It Was a Very Good Year

UNLV life sciences researchers brought in more than $7 million last year to study topics ranging from the life span of honeybees to global climate change.

By Gian Galassi
Photography by R. Marsh Starks and Aaron Mayes

As with any great team–be it in sports or in the laboratory–success is rarely a product of happenstance.

So it was no accident when, in the span of just three months last year, several research teams in UNLV's School of Life Sciences (SOLS) were awarded sizable grants from some of the nation's most respected funding agencies.

Seven teams were notified last summer that they would receive more than $3 million in grant funding. All told, in 2007 faculty in the school received nine grants totaling more than $7 million from the National Science Foundation (NSF), the National Institutes of Health (NIH), and other agencies, resulting in the single most productive funding year in the school's history.

"We couldn't be more proud of the faculty," says Carl Reiber, associate dean of the College of Sciences and former director of the SOLS. "The school's recent success makes evident the importance of building a team of researchers who has not only a strong and complementary range of expertise but also a chemistry that allows them to build on each other's strengths."

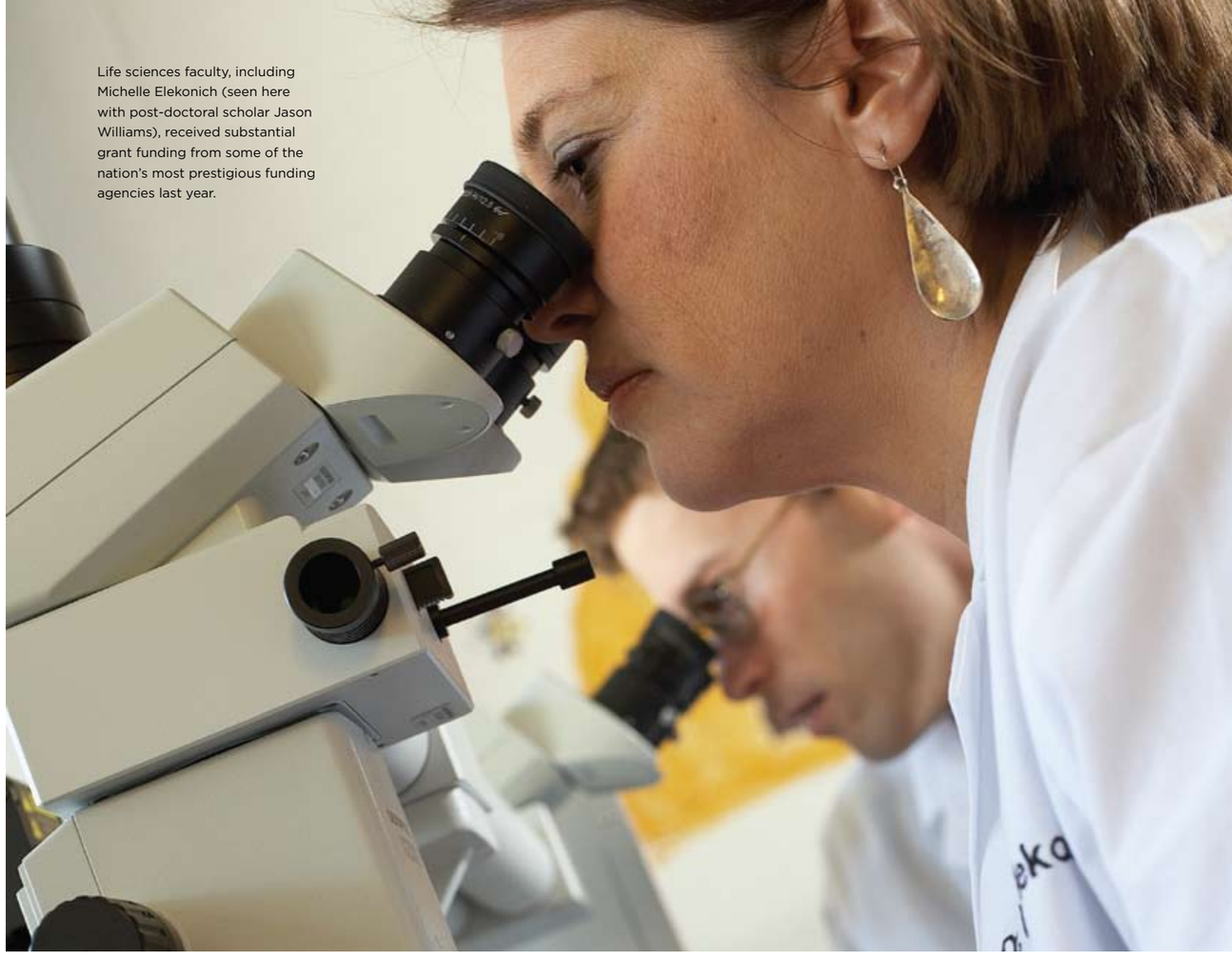
He adds that the school has worked arduously in the last several years to develop the research and personnel infrastructure required to produce this achievement.

The initial groundwork for the accomplishment, Reiber says, was laid six years ago when he and other colleagues from the then-biological sciences department received a grant from the NSF Experimental Program to Stimulate Competitive Research (EPSCoR). The grant was awarded to help UNLV build the technical infrastructure required to support the advancement of life sciences research.

Those funds, along with a grant from the Nevada IDeA Networks for Biomedical Research Excellence (INBRE) program, helped build a genomics lab, imaging facilities, and bioinformatics program. All of these additions proved integral to the school's ability to attract and retain a corps of active faculty researchers, who set about acquiring competitive grant funding with vigor.

Still, given the enormous competition for prestigious federal grants, their success was quite an achievement, according to Dennis Bazylinski, the current director of the SOLS.

"The sheer number of proposals submitted to these agencies by faculty throughout the country each year is staggering," Bazylinski says. "To have so many UNLV faculty members receive this level of funding in such a short time frame is remarkable."



Life sciences faculty, including Michelle Elekonich (seen here with post-doctoral scholar Jason Williams), received substantial grant funding from some of the nation's most prestigious funding agencies last year.

* * *

But, to College of Sciences Dean Ron Yasbin, this kind of achievement seemed just a matter of time. When he joined the college as dean in 2003, he saw momentum building in the promising team of researchers in the biological sciences. In the following years, he worked to foster that momentum and to demonstrate to peer institutions and funding agencies that UNLV was now staffed, prepared, and ready to compete for a larger share of federal research dollars. This strategy, which included bringing representatives from the NSF and NIH to tour UNLV's facilities and to meet with the faculty and staff, seems to have paid off.

"Word got back to NSF and NIH that we were hiring great researchers out of labs at some of the best research institutions in the world," Yasbin recalls.

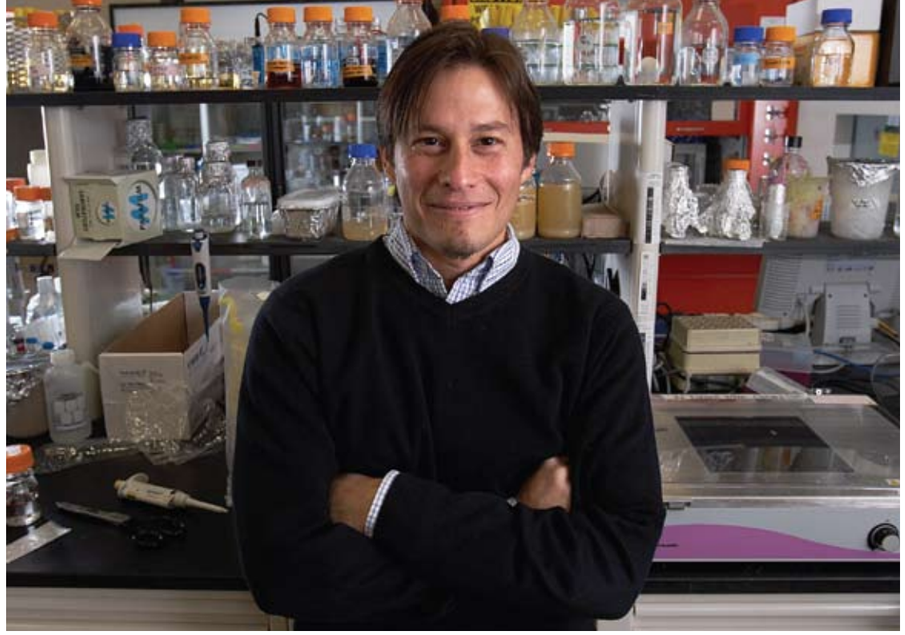
He adds that the faculty's recent accomplishments serve as a bellwether for the school, which now must deal with the inevitable consequences of success: namely, warding off the deep pockets of older, more established institutions seeking to recruit UNLV faculty.

"You know you're succeeding when other highly reputable institutions start trying to steal your faculty away. And that is definitely starting to happen here," says Yasbin.

In many ways, says Bazylinski, this new challenge signals the next stage in the school's evolution, which includes promoting its solid reputation for research by building on its accomplishments and continuing to attract the best and brightest faculty and students.

In order to achieve this, he notes, the school will seek to leverage its many assets, among which UNLV's new Science and Engineering Building may be counted. The state-of-the-art research facility will open soon, providing laboratory space to a number of life sciences faculty members pursuing multidisciplinary research.

Additionally, the school is working to capitalize on UNLV's unique status as the only research university in the Mojave Desert. It has developed areas of emphasis that focus on un-



Left: Life sciences professor Eduardo Robleto studies whether certain cellular mechanisms in bacteria enhance genetic diversity. Below: Elekonich examines aging theory by manipulating the timing, intensity, and duration of foraging behavior in honeybees.

derstanding environmental stresses in arid regions, the ecology of life forms and communities in Nevada, and the potential dangers that exist to human and animal populations because of dramatic changes to our desert region.

The school is also advancing research through the appointment of postdoctoral scholars, who provide valuable assistance to faculty in the laboratory while gaining research experience. One such life sciences postdoctoral scholar is Jason Williams, who received a prestigious fellowship from the NIH—one of the most competitive awards available. For Williams, who conducts research on honeybees with life sciences professor Michelle Elekonich, the postdoctoral appointment has been a wonderful opportunity.

"My UNLV postdoc experience and this prestigious NIH fellowship have provided me with some very beneficial experience," Williams says. "They have expanded my professional options tremendously and will allow me to be more selective in choosing my career path."

Williams' appointment at UNLV also speaks well of the university, according to Elekonich.

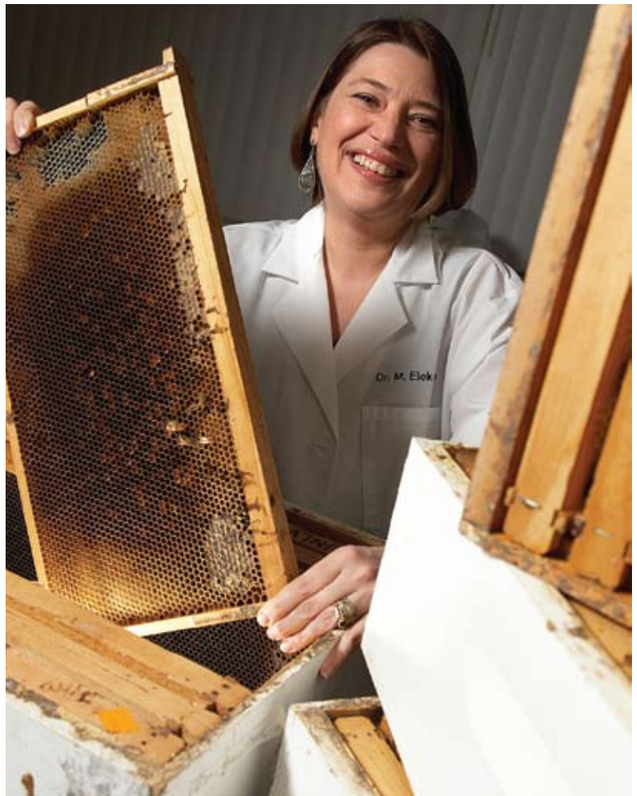
"This award reflects Jason's ability, creativity, and promise as a researcher," Elekonich says. "It also signifies that the NIH believes UNLV can train outstanding biomedical researchers, which speaks volumes about our growing prominence as a research university."

* * *

With the success the school has experienced of late, Bazylinski acknowledges, comes distinction but also a desire to continue the trend. Looking to the future, he sees even greater potential. The faculty who have acquired grant funding serve as excellent role models to junior faculty, who in turn stand ready in the on-deck circle, conducting their research and preparing their own grant proposals.

And, he notes, all of them remain committed to the outcome grant funding is intended to yield—quality scholarship.

"We will see a number of excellent scholarly publications grow out of this funding," he says, "as well as increased opportunity for our students to learn alongside the faculty in our laboratories. That is, after all, what grant funding seeks to build – an environment that nurtures scholars, both faculty and students, who are creating new knowledge through research."



Grant Funding At Work

Below are several of the grant-funded projects currently under way in UNLV's School of Life Sciences.

Allen Gibbs
$950,000, National Science Foundation

Assistant professor Allen Gibbs is collaborating with William Etges, professor of biological sciences at the University of Arkansas, to study how certain environmental stresses—such as extreme temperatures, lack of water, and noxious chemicals produced by cacti—affect the genetic responses of desert fruit flies in the laboratory and in the wild. The results will be integrated with physiological and biochemical studies to identify which genes are activated to allow the insect to survive in harsh environmental conditions. The findings are expected to produce knowledge critical to understanding how other species will respond to the conditions predicted by global climate change models.

Eduardo Robleto
$222,000, National Institutes of Health

Assistant professor Eduardo Robleto is studying whether certain cellular mechanisms in bacteria enhance the generation of genetic diversity, including both beneficial and harmful mutations. The study may also provide insight into the generation of cancer as well as cell aging and growth in conditions of stress. The research is crucial to the understanding of evolutionary processes and may someday lead to strategies that could regulate cancers and other developmental diseases.

Michelle Elekonich and Steve Roberts
$667,000, National Science Foundation

Associate professors Michelle Elekonich and Steve Roberts are testing models of aging theory by manipulating the timing, intensity, and duration of foraging behavior in honeybees—the most metabolically intense behavior in the animal kingdom. They seek to further understand how foraging behavior affects honeybee flight performance, muscle function, cellular damage, anti-aging mechanisms, and overall lifespan. The project marks the first time researchers will attempt to study these traits in free-living animals in their natural habitats.

Jeff Shen
$295,000, U.S. Department of Agriculture

Associate professor Jeff Shen is working on a three-year project to determine how the plant hormone Gibberellin works to regulate the growth and development of rice, one of the world's most important food crops and a significant source material used in biofuel production. The knowledge gained from this study will make it possible to manipulate grain quality, to alleviate major seed crop losses due to preharvest sprouting, and help increase biomass production. All of these developments are expected to enhance economic opportunities for agricultural producers as well as improve the protection and safety of the nation's agriculture and food supply.

Deborah Hoshizaki and Allen Gibbs
$518,846, National Science Foundation

Associate professor Deborah Hoshizaki and Gibbs are collaborating on a three-year study to examine how the fruit fly regulates its internal environment during metamorphosis. The goal of the research is to understand the role that fat cells play in regulating pupal development. The study will test the hypotheses that fat cells respond to the metabolic needs of the pupa and that these cells monitor and regulate the release of energy through signaling from hormones.

Stan Smith
$488,774, U.S. Department of Energy

Distinguished professor Stan Smith, who also serves as associate vice president for research, is wrapping up a 10-year study that will provide an examination of how an arid ecosystem, the Mojave Desert, will respond to the elevated carbon dioxide levels expected to occur by mid-century. The global scientific community is very interested in the outcome of this research because approximately 40 percent of the Earth's terrestrial surface is arid or semiarid, and more land is undergoing desertification each year.

Scott Abella and Stan Smith
$179,000, U.S. Department of the Interior

Assistant research professor Scott Abella and Smith are working to identify native vegetation that will help improve the restoration of arid lands following uncontrolled wildfires. Currently, the scars of post-burn landscapes often remain visible as efforts to re-establish native vegetation fail, leaving non-native grasses to grow and serve as fuel for the next lightning- or human-sparked wildfire. The researchers are collaborating with scientists from the Lake Mead National Recreation Area and the Las Vegas field office of the Bureau of Land Management on the project.