

BIOSCOPE

BRINGING FUN AND INTERESTING FACTS ABOUT THE CSUCI BIOLOGY PROGRAM TO YOU!

1ST EDITION - FALL 2007

ISLAND VIEWS

FALL 2007 SYMPOSIUM

It's that time of year again for the Fall symposium! This year the symposium is organized by the following programs: Anthropology, Biology, ESRM and Political Science. The title of the symposium is: Understanding the Channel Islands: An Interdisciplinary Approach. Close to our campus, for which our campus is named, the Channel Islands National Park encompasses five islands: Anacapa, Santa Cruz, Santa Rosa, San Miguel and Santa Barbara. The Islands and their ocean environment provide a wealth of natural and cultural resources.

The protection of these fragile island resources could be only possible if we understand and appreciate what the Islands are all about. This symposium is aiming at educating the public with the knowledge of and the issues related to the Channel Islands. The Symposium will explore the biological, ecological, conservational, anthropological and political aspects of the Islands.

The symposium will be held on Friday, Dec. 7th, from 12:30-4:00pm. Additionally, a trip is planned to the Islands the following day and is FREE to the first 100 who register. For more information and to register, visit:
http://biology.csuci.edu/channel_islands

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ALUMNI SPOTLIGHT



Zoya Kai is a 2005 CSUCI graduate with a B.S. degree in Biology. After graduation Zoya entered the Biology Program at UCSD where she is working on her Ph.D. in Molecular Biology. Zoya is studying microRNAs (miRNAs). miRNAs are tiny regulatory molecules (about 22 nucleotides), discovered only a few years ago, and are now known to be essential in stem cell regulation, overall development and other diverse biological processes such as viral defense. In her research she is using *C. elegans*; a tiny nematode (worm) only 1 millimeter long at full maturity. These little organisms are very useful: they have many of the same genes as humans, they are hermaphrodites (which makes genetics much more straightforward), and they can be frozen for years on end without consequence.

Zoya had this to say about her time at CSU Channel Islands:

"I really appreciate the education I received at CSUCI. Had I not been accepted into the biology program at Channel Islands, I never would have had the chance to pursue this research and my PhD at UCSD."

UNDER THE SCOPE: STRUCTURE BIOLOGY

X-ray crystallography is the science which allows the atomic three dimensional resolution of the structure of a protein or other molecules. The atomic resolution of the data is measured in Ångströms which is a measurement equivalent to 1.0×10^{-10} meters. The quality of the data that is produced allows scientists to measure precise distances within proteins allowing the rational design of drugs targeted to proteins associated with a disease state.

The first and rate limiting step in protein X-ray Crystallography is growing crystals. A protein crystal is made up of thousands of proteins which naturally arrange themselves into a crystal lattice. Since most proteins are relatively large and have disorder inherent in their structure, crystallographers are only successful about 20% of the time in obtaining crystals for any given protein. The method of growing crystals is varied but generally an empirical process in which a variety of salts, organics and other additives are placed in the presence of the protein enticing the protein to form a crystal.

If the crystallographer is fortunate to discover a crystal growth solution, the next step is to put the crystal in an X-ray beam. At CSUCI we have an X-ray generator and an Area Detector which is used to measure the data that is achieved when the crystal is placed in the X-ray beam. The data comes off the Area Detector as a collection of spots which have varied intensity but a geometric pattern which is based on the geometric pattern of the proteins within the crystal. The geometric pattern of the crystal allows the crystallographer to determine the symmetrical elements of the protein packed in the crystal.

The data that crystallographers use to solve structures of proteins is the visualization of the electron density of the atoms which make up the amino acids which make up the protein. Unfortunately, in the process of collecting the "spots" crystallographers don't collect the phase information required to visualize the electron density. One method which is employed to solve this problem utilizes the unique property of proteins to specifically bind heavy atoms. Crystallographers exploit this ability and phase the electron density by determination of the position of the heavy atoms within the crystal.

After the "Phase Problem" has been determined, the electron density can be visualized and the crystallographer begins to build a model of the protein. Once the model is completed the data is combined with the structure and is passed through a program which refines all the angles and bond lengths of the protein just in case there were some errors introduced in the original model. If all goes well the last step is validating the model and publishing the structure.

If you are interested in Structural Biochemistry, you may want to consider taking Biology 403 where all aspects of X-ray crystallography are not only discussed in lecture but are prepared in the lab where the students grow, diffract and resolve the structure of proteins in the crystal lattice.

Timothy Osslund, Adjunct Professor Biology 403/505

The Desert Fishes Council



The Desert Fishes Council held its 39th annual meeting from November 14-18 at the Pierpont Inn in Ventura, California. The local host and organizer was Steven M. Norris.

The DFC is a unique gathering of scientists, conservation workers, resource managers and interested citizens drawn from governmental and non-governmental organizations and academia. The group is dedicated to advocacy for scientific study and conservation of desert fishes and their habitats. The membership meets annually to talk informally and attend formal working sessions to discuss and plan scientific, conservation, educational and legal actions. There are also 3 days of presented scientific research papers and posters.

About 160 members attended the Ventura Meeting, representing most western states of the USA and northern states of Mexico, along with Federal Agency employees from Washington D.C. About 80 papers and posters were presented on a broad range of topics related to the Council's mission.

CSUCI students in Biology and ESRM were offered the opportunity to attend the meetings and assist with meeting support duties. Students who participated attended paper sessions, met members of the Council, and joined the membership for the annual banquet at the Pierpont.

The meeting adjourned Saturday afternoon. Some members took field trips to Ventura freshwater habitats to meet some of our freshwater fishes (these were lead by DFC members from the region). On Sunday, Dr. Norris lead a large group of Council members, CSUCI Biology/ESRM students and OSHER/OLLI (extended education) students on a day trip to Santa Cruz Island.

Overall, it was a very successful meeting and the membership greatly enjoyed their visit to Ventura County.

Read more about the Desert Fishes Council at www.desertfishes.org.

Steven M. Norris



Biology Staff 2007



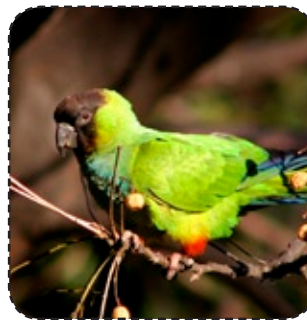
From left to right: Angela Chapman, Nitika Parmar, Kenneth Diffenderfer, Tom Schimdhauer, Catherine Hutchinson, Jessyka Dalton, Tamara Payes, Michael Mahoney, Parissa Keshavarzian, Amy Denton, Elizabeth Norris, Steve Norris, Nancy Mazingo, Ching-Hua Wang, R. Craig Seabaugh, Rachel Cartwright, Kimberly Gardner and Brittney Calhoun

DEGREE SPOTLIGHT

The Master of Science degree in Biotechnology and Master of Business Administration is a dual professional degree program designed to meet the needs of biotechnology industry and related public and private agencies and organizations. The program combines rigorous scientific training in biotechnology with graduate course work and experience in business management and regulatory affairs. The program includes the foundation courses for the dual degree program, a set of graduate level core courses in both biotechnology and business, along with several elective courses.

Our approach includes team projects drawn from Biotechnology industries to focus on real-world problems and applications of biological sciences and business to promote interpersonal skills and problem-solving skills from multiple perspectives.

DID YOU KNOW ?



The Black-hooded Parakeet is a native of South America, occurring from southeast Bolivia to southwest Brazil, central Paraguay and northern Argentina. However, they can also be found right here in Ventura County at Big Sycamore Canyon! With their dark hood, red thighs, blue breast patch, and very loud calls, Black-hooded Parakeets are easily identified. The birds feed on seeds, fruit, palm nuts, berries, flowers and buds. Black-hooded Parakeets usually find holes in trees to nest in and lay 3-4 eggs. After raising their young, the birds form large communal roosts until the next breeding season.

We'd love to hear from you ! Let us know what you think of our e-Newsletter.
Please send your thoughts to: Catherine Hutchinson at catherine.hutchinson@csuci.edu