

Prestigious grants to four exceptional faculty members set the pace for a critical year in external support for OU's research program.

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# THE YOUNG RESEARCHERS

**T**he University of Oklahoma has experienced three very good years in terms of externally funded research at a time when financial cut-backs have severely hampered progress in so many other areas of the institution's academic program.

From 1982 to 1984 external research grants — both public and private, over and above funds provided through state appropriations — jumped more than \$1 million to \$13.6 million on the Norman campus. At the Health Sciences Center in Oklahoma City, outside research funding rose from \$5.2 million in 1982 to \$10 million in 1984.

Why such progress in difficult times? OU Vice Provost for Research Administration Kenneth L. Hoving credits the quality of the faculty and that faculty's increased efforts to compensate for budgetary shortfalls by attracting external support. Proposals submitted by Norman faculty in the last three years went from 354 to 508. Hoving contends that, by anybody's standards, "Our faculty members have been enormously successful. As a result, OU ranks in the top 100 universities in terms of external research support."

The major portion of the research budget of every major public or private university comes in the form of grants and contracts secured in competition with all other universities. With state appropriations providing \$7.35 million for organized research on the Norman campus and \$1.15 million at the HSC, Hoving points out that external support is funding nearly 65 percent of the separately budgeted research in Norman and nearly 90 percent in Oklahoma City.

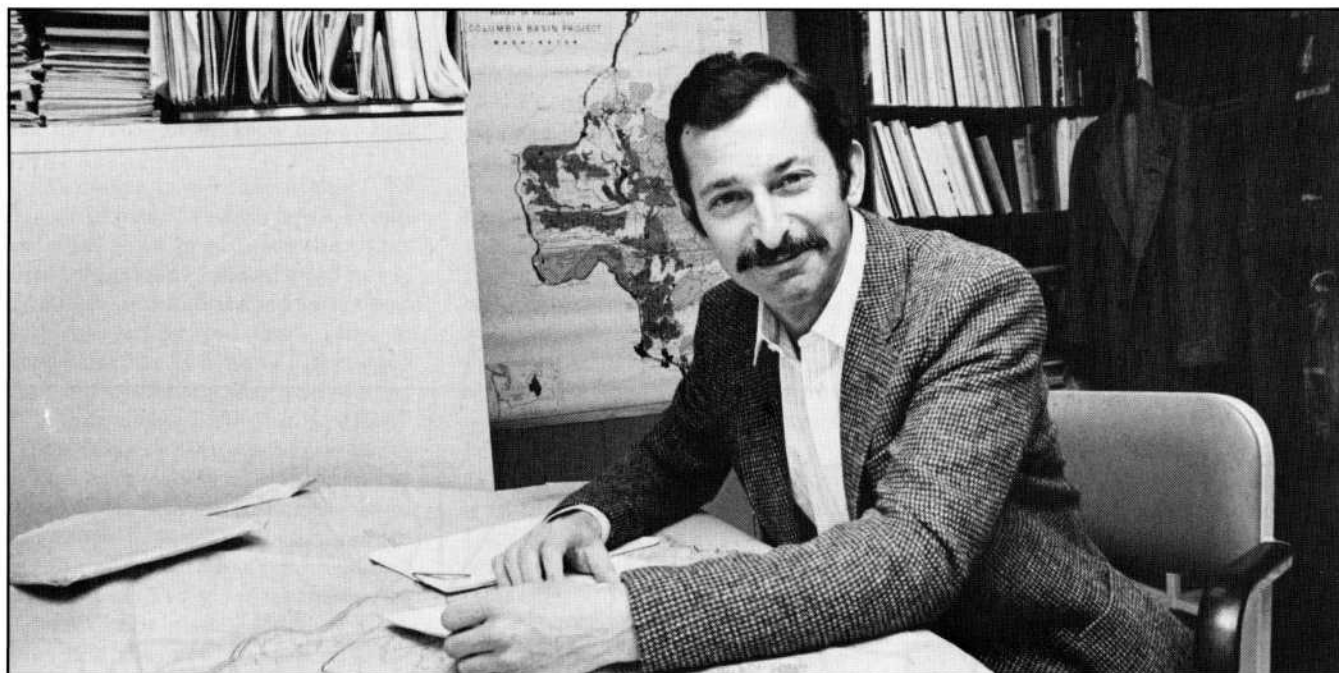
Interestingly, while federal support for higher education in general has decreased in the past few years, there has been no significant cut in federal support for basic research, Hoving adds. The vice provost defines basic research as "research into the basic building blocks of knowledge, which may or may not have immediate practical application.

"This is a reflection of the impact of basic research on industry," Hoving says, "a recognition that to cut back on basic research is to lose our competitive edge economically." Hoving notes that 60 percent of all the basic research done in the United States, whether scientific or social, is conducted on university campuses.

Hoving contests the view that research should be funded only after all the traditional classroom teaching needs of undergraduate education are met. "The central, critical part of the education of graduate students is research, and there is a fallout effect on undergraduate education as well," he says. "The presence of quality research programs makes it possible to attract quality graduate students, and they, along with our regular faculty, teach our undergraduate courses."

A graphic illustration of the major research prizes that have come to OU faculty in the past few years can be found in the achievements of the four young investigators who garnered top honors in 1984: Drs. Lynn Devenport in psychology, Michael H. Engel in geology and geophysics, Bret Wallach in geography and Timothy P. Yoshino in zoology.

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The MacArthur Fellowship will enable cultural geographer Bret Wallach to spend much of the next five years at the typewriter, while pursuing his research in agricultural and natural resources policies, such as irrigation management.

### **BRET WALLACH** **Geography**

One of the most prestigious research prizes in America will bring approximately \$208,000 to geographer Bret Wallach over the next five years and an additional \$15,000 annually to the University of Oklahoma. Wallach is one of only 25 recipients nationwide of a MacArthur Fellowship, awarded by the John D. and Catherine T. MacArthur Foundation, in recognition of "accomplishments in geography which demonstrate originality, dedication to creative pursuits and capacity for self-direction." The 41-year-old associate professor, who came to the University in 1981, is the first OU faculty member and only the second geographer in the United States to be named a MacArthur Fellow.

A cultural geographer with special interests in the rural landscapes of North America and agricultural and natural resources policies, Wallach spent a year in Washington, D.C., as a Gilbert F. White Fellow at Resources for the Future, a research and policy organization. There he worked in the area of irrigation management, building on work he had done while in India as the recipient of an Indo-American

Advanced Research Fellowship.

This spring, he will lead a group of scientists to Sri Lanka to design a research program for the International Irrigation Management Institute, which is funded in part by the World Bank and the Ford Foundation. Wallach explains that the sponsoring organizations share a major concern for the management of irrigation projects in the several countries which the scientists will tour.

"Ford and the World Bank see the tremendous inefficiencies that exist at present," he says. "If you could improve irrigation management, you could increase food production."

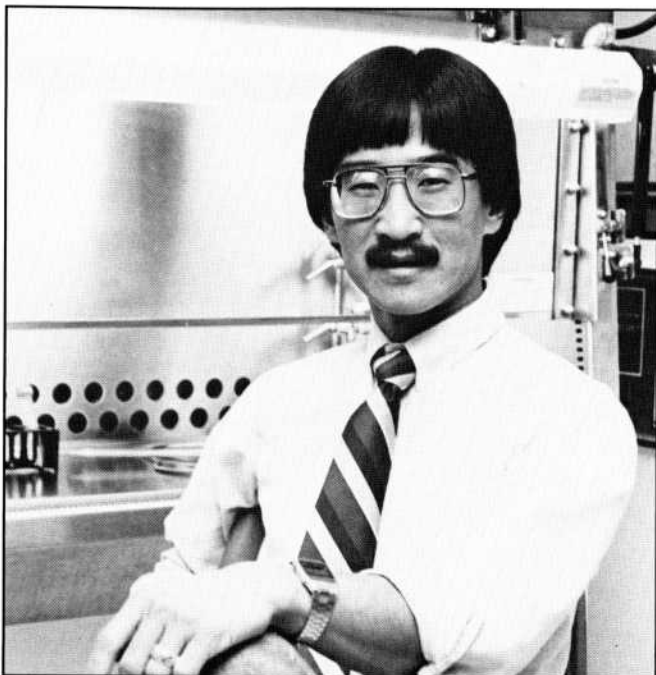
In addition to pursuing his own research interests, serving as a consultant on several other projects and teaching graduate seminars at OU, Wallach plans to spend the five years of his MacArthur grant at the typewriter. He will write a regular column, "The Geographer's Journal," for the new quarterly, *Focus*, to be published by the American Geographical Society. He will be writing a book on the dilemma of agricultural surpluses in this country, as well as editing a collection of his essays for the University of Arizona Press. A third book will be about South Asia.

"I'm really interested in writing for a lay audience," Wallach says. "Geography is a great subject, but it has yet to reach a middle ground between academic and popular and find its potential audience."

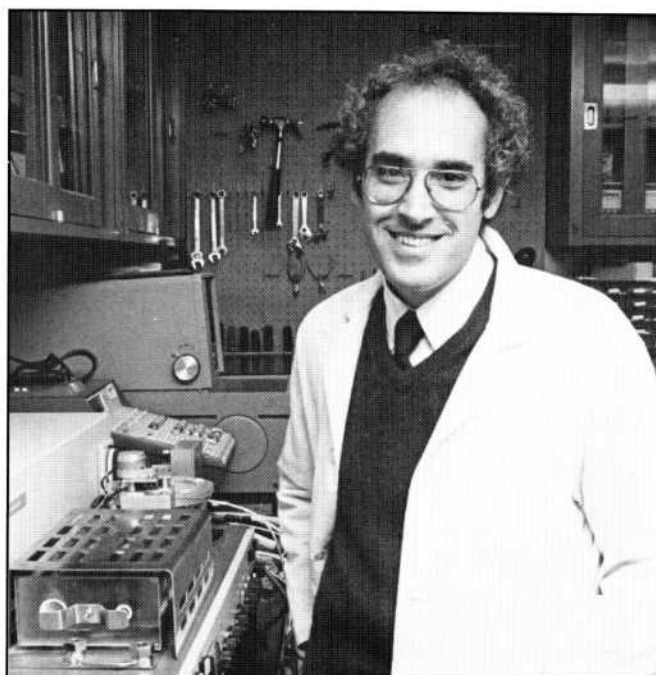
### **TIMOTHY P. YOSHINO** **Zoology**

A \$184,500 grant from the National Institutes of Health is enabling a talented young University of Oklahoma parasitologist to devote five years to the search for knowledge to stop the spread of schistosomiasis, a life-shortening disease which can damage the liver, spleen or bladder.

Timothy P. Yoshino, a 37-year-old associate professor of zoology who joined the OU faculty in 1977, will use the grant to continue his study of *Schistosoma mansoni*, one of four species of schistosome parasites, more commonly known as blood flukes, which live in the bloodstream of human hosts. Although not present in the United States, schistosomiasis affects an estimated 200 million people worldwide, with children in endemic areas composing the greatest risk group.



*Timothy Yoshino's search for the cause of a snail's resistance to parasites could help 200 million disease sufferers.*



*Michael Engel's Presidential Young Investigator Award is designed to keep the brightest faculty in higher education.*

Yoshino will focus his research efforts on the snail which plays first intermediate host to the parasite. "The parasite multiplies in snails through several generations of asexual reproduction," the zoologist explains. When eventually released from the snail, the parasite is infectious and can penetrate the skin of humans who come in contact with water inhabited by the snails.

In the human bloodstream, the parasites reach sexual maturity and lay many eggs which are swept with the flow of blood into the liver, impairing circulation and damaging the liver and other tissues when they are filtered out by the liver. Eggs which reach the intestines and are released in human feces may eventually reach an aquatic environment, hatch into larva and enter the snails, beginning the cycle all over again.

"As long as the snails are around and are the natural hosts for the parasites," Yoshino says, "they can transmit the disease and reinfect the population." Unfortunately, pesticides used to control the snails in their aquatic habitat are prohibitively expensive in underdeveloped countries and are dangerous to water supplies.

Some strains of snails have natural

resistance to the parasite, however. Yoshino wants to learn the reasons for this genetic resistance, knowledge which later might be applied to developing snail populations which no longer would offer refuge to the schistosome parasite, thereby controlling or eliminating the parasitic disease.

Although Yoshino will be allowed to concentrate on research during the life of the NIH grant, he also will be involved in graduate training and will teach some graduate-level seminars.

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#### **MICHAEL H. ENGEL** **Geology and Geophysics**

Assistant Professor Michael H. Engel was still in his first year on the University of Oklahoma faculty when his colleagues in the School of Geology and Geophysics nominated him for the Presidential Young Investigator Award. This new federal program, which can provide up to \$100,000 a year for five years, is designed to encourage young faculty members to remain in teaching and research rather than pursue more lucrative careers in industry.

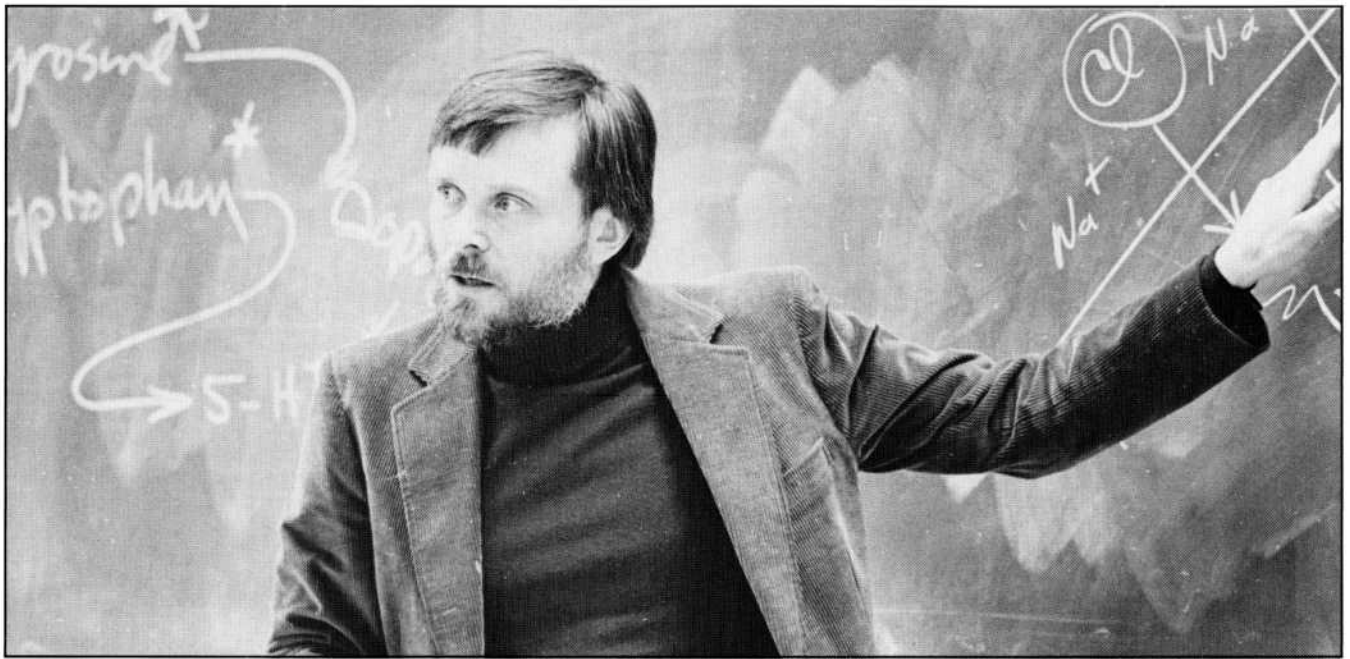
One of 200 recipients selected by the White House Office of Science and

Technology Policy from 1,549 nominees in 1984, Engel is receiving \$25,000 annually to support his research activities, with an additional \$37,500 a year available to be matched by funds from private industry. Exxon, Arco and Phillips Petroleum provided the first year's matching funds. The University is still seeking donor companies for the remaining four years of the grant. The program is administered by the National Science Foundation.

"This is one of those dream opportunities," the 34-year-old Engel says. "I was very surprised and honored. It will give me an opportunity to do something constructive for the University. The grant will free up money for others in the department. It is a morale builder; everyone stands to benefit."

OU Geosciences Dean Frank Stehli agrees that "this is a signal honor for Engel and the University. He is the only recipient in Oklahoma and one of only 200 in the country from nominees that spread across all fields. These were awarded to researchers who look like real superstars at an early stage in their careers."

An organic geochemist, Engel teaches both undergraduate and grad-



Grants will finance Lynn Devenport's studies of alcohol's effect on the brain and a hormone's influence on obesity.

uate courses while pursuing his research interests related to petroleum formation and migration. He also is continuing extraterrestrial research on meteorites that he began at the University of Arizona, where he received his master's and doctoral degrees in geosciences after earning bachelor's degrees in geology and anthropology at State University of New York at Binghamton. He also is involved in a collaboration with other scientists in biochemical research on new hormones for the detection of cancer.

Engel was the first Abelson Fellow, a postdoctoral fellowship named for the former president of the Carnegie Institution, and worked at the Carnegie Institution's Geophysical Laboratory in Washington, D.C., for two years. Before coming to OU in the spring of 1983, he was a visiting scientist with Cities Service Company in Tulsa.

### LYNN DEVENPORT Psychology

Two separate grants, totaling nearly \$475,000, have been awarded to University of Oklahoma psychologist Lynn Devenport to study the effect of alcohol on the brain and to investigate the role which a particular

hormone may play in the problem of obesity.

A \$311,738 grant from the National Institute on Alcohol Abuse and Alcoholism is enabling Devenport to continue a four-year search for the area of the brain affected by alcohol and the causes of short-term addiction.

"Some alcoholics can prevent drinking for months at a time," the associate professor says, "but when they start drinking, say at a party, they drink to oblivion. Their thoughts become obsessive about alcohol."

Earlier research by Devenport already has eliminated one area of the brain previously thought to be affected by alcohol. Currently the 38-year-old neuroscientist, who is in his fourth year on the Norman campus after three at the Health Sciences Center, is examining a portion of the brain which also is associated with the mental diseases of old age. He believes the two problems may share a common denominator.

"This structure of the brain supplies a critical chemical to the cortex, the cognitive part of the brain that controls thinking, remembering, planning," he says, "and alcohol inhibits the formation of that chemical."

Devenport's second grant, \$167,205 from the National Institutes of Health, is supporting the study of a

possible relationship between the adrenal hormone aldosterone and obesity in human beings. He already has determined that a laboratory rat injected with slightly higher than normal levels of aldosterone will gain weight even if caloric intake is restricted.

"As in human obesity, fat is exacting its own demands, capturing calories and holding them, regardless of the body's needs," Devenport explains. "The rats can't lose weight. They look healthy, but they can't mobilize fat from stores and, when placed on a starvation diet, they cannot endure half as long as a normal animal." If the level of aldosterone is decreased, however, the rats lose weight.

Devenport has no evidence as yet that the same hormonal imbalance occurs in people who do not overeat but still become and remain obese, but he feels strongly that the possibility exists.

In determining whether the aldosterone is a direct cause of obesity, Devenport will study different diets, their interaction with aldosterone and whether the hormone activates a special enzyme that removes nutrients from the bloodstream and lays them down as fat rather than allowing them to go where needed in the body. 