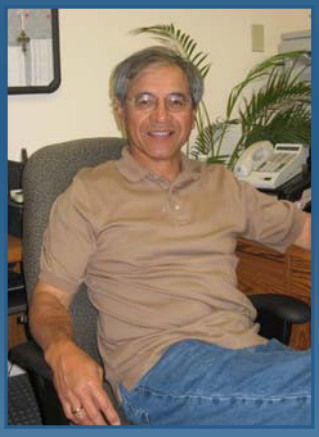
Bridges Newsletter

Spring 2007

Richard Bray

Bridges Director



Victor Rocha

OBRT Director

Inside this issue:

Denise Stillinger

MiraCosta, Site Coordinator

Dan Sourbeer

Palomar, Site Coordinator

From the Director

The North County Bridges to the Future program is pleased to provide our roll out issue of the Bridges Newsletter. The Bridges Program is designed to identify and support underrepresented community college students who are interested in pursuing research careers in the biomedical sciences. The assistance takes the form of mentoring, motivating experiences, exposure to undergraduate research, Supplemental Instruction to enhance academic performance, and financial support. It is funded primarily by a grant from the National Institutes of Health and involves a partnership between MiraCosta and Palomar Colleges and California State University San Marcos. The program has also greatly benefited from ongoing support from the North County Higher Education Consortium (NCHEA); the NCHEA support has been instrumental in convincing the NIH that the three partnership institutions are committed to the project.

Our Bridges program started in 2002 and it was renewed in fall 2005 for another three years. Victor Rocha was Program Director for the original grant and Richard Bray is the current director. Denise Stillinger and Dan Sourbeer are the Site Coordinators at MiraCosta and Palomar Colleges and are involved in day-to-day activities with the Bridges Scholars. The program is administered through the CSUSM Office for Biomedical Research and Training (OBRT); Victor Rocha is the Director. Below are some highlights of activities of the Bridges Program.

Program Accomplishments

Here are examples of how our partnership has addressed national goals of the NIH-Bridges program.

Success Rates

The Bridges program has supported a total of 93 Scholars over the past five years. Of the 62 Scholars who have already finished community college, at least 56 (90%) have transferred to 4-year institutions. To date, 24 Bridges alumni have transferred to CSUSM, where 17 received continued support through NIH-Research Initiative for Science Enhancement (RISE) or Minority Access to Research Careers (MARC) grants awarded to OBRT.

We are now starting to see our Bridges alumni enter PhD programs in the biomedical sciences. Two alumni are completing their second year in graduate school, three are finishing their first year, and four more will be starting this fall (see Bridges Alumni Highlights). Bridges alumni at CSUSM and elsewhere are beginning the application process for Fall 08 admission into graduate school. Thus, the pipeline is beginning to flow with Bridges Scholars from Palomar and MiraCosta Colleges to PhD programs in the biomedical sciences.

Supplemental Instruction

SI targets tough courses, not struggling students, and consists of regularly scheduled review sessions conducted by SI leaders who are trained to facilitate group learning. The Bridges program has provided SI for the most challenging courses in chemistry, physics, mathematics, and biology at MiraCosta and Palomar Colleges; another NIH grant provides SI at CSUSM. SI is open to everyone and thus benefits many students. Our evaluation data indicate SI participants receive fewer Ds, Fs, and Ws and have higher course grades compared to non-participants. We also found that SI helps create persistent “learning communities” and a sense of campus engagement by students – an important benefit to our commuter campuses. The success of the SI program has resulted in partial support from all three partner campuses.

Course articulation

A national goal of the Bridges program is to improve articulation and increase collaborative teaching activities among Bridges institutions. Last year, the Bridges program supported meetings between Mike Fino at MiraCosta and Bill Kristan and Richard Bray at CSUSM to develop a 4-unit biostatistics lecture and lab course at MiraCosta. The course was offered for the first time this past fall; because in the evenings, students from all 3 institutions have additional flexibility when taking the class.

Program Highlights

Below are examples of the ongoing activities in the Bridges program.

Bridges Scholars from Palomar and Mira-Costa learn about research opportunities with science faculty at CSUSM during the annual Bridges Open House.

Bridges Open House and Lab Shadowing at CSUSM

Each fall, Bridges Scholars are invited to a luncheon and tour of the lab facilities at CSUSM. The goal is to introduce the Scholars to biomedically-related research. During this half-day event, faculty and undergraduates in their labs describe the research opportunities that are available at CSUSM. The Bridges Scholars then select labs in which they assist undergraduate students while they conduct their research throughout the rest of the year. We have found that this near-peer relationship often enables Bridges Scholars to get a realistic feeling of research and develop a sense of self-confidence in pursuing a graduate degree in the sciences.

Annual Biomedical Research Conference for Minority Students

Last November, 12 of our current Bridges Scholars attended the Annual Biomedical Research Conference for Minority Students (ABRCMS) held in Anaheim. The Bridges grant paid all expenses (e.g., registration, travel, housing, and meals). ABRCMS is the largest multidisciplinary conference for students planning careers in the biomedical sciences and each year attracts approximately 2000 undergraduate and graduate students, and 800 faculty and administrators. The conference includes keynote presentations by prominent biomedical researchers; oral and poster presentations by undergraduates; workshops on preparing for graduate school; networking breakfasts, luncheons, and dinners; graduate school preparation workshops; and a hall filled with recruiters from over 200 graduate programs in the biomedical sciences. In November, 2005, six Bridges Scholars attended ABRCMS in Atlanta. The 2007 ABRCMS will be held in Austin, Texas, and we intend on sending as many Bridges Scholars as possible to this meeting. Feedback from our Bridges Scholars has consistently indicated that the ABRCMS experience generates long-lasting self-confidence and excitement in graduate school and careers in the biomedical sciences.

Bridges alumni at a poster session at ABRCMS in Atlanta. Jason Rodriquez (in rear) presented the poster. To the left is Rita Cooper, the OBRT Office Manager.

Bridges Scholars at ABRCMS in Atlanta having lunch with Dr. Bert Shapiro, a program director at NIH-National Institute for General Medical Sciences.

Annual Meeting American Association for the Advancement of Science

Last June, 15 Bridges Scholars attended the Pacific Division meeting of the American Association for the Advancement of Science meeting at the University of San Diego. This meeting provided Scholars very broad exposure to many areas of the biological and physical sciences.

Mindy Capes giving an oral presentation on her research at the Bridges Alumni Symposium.

Bridges Alumni Symposium

On Friday, April 14, 2006, the MiraCosta Bridges program hosted the second annual Bridges Alumni Symposium. The program was organized by CSUSM Bridges alumni under the supervision of Denise Stillinger, our MiraCosta Bridges Site Coordinator. The Bridges alumni who were completing their BS degrees from CSUSM gave oral presentations on their research to room full of students, staff, and faculty at MiraCosta College. Below is a list of the Presentations:

Paulina Griffing. "Infectivity Success of Tapeworms of Their Definitive Host". Deborah Kristan Research Group CSUSM

Jason Rodriguez. "The Initial Identification, Expression and Characterization of a PEPCK and gamma Carbonic Anhydrase in the Marine Alga, *Emiliania huxleyi*". Thomas Wahlund Research Group CSUSM

Cristina Jaime-Ramirez. "Genomic Identification of MHC Class I alleles in the Chinese-origin Rhesus Macaque". Bianca Mothé Research Group CSUSM

David Gonzalez "Investigating the role of a Watson-Crick base pair between the tRNA acceptor arm and 23S rRNA". Simpson Joseph Research Group UCSD

Linda Villa "Sequencing of the Major Histocompatibility Complex Class I Loci in the Chinese-Origin Rhesus Macaque". Bianca Mothé Research Group CSUSM

Mindy Capes "Conformational Changes of Alpha-crystallin upon binding of Calcium as Detected by Fluorescence Spectroscopy". José Mendoza Research Group CSUSM

The third annual "Bridges Alumni Symposium" will take place on the MiraCosta College campus on Friday, April 20, 2007 at 10 am in room 1068. Five former MCC Bridges scholars will be presenting their current research projects as well as describing their experiences at CSUSM and applying to graduate school to MiraCosta faculty and students. MiraCosta Alumni Cristina Jaime-Ramirez, Israel Alvarado, Linda Villa, Paulina Griffing, and Sam Fernandez will all present. Cristina, Linda, and Israel are all on their way to graduate school this fall.

Palomar PreMed/Biomed Club

Bridges scholars have served as the club president for the past two years. The club has had a number of speakers in the last year addressing such topics as emerging epidemics, bioterrorism, application advice for medical and graduate school, and careers in the health care field. The club also took a field trip to the Body Worlds Exhibit at the LA Museum of Natural History. Additionally, club members conduct community service activities, such as working with the Flying Samaritans to volunteer at a clinic in Mexico.

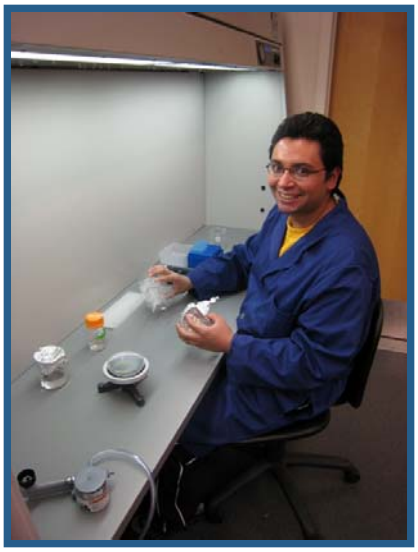
Bridges Scholars on a field trip to the Salk Institute.

Field Trip to Salk Institute

The Bridges to the Future program has taken advantage of our proximity to the Salk Institute for Biological Studies. Private tours of this facility, including presentations on current project by the researchers involved, have been a regular part of our program. This past fall 12 Bridges scholars from MiraCosta heard a presentation from a doctorate student studying gene expression at the Salk. This researcher had been a MARC (Minority Access to Research Careers) scholar at the University of California Riverside as an undergraduate. The Office of Biomedical Research and Training at CSUSM also administers a MARC program. This concrete example of the opportunity for continued support and success all the way to a lab at the Salk Institute was a valuable experience for our community college students who are laying the foundation of their journey into the biomedical research field.

Bridges Alumni Highlights

At least 90% of our Bridges alumni have continued their education after finishing their Bachelor's degree. Below are brief updates on some of our alumni who are currently at CSUSM working toward their BS degrees in the sciences and others who are already in graduate school pursuing the PhD in the biomedical sciences. The success of these students is due in large part to the commitments and talent of faculty at all 3 institutions. Subsequent newsletters will showcase other Scholars.



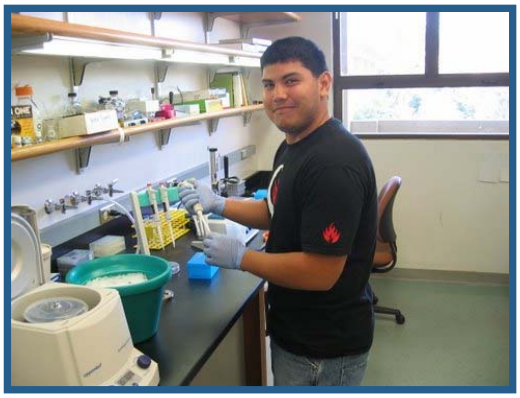
Israel Alvarado working on plant gene expression in Dr. Matthew Escobar's research lab at CSUSM.

Israel Alvarado

Transferred from MiraCosta Community College in Spring 2004 and is completing his BS degree in Molecular Cellular Biology at CSUSM. He has been conducting research in Dr. Matthew Escobar's lab evaluating whether transient expression of transformation-associated plant genes can increase the efficiency of *Agrobacterium* mediated transformation of recalcitrant plant species. He has been accepted to graduate molecular cellular programs at UC Santa Cruz (Molecular Cellular & Developmental Biology), UC Riverside (Botany & Plant Sciences), The City of Hope Beckman Research Institute (Biological Sciences), and plans on attending University of California Irvine (Molecular Biology, Genetics, and Biochemistry). His career goal is to be a professor at a university, complete research, and instruct students in molecular biology. Professors process a depth of experience which can not be acquired from just reading a book, and as a professor he would like to be able to train future scientists.

Raymond Malfavon-Borja

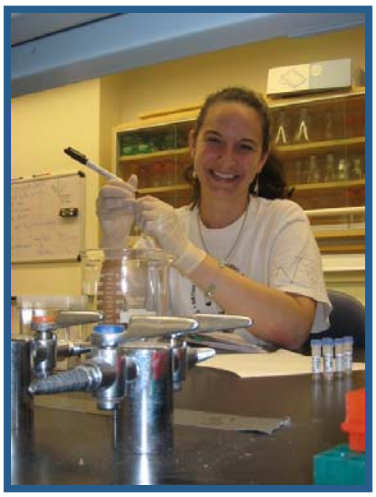
Transferred from the Palomar Community College program in the spring of 2005 and will be completing his BS degree in the Biological Sciences this spring. Ray has been conducting research in the lab of Dr. Denise Garcia, where the overall aim of the research has been to elucidate the role of retrotransposons in stress and immune response. His most recent work in the lab has been to quantify gene copy number and expression of a retrotransposon in the shrimp *Litopenaeus stylirostris*. In the Summer of 2006, Ray was invited to participate in the Stanford Summer Research Program during which he worked in the lab of Dr. Dmitri Petrov, and investigated differences in the transcription, evolution, and expression between ancestral and derived CHKov1 genes to infer causes of pesticide resistance in *Drosophila.* Ray has been accepted to the Genome Sciences graduate program at the University of Washington and the Biological Sciences graduate program at Stanford University and Texas A&M. Over the next several weeks Ray will be making a difficult decision indeed. Once he earns his PhD, he hopes to teach at the university level, and continue to conduct scientific research in the Biological Sciences.



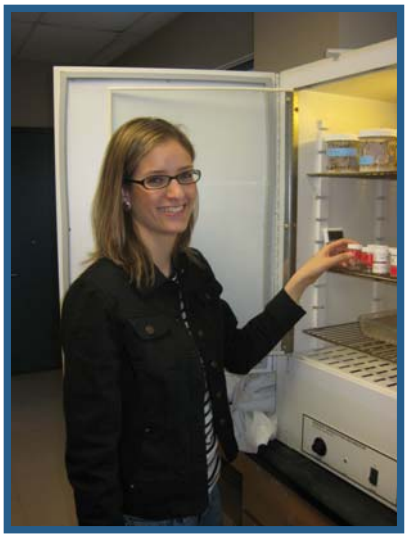
Ray Malfavon-Borja working on pesticide resistance during the summer in Dr. Dmitri Petrov's lab at Stanford University.

Tiffany Dunbar (Hauck)

Transferred from Palomar in fall 2006 and is completing her BS in Biology. She started her research in Dr. Escobar's lab earlier this year, investigating the effects of soil pH on molecular response of *Arabidopsis thaliana*. She plans to graduate in fall 2008 with a minor in Physics and will be applying to graduate schools early next year. After obtaining her PhD, she plans on teaching at a university and conducing research.



Tiffany Dunbar studying the molecular response of plants to differences in soil pH in Dr. Matthew Escobar's research lab at CSUSM.



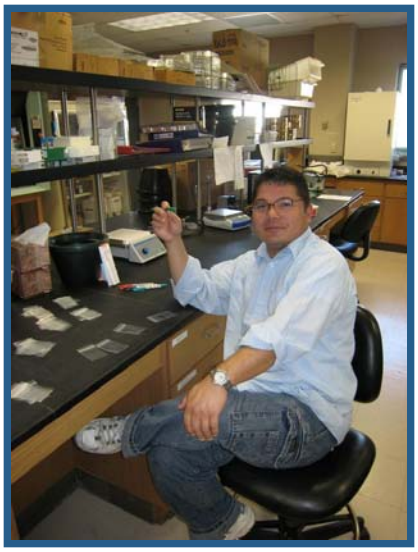
Paulina Griffing checking on her cultures in Dr. Deborah Kristan's research lab at CSUSM.

Paulina Griffing

Transferred from MiraCosta college in Fall of 2005 and is completing her BS degree in Biology. She is conducting research in Dr. Deborah Kristan's lab on the effects of caloric restriction of the intermediate host on the ability of *Rodentolepis. microstoma* tapeworm to successfully infect their definitive rodent host. Paulina will be applying to graduate schools in fall of '07.

Pierre Manibusan

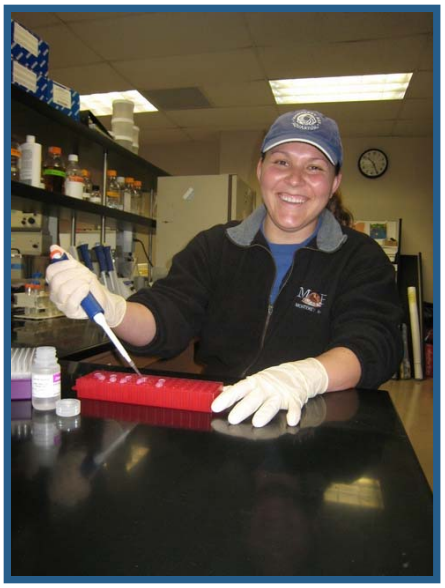
Senior at CSUSM majoring in biology and will graduate in the fall 2007. He arrived at California State University through the Bridges Program between CSUSM and MiraCosta College. Pierre found his niche in Dr. Deborah Kristan's lab where he has acquired many lab skills and has been conducting hands-on scientific research. He plans to take GREs in the summer and apply to PhD programs in the fall. Pierre enjoys research and looks forward to progressing to graduate school and a career in science.



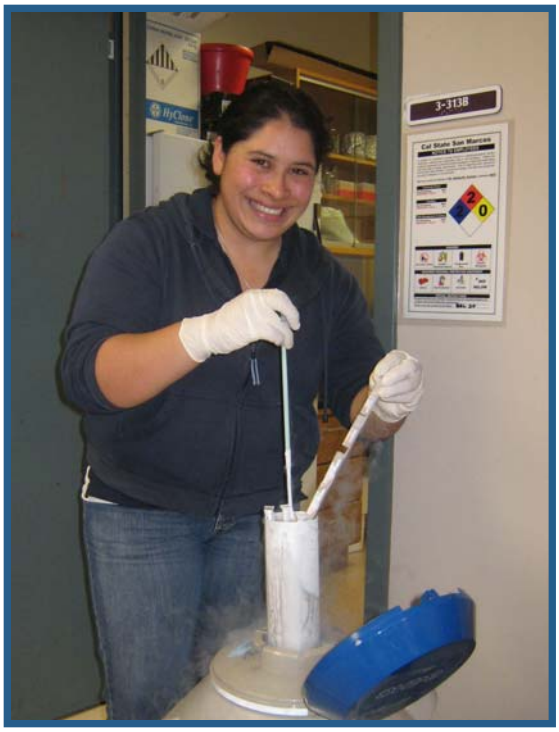
Pierre Manibusan studying the effects of parasites on mice in Dr. Deborah Kristan's research lab at CSUSM.

Alena "Cristina" Jaime-Ramirez

Transferred from MiraCosta college in the Fall of 2004. She will be completing her BS degree in Biological Sciences this semester. She has been conducting research in the lab of Dr. Bianca Mothé, where she focuses on immunology, immunogenetics and virology. She has been accepted to interdisciplinary graduate programs at Pennsylvania State University, University of Pittsburgh, Texas A & M, University of Texas Southwestern, University of Cinncinati, Ohio State University, and Case Western Reserve University. She is leaning toward attending graduate school at Ohio State University -- at no cost to her or her family. After earning her PhD, she hopes to conduct research on ways to combat infectious diseases or cancer, especially in children.



Christina Jaime-Ramirez conducting immunogenetics research in Dr. Bianca Mothe's research lab at CSUSM

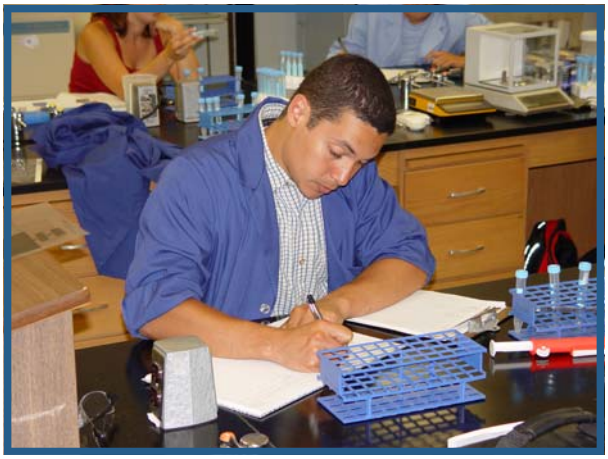


Linda Villa maintaining her Chinese macaque cell lines in Dr. Bianca Mothe's research lab at CSUSM.

Linda Villa

Transferred from MiraCosta Community College in the fall of 2005 to California State University San Marcos and is completing a B.S. degree in Biology. Her research has involved sequencing the major histocompatibility complex of the Chinese origin rhesus macaque in Dr. Bianca Mothe's laboratory. She will be attending Virginia Tech in the fall to pursue her PhD.

Mario Malfavon



Transferred from Palomar in Fall 2003, completed his BS degree in Chemistry at CSUSM in 2005, and is now working on his PhD in the Department of Chemistry at The University of Arizona in Tucson. He is currently working on the preparation of improved polymer electrolyte membranes for fuel cell applications. After earning his PhD he hopes to become a university professor, teaching, and conducting research.

Mindy Capes conducting biochemical research at the University of Maryland.

Melinda Capes

Transferred from MiraCosta in Fall 2004, completed her BS degree in Biochemistry at CSUSM in 2006, and is now working on her PhD in the Department of Biochemistry and Molecular Biology at the University of Maryland School of Medicine in Baltimore. She has recently joined the lab of Dr. Shiladitya DasSarma at the University of Maryland Biotechnology Institute, Center of Marine Biotechnology. Her research is focusing on post-genomics and biochemistry of halophiles. After earning her PhD, she hopes to become university professor, teaching and conducting research.

Jason Rodriguez

Transferred from Miracosta College in Fall 2004, completed his BS degree in Biochemistry at CSUSM in 2006, and is now working on his PhD in the Department of Biochemistry at Virginia Polytechnic and State University. Currently, Jason is working on two projects: identifying and characterizing enzymes involved in a novel electron transport chain in the methanogenic archaeon *Methanocaldococcus jannaschii*; and identifying key enzymes involved in sulfur metabolism in *Mycobacterium tuberculosis* using transposon mutagenesis. After completing his PhD, Jason hopes to attain a faculty position at the university level in order to pursue both his scientific interests and his interest in motivating under represented minority students to pursue their own careers in the sciences.

How to contact us

One Barnard Drive
Oceanside, CA 92056

Denise Stillinger
MiraCosta Site Coordinator
stillinger@miracosta.edu
(760) 944-4449 ext. 8030

1140 West Mission Road
San Marcos, CA 92069

Dan Sourbeer
Palomar Site Coordinator
dsourbeer@palomar.edu
(760) 744-1150 ext. 2775

Office for Biomedical Research & Training
California State University San Marcos
333 S. Twin Oaks Valley Rd
San Marcos, CA 92096

Victor Rocha
OBRT Director
vrocha@csusm.edu
www.csusm.edu/orbt
(760) 750-4084

California State University San Marcos
Office for Biomedical Research & Training
333 S. Twin Oaks Valley Rd
San Marcos, CA 92096

Richard Bray
Bridges Program Director
rbray@csusm.edu
www.csusm.edu/obrt
(760) 750-4175