When the Eyes Have It

UW profs find that exercise counters age-related vision loss.

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A fifteen-year study with residents of Beaver Dam, Wisconsin, points to another benefit of regular physical activity.

If you're looking for an excuse to renew your gym membership, try this one on for size — a healthy lifestyle could protect your eyesight in old age.

Ron and **Barbara Klein,** a husband-and-wife ophthalmology research team at the UW's School of Medicine and Public Health, have found that people who exercise regularly aren't as likely to develop the "wet" form of age-related macular degeneration (AMD), a debilitating condition in which leaky blood vessels in the eye eventually cause severe vision loss. Although wet AMD is linked to cardiovascular health, the Kleins were the first to investigate the long-term role of exercise in the onset of the disease.

They did so by enlisting nearly five thousand residents of Beaver Dam, Wisconsin, to participate in a fifteen-year medical study. Every five years beginning in 1987, local doctors measured patients' height and weight, took photos of their retinas, conducted blood tests, and issued a health questionnaire.

"The physicians, town leaders, optometrists, and ophthalmologists were all very supportive," says Ron Klein.

Because the Beaver Dam study didn't involve clinical trials, it doesn't prove a cause-and-effect relationship between exercise and AMD. But the correlation is striking. The Kleins found that participants who exercised at least three times per week were 70 percent less likely to develop wet AMD. Physical activity was also linked to lower blood pressure, a lower rate of obesity, and lower white blood cell counts — all factors known to be associated with the condition.

"Of course, being physically active is very important in preventing cardiovascular disease," Ron Klein says, "so it's a no-brainer to recommend physical activity."

The Beaver Dam study is extraordinary because of its size and scale. Nearly one-third of the town's population participated in the project, which was funded by the National Eye Institute. Beyond AMD, the long-term evaluations are helping researchers understand the factors that contribute to age-related eye conditions such as cataracts and glaucoma. There are no known cures for these conditions, which affect millions of people in the United States each year.

— Erin Hueffner '00

Jogging the Memory

While everyone knows the proverbial fly prefers honey to vinegar, **Jerry Yin PhD'86** wants to know how it remembers which smell it favors.

Yin, a UW-Madison genetics and psychiatry professor, uses fly olfactory memory to study the genetics of learning and memory. He trains fruit flies to associate a specific odor with a mild but unpleasant electric shock, then tests them later to see how well they remember to avoid that odor. After a few hours of training, typical flies retain the connection for about ten days.

To unravel the memory mechanisms at work in the flies, Yin and his colleagues have identified some of the proteins in the neural circuits that are responsible for creating and retaining memories. By blocking or turning on specific genes, Yin can program forgetful flies or give them a memory boost.

Why should we care about amnesiac insects? Many of the proteins involved in flies are likely also important for learning and memory in humans, Yin says. For example, he is currently studying proteins similar to the one whose absence causes human fragile X syndrome, a genetic disorder characterized by learning disabilities and cognitive impairment. He expects ongoing research may reveal similar mechanisms underlying problems as diverse as autism and addiction.

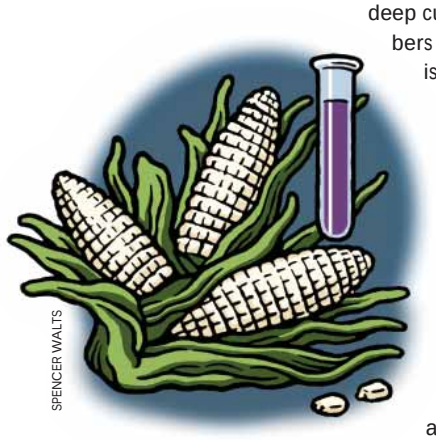
JEFF MILLER

In Jerry Yin's lab, an anesthetized fruit fly is examined under a microscope for visible characteristics, such as eye color, that mark insects genetically engineered to have weakened or enhanced memory circuits.

— Jill Sakai PhD'06

Seeds of a Growing Partnership

Researchers cultivate corn and cooperation with Oneida farmers.



SPENCER WALTS

On a fall day last year, huge braids of corncobs hung from the beams of a barn in central Wisconsin. Each ear shone bright white, with only an occasional streak of color — a striking portrait not only of a fruitful harvest, but also of a growing collaboration.

White corn, a crop with deep cultural meaning to members of the Oneida nation, is making a comeback in Wisconsin, thanks in part to a partnership between UW-Madison and Tsyunhehkwa, an organic farm located on the Oneida reservation near Green Bay. Launched two years ago by agronomy professor **Bill Tracy,** the project aimed to improve yield and selection techniques while incorporating Oneida knowledge and customs.

Along with beans and squash, corn is considered one of the "Three Sisters" in Oneida tradition. The crops play a role in the Oneida creation story and were staples for much of their history. As the Oneida were displaced from their lands, however, many of them gave up farming.

Now, revenue from casinos is allowing Wisconsin Oneida to buy back land and expand their farms. At the Tsyunhehkwa farm, staff have been working to reintroduce crops such as white corn — which is richer in protein than commercial sweet corn — as well as traditional medicines to address health problems such as diabetes.

While assisting people with such problems lies at the heart of the Wisconsin Idea, Tracy says communities such as the Oneida often aren't equally served by university resources. In 2004, he applied for a two-year grant from UW-Madison's Baldwin Wisconsin Idea Endowment to help remedy the situation. "If it didn't benefit [the Oneida], there was no benefit for me to do it," he says.

The project has been both encouraging and challenging. Tracy and research assistant **Samuel Pratsch '99, MS'06** say they encountered cultural and agricultural realities that compelled them to work in more community-oriented and inclusive ways.

Tracy's training in agronomy, for instance, led him to expect that high field productivity with low labor would be desirable. But, he says, he found that "the cultural aspects are far more important."

Tradition dictates that white corn be planted together with squash and beans in a labor-intensive process. The corn grows on small mounds, the beans trail up the corn stalks, and the squash grow around the mounds to discourage animals from eating the vegetables**.**

"All of our corn is picked by hand," says Ted Skenandore, a Tsyunhehkwa farmer.

The Baldwin project succeeded in improving machinery and proposing new planting schemes, such as planting corn in a checkerboard pattern and rotating crops to prevent weeds. Tracy also invested some of the project's funds in determining nutritional data on white corn, which he says was an important goal of Tsyunhehkwa staff.

But Tracy also says he found he needed to assure people that the Oneida community would still own the corn. "It's Tsyunhehkwa's responsibility to protect the corn," he says, noting that some were uncomfortable when he proposed bringing some of the corn to Madison.

To foster stronger relationships and accomplish the educational aspect of their project, the researchers focused some of their efforts on a children's garden at the reservation's Turtle School, where the school curricula emphasize Oneida history and culture. Teachers at the school helped organize activities that encouraged community participation throughout the growing season.

Skenandore says Pratsch's dedication to the children's garden helped build trust among members of the community. "Samuel took it to the next level," he says.

Such personal involvement may be helping the white corn project succeed, but it remains somewhat controversial in academia, which often prefers its researchers to be detached from the outcomes of their subjects. Pratsch says some faculty advised him not to engage in this kind of participatory research, especially since he was considering using this project as a foundation for his doctoral dissertation.

After the 2006 growing season ended, the researchers decided not to apply for further funding. However, they are maintaining their connection with Tsyunhehkwa and Turtle School. Pratsch says he plans to continue to visit the school and build on the successes of the garden project.

Pratsch says he "struggled a long time" with being an "activist scholar." Ultimately, however, he believes it may be the answer to a question that universities have been asking more and more: how can we work better with the communities around us?

— Katherine Friedrich '00, MS'06

Anatomy of a Conversation

UW sociologist gives doctor-patient dialogue a thorough check-up.

Stethoscope in hand, a concerned physician asks a sick patient, "How are you feeling?"

It's a familiar scene to anyone who's ever had a physical, and one that happens in health care settings every day. But according to UW sociology professor **Douglas Maynard,** this seemingly innocent question can have a poisonous effect on a patient's trust if asked at the wrong time.

Maynard worked with a team of conversation analysts to study the complicated interactions that take place between doctors and patients. Eighteen researchers from the United States, Finland, and the United Kingdom contributed to the project, and their collected findings have been published in a new anthology titled *Communication in Medical Care: Interaction Between Primary Care Physicians and Patients.* It was the first comprehensive research to pick apart the entire primary care medical interview, spanning from the initial patient presentation to subsequent follow-up visits.

Collectively, the authors posit that while it's crucial for physicians to have a solid scientific background, an impeccable bedside manner can mean just as much to their patients' health.

Maynard, co-editor of the anthology, says that effective communication is closely related to patient satisfaction, faster healing time, and adherence to medical recommendations.

"It is one thing to understand biology, anatomy, chemistry, or the body and its processes in general," says Maynard. "It is another matter to be able to communicate medical knowledge to patients."

Researchers worked with detailed audio and video recordings of office visits and after-hours phone calls to collect conversation data. They were looking not only for what was said, but also for what was unsaid — silences, intonation, and volume of voice, for example.

Each chapter of the book takes a quantitative look at a different aspect of the dialogue, including how patients present their own ideas about an illness for the doctor to confirm or deny, how doctors deliver good and bad news, and how patients respond to treatment recommendations.

A number of medical schools are already starting to use the study's findings in their curricula, and several now require students to pass an exam that evaluates communication skills.

Residency programs are also beginning to see the value of recruiting doctors with communication training, because studies have shown that medical encounters are shorter when patients understand their diagnosis. "From a physician's point of view," says Maynard, "effective communication can be a way of gaining a patient's trust."

— Erin Hueffner '00

JEFF MILLER

One of the world's oldest tree species is now at home in Birge Hall.

COOL TOOL

Living Fossil

The newest addition to UW-Madison's botany greenhouses is hardly new. It's a plant so ancient it once co-existed with dinosaurs.

Known as the Wollemi pine, the plant was presumed extinct until a bushwalker named David Noble discovered it in an Australian national park in 1994. As part of a worldwide effort to conserve and propagate the tree species — one of the oldest and rarest on earth — botany greenhouse director **Mo Fayyaz MS'73, PhD'77** recently purchased a foot-tall Wollemi pine seedling, one of a limited number of the plants that recently became available in the United States.

Fayyaz says the ancient conifer will be used to teach students about topics such as plant diversity, evolution, and geography. The discovery of this "living fossil," he says, also underscores the importance of conserving the world's natural areas, which can still hold unexpected treasures.

— Madeline Fisher PhD'98

WISCONSIN IDEAS

In 2004, as the details of the televised **presidential candidate debates** were being ironed out, Republicans argued against allowing split-screen images. It turns out they needn't have worried. A study by UW-Madison researchers has found that President George W. Bush — not Democratic challenger John Kerry — reaped the most benefits of the coverage. Both camps agreed to ban split-screen views, but some networks used them anyway. The broadcast images "hurt Kerry quite a bit and didn't hurt Bush at all," says journalism professor Dietram Scheufele, who conducted the study with journalism assistant professor Dominique Brossard and doctoral student Eunkyung Kim. The study asked seven hundred university students to evaluate a five-minute debate clip in single-screen and split-screen formats. Their response was based primarily on what they already thought about the two candidates. Those who liked Bush liked him more after watching split-screen coverage; Kerry voters still didn't like Bush, yet didn't increase their support for Kerry.

UW civil and environmental engineers have tested an innovative way to keep **mollusks and barnacles** from taking up residence on boat hulls. The researchers shot tiny electric jolts through the undersides of boats, cutting the marine life by 50 percent and offering a promising way to combat the problem for boaters and shippers.

K. KISER