteria generally used has been modified such that it cannot survive conditions outside the laboratory.



Research using recombinant DNA is monitored by the Biosafety Committee. Above is an electron micrograph of a plasmid from the bacterium *E. coli*. A plasmid is a tiny loop of DNA that exists apart from the chromosome. It replicates on its own and carries genes for such things as virulence and antibiotic resistance. Plasmids are a basic part of most gene manipulation work.

possible for any to survive should they get out. For example, the *E. coli* bacteria generally used has been modified such that it cannot survive conditions outside the laboratory.

In addition, highly hazardous work requires approval at three levels: by the NIH; by the Recombinant DNA Advisory Committee, a federal advisory committee; and by the Institutional Biosafety Committee, a local committee that reviews, approves, and oversees recombinant DNA research, and ensures that it

complies with NIH standards

At the OHSU, the vast majority of recombinant DNA research poses no hazard and is exempt from the NIH guidelines. However, the seven-member Institutional Biosafety Committee reviews all recombinant DNA research on campus, says Michael Litt, professor of biochemistry and medical genetics and the committee chairman. Two of the committee members, who together provide additional expertise in microbiology and genetics, are from off-campus.

Recombinant DNA, says Litt, "is not

generally exempt from NIH guidelines, says Litt. "Most cloning procedures do not involve expression of the gene, that is the gene does not make its product. Cloning is used to learn something of the structure of the gene, rather than its product. We use it to try to map genes that cause inherited diseases."

For a researcher, the Institutional Biosafety Committee enters the picture while experiments are still just ideas on paper. A researcher proposing the use of recombinant DNA must note this on the front of his or her grant application. When the proposal reaches the OHSU Office of Research Services, which ensures that proposals are reviewed by all appropriate committees (see related story on page 4), it is sent to the Institutional Biosafety Committee for review. "We can tell very quickly in most cases whether the research is exempt (from NIH guidelines) when looking at the proposal," says Litt.

The committee may then request detailed information on the laboratory facilities, the training program for employees, and the bacteria and/or viruses to be used. It may also choose to tour the laboratory.

The Institutional Biosafety Committee has existed for nearly 15 years. Initially, every experiment using recombinant DNA techniques had to be approved by the committee. But, like the initial quarantining of astronauts returning from the moon, many of the precautions proved unnecessary. A long period then followed in which all recombinant DNA research fell outside the guidelines. During that time the committee rarely met. Over the past several years the committee has examined between five and seven proposals to ensure that they met necessary standards.

"As far as I'm aware," says Litt, "there has not been any documented case of a hazard resulting from actual recombinant DNA research." To help keep things that way, if the committee is unsure as to whether an experiment falls within federal guidelines, it will check with the NIH in Washington, D.C., says Litt. "We tend to err on the side of caution if there is any doubt."

Dental research keeping pace with profession

At first glance, dental research conjures up images of finding better ways to fill cavities, or preventing them in the first place.

But take a closer look and open wide.

Research in this field parallels a profession that has grown dramatically in the past few years. "Dentistry isn't just filling teeth," says Dean Hank Van Hasel, who came to the school in 1984 with an impressive background in research as well as dental practice, teaching and administration. "For instance, we're now dealing with complex periodontal (gum) disease, adult orthodontics and new sophisticated materials to restore teeth to their natural beauty. People are maintaining their teeth longer now. In general, oral health isn't separate from general health, so close collaboration is occurring among the OHSU's researchers. The profession is more demanding, so our research has expanded to keep pace."

The school's research — which involves at least a dozen major projects — spans the gamut from studying pain and tooth sensation to designing strategies to improve care to the elderly. Researchers bring varied specialties to their labs and clinics. They're not only dentists, but nutritionists, statisticians, biochemists, etc.

"Our research strength comes from diversity," says Dr. Tom Shearer, chairman of the school's Research Committee. Shearer is professor of biochemistry in the Division of Nutrition. "We're also fortunate to have our own basic science departments. The advantage crosses over into the classroom, because students learn from teachers who not only share information, but create new knowledge that keeps them at the forefront of their fields."

Two types of research

As in most health research, dental research is divided between two areas: basic (generally done in the lab) and clinical (treating patients). The goal of the first is to discover fundamental information, such as the mechanisms by which the body protects itself against infection. The second is designed to evaluate and improve clinical practice, for example testing a variety of amalgam alloys (silver fillings) in the mouth to determine which is the most durable.

The OHSU has made significant advances in both arenas. For instance, Dr. David Mahler's work 15 years ago led to the first major breakthrough in amalgam since 1900. Mahler, professor and chairman of dental materials science, pioneered lab and clinical methods to test the durability of these materials. His work can be likened to perfecting stainless steel because the new amalgams which were developed based on his research were remarkably more resistant to corrosion than alloys previously used. Today they are used in about 75 percent of all molar fillings.

"Our studies are continuing to seek refinements in these amalgams," Mahler adds.

While Mahler has left his mark on this traditionally recognized dental field, Drs. Walter Gabler, Wesley Bullock and Howard Creamer are attacking an area of major growth and importance: understanding the body's immune system, primarily the function of white blood cells. Gabler is professor and chairman of biochemistry; Bullock is professor of oral microbiology and immunology; and Creamer is associate professor and chairman of oral microbiology and immunology.

This work is important because the mouth is a battleground of bacteria, which can lead to infection — a major contributor to periodontal (gum tissue) disease. Now that rampant decay has been lessened, thanks to fluoride and increased preventive care, teeth are lasting longer, so supporting gums and bone need to stay healthy.

Their investigations, along with those of other researchers at the OHSU, will shed light on how white blood cells function in fighting infection. "We know that these cells destroy bacteria, but we don't understand the processes involved," says Creamer. "Gaining insight into this function could someday help us develop better ways to fight infection, not only in the mouth but throughout the body."

Several research projects are under way in this area. Gabler is the principal investigator in a study that examined the effect on tissue of applying a newly approved antiseptic, chlorhexidine, below



Dr. Louis Terkla, School of Dentistry, has developed an apparatus that may someday more accurately test the bonding capabilities of tooth filling material. He uses a pressurized water system that "mimics" moist, living dentin.

the crest of the gums. The substance is primarily used by dentists in treating gum disease.

"We discovered chlorhexidine not only kills disease-causing bacteria, but can also damage the host cells, the body's defense against bacteria," Gabler says. "Therefore, there's greater potential for oral infection, although we have no way of knowing to what extent this problem has occurred. We hope to be working with the manufacturers to redefine the use of this oral medicine."

Other studies

Since July 1985, the dental school has received \$1.5 million for 14 research grants, primarily federally funded. In addition to the amalgam and immunology studies, other major areas of exploration include:

- Periodontal disease, through the work of Drs. Tony Adams, professor of periodontology, and Don Adams, professor and chairman of periodontology. "Although this is a major disease, very little is known about the disease process itself," says Tony Adams. The investigators are developing a mathematical model to help dentists better predict the progression of gum disease. "Also, in March we began experimenting with gum tissue transplantation to see if we can get healthy cells to regenerate in diseased gum tissue." In another investigation, the doctors are studying the adverse effects of smokeless tobacco on gum tissue and the jaw bone.

- The toxicity to dentists of nitrous oxide, used as an anesthetic, and mercury vapor, released when dentists mix amalgam. Both have been studied separately, but not as a joint hazard — until recently. Although patients are not at risk, dental personnel face this hazard because they are exposed regularly to both. Dr. John Smith, associate professor of physiology and pharmacology, has discovered that dental personnel are exposed to an even greater health hazard when using the two simultaneously. His work may someday lead to new regulations on the simultaneous use of these two compounds.

- The use of hypnosis to reduce tooth grinding (bruxism) and dental anxiety.

Drs. J. Henry Clarke, director of behavioral science, and Patrick Reynolds, assistant professor of physiology and pharmacology, have been working on the theory that stress is the major factor in bruxism. Bruxism was dramatically reduced in six patients trained to relax through self-hypnosis as part of their study. The technique can diminish "dental anxiety" as well, they say.

- The development of a new apparatus to improve the way to test bonding and sealing abilities of filling materials, primarily the new resins (plastics). Tests for these materials are usually conducted on dried dentin material, an unrealistic

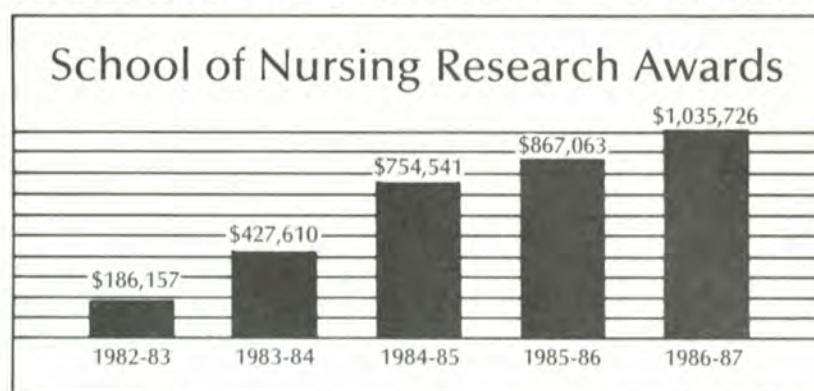
measure, rather than living, moist teeth. A dentin surface is moist when the dentist prepares the tooth for filling. Dr. Louis Terkla, professor of dentistry and School of Dentistry dean emeritus, has created a device that mimics the environment of the human mouth, so realistic testing can be done before these materials are used in humans.

- Study of itch sensation. Dr. Arthur Brown, associate dean of academic affairs and professor of physiology and pharmacology, is studying the stimulus/response characteristics of dental pain, and was recently awarded a grant to do similar work on the itch sensation. He is working with Dr. Susan Denman, adjunct faculty member of the School of Dentistry. Increased knowledge of pain and itch will lead to better diagnosis of skin disease.

- Selenium's effect on cataracts. Studies to test effects of the trace mineral selenium on cataracts have led to new information about cataracts. Drs. Tom Shearer and Larry David, assistant professor of biochemistry, were investigating whether selenium affected the rate of tooth decay. A surprising observation was that selenium causes a breakdown of the protein in the lens of the eye, leading to cataract formation. The original study was done in 1978 and today they continue work with the Department of Ophthalmology on further studies of how lens proteins are affected.

"In the past 30 years, it's safe to say that the discovery of fluoride's effect on tooth decay was one of the major research advances in dentistry," Van Hasel says. "We're confident that the School of Dentistry's research holds promise for future significant advances."

School of Nursing: 550% increase in research funding



Nursing research has evolved rapidly in recent years, just as changes in health care and society have propelled this profession into much more than a bedside caretaker.

Nurses have fanned out to the cities, rural communities, clinics and homes — often as the source of primary care. They specialize in everything from emergency to hospice care. Research, therefore, is seldom done in a lab.

"Relevance to patient care is the benchmark of our research," says Dr. Christine Tanner, director of the Office of Research Development and Utilization in the School of Nursing.

Last year, the nursing profession achieved a major victory when a National Center for Nursing Research was established at the National Institutes of Health (NIH). "This new center will give nursing research national recognition and greater support," Tanner says.

The nursing school has gained national prominence for its research, as evidenced by the fact that it received \$800,000 of the approximately \$9 million in federal funds available for nursing research last year. Remarkable funding growth is also worth noting: Since the 1981 creation of the nursing research office, funding has increased 550 percent — from \$186,157 in 1982 to \$1.03 million this year.

"Our faculty is very successful in developing fundable studies," Tanner says, crediting the school's master and doctoral programs with nurturing a fertile research environment. Research focuses on two areas: improving patient care; and developing the tools to conduct research — valid and reliable measurement instruments.

"Not having these tools has been one of our major problems," Tanner explains. "We're just beginning to design tools to collect data and it's exciting to know that some of our faculty members are pioneering these methods."

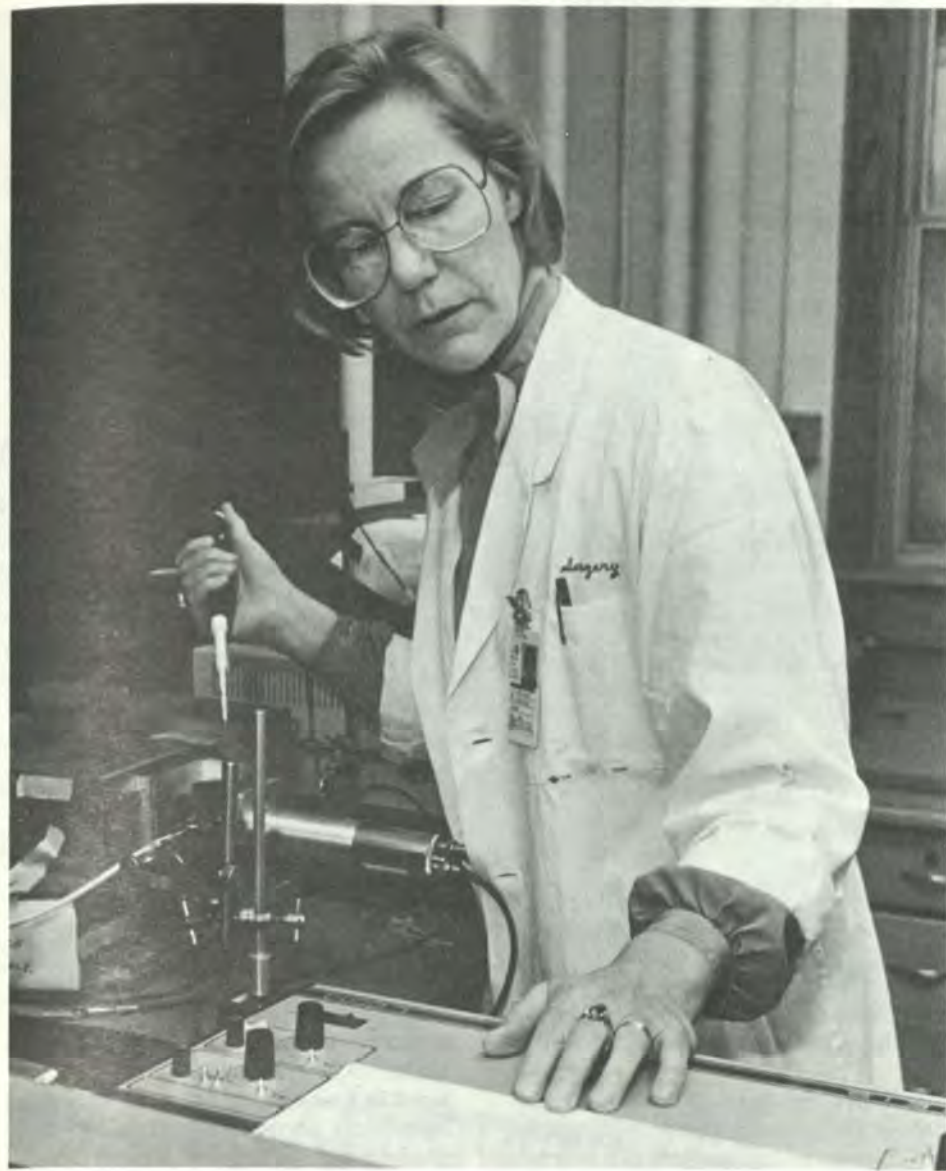
A major NIH grant awarded to the school last year is helping to direct these efforts. The first year of the grant supports the methodology aspect, which paves the way for the actual research. Each of the three grant components involves one faculty member as project director and at least one doctoral student serving as a graduate research assistant. The grant also provides for the sponsorship of visiting scholars and research seminars for faculty and student enrichment.

Focus areas of the grants include:

- 1) Evaluating the quality of life of adults with chronic illness. This information will help develop new nursing practices to enhance the quality of life for these people. The principal investi-

(continued on page 8)

SOM: new chairmen, funding quicken pulse



Research is conducted in most of the School of Medicine's departments — from biochemistry to psychiatry. Above, Dr. Leena Mela-Riker, Department of Surgery, conducts basic research that could someday lead to better clinical care for trauma and stroke victims. Below, Steve Bylsma, third-year medical student, is part of a Department of Ophthalmology team headed by Dr. Ted Acott. The cornea and surrounding tissue Bylsma is trimming from a donated human eye will be used in an organ culture for glaucoma research.

The pulse of research in the School of Medicine has quickened. In 19 of the school's 21 departments — from biochemistry to psychiatry — a wide range of basic, clinical and applied research is being conducted to increase our knowledge of the causes, diagnosis and treatment of disease.

Studies range from the molecular causes of glaucoma to the treatment of depression with light; from the dietary habits of 200 families in Portland to the movement of electrons within a subsystem of a cell; from uncovering how virulent bacteria kidnap iron in blood to developing artificial skin for burn victims.

Overall funding for research in the school has grown from about \$11 million in 1985 to nearly \$18 million in 1986. While this growth can be attributed to several factors, Dr. John Kendall, dean of the School of Medicine, noted two in particular: attaining a critical mass of researchers and the hiring of seven new department chairmen over the last three years.

Given the amount of research in the School of Medicine, a complete description can't be given here. Below are examples, beginning with work that relates to the top five causes of death

among Oregonians: heart disease, cancer, stroke, accidents and lung disease.

- **Heart disease:** Dr. William Connor, professor of medicine and head of the Division of Endocrinology and Metabolism and Clinical Nutrition, has achieved international recognition for work in clinical nutrition and lipid metabolism. Three projects in particular have won wide recognition. In 1985, Connor and his colleagues published the results of a landmark study establishing that omega-3 fatty acids — found in salmon and oily fishes — lower the blood levels of cholesterol and saturated fats and help to prevent heart disease. This eight-year, \$1.1 million project runs through 1988. Connor, together with Dr. Martha Neuringer, research assistant professor of medicine, is also conducting a 10-year, \$1.2 million study of the effects on monkeys when omega-3 fatty acids are missing from the diet. In an effort to reduce heart disease, Connor, with his wife Sonja, also conducted an 11-year study examining the acceptability of an alternative low-fat diet for 233 Portland families to ascertain if their plasma cholesterol levels would fall. This \$3.2 million project was funded by the National Heart, Lung and Blood Institute.

Dr. Roger Illingworth, associate pro-

fessor of medicine and director of the Oregon Lipid Disorders Clinic, has grants totalling \$3.2 million to support work examining the effects of cholesterol-lowering drugs in patients with hereditary causes of high cholesterol, and the effects of dietary fats on lipoprotein metabolism.

The cause and control of high blood pressure are important factors in the control of heart disease. Dr. David McCarron, associate professor of medicine and director of the Oregon Hypertension Program of the Division of Nephrology and Hypertension, has shown that in some people an increase in dietary calcium reduces hypertension and the risk of heart disease. His surprising, exciting and controversial results have stimulated expanded research on the potential benefit of calcium to treat hypertension. McCarron's work will be funded at a rate of \$4.5 million for the next three years.

- **Cancer:** Drs. Grover Bagby, Bruce Magun, and John Fitchen are three of the 25 to 30 investigators in the school doing cancer research.

Bagby, professor and head of hematology and medical oncology at the OHSU and director of the Cell and Molecular Biology Laboratory at the Veterans Administration Medical Center, began a seven-year project in 1984 in which he and his staff isolated, purified and characterized a protein that leads to the proliferation of bone marrow cells. The second phase of their work, looks at how the cell controls the synthesis and regulation of these and related proteins. This work should contribute to an understanding of the causes of leukemia.

Magun, professor and chairman of cell biology and anatomy, has received \$1.4 million for a five-year study of the cellular and molecular mechanisms that permit cancer cells to grow in an uncontrolled fashion. Magun is looking at an enzyme, protein kinase C, that may be involved in signalling runaway cell division.

John Fitchen, associate chief of staff for research at the VAMC and professor of medicine, is doing research that may someday lead to the control of certain types of leukemia through diet. Fitchen notes that both normal and leukemic cells must get the amino acid methionine from the diet. Test tube experiments have shown him that normal cells can get methionine from a compound called MTA, but that some strains of leukemia cells cannot because they lack a necessary enzyme. These cells die of methionine starvation. If this also proves true in animal models, it may set the stage for treatment of certain leukemia patients by substituting MTA for methionine in their diet. Even more significantly, indirect evidence suggests that the lack of the enzyme, known as MTAase, may be involved in the transformation of normal cells into malignant cells.

- **Stroke:** Dr. Bruce Coull, chief of neurology service at the VAMC, associate professor of neurology and head of the Comprehensive Stroke Center of Oregon, is conducting a major four-part study involving 12 faculty and 13 support personnel. The four-year, \$2 million project seeks answers to a variety of questions: Who among high risk individuals are more prone to having a stroke? How can the effects of stroke be reduced during the acute phase? What chemical changes occur in neurons during stroke? How is brain tissue injured and repaired during and following stroke?

- **Accidents:** The school has a variety of research relating to treatment of trauma victims and the reporting and prevention of accidents. For example, Dr. Leena Mela-Riker, professor of surgery and biochemistry, is studying the chemical changes that occur in cells during periods of reduced blood flow

resulting from injury or stroke.

Dr. Brent Burton, assistant professor of emergency medicine, and colleagues conduct research pertaining to the reporting and treatment of accidental poisoning. Burton, director of the Oregon Poison Control located in University Hospital North, has conducted research on such topics as the most effective way to treat aspirin overdose, the correlation of breath alcohol levels with blood alcohol levels and the effects of 9-1-1 system implementation on access to the poison control center.

- **Pulmonary diseases:** Dr. Sonia Buist, professor of medicine and acting head of the OHSU's Pulmonary and Critical Care Division, has received international recognition for studies of smoking-related lung diseases. Her 13-year, \$1.1 million project on the natural history of chronic obstructive pulmonary disease examined why some smokers develop COPD while others do not. From this work has stemmed a seven-year, \$3.5 million NIH study that is part of a national 10-center clinical trial to evaluate the effects of specific treatment in preventing the progression of COPD in smokers who already have some impairment of lung function.

School of Medicine funding has grown from \$11 million to \$18 million since 1985.

Dr. Michael Wall, associate professor of pediatrics and director of the Pediatric Pulmonary Section, began his research program with a \$10,000 seed grant from the Medical Research Foundation and a \$15,000 grant from the Oregon Lung Association followed by \$87,000 in federal NIH funding spread over a three-year period. His work resulted in development of two ways of assessing lung function in young children and established the pattern of lung development from birth to age six.

Research in other areas

The school's researchers not only help to preserve life, they also help to give life. Dr. Don Wolf, professor of obstetrics and gynecology, conducts research on campus and at the Oregon Regional Primate Research Center, an OHSU affiliate. At the primate center, Wolf is using Rhesus monkeys to develop a method for determining whether a particular egg or embryo is healthy prior to fertilization or implantation. At the OHSU, Wolf is trying to identify fertile human sperm based on their swimming patterns.

In the Department of Ophthalmology, Dr. Frederick Fraunfelder, professor and chairman of ophthalmology, has established a registry of ocular side effects induced by drugs. Research groups within the department are investigating the causes of glaucoma, uveitis, healing of wounds to the cornea, the causes of retinopathy or prematurity and the causes of retinitis pigmentosa.

In the Department of Diagnostic Radiology, Dr. Josef Rosch, professor and director of the angiography laboratories, and Dr. James Putnam, fellow in vascular radiology, are experimenting with a nonsurgical treatment of the dangerous bleeding that often accompanies cirrhosis of the liver. In a new and nonsurgical technique, Dr. Amy Thurmond, chief resident in radiology, and Rosch are using a special guidewire and small catheter to open obstructed Fallopian tubes, a frequent cause of infertility. The method has been used on 30 women in the last eight months.

Yes, the pulse of research in the School of Medicine has quickened. It reflects the vibrant activity of people asking questions, designing experiments and seeking new knowledge to improve human health.

OHSU nursing research gains national attention

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gator (PI) is Dr. Carol Burckhardt, associate professor of mental health nursing.

2) Evaluating the well-being of people who care for terminally ill family members. People who must care for dying family members have health problems of their own, and the long-range plan in this project is to measure the physical and mental effects these conditions have on the family. The PI is Dr. Jane Kirschling, associate professor.

3) Evaluating parents' perceptions of caring for blind children. The long-term goal here is to learn how parents care for these children and how they learn these skills. This will lead to developing strategies to help parent and child. The PI is Dr. Sheila Kodadek, associate professor of family nursing.

In addition to clinical research, laboratory research using animal models is being pursued through the work of Dr. Linda Felver, associate professor of adult health and illness. Felver's basic thrust is to determine the best time to administer treatments, such as oral medications. "These treatments are often given at the convenience of the caregiver," she says.

"I hope to determine the optimal time, based on the patient's physiological rhythms," Felver received a biomedical research support grant through the School of Nursing to determine the most effective time to administer oral potassium to potassium deficient rats.

Two other major studies being conducted by School of Nursing faculty involve improving care to the elderly. Urinary incontinence and wandering behavior, two major reasons the elderly require nursing home care, are being studied by Drs. Joyce Colling and Beverly Hoeffler, respectively. Colling, associate professor of community health, hopes to help caregivers better predict the patterns of incontinent episodes — and therefore avoid them as much as possible. Hoeffler, associate professor of mental health nursing, is collaborating with Joanne Rader of the Benedictine Nursing Center in Mt. Angel to develop more humane methods of handling unsafe wandering behavior.

The largest grant involves studying ways to incorporate results from research into nursing practice. This study is being done by Dr. Jo Anne Horsley,



From left, Drs. Jane Kirschling, Sheila Kodadek and Carol Burckhardt are principal researchers in a major NIH grant to develop nursing research methodology.

professor of mental health, nursing, in collaboration with the University of Washington and Arizona State

University.

Researchers are also addressing these issues: finding better ways to provide relief for people who must give constant care to the chronically ill; helping people adjust to parenthood; and helping families adapt to a child with cancer. All of these projects are federally funded and competitively obtained.

The School of Nursing makes small grant monies available to beginning researchers. "We support 15 to 20 studies each year this way and conduct peer reviews and critiques just as carefully as federal agencies do," says Tanner.

Tanner is excited about the school's research growth. "We continually question how things have been done and work to find better ways," she says. "It's very creative work. Sometimes we've heard people outside of nursing say things like, 'why are you doing research on that?' The truth is, we don't often know about the effectiveness of certain procedures and practices. Nursing, like other professions, has a lot of folklore to it, and much of that has never really been tested in a sound research environment."

MD./Ph.D programs hone next generation of researchers

These are exciting times for biomedical research. Advances made in just the last 10 years in virology, molecular biology, pharmacology, cell biology and immunology have created infinite opportunities for clinical investigators. Continued advances in technology will soon need the contributions of more clinical investigators, according to James Wyngaarden, director of the National Institutes of Health.

Yet, surveys by the Association of American Medical Colleges reveal that in 1960, 39 percent of medical school seniors preferred a career that included research; by 1982 that number had dropped to 22 percent.

Reasons for the decline include fluctuating federal funding for research and the sacrifices presented by a research career, according to the U.S. House of Representatives Committee on Appropriations while considering that proposed 1983 budget for the NIH. The NIH has since attempted to help reverse the decline by stabilizing its funding at about 5,000 investigator-initiated research awards per year.

The OHSU's response to the problem has been the formation of the School of Nursing's Ph.D. program, and the School

of Medicine's M.D./Ph.D. Combined Degree Program.

"The M.D./Ph.D. Combined Degree Program is needed to produce people who know the clinical problems, but also have a very good science background and the training to do research," says Dr. Leena Mela-Riker, professor of surgery and chairwoman, M.D./Ph.D. committee.

The M.D./Ph.D. Combined Degree Program is designed for superior students, with the maximum number admitted each year set by the dean. It takes an average of six years to complete. Prospective students must first be admitted to the School of Medicine and then to a degree program in one of the basic science departments.

Students in the program must meet graduation requirements of the School of Medicine and of the Graduate program. "They have to do double work, in a way," says Mela-Riker, although she points out that some medical school courses qualify for graduate level requirements in a given department.

Admission to the program, which currently contains eight students, is not to be taken lightly. "If you enter the M.D./Ph.D. program you've got to stay with it.

You can only drop it with permission and there must be good reason," she says.

In 1981, the Medical Research Foundation of Oregon began providing a full scholarship to one student per year who is entering the M.D./Ph.D. program. Six MRF scholars, including this year's recipient, David Wu, have been sponsored.

Medical students can also get summer research experience through fellowships from the Leukemia Society, the Oregon Heart Association, the American Cancer Society and the Tarter Trust.

The School of Nursing Ph.D. Program was started in 1985 to meet the demand for nurses with Ph.D. degrees to serve as researchers, faculty, clinicians, consultants and administrators. It has a current enrollment of 27 students.

The demand for nurses with doctoral degrees has also outstripped the supply. "There is a tremendous demand for nurses with doctoral training," says Carol Lindeman, R.N., Ph.D., and dean of the School of Nursing. Health care agencies and nursing schools in the western states have a particularly difficult time recruiting nurses with doctorates, she said.

The school's Ph.D. program, one of

only about 40 in the country, accepts about 10 doctoral candidates per year. A Master of Science program is also offered in four clinical areas: adult health and illness, community health care systems, family nursing and mental health nursing. The Ph.D. portion of the graduate program emphasizes research methodology and theory development in the areas of health protection and promotion, illness experiences and health deviations, human responses to developmental transitions, and nursing and health care delivery.

What about the sacrifice required of research? There's no getting around it. "Research is a labor of love," says Dr. Robert Koler, professor and chairman of the medical genetics department and a member of the School of Medicine's M.D./Ph.D. Program Committee. You compete for funding and tenure, and you'll be expected to teach, do administration and do research. It's very demanding."

A research degree program requires a certain kind of student, says Koler. "We have to attract people who are turned on by seeking new knowledge, who enjoy designing experiments and the gratification of teaching."

Gayamat's office steers researchers through maze of paperwork, guidelines and rules

(continued from page 4)

responding to an RFP can be an intimidating, time-consuming experience.

In addition, there's deadline pressure. The researcher has about 30 days in which to design his or her experiments, determine equipment and personnel needs, shop for the best buys in laboratory equipment and calculate the total cost. Then two proposals must be written; a technical proposal that describes the experiments and the theory behind them, and a budget proposal that explains what the study will cost.

Gayamat and her staff of 10, however, can take a lot of the time and frustration out of the process. They can painlessly interpret the blur of legal jargon, shop for the best buys in expensive equipment and work up drafts of the cost proposal. With 15 years of experience as a research grants and contracts administrator at the University of Wisconsin, University of Florida and here at the OHSU, Gayamat can also advise a researcher on how to best compete for award of a contract.

Gayamat will also make sure that the proposal meets all legal and institutional

requirements and shepherd a proposal through all appropriate review committees.

If the researcher desires, Gayamat, a certified public accountant, can negotiate the budget with government contract officers.

Timing the submission of a grant proposal is also important, and Gayamat

can help here, too. "Right now drug abuse and AIDS are big. If you have a project and you're doing basic research and can tailor your project to affect those two, this is the time to submit your proposal."

After a project is funded and under way, Gayamat's knowledge of federal guidelines can reduce such paperwork

headaches as how to change principal investigators, how to expand the scope or time period of a project, and opening and closing university accounts. "I got 20 calls today and about 75 percent of those were just for advice," she says.

Members of my staff are service oriented," says Gayamat. "We're here to assist the faculty."

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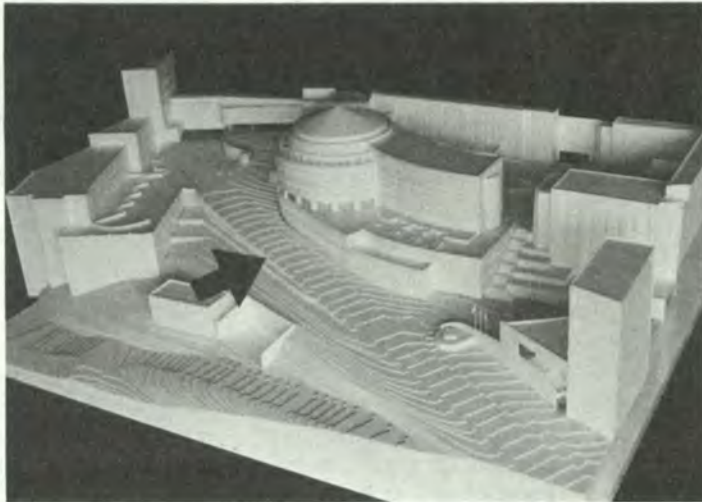
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Capital projects reflect changing health needs



From left, new helipad is delivered to University Hospital North; at the Pediatric Intensive Care Unit dedication, Doernbecher Hospital Guild President Alyce Cheatham receives a "memento" of her help in demolishing the old PICU — the speaker she hammered; view of the new parking structure for patients and visitors.



Marquam Hill is growing and changing rapidly, with many capital projects completed, in full swing or on the verge of ground-breaking.

The focus? Better patient care . . . care that will meet society's rapidly changing health care needs; care that will foster better education; and care that will support research programs.

The Legislature approved 11 projects last fall, geared to renovating, improving and consolidating patient services. University Hospital South will be the clinical site for most tertiary care and University Hospital North will house ambulatory and other less-intensive care programs. Changes also reflect:

- a shift in focus from inpatient care to outpatient care whenever possible;
- a shorter length of stay for inpatients;
- an increase in the severity of illness among inpatients;
- the need to consolidate "like" services and treatments.

Stories on this page include updates on major projects. The university apologizes for any inconveniences resulting from construction. The end result, however, will provide the region with more modern and effective health care.

More parking for patients

Parking has been a vexing problem at the OHSU, but a solution for patients and visitors recently broke ground.

By next January parking structure adjacent to the Outpatient Clinic will be completed as a major portion of this year's capital plan.

Construction of the 420-space facility began in July, with an accelerated schedule to avoid as much inconvenience as possible, according to Gordon Ranta, OHSU facilities planner. "Construction of this type of project could normally take at least a year," he says. "But to minimize disruption the contractor will be required to complete construction next March."

The location of the new structure (see model) will require permanent changes in traffic patterns around the hospital and clinic complex. Today's visitors are often confused when they arrive, which causes hazards and congestion around the entrance commonly called the "outpatient circle." Next February the element of uncertainty will be removed. Visitors driving up Sam Jackson Park Road will be greeted by color-coded signs directing them to the new structure. Once in the structure, signs, elevators and walkways will lead them to their destinations.

New traffic patterns will improve vehicle flow throughout the main campus area after construction is completed, Ranta adds.

(continued on page 4)

1987-88 Marquam Hill lecturers selected

The Marquam Hill Steering Committee will launch its seventh annual lecture series this fall, featuring six outstanding OHSU researchers. Their

topics range from teenage suicide prevention to infertility.

Lectures include:

- Drs. William Sack and Greg Clarke

will discuss adolescent depression and suicide on Sept. 30, 1987. Sack is professor of psychiatry and director of the Division of Child Psychiatry, and Clarke is associate professor of psychiatry.

• Dr. Ken Burry, associate professor of obstetrics and gynecology, will discuss the ethics of new reproductive technology on Nov. 5, 1987.

• Dr. Pat Archbold, professor of family nursing, will discuss home health care for the elderly on Dec. 3, 1987.

• Dr. John McAnulty, professor of medicine and director of the Cardiac Catheterization Laboratory, will discuss diagnosis and treatment of cardiac arrhythmia on Feb. 4, 1988.

• Dr. Ralph Merrill, professor and chairman of oral maxillofacial surgery, will discuss diseases and treatment of the temporomandibular joint (TMJ) on March 3, 1988.

• Dr. Robert Neerhout, professor and chairman of pediatrics and chief of service, Doernbecher Children's Hospital, will discuss childhood cancer on April 7, 1988.

For more information, call University Relations, 225-7686.



Marquam Hill lecturers, from top left: Drs. William Sack, Greg Clarke, Ken Burry, Pat Archbold, John McAnulty, Ralph Merrill and Robert Neerhout.



Steering Committee begins seventh championship season

Last month the Marquam Hill Steering Committee launched its seventh season as the champion of a major cause: the Oregon Health Sciences University.

The committee has been increasing public awareness about the university, developing support and enhancing the quality of life here since 1981. Today the group includes 10 active members and draws on support from the OHSU Foundation Board of Trustees (formerly the Board of Overseers), Oregon citizens and the Marquam Hill Society. (The society was created to recognize people who give at least \$1,000 per year to the foundation.)

The steering committee has been "raising friends" through 40 well-attended public lectures, several hundred campus tours and special events such as concerts.

Although organizing and sponsoring the Marquam Hill Lecture series is one

of the committee's major projects (see accompanying story), other subcommittees have been making an impact on campus. They include:

Campus art: Chaired by Deanne Rubinstein, Portland, this group includes a jury that has approved nearly 200 gifts of original prints, sculptures, paintings and other fine pieces for display in hallways, student lounges, hospital and waiting rooms, and other areas.

Campus tours: Chaired by Marcia Johnson, Portland, this program began as a volunteer project and now boasts a part-time staff funded by the Marquam Hill Steering Committee. Since 1982, more than 7,300 people have gained first-hand knowledge about the OHSU's patient care, education and research programs through free tours.

Network: One of the newest subcommittees, this group, chaired by

Claire Rives, Newberg, plans to increase the public's understanding of university programs by expanding the network of statewide support. They hope to cultivate new friendships in cities throughout Oregon and repeat some of the Marquam Hill Lectures in these areas.

Steering committee members have organized projects ranging from the large — raising funds to increase faculty travel to scientific meetings — to the small but important amenities — purchasing auditorium devices for the hearing impaired. They also support the annual Research Convocation and Medical Student Research Forum. The group commissioned an inspiring audiovisual presentation explaining the university's purpose, and has contacted lawmakers and written letters to editors in support of legislation that would enhance university programs.

Art exhibits

The Marquam Hill Steering Committee also sponsors the "Art on the Hill" exhibits by Oregon artists. The 1987-88 schedule includes:

- Prints by Frank Boyden; Sept. 8 — Oct. 18.
- Paintings by Amanda Snyder; Oct. 26 — Dec. 13.
- Prints by Sherrie Wolf; Feb. 29 — April 17.
- Paintings and prints by Byron Gardner; May 2 — June 18.
- Paintings and prints by George Johanson; June 27 — Aug. 24.

For information, call 225-7686.

Regional eye center closer to ground-breaking

Thanks to many generous gifts and final legislative approval, the OHSU's new regional eye center is closer to becoming the nation's first center to join state, local and Veterans Administration eye programs under one roof.

"This center represents a significant advancement in eye research facilities," says Dr. Frederick Fraunfelder, professor and chairman of the OHSU Department of Ophthalmology. "It will be the only free-standing academic ocular research center north of San Francisco and west of St. Louis."

Focusing primarily on research, the center will enable basic scientists and clinicians from the OHSU's and VAMC's ophthalmology departments to work closely in developing new techniques to prevent and treat eye disease. With six levels and more than 80,000 square feet, the center will house laboratories, the Elks Ophthalmology Center which includes the Elks Children's Eye Clinic, a new senior citizens clinic and numerous other clinics.

The new center will be a significant facility for practicing ophthalmologists, serving as a resource for complex cases and as a place for regional ophthalmologists to treat their patients in a state-of-the-art facility.

When completed in mid-1989, the center will provide a stunning gateway to the OHSU campus at the intersection of Terwilliger Blvd. and Campus Drive (see aerial view). Construction of the center is scheduled to begin next March.

Funding nears completion

The eye center is within \$1 million of its \$18.5 million campaign goal. Major sources include (figures are approx-

imate):

- Nearly \$7 million has been raised or pledged by private individuals, alumni, physicians, foundations and corporations. (This includes a \$3.2 million anonymous gift from a Portland family.)

- \$1 million from the OHSU's ophthalmology faculty;

- \$250,000 from local ophthalmologists;

- \$1.5 million from the Oregon State Elks Association;

- \$1 million from the National Eye Institute;

- \$500,000 will be realized from earnings on the above gifts;

- \$6.5 million to come from bond financing to be amortized by University Hospital and the campus parking program.

Research to Prevent Blindness, Inc., the largest foundation in the country dedicated to eye research, selected the OHSU as the site of its seventh regional eye center. RPB has provided about \$200,000 to help launch planning and fund-raising efforts.

OHSU department grows

The OHSU Department of Ophthalmology gained national stature under the 29-year leadership of Dr. Kenneth Swan, its first chairman. Since Dr. Frederick Fraunfelder succeeded Swan in 1978, the department has continued this tradition. Today it's widely recognized for studies of toxic effects of ocular drugs and other medications on the eye. Through Fraunfelder's work, the National Registry of Drug-Induced Ocular Side Effects was established at the OHSU and serves as an international clearinghouse for information regarding adverse effects of drugs, chemicals and



Artist rendering shows the new eye center as an impressive gateway to campus from Terwilliger Blvd.

environmental effects on the eye. The promise of locating the nation's seventh regional eye center in Oregon has attracted a cadre of new faculty members, increased research and patient services to the OHSU Ophthalmology Department.

New contact lens clinic

For example, patient services have increased through a new full-time contact lens clinic. Replacing the weekly half-day service, the clinic serves OHSU faculty and clinicians, staff and students. It also accepts referrals from other practitioners. "These patients often have unique health or contact lens

needs," says Mark Andre, who came to the department as its contact lens specialist last September. "We are not in competition with other clinics; rather we specialize in helping other practitioners with hard-to-fit patients."

In the past eight years, faculty has increased five-fold, not including four full-time faculty members to be added in the next two years. Since 1982, research has grown tremendously — from about four projects with grants totalling \$466,500 to more than a dozen bringing in grants of \$6 million.

For information on making donations to the eye center campaign, contact the Office of Development, 225-8223.

Other projects expand service, update clinical facilities

(continued from page 3)

Examples of improvements include:

- replacing the "point of indecision" intersection at the hospital and clinics with a safer, well-marked 90-degree intersection;

- changing traffic flow from two-way to one-way starting at the hospital/clinics intersection and winding past Baird Hall, Mackenzie Hall and the Library;

- providing patient drop-off areas near the hospital and clinic entrances, and;

- adding more signs to mark the Shriners Hospital entry, and to direct Shriners staff to spaces arranged for their use in the new structure.

The above-ground portion of the parking structure will house medical offices to be completed at a later date.

Morris art

(continued from page 2)

puts a stroke to a canvas, but then something unexpected happens. "It's the parallel of discovery that creates the affinity between artist and scientist."

Carl Morris' work has been shown internationally and can be found in such public and private collections as the Metropolitan Museum of Art and the Guggenheim Museum in New York; the National Gallery of Art in Washington, D.C.; the Seattle Art Museum; the San Francisco Museum of Art; and the Portland Art Museum.

Asked why he decided to surprise the university with the gift of the four paintings for the Auditorium, he says he became covetous of the space (after it had been temporarily occupied by four of the nine canvases that eventually were hung in the Vollum Institute). Besides, he says, "Leonard Laster (OHSU President) got a hold of my heart and twisted."

With the variety of buildings on campus, the architects were faced with the challenge of designing a structure that will not only fit into the site, but enhance the environmental scheme. "Landscaped terraces on and around the structure will blend into the natural environment," Ranta says. "In general, we'll have more gardens and gathering places for people than before."

Other Progress

University Hospital expansion: While the parking structure is under way, a major addition to University Hospital South will expand and improve adult intensive care and surgery facilities. Known as the C-Wing addition, this project will expand UHS on the fifth, sixth and seventh floors of the existing C-Wing, creating a new Adult Intensive Care Unit. Construction will begin in early July. Estimated completion time is October, 1988.

Doernbecher Children's Hospital: The new Pediatric Intensive Care Unit was ushered in with a ceremony on May 27, celebrating the success of a public/private venture. The \$1.25 million unit was

made possible without any state financing — 60 percent came from contributions made through the Doernbecher Children's Hospital Guild and Children's Miracle Network Telethon; and 40 percent came from private contributions made to Doernbecher.

Diagnostic imaging services: The latest technologies to see inside the body will be consolidated in UHS. New equipment was purchased, including a Magnetic Resonance Imaging (MRI) scanner that provides more detail of soft tissue. The MRI, a joint venture of the OHSU and Veteran's Administration Medical Center, has been installed in its own module near the emergency room.

New heliport: Although not a part of the capital plan, a new heliport installed in May will improve patient care by providing quicker transport to the emergency room. Its location atop the southwest wing of University Hospital North cuts two to three minutes off transport time.

Psychiatric services: The Psychiatric Crisis Unit and other psychiatric services, currently located in three separate buildings, will be consolidated in newly

remodeled space within University Hospital North by next October.

Otolaryngology clinic: Remodeling will improve facilities of the Otolaryngology Clinic in the Outpatient Clinic building and enable future expansion. This area will also house hospital activities currently located in the Child Development and Rehabilitation Center and the Portland Center for Hearing and Speech. Work to begin this September, will be completed in January.

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