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David Cerna, Ph.D., a former participant in the Minority Access to Research Careers program, researches the effect of radiation on cancer for the National Cancer Institute. For more on former NIGMS minority program participants working at NIH, see the cover story.

**DIVERSE ROADS**  
*Lead to NIH*

BY SUSAN ATHEY, NIGMS

**Like many at NIH, they came from across the country to work alongside top-notch scientists and scientist-administrators.** But they have something else in common: They are former participants in NIGMS programs aimed at increasing the number of underrepresented minority biomedical scientists.

The Institute's Division of Minority Opportunities in Research (MORE) supported these students-turned-scientists at various stages of their education by providing them with training opportunities, mentors and role models, lab equipment and supplies, and often, their first experience in a research lab.

**Working a "Dream Job"**

Brandi Mattson, Ph.D., calls her job at NIH a "dream postdoctoral position." She spends her days performing molecular neuroscience research in a National Institute on Drug Abuse lab in Baltimore, MD, where her work focuses on integrating the behavioral and molecular aspects of drug abuse, specifically how the brain changes when stimulated by drugs. Mattson hopes this research will aid in the understanding of how drugs of abuse work and assist in developing new treatments for addiction.

But performing experiments and a love of science are nothing new to Mattson—they are something she traces back to childhood.

"By the time I was 5, I already had my own microscope and histology slides," she said.

An avid violin and piano player, Mattson's "other" love—that of music—got her accepted into 2 of the top 10 music schools in the country with full scholarships. But her passion for science won out, ultimately landing her as an undergraduate student at Southwestern University in Texas and later at the University of Colorado, Boulder. While attending the University of Colorado, Mattson was diagnosed with multiple sclerosis. Refusing to let her illness stand in the way of her dreams, she moved back home to be closer to her network of support and enrolled in the University of Southern Colorado, Pueblo, where she finished her bachelor's degree in psychology with minors in mathematics and sociology.

The first in her family to earn a bachelor's degree, Mattson continued her education at Rutgers, The State University of New Jersey, where she earned a Ph.D. in behavioral and neural sciences in 2002.

Throughout her college education, NIGMS' Minority Biomedical Research Support (MBRS) program was behind Mattson just about every step of the way.

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## From the NIGMS Director

I am writing to introduce myself as the new director of NIGMS and to give you an update on several issues that may be of interest to you. The first item relates to the Institute's budget.

For FY 2004 budget-related details, see the following Web sites:

NIGMS FY 2004 financial management plan [http://www.nigms.nih.gov/about/financial\\_management\\_strategy.html](http://www.nigms.nih.gov/about/financial_management_strategy.html)

FY 2004 budget table (with a comparison column for FY 2003) [http://www.nigms.nih.gov/about\\_nigms/budget.html](http://www.nigms.nih.gov/about_nigms/budget.html)

For FY 2005, the budget proposed by the President has a 2.9 percent increase for NIGMS and a 2.6 percent increase for NIH overall. While these increases are lower than those during the doubling period, one should not lose sight of what a strong statement of importance and support the increases represent in the present budget climate.

For the FY 2005 budget tables and justification narrative, see: <http://www.nigms.nih.gov/about/cj2005/>

For additional information on NIGMS success rates, percentile ranks, and grant budgets, see the question-and-answer document at [http://www.nigms.nih.gov/funding/success\\_faq.html](http://www.nigms.nih.gov/funding/success_faq.html).

The second item that I would like to draw to your attention is the NIH Roadmap for Medical Research. This exciting set of initiatives reflects a significant reaffirmation of the importance of fundamental discovery in driving medical advances. Two of the three themes of the NIH Roadmap are of particular interest to NIGMS and the scientists it supports: New Pathways to Discovery and Research Teams of the Future. I strongly recommend that you take some time to explore the Roadmap Web site at <http://nihroadmap.nih.gov> to learn more about programs that may be of interest to you. Some of the larger programs will involve interactions between you, colleagues at your own institution, and perhaps colleagues at other institutions.



Jeremy M. Berg

I encourage you to look into these opportunities. In addition, while many of the Roadmap initiatives that have been announced so far involve multi-investigator activities, opportunities for individual investigators are part of the Roadmap as well.

Finally, I welcome your comments and suggestions. We depend on your input for our short-term and long-term planning as well as for information that is useful in communicating to various audiences the importance of the research and training programs that NIGMS supports. In addition, I recommend that you stay in contact with your NIGMS program director. In my short time here, I have been deeply impressed by the ability and level of commitment of the NIGMS staff. They are dedicated to working with you to get the best science done.

Jeremy M. Berg, Ph.D.  
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## The BIO2010 Revolution: What It Is, Why NIGMS is Helping to Lead It, and Why You Should Join It

BY DERRICK TABOR, PH.D., AND ERIC JAKOBSSON, PH.D., NIGMS

The National Academy of Sciences report, *BIO2010: Transforming Undergraduate Education for Future Research Biologists*, is an important read for MORE grantees and others committed to training the next generation of researchers and scientific leaders. The report, commissioned by NIH and the Howard Hughes Medical Institute, points to a coming crisis in biomedical research. After reading the report, one can only conclude that the education of most young biologists is incomplete because it does not provide the quantitative skills and knowledge of chemistry, physics, and engineering necessary to function at the cutting edges of modern biomedical research.

To solve this problem, the report suggests dramatic changes in biology curricula and in how students are taught. The content of biology instruction needs to match the quantitative and interdisciplinary nature of modern biomedical research; the way students learn should also match the way scientists learn—through research. *BIO2010* recommends inquiry- and problem-based learning so that students can have meaningful exposure to how scientists think and how they analyze scientific problems. General skills like writing, reading, critical thinking, and clear communication should be stressed in all biology classrooms.

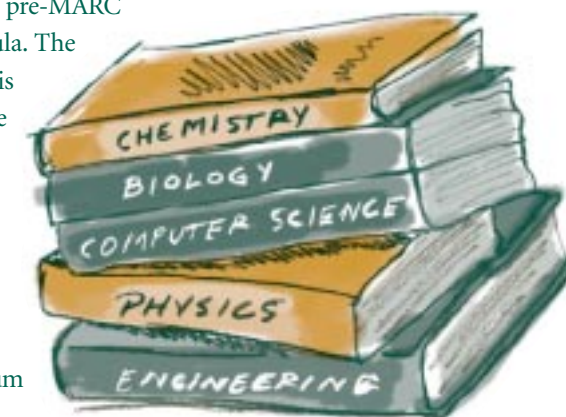
NIGMS has adopted the *BIO2010* education reform agenda as critical to the long-term success of the Institute's mission to train future scientists. NIGMS is spearheading an NIH Roadmap initiative to develop interdisciplinary curricula, and proposals from this initiative are under review. The Institute is also collaborating with the NIH Office of Science Education to issue a funding announcement for curriculum development aligned with *BIO2010*. In addition, a summer workshop for faculty that will lay the foundation for a lasting partnership between MORE grantees and other institutions of higher education is in the planning stage. This partnership is expected to enhance tomorrow's biomedical research workforce and to ensure that all segments of our

nation's youth will have an equal opportunity to benefit from the biology education reform movement.

Staff of the NIGMS Center for Bioinformatics and Computational Biology and the MORE Division, along with others in the Institute, will continue their efforts to advance NIGMS' contribution to the reform of biology education. We hope that you, too, will be motivated and empowered to work with us to achieve that goal. Several MORE institutions have applied for and received administrative supplements to their existing Minority Access to Research Careers (MARC) Undergraduate Student Training in Academic Research (U\*STAR) grants to integrate quantitative analytical methods into the pre-MARC and MARC science curricula. The aim of these supplements is to improve the quantitative skills of underrepresented minority students in biomedical science fields. For both the MARC and Research Initiative for Scientific Enhancement (RISE) programs, curriculum reform is an allowable cost.

The complete *BIO2010* report is available online at <http://www.nap.edu/books/0309085357/html>. Inviting biology, chemistry, physics, computer science, and engineering faculty to read and respond to *BIO2010* might be one way to jump-start or continue the biology education reform movement at your institution. Stay ahead of the curve! ●

*Editor's Note: Tabor was a program director in the MORE Division and is now with the NIH National Center on Minority Health and Health Disparities; Jakobsson is director of the NIGMS Center for Bioinformatics and Computational Biology.*



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Her first experience with MBRS was right after she finished high school, when she enrolled in a small summer program for high school graduates offered by the University of Southern Colorado. It was this program that gave Mattson her first opportunity to work in a research lab.

“I really enjoyed it and I came back the following summer to do more research,” she said.

Mattson continued as an MBRS participant at both the University of Southern Colorado and Rutgers. She credits the program for providing her with research supplies, mentors, and opportunities to attend national scientific meetings.

“Without the MBRS program, graduate school would have been much more difficult for me to complete,” Mattson said.

“The program provided me with a network of mentors—both faculty and students—to advise me on my research and plan my long-term career goals, and to support me in my non-scientific endeavors. Even though I no longer participate in the program, I still have the same mentors to turn to. I am fortunate



Postdoctoral fellow Brandi Mattson works in an NIH lab in Baltimore, MD, where she studies how the brain changes when stimulated by drugs.

that my mentors will be there for the duration of my career—as advisors and research collaborators.”

As to what the future holds for Mattson, we’ll just have to wait and see. She plans to be at NIH for another year and a half, and then she hopes to move back West and possibly do some biotechnology research and look for a faculty position.

“My goal is to continue conducting medical research and unraveling the mysteries of neurological and psychiatric diseases,” she said.

#### Realizing One’s Potential

Some people are just not born farmers. Growing up in a farming family on the central coast of California helped David Cerna, Ph.D., to realize this early on.

“I decided being a farm laborer wasn’t for me,” Cerna said, adding that this was a major influence in his decision to attend college.

During his undergraduate years at the University of California, Santa Cruz, Cerna was exposed to biomedical research through the MARC program.

“One of the great things about the MARC program was that it gave me one-on-one time with my professors and instructors—this is something I wouldn’t have had the courage or the opportunity to do otherwise,” he said.

Also the first in his family to attend college, Cerna received a stipend, tuition assistance, and funds for books through the MARC program. He says this support was a “great relief” to his parents back on the farm.

Cerna went on to finish his undergraduate degree in biology at Santa Cruz and credits the MARC program with helping him to recognize his potential.

“Getting involved with MARC helped me to realize that I wanted to do something more than getting a bachelor’s degree, so I applied for and was accepted into a Ph.D. program at the University of California, Davis,” he said. He received his Ph.D. in biochemistry and molecular biology in 2003.

Cerna now finds himself performing cancer research at the National Cancer Institute through the Cancer Research Training Award (CRTA) program. In the lab, Cerna is studying why certain drugs make cancer cells more sensitive to radiation therapy. Cerna says the goal of this research is to find and establish “molecular targets” for use in the potential design of new drugs and to shed light on the effect of radiation on cancer.

“Working at NIH is great,” Cerna said.

“Having the opportunity to perform real-life research that is directly correlated to patients is the best part,” he said, noting that all his previous research was done on non-human models, like yeast or *E. coli*.

After his term in the CRTA program ends, Cerna hopes to stay on the East Coast and find a faculty position or a job in industry.

“My ideal job would be one that allows me to perform my own research, and hopefully this research will have direct application in patients.”

#### Hooked on Research

Senator Hazelwood, M.D., credits the MBRS program with introducing him to research.

“My interest in science didn’t begin until I was an undergraduate student at Rutgers,” he said, “and this was a direct result of my involvement with MBRS.”

Hazelwood’s initial plan was to get a medical degree, but MBRS sparked his interest in biomedical research as well.

After completing a bachelor’s degree in chemistry at Rutgers, Hazelwood went on to Temple University School of Medicine, where he completed his medical degree in 2000. During medical school, he also worked at NIH for 2 years as a Howard Hughes Medical Institute fellow. He was hooked.

“That experience was wonderful. NIH is unique: Everyone is concentrating on research here on campus—you’re free to walk down the hall and collaborate with other scientists—and this gives you an edge you don’t find anywhere else,” he said.

Hazelwood received further postdoctoral training at Children’s Hospital of Philadelphia and interned in general surgery at the State University of New York Downstate Medical Center. But he always hoped to return to NIH at some point during his training. He applied to the Intramural Research Training Award (IRTA) program, which is designed to give junior scientists the opportunity to further their development as researchers, and returned to NIH in September 2003.

And today, when he’s not fishing the Northeast waters or trying his hand at boating, he’s working in a National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK) lab where he studies the role of receptor signaling in breast cancer.



Senator Hazelwood performs breast cancer research for NIH. Trained as a physician, Hazelwood hopes for a career in research as well as medicine.

“My research involves examining the signaling pathway of Sigma receptors, which are a novel class of drug-binding proteins that have been implicated in various biochemical, physiological, and behavioral processes. These receptors are highly expressed in breast tumor cell lines, while there is virtually little or no expression in normal breast tissue,” Hazelwood explained.

“These receptors represent a potentially novel approach for understanding and treating breast cancer.”

After his IRTA fellowship ends, Hazelwood hopes to further his medical training, perhaps in general surgery or internal medicine.

“My ultimate goal is to be an academic clinician—to be a researcher and a practicing M.D. in an academic environment.”

#### Giving Back

LaShawn Drew, Ph.D., spends her days administering grants for the very program that helped her obtain her doctoral degree. As a program director in the NIGMS MORE Division, Drew manages training grants and fellowship programs at colleges and universities across the country.

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# Profile

## MARQUEA KING, PH.D.



*This section profiles former MORE participants who have excelled in their fields. We hope that the profiles will give students an idea of the types of careers available with science degrees and the paths others have taken to achieve those careers.*

### The Path to Success: From MARC Student to Toxicologist

BY JILLIENE MITCHELL, NIGMS

It seems as though Marquea King, Ph.D., was destined for a career in science. An animal lover since childhood, King's parents thought that she would one day become a veterinarian.

"I was always able to convince my parents to let me save stray animals or wounded rodents that our cats seemed to constantly get hold of," King said, referring to herself as an "animal crusader" by the age of 7.

"While in high school, I had an early interest in science not only due to my love of animals and a home full of pets, but also because chemistry came to me quickly and I picked up on the subject matter well—it seemed only natural to continue pursuing science in college," she explained.

As an undergraduate student at Delaware State University (DSU), King had several professors who served as role models to her. They gave her encouragement and made her believe she had the ability to pursue a doctoral degree.

King's experiences during summer internships at the Milton S. Hershey Medical Center, the University of Pennsylvania, and the National Institute on Aging also had an impact on her.

"I was able to do hands-on research with mammals and amphibians, and I even had the opportunity to deal with human subjects," she said.

During these internships, she met great mentors and gained experience—in addition to becoming more confident of her decision to pursue a career in science.

King earned a bachelor's degree in chemistry at DSU in 1997 and went on to the Virginia-Maryland Regional College of Veterinary Medicine at Virginia Polytechnic Institute and State University. Her interest in science continued to flourish during her graduate education, but she reached a point of where she felt "burned out" and tired of lab life. As a solution, she joined various graduate societies and organizations. Taking on leadership positions with these groups, King served as president of the Black Graduate Student Organization and the Graduate Student Assembly, and she was the first African American chair of the Commission on Student Affairs at Virginia Tech. King soon discovered that mixing science with extracurricular activities helped to rejuvenate her passion for science.

"I was able to maintain a healthy balance, and that is a major reason why my interest in science continued for such a great period of time," she commented.

King attributes much of her success during college to the MARC program, calling it a "fundamental part" of her professional upbringing. At DSU, the MARC program provided her with tuition, a stipend, training, and books. The program also offered her the opportunity to present her research at national scientific meetings.

"I surpassed all my expectations because of the educational, emotional, and social assistance the MARC program provided," she said.

At Virginia Tech, King received a MARC predoctoral fellowship, which supplied her with a stipend and funds for tuition and fees during the last 3 years of her studies. In 2002, she received her Ph.D. in toxicology.

King is now a toxicologist with the U.S. Environmental Protection Agency in Washington, DC, where she works with the agency's National Advisory Committee on Acute Exposure Guideline Levels. The committee develops guidelines for toxic chemicals to assist emergency responders and other organizations in preventing, planning for, and responding to emergencies involving hazardous spills and exposures. She also finds herself in a position to serve as role model to others. Coming from a family in which few went to college, King said she wanted to let her siblings and their children know that "they, too, are capable [of achieving success]."

In addition, King takes time to give scientific and motivational talks to current MARC participants and other aspiring minority scientists.

"The MARC program has given me the tools and the opportunities to be a true role model ... as well as a key figure in the lives of other promising students." ●

*If you know an outstanding former MARC, MBRS, or Bridges participant who has excelled academically or professionally and you would like to nominate that person as a future Update profile subject, please let us know. Your suggestions are always welcome.*

**"I surpassed all my expectations because of the educational, emotional, and social assistance the MARC program provided."**



**FROM THE MORE DIRECTOR**

*Crazy Thinking as a Tool for Rethinking*

BY CLIFTON POODRY, PH.D., NIGMS

**Has it really been 10 years since I traded a professorship at the University of California, Santa Cruz, for a position at NIH? What was I thinking?**

Well, for one thing, I felt that there was an important challenge to meet. The early 1990s had brought changes to the long-standing minority programs that were the core of the newly created MORE Division. Advisory groups had suggested changes in the student research component of the programs. The policies and procedures for the review of MBRS research proposals were evolving.

The specter of change brought some anxiety to the community of minority-serving institutions. Indeed, changes were made. But they came about following much community consultation, both formal and informal. A distillate of many ideas and recommendations became a set of guiding principles that served as the basis for modifications to existing programs and for the development of new programs in the years that followed.

Improvement was—and still is—a core value. The programs would be developmental, with improvement as an essential component. Institutions would be given as much flexibility as possible to design programs to meet their stated needs. Programs would have clear goals and measurable objectives. We would be making awards for programs to improve rather than providing rewards for past accomplishments. We would know whether progress was being made because evaluation would be a part of every program.

Now, 10 years later, it is a good time to re-examine

our objectives, our reasoning, and our practices—all of which are guided by our values, our principles, and, of course, our mission. All principles and policies have consequences. Take, for example, the notion of making awards versus rewards. We recognize that one who has a long history of training competitive students is very likely to continue to do so. Might it be a low-risk, efficient way of making a decision to rely more on track record than on promises of future outcomes? Perhaps. There are consequences either way. I don't want to go into the pros and cons of our current practices, but I do want to let you know that self-reflection is not just a once-a-decade ritual. We are constantly looking for the best ways to accomplish our mission and we expect you to be a part of the process.

Let me share a method that I use to generate ideas. It is derived from Linus Pauling's advice to have a lot of ideas and throw the bad ones away. I try to come up with 20 different ways to approach a problem. I realize from the outset that most of the ideas will fall by the wayside. But discussions of ideas often foster new

realizations that, in turn, foster new ideas. Add to the mix of ideas some diversity. Imagine that I have some new recipes brewing in my head, but my knowledge lacks the spice or other secret ingredients that diverse experiences might provide. What if

we were to pool our ideas and stir the pot of creative thinking?

What if each of you, whether you are a program director, a student, or just someone who picked up this column, would write down 10 different approaches to accomplish our mission of increasing (significantly) the number of underrepresented minorities going into biomedical research careers? Yes, I do mean 10 different approaches (20 for the hard core). Don't try to identify the perfect program. Rather, let's engage in some crazy thinking. I'll start by offering two examples.

Example 1. What if we used all of the money of the MORE programs directly for student aid? This approach would apply the available dollars to students while minimizing other expenses. We could support 7,500 students with \$20,000 each. Or maybe we could support fewer students but offer more money with performance incentives.

Example 2. What if we directed all of our resources to the improvement of institutions, and, rather than providing support to students (who are transients) or even to research projects (which come and go), we supported institutional development that would have lasting effects?

See what I mean by crazy thinking? These suggestions may represent the extreme, but we must withhold judgment and resist the temptation to analyze the ideas until we have gathered them all. We must resist the notion that there is one great approach that should be offered. It is the aggregate of ideas, including the crazy ones, that is valuable.

So extend yourself to come up with 10 ideas, crazy or not. If we could gather your 10 different approaches and the 10 approaches of all other interested parties,

we would have a wealth of raw material for a rethinking of our programs.

By studying and analyzing the list of ideas, even crazy ideas, values will emerge. Guiding principles consistent with the values will become evident. The activity stretches the realm of the possible and supports a reconsideration of our working strategies. We might end up reaffirming the current programs and current methods; if we do, we will approach our mission with renewed vigor. But if we find that change is called for, we will be happy to be at the tiller taking firm control of our new direction.

Your input is important. Send in your ideas and join us in the analysis and synthesis of ideas that will give guidance to the MORE Division for

the next 10 years. Ten different suggestions from all of our readers. Is that crazy or what?

As always, I would appreciate your feedback and comments. ●

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**New NIGMS Brochure Available**

NIGMS recently published a new brochure about the importance of basic biomedical research. *Curiosity Creates Cures: The Value and Impact of Basic Research* explains the economic payoffs of untargeted research and its role in the development of new medicines, technologies, and scientific tools. *Curiosity Creates Cures* also emphasizes the importance of scientific collaboration, explains the use of model organisms, and lists recent Nobel laureates in basic biomedical research. If you'd like to order a supply of these publications for your program offices, free copies are available by contacting:

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## NEWS and Notes

- NIGMS, along with the **Indian Health Service** and the **Agency for Healthcare Research and Quality**, has reannounced the Native American Research Centers for Health (NARCH) program. The program encourages research on diseases and health conditions of importance to American Indians and Alaska Natives. It also prepares Native American biomedical and behavioral scientists and health professionals to compete for NIH funding. A third goal is to increase the capacity of both the research-intensive organizations and the Native American organizations to work together to produce competitive research proposals. For more information on the NARCH awards, see the announcement on the NIGMS Web site at <http://grants2.nih.gov/grants/guide/notice-files/NOT-GM-04-107.html>.
- NIH sponsors several loan repayment programs that will repay up to \$35,000 per year of qualified education debts and provide coverage for Federal and state tax liabilities in exchange for a 2-year research commitment from Ph.D. and M.D. professionals pursuing research careers in specified areas. Applicants must commit 50 percent of their work time, or at least 20 hours per week, to the research program. The awards are open to U.S. citizens, permanent residents, or U.S. nationals. The next application season is expected to begin on September 1, 2004. For more information on the **NIH Loan Repayment Program**, see <http://www.lrp.nih.gov>.
- **Carlos G. Gutierrez, Ph.D.**, the MARC and MBRS program director at California State University, Los Angeles, received the Lifetime Mentor Award from the American Association for the Advancement of Science at the organization's annual meeting in February. The award honors individuals who have demonstrated extraordinary leadership to increase the participation of under-represented groups in science and engineering fields. Gutierrez, a professor of chemistry, is credited with mentoring more than 200 students during his 27-year career at the university.

- **Keith Pannell, Ph.D.**, the MARC program director at the University of Texas at El Paso, received the American Chemical Society Award for Research at an Undergraduate Institution at the society's national meeting in March. The annual award recognizes a chemistry faculty member whose research in an undergraduate setting has achieved wide recognition and contributed significantly to chemistry and to the professional development of undergraduate students. Over the course of his career, Pannell, who is also an MBRS subproject investigator, has published more than 180 research papers, many with undergraduate coauthors.

- **Joseph Cameron, Ph.D.**, the Bridges to the Future program director at Jackson State University in Mississippi, has received the Outstanding Contributions to Science Award from the Mississippi Academy of Sciences. The award is presented annually to an academy member whose research, teaching, or service to the community has significantly furthered the cause of science. Cameron is a professor of biology and coordinator of graduate studies at Jackson State University.

- For more than 20 years, the **Federation of American Societies for Experimental Biology** (FASEB) has supported the training of minority scientists through a MARC grant that funds visiting scientist programs, travel awards, grant workshops, and career development seminars. For more information about FASEB's MARC program, including an overview of recent activities and applications for its programs, visit <https://ns2.faseb.org/marc>.

- In recent months, we have received word about the following student participants in NIGMS minority programs. • **Constanza Berger**, a former MARC undergraduate student at Barry University in Miami Shores, FL, is currently pursuing a Ph.D. in psychology at Florida International University in Miami. • **Jeff Celaje**, a former MBRS program participant at California State University, Los Angeles, is now in graduate school at Princeton University in New Jersey. • **Ferman Chavez**, a

former MARC undergraduate student at California State University, Long Beach, completed his Ph.D. at the University of California, Santa Cruz, and is now an assistant professor of bioinorganic chemistry at Oakland University in Rochester, MI. • **Alvaro Duque**, a former MBRS program participant at Rutgers, The State University of New Jersey, Newark, is now a postdoctoral fellow in the neurobiology department at Yale University School of Medicine in New Haven, CT. • **Sixto Gonzalez**, a former MARC undergraduate student at the University of Puerto Rico, Humacao, received his Ph.D. in physics from Utah State University in Logan and is now director of the Arecibo Observatory in Puerto Rico. Gonzalez also serves as assistant director for Space and Atmospheric Sciences at the National Astronomy and Ionosphere Center, where he is a senior research scientist in the Atmospheric Sciences Department. • **Kester Haye**, a former MARC undergraduate student at the City University of New York, Brooklyn College, is in his second year of M.D.-Ph.D. studies at Mt. Sinai School of Medicine in New York City, where he participates in the NIGMS Postbaccalaureate Research Education Program. • **Dale Lewis**, a former MBRS program participant at the City University of New York, Bronx Community College, earned a Ph.D. in molecular biology at Princeton University and is now a research scientist with the National Cancer Institute. • **Pedro Ortiz**, a former MARC undergraduate student at Pontifical Catholic University of Puerto Rico, is currently a graduate student at the University of Medicine and Dentistry of New Jersey, Robert Wood Johnson Medical School in Camden, where he is the recipient of a MARC predoctoral fellowship. • **Randolph Roberts**, a former MBRS and Bridges program participant at Barry University, is pursuing a Ph.D. in biomedical science at Vanderbilt University in Nashville, TN. • **Alex Rodriguez**, a former MBRS program participant at Rutgers, The State University of New Jersey, Newark, is now a postdoctoral fellow at Albert Einstein College of Medicine in New York City. • **Vanessa Ruta**, a former MBRS and MARC program participant at the City

University of New York, Hunter College, is currently a graduate student at Rockefeller University in New York City, where she works in the lab of NIGMS grantee Roderick MacKinnon, a winner of the 2003 Nobel Prize in chemistry. Ruta was part of the research team that solved the structure of the voltage-dependent potassium ion channel. She contributed to three papers about the research in the journal *Nature* last spring, including one as first author. • **Joseph Sisneros**, a former MARC undergraduate student at California State University, Long Beach, completed his Ph.D. at the Florida Institute of Technology in Melbourne and is now an assistant professor of psychology at the University of Washington in Seattle. • **Christina Stujenske**, a former MARC undergraduate student at Barry University, is currently pursuing a Ph.D. in biomedical science at Vanderbilt University. • **Irving Vega**, a former MARC undergraduate student at the University of Puerto Rico, Mayaguez, and a former MARC predoctoral fellow at the University of Medicine and Dentistry of New Jersey, Robert Wood Johnson Medical School, is now a senior research fellow in the department of neuroscience at the Mayo Clinic College of Medicine in Jacksonville, FL. • **Jose Vega**, a former MBRS program participant at Rutgers, The State University of New Jersey, Newark, is now a postdoctoral fellow at the Schepens Eye Research Institute at Harvard University in Boston, MA. •

**We are always interested in hearing about NIGMS minority program faculty, alumni, and students.**

*Photographs of your students, research labs, and activities are also welcomed and encouraged.*

*Please send information to:*

*Editor*

*NIGMS Minority Programs Update*

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### Attention All Readers

Be sure to check out the expanded online version of the *Minority Programs Update*. There you will find additional news about MORE activities and participants including student presentations, recent graduates, and upcoming meetings.

<http://www.nigms.nih.gov/news/mpuspring04>

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“I am not only responsible for maintaining some of our current science programs, but I am also charged with thinking of new ways to help meet the mission of the MORE Division,” Drew said of her new position.

Drew joined the division this past fall after spending 3 years directing the NIH Academy, a postbaccalaureate program that provides recent college graduates with opportunities to spend a year performing biomedical research at NIH. Her NIH experiences also include working as a chemist in the National Eye Institute for a couple of years after receiving her bachelor’s degree in natural science from Spelman College, as well as doing predoctoral and postdoctoral research at NIDDK.

Drew, who admits to once starting a kitchen fire during an at-home science project in the 7th grade, says she accepted the job with the MORE Division because she “wanted to give back” to the organization that aided her scientific career.

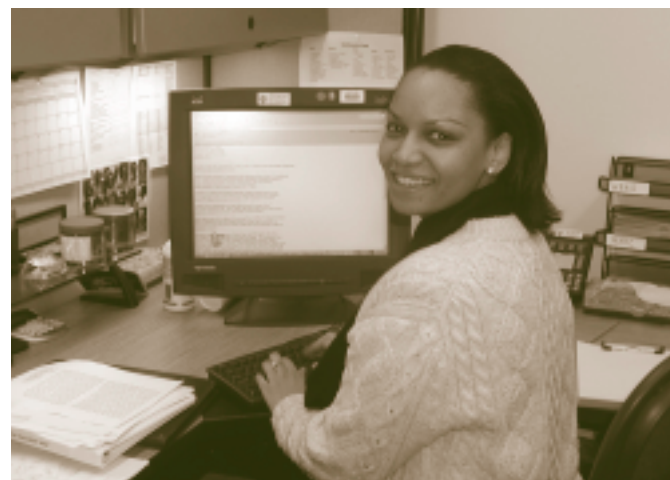
A former MBRS program participant at Howard University, Drew earned her Ph.D. in biology in 1998. She credits the MBRS program with giving her the opportunity to conduct experiments and inform the scientific community about her research on sickle cell anemia, something of great importance to her since the disease afflicts several family members.

“The program also allowed me to present my research at national scientific conferences, while meeting other students and scientists much like myself, in a field where too few underrepresented professionals exist,” she added.

Drew says she made the move from bench research to program administration in the hopes of making a difference.

“I believe science administration is where I can make the greatest impact to aid NIH’s goals and ensure the training of underrepresented researchers is met.”

“Helping students become competitively trained, faculty develop into professional researchers capable of obtaining grant awards and providing mentorship



LaShawn Drew administers NIGMS programs aimed at training the next generation of minority scientists.

to students, and academic institutions develop outstanding science programs are important processes that I participate in through my work in MORE,” Drew said.

“I am very excited about this task and have several ideas brewing,” she added.

#### More on MORE

Clifton Poodry, Ph.D., director of the MORE Division, is pleased to see former MORE participants choose NIH for research experiences and, in some cases, for their careers.

“These shining examples are evidence that NIGMS programs aimed at increasing the number of underrepresented minority researchers have an impact—that we are motivating and inspiring the next generation of biomedical scientists,” Poodry said, quickly noting that these are just a handful of the MORE success stories at NIH.

“There are other former MORE participants working here at NIH, and there are even more at other Federal agencies, at colleges and universities, and at companies throughout the United States and elsewhere,” he added.

“We are proud of them all.”

For more information on NIGMS’ minority programs, see the MORE Division Web site at <http://www.nigms.nih.gov/minority/>. ●

## SELECTED PUBLICATIONS

by MORE Faculty and Students (listed by institution)

### CALIFORNIA STATE UNIVERSITY, LOS ANGELES

Baca AJ, De la Ree AB, Zhou F, Mason AZ. Anodic stripping voltammetry combined on-line with inductively coupled plasma-MS via a direct-injection high-efficiency nebulizer. *Anal Chem* 2003;75:2507-11.

Villareal V, Kaddis J, Azad M, Zurita C, Silva I, Hernandez L, Rudolph M, Moran J, Gomez FA. Partial-filling affinity capillary electrophoresis. *Anal Bioanal Chem* 2003;376:822-31.

### CITY UNIVERSITY OF NEW YORK, BROOKLYN COLLEGE

Hosein RE, Williams SA, Haye K, Gavin RH. Expression of GFP-actin leads to failure of nuclear elongation and cytokinesis in *Tetrahymena thermophila*. *J Eukaryot Microbiol* 2003;50:403-8.

### CITY UNIVERSITY OF NEW YORK, HUNTER COLLEGE

Harrow F, Amuta JU, Hutchinson SR, Akwaa F, Ortiz BD. Factors binding a non-classical cis-element prevent heterochromatin effects on locus control region activity. *J Biol Chem* 2004;279:17842-9.

### MOREHOUSE SCHOOL OF MEDICINE

Dutt K, Harris-Hooker S, Ellerson D, Layne D, Kumar R, Hunt R. Generation of 3D retina-like structures from a human retinal cell line in a NASA bioreactor. *Cell Transplant* 2003;12:717-31.

Dutt K, Sanford G, Harris-Hooker S, Brako L, Kumar R, Sroufe A, Melhado C. Three-dimensional model of angiogenesis: coculture of human retinal cells with bovine aortic endothelial cells in the NASA bioreactor. *Tissue Eng* 2003;9:893-908.

### MORGAN STATE UNIVERSITY

Hohmann CF. A morphogenetic role for acetylcholine in mouse cerebral neocortex. *Neurosci Biobehav Rev* 2003;27:351-63.

### PRAIRIE VIEW A&M UNIVERSITY

Guinn L, Doctor VM. Mechanism of the stimulatory effect of 6-aminohexanoic acid on plasminogen activation by streptokinase or tissue plasminogen activator: the role of chloride. *Eur J Drug Metab Pharmacokinet* 2003;28:315-20.

### SAN DIEGO STATE UNIVERSITY

Montalbano A, Ogwaro KM, Tang A, Matthews AG, Larijani M, Oettinger MA, Feeney AJ. V(D)J recombination frequencies can be profoundly affected by changes in the spacer sequence. *J Immunol* 2003;171:5296-304.

### SAVANNAH STATE UNIVERSITY

Reddy GR, Basha MR, Devi CB, Suresh A, Baker JL, Shafeek A, Heinz J, Chetty CS. Lead induced effects on acetylcholinesterase activity in cerebellum and hippocampus of developing rat. *Int J Dev Neurosci* 2003;21:47-52.

### SOUTHEASTERN OKLAHOMA STATE UNIVERSITY

Bench BJ, Johnson R, Hamilton C, Gooch J, Wright JR. Avidin self-associates with boric acid gel suspensions: an affinity boron carrier that might be developed for boron neutron-capture therapy. *J Colloid Interface Sci* 2004;270:315-20.

### UNIVERSITY OF HAWAII AT MANOA

Brown DE, James GD, Nordloh L, Jones AA. Job strain and physiological stress responses in nurses and nurse’s aides: predictors of daily blood pressure variability. *Blood Press Monit* 2003;8:237-42.

Brown DE, James GD, Aki SL, Mills PS, Etrata MB. A comparison of awake-sleep blood pressure variation between normotensive Japanese-American and Caucasian women in Hawaii. *J Hypertens* 2003;21:2045-51.

### UNIVERSITY OF PUERTO RICO, MEDICAL SCIENCES CAMPUS

Torres-Mercado E, Renta JY, Rodriguez Y, Lopez-Garriga J, Cadilla CL. The cDNA-derived amino acid sequence of hemoglobin II from *Lucina pectinata*. *J Protein Chem* 2003;22:683-90.

*Send in your references for inclusion in Selected Publications. We would appreciate your contribution to this section in order to represent as many NIGMS minority programs as possible. Complete bibliographical citations can be phoned, faxed, mailed, or e-mailed to the Editor (see page 2).*

## ACRONYMS USED IN THIS ISSUE

CRTA	Cancer Research Training Award
DSU	Delaware State University
FASEB	Federation of American Societies for Experimental Biology
IRTA	Intramural Research Training Award
MARC	Minority Access to Research Careers
MBRS	Minority Biomedical Research Support
MORE	Minority Opportunities in Research
NARCH	Native American Research Centers for Health
NIDDK	National Institute of Diabetes and Digestive and Kidney Diseases
NIGMS	National Institute of General Medical Sciences
NIH	National Institutes of Health
RISE	Research Initiative for Scientific Enhancement
U*STAR	Undergraduate Student Training in Academic Research

**RECENT**

*Awards and Fellowships*

**PREDOCTORAL FELLOWSHIPS FOR MINORITY STUDENTS**

*(listed by fellow and graduate institution)*

**Victor D. Acevedo**  
Baylor College of Medicine, Houston, TX

**Lourdes M. Aleman**  
Massachusetts Institute of Technology, Cambridge

**Elsa V. Arocho Quinones**  
Massachusetts Institute of Technology, Cambridge

**Agedi N. Boto**  
Johns Hopkins University, Baltimore, MD

**Wendy Brisbon**  
Meharry Medical College, Nashville, TN

**Cheryl E. Broderick**  
Indiana University, Bloomington

**Leslie L. Chavez**  
University of California, San Diego

**Marielena Chavira**  
University of California, Los Angeles

**Timothy H. Click**  
University of Oklahoma, Norman

**Holly N. Cukier**  
Baylor College of Medicine, Houston, TX

**Hugh M. Fentress**  
Vanderbilt University, Nashville, TN

**Eugena Griffin**  
University of South Carolina, Columbia

**Carlos A. Guerrero**  
Scripps Research Institute, La Jolla, CA

**Gerod S. Hall**  
Cornell University, Ithaca, NY

**Shardell M. Hawkins**  
University of Maryland, Baltimore County

**Jason T. Heale**  
University of California, Irvine

**Nick C. Herrera**  
Salk Institute for Biological Studies, San Diego, CA

**Cimona V. Hinton**  
Meharry Medical College, Nashville, TN

**Andre O. Hudson**  
Rutgers, The State University of New Jersey, New Brunswick

**Aminah D. Ikner**  
University of California, Davis

**Landon J. Inge**  
University of California, Los Angeles

**Candace A. Jones**  
Meharry Medical College, Nashville, TN

**Kristen N. Koch**  
University of California, Los Angeles

**Catherine I. Lacayo**  
Stanford University, CA

**Ronald P. Leon**  
University of Colorado Health Sciences Center, Denver

**Edward P. Leverich**  
University of California, Los Angeles

**Ana L. Luis**  
University of Texas at Austin

**Aron R. Marquitz**  
Duke University, Durham, NC

**Damali N. Martin**  
University of Maryland Biotechnology Institute, Baltimore

**Santosha N. Odoms**  
University of Connecticut Health Center, Farmington

**Sara J. Oppenheim**  
North Carolina State University, Raleigh

**Pedro A. Ortiz**  
University of Medicine and Dentistry of New Jersey, Robert Wood Johnson Medical School, Piscataway

**Brian D. Patterson**  
University of California, Irvine

**Elena M. Perrineau**  
University of North Carolina at Wilmington

**Scott D. Philibin**  
Virginia Commonwealth University, Richmond

**Gabriel Pineda**  
University of Texas Southwestern Medical Center at Dallas

**Jason M. Rauceo**  
City University of New York, Hunter College

**Antonio Romero**  
University of California, Irvine

**Mickeha D. Rose**  
Emory University, Atlanta, GA

**Ro Shauna S. Rothwell**  
University of North Carolina at Chapel Hill

**Edgardo L. Sanabria-Valentin**  
New York University School of Medicine, New York City

**Michael Santiago-Cintron**  
University of Wisconsin, Madison

**Daniel R. Santillano**  
Texas A&M University Health Science Center, College Station

**Alvin L. Smith II**  
Howard University, Washington, DC

**Bharti T. Solanki**  
University of Wisconsin, Madison

**Teresa M. Tibbets**  
University of New Mexico, Albuquerque

**Alejandro J. Toro**  
University of Medicine and Dentistry of New Jersey, Robert Wood Johnson Medical School, Piscataway

**Victor J. Torres**  
Vanderbilt University, Nashville, TN

**Jimena Varon**  
University of California, Los Angeles

**Thomas E. Vasquez**  
University of California, Irvine

**Stephen P. Voght**  
University of Washington, Seattle

**Shanta M. Whitaker**  
Yale University, New Haven, CT

**Kirk Y. Williams**  
Tulane University, New Orleans, LA

**BRIDGES TO THE FUTURE AWARDS**  
*(listed by institution and principal investigator)*

**Bridges to the Baccalaureate**

Kansas State University, Manhattan  
Denis M. Medeiros

Prairie View A&M University, Texas  
E. Gloria Regisford

**Bridges to the Doctorate**  
Northwestern University, Evanston, IL  
Robert C. MacDonald

Texas A&M University-Kingsville  
A. Bhattacharya

**MBRS RISE AWARD**  
*(listed by institution and principal investigator)*

Oakwood College, Huntsville, AL  
Anthony D. Paul

**MBRS SCORE AWARDS**  
*(listed by institution and principal investigator)*

Charles R. Drew University of Medicine and Science, Los Angeles, CA  
Theodore C. Friedman

Johnson C. Smith University, Charlotte, NC  
Nsoki Phambu

University of Texas at Brownsville  
Luis V. Colom

**MARC U\*STAR AWARD**  
*(listed by institution and principal investigator)*

Fort Lewis College, Durango, CO  
Julia Page Lindsey

**MARC FACULTY FELLOWSHIPS**  
*(listed by institution and principal investigator)*

University of Puerto Rico, Medical Sciences Campus, San Juan  
Nitza L. Diaz-Blanco

Ponce School of Medicine, Puerto Rico  
Zaira Mateo-Mayol

**INSTITUTIONAL RESEARCH AND ACADEMIC CAREER DEVELOPMENT AWARDS**  
*(listed by institution and principal investigator)*

Northwestern University, Evanston, IL  
Luis A. Amaral

San Francisco State University, CA  
Joseph M. Romeo

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