OSU Students and Researchers Working to Improve Quality of Life

In the gymnasium of the stately Women’s Building, Breeanna Hart, a cheerful undergraduate student plays catch with a young girl with Down’s syndrome in a carefully planned exercise to improve the child’s motor skills.

In the Center for the Humanities building on the outskirts of campus, associate professor of human development and family sciences Karen Hooker finishes a study on the impact of caregiving on the family and friends of Alzheimer’s disease patients.

And in Multnomah County, Extension specialists Patricia Aune and Caroline Cannon coordinate the Oregon Family Nutrition Program, which is helping families improve their nutrition—and stretch their food dollars. This highly successful outreach program has helped more than 10,000 children in one year alone, giving them a head start on learning a healthy lifestyle.

Oregon State University faculty, staff and students—in every OSU college and in every Oregon county—are helping to improve the lives of people with their research and public outreach in health-related fields.

“For a university without a medical school, Oregon State has an astonishing breadth of health-related research,” said Tim White, OSU’s provost and executive vice president.

A key to the success of the OSU faculty, White said, is their ability to transcend institutional boundaries and create unique partnerships. Some of those partnerships team engineers with physiologists. Some match humanities scholars with physical scientists. And others pair OSU students with faculty—sometimes in a mentoring situation and sometimes as collaborators.

The university’s outstanding research faculty also partner with scientists from prestigious institutions and organizations around the world. Here are a few examples:

**Bridging Disciplines**—George Constantine, a professor emeritus of pharmacy, and Joe Karchesy, an associate professor of forest products, formed a new laboratory to explore natural products. Constantine specializes in the study of herbal compounds, while Karchesy conducts chemical and biological screening of Northwest forest plants for potential new medicines and insecticides. Other OSU faculty members from chemistry, veterinary medicine and agricultural sciences also work in the lab.

**Students and Faculty**—Eric L. Sauers, a doctoral student in sports medicine at Oregon State, and Derald Herling, an OSU assistant professor of mechanical engineering, worked together to create a new instrument called a “shoulder arthrometer,” that can help physicians better diagnose and treat athletes with shoulder dislocations and other injuries.

**Global Cooperation**—Andy Blaustein, a professor of zoology at OSU, and colleagues at the British Antarctic Survey collaborated on a study about the possible effects of an asteroid colliding with Earth. The effects on human and animal health could be catastrophic, not just from the collision, but the ensuing ozone depletion, increased ultraviolet radiation, and widespread acid rain.

**Institutional Collaboration**—Scientists at OSU’s Linus Pauling Institute and doctors at the Boston University School of Medicine collaborated on a study that revealed the role that vitamin C can play in reducing high blood pressure in persons suffering from hypertension. It was published in the prestigious medical journal, Lancet.

“We have a commitment to addressing the needs of the region in many areas, and health is certainly a critical one,” White said. “Addressing quality of life issues from the cradle to the grave will be an increasing area of emphasis for the university—in research, education and outreach.”
Special Movement Clinic

On most Friday evenings, as many as 60 children and young adults excitedly congregate in the Women's Building gymnasium to do things that most of us take for granted. Catching a ball. Swinging a bat. Climbing warily atop a balance beam. The Friday night ritual is part of the Special Physical and Motor Fitness Clinic, offered by the College of Health and Human Performance. It is designed to help children with all kinds of disabilities work on their fitness, motor skills, and aquatic skills. But mostly they just have fun.

The skills these youngsters develop will help them with day-to-day life in their classrooms, on playgrounds, and at home. An even deeper imprint is made on the undergraduate and graduate students at OSU who work the clinic. In this photograph, Lai Saeturn, a student in the College of Home Economics and Education, works on hand motor skills with Kaycee Settlemire.

Oregon State is becoming nationally known for its Movement Studies in Disability program, and top doctoral students are lured to campus by this reputation and by outreach programs like the clinic. Undergraduate students in a variety of fields gladly give up their Friday evening social life for the chance to work with the kids.

"It's hard to say who gets more out of it—the OSU students or the kids," said Jeff McCubbin, who directs the clinic and the movement studies program. "I think it's safe to say everyone comes out a winner."

we are teachers
Smoking is a powerful addiction—so powerful that targeted education efforts to help low-income pregnant women give up cigarettes are successful less than one out of 10 times.

So when Oregon State University researchers completed a project during which they got 34 percent of their subjects to quit smoking during pregnancy, it opened some eyes. And the prestigious Robert Wood Johnson Foundation responded with a four-year, $850,000 grant to continue the work.

The key to the OSU researchers’ success: money. They found that regular cash incentives of just $50 a month—to pregnant women and their social support partners—helped the women kick their smoking habit.

Rebecca Donatelle, an associate professor of public health at OSU, is principal investigator in the latest study. She acknowledges that some people may question the strategy of giving pregnant women money “to do what they should be doing anyway. If you set aside the ethical debate for a moment and look at the financial implications,” Donatelle said, “they are profound.”

She points to new economic estimates that put the cost of complicated births for smokers at 66 percent higher than similar births for non-smokers.

“And that doesn’t begin to address the potential health problems that these babies, their families, or the smoking mothers will have throughout their lifetimes.”

“Smoking consequences, ranging from cancers, asthma and other respiratory diseases and risk, add up to one of the costliest health problems in society today,” Donatelle said. “It’s a question of paying a relatively small amount for prevention now…or paying many times that later.”

With their new grant, they will partner with the Providence Health System and other health care providers in Oregon, to determine whether the success varies with the amount of the incentive, and how important the role is played by the social support partner.

As part of the project, OSU is offering “best practice” guidelines to volunteers. The researchers will identify smokers, assess their habits, advise them on health risks, and provide follow-up counseling and education.

“What we’ve found thus far is exciting,” Donatelle said. “The national average for smoking cessation efforts is 9 percent and the success ratio rarely exceeds 14 percent. The OSU study was 34 percent. That means we’ve clearly identified an area that needs to be further explored.”
Out of the Mouths of Bays…

Researchers Finding Treasure in “Pond Scum”

Kalki Beach is a tropical island paradise. Its lush foliage, white sandy beaches and sparkling blue waters are rarely disturbed by vacationers, who have yet to discover the beauty of Curacao. But this hidden gem off the coast of Venezuela tantalizes one Oregonian for a different reason. It is a treasure trove in natural pharmaceuticals.

Bill Gerwick, a professor in OSU’s College of Pharmacy, has spent much of the last decade studying marine blue-green algae. In some locales, that same algae is known as “pond scum.” The species known as Lyngbya majuscula, however, is gaining a much more dignified reputation.

During the past year, Gerwick and his research team extracted a compound from algae harvested in a bay near Kalki Beach that is one of the most powerful neurotoxins they had seen. Dubbed “kalkitoxin,” the compound is so potent that a single drop of it could kill two swimming pools full of animal-derived nerve cells—or neurons.

The potency and unique structure of kalkitoxin has the potential to lead to new treatments for pain, epilepsy and neurodegenerative diseases.

Gerwick said he believes the compound works by blocking sodium channels, thus preventing nerve cells from firing off their electrical signals. “Kalkitoxin is incredibly potent, which means it likely binds with greater affinity,” Gerwick said. “When that happens, there is a good chance that you can create a pharmaceutical that has greater specificity of drug action. Studying the compound also will help us learn more about how these complex sodium channels work and how diseases and drugs affect them. “It is,” he said, “a valuable discovery.”

This isn’t the first time that the OSU researchers have found success in mining drugs from the sea. Several years ago, Gerwick discovered a compound called “Curacin A” in different samples of Lyngbya majuscula that had powerful anti-cancer properties. In fact, Curacin A was remarkably similar to taxol.

Since that early discovery, Gerwick has expanded his research lab and now works with a team of 10 faculty and graduate students as OSU continues to become a leader in the promising field of mining drugs from the sea.

Gerwick presented his latest findings on kalkitoxin in December 2000 to a prestigious research conference hosted by the American Chemical Society. His research was funded by the National Institutes of Health, Dow AgriSciences and Oregon Sea Grant.

“To think that such promising compounds come from what essentially is pond scum is amazing and ironic,” Gerwick said. “It is a great example of that old saying that one person’s garbage is another person’s treasure.”

OSU continues to become a leader in the promising field of mining drugs from the sea.