Research Alliance in Math and Science
http://www.csm.ornl.gov/Internships/RAMS.html
Debbie McCoy, Computing and Computational Sciences Directorate
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Summary

The Research Alliance in Math and Science (RAMS) program is carried out through the Computing and Computational Sciences Directorate at the Oak Ridge National Laboratory (ORNL) for the U. S. Department of Energy's Office of Advanced Scientific Computing Research. The RAMS program continues to provide unique, hands-on educational experience through innovative approaches to underrepresented students majoring in mathematics, computer science, engineering technology, and the computational sciences.

Computational biology work as RAMS intern becomes material for PhD thesis

Research Alliance in Math and Science (RAMS) summer intern Andrea Rocha used computational biology tools to study the bacterium Shewanella during two consecutive summer internships at the Oak Ridge National Laboratory (ORNL) in 2007 and 2008.

"I loved it!!," said Ms Rocha, who is now a PhD student in the department of civil and environmental engineering at the University of South Florida. "It was the best work experience and training in computational biology. I was challenged, inspired, mentored, and I developed a great network of peers."

Ms. Rocha said of the RAMS program at ORNL, "It was very important to my life. It confirmed that I would like to work at a national lab one day."

"Both summers, I used computational biology tools to study the bacterium Shewanella. The first summer, I reconstructed the metabolic pathways of 11 Shewanella strains, to predict the metabolic capabilities of this potentially important bacteria. I am currently finishing up some additional work at my home university, related to this project. During the second summer, I used computational tools available to reconstruct the transcriptional regulatory pathways of one species of Shewanella."

Ms. Andrea Rocha explains her summer research project during the annual RAMS poster reception and recognition event to visiting faculty and parents.

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Ms. Rocha's RAMS summer research has become part of her dissertation work at the University of South Florida. "I am currently working on a manuscript with my mentor on the first study."

She also assisted RAMS program director, Debbie McCoy of the Computing and Computational Sciences Directorate at ORNL, in outreach at the SACNAS 2008 National Conference (Society for the Advancement of Chicanos and Native Americans in Science) in Salt Lake City, Utah. While there, she presented a paper entitled, "Reconstruction and Comparative Analysis of Transcriptional Networks of Shewanella," with Prof. P.G. Stroot.
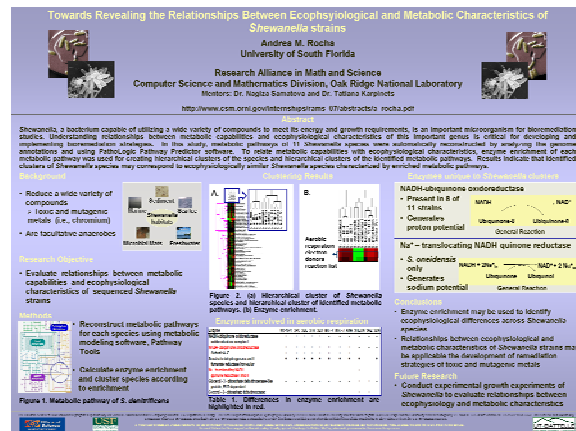
Ms. Rocha has presented her RAMS research poster at several conferences and has written conference papers based on her summer research. She was an invited speaker at a research session at the FGLSAMP exposition (Florida Georgia Louis Stokes Alliance for Minority Participation) at the University of Miami. "I spoke about the RAMS program and how the experience has inspired and helped me progress as a researcher, person, and in my degree program," she said.

Last September, she was invited to participate and present her research at the annual Fall Creek Falls Conference at Montgomery Bell State Park, Tennessee, where her collaborative work, "Reconstruction of Transcriptional Networks of Shewanell oneidensis," with G. Kora, P. Stroot, and N. Samatova was presented.

In October 2007, in Kansas City, Missouri, her collaboration with T. Karpinets, P.G. Stroot, and N. Samatova, "Towards revealing the relationships between ecophysiological and metabolic

characteristics of Shewanella strains," was presented at the SACNAS National Conference http://arcticportal.org/apecs/sacnas.

"Towards Revealing the Relationships Between Ecophsyiological and Metabolic Characteristics of Shewanella strains."

Additional information on the RAMS program, student projects, and photographs from tours and events by year can be accessed at: http://www.csm.ornl.gov/Internships/RAMS/.

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