BIOSPHERE
The Weekly Bulletin of Biology

Biology Colloquium: Friday, 26 October 2012, 2:00 pm in CR 5125

"A Portrait of *Pristionchus pacificus* Nematodes as a Young Model Organism for Chemosensation – Ecology to Genes"

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Cell Adhesion Mechanism Discovered Here at CSUN

—Steve Oppenheimer

For about 45 years my lab has been trying to unravel the intriguing puzzle of molecular mechanisms involved in cellular interactions. It started in 1967 while I was a Ph.D. student. Since then, with hundreds of students as co-authors on our publications and presentations, we have made some headway into this interesting problem. Most recently, in a new paper in *Zygote*, we provided evidence that a classic cellular interaction in the sea urchin embryo is mediated at least partially by chains of glucose molecules called polyglucans.

The *Zygote* paper was on sea urchin embryos, which have been studied by biologists for more than 100 years. The sea urchin embryo has been designated as a model system by the National Institutes of Health to study mechanisms of importance in human health and disease. For example, cancer spreads partially because of defective cell adhesion.

In our study and several before it, we used an elegant assay developed in collaboration with the late Dr. **Cathy Coyle-Thompson**. We microdissected the roof of the blastocoel and the archenteron out of gastrula stage embryos, and used glycosidases (sugar-cleaving enzymes) to determine if specific sugars are involved in the cellular interaction between these two embryonic structures. Through many precisely controlled experiments we found that the enzyme ß amylase immediately inhibited the cellular interaction. This demonstrated a likely role for polyglucans in the mechanism of cell interaction.

This is the first time that this cellular interaction was demonstrated outside of the embryo-proper with purified glycosidases. We were able to do it in a pristine system because of the elegant direct microdissection method.

We also independently characterized the glycosidases that we used. We didn't just use enzymes off the shelf. One of the reasons why our work was appreciated by the reviewers of this manuscript is that we spent many months in independently assessing the purity and activity of commercially purchased enzymes.

This is perhaps the best team effort in my four decades at Cal State Northridge. The authors on the *Zygote* paper were my graduate students **Suprita Singh**, **Eddie**

Karabidian, and **Alex Kandel**, together with my colleagues Drs. **Stan Metzenberg**, **Ed Carroll** and myself. This work was also made possible by other work, reported on earlier, involving a number of my other students and collaborators. I would like to again acknowledge the people who have made this achievement possible.

Outreach involving Corals

Last summer brought a wide diversity of unique opportunities for educators and high school students to work with members of Dr. **Peter Edmunds**' lab on studies of coral reefs around the world.

In July, **Micah Hagan** (a teacher at Bridges Charter School in Thousand Oaks) travelled with **Maya Schneiderman** (a student at Palisades Charter High School) to the National Museum of Marine Biology and Aquarium in Taiwan. There they worked with a research team from CSUN to study the effects of climate change on coral larvae. **Hagan** and **Schneiderman** also led a two-day experiential learning program that involved children from Taiwan who were visiting the lab. The Taiwan team was joined by **Dr. Garen Bhagdasarian** from Santa Monica College (SMC), who was supported an NSF-ROA award to conduct research on coral reproduction. **Bhagdasarian** brought students **Andrew Osberg** and **Daniella Mihora** to Taiwan from SMC, and these students worked closely with CSUN students to conduct field and laboratory research.

In July, **Craig Didden** (a teacher at Viewpoint School) traveled with Edmunds where he worked with the group on coral reef ecology and led activates in several "Eco-camps" hosted at the Virgin Islands Ecological Research Station where the group stays. Didden was the science teacher for **Amanda Arnold,** who returned to the team as a college freshman from the University of British Columbia.

In August, **Dan McDonald** (a teacher at Sun Valley School) traveled to Moorea, French Polynesia to complete outreach activities with Polynesian children, conduct field research on the population biology of corals, and develop video interviews on ocean science for use in his classroom in California. McDonald was accompanied by CSUN undergrad **Jennifer Smolenski**, who assisted with outreach activities and conducted research supported by the NSF Research Experiences for Undergraduates program on the effects of light on the growth of corals in more acidic oceans.

New Publications

Drs. **Vivian Cumbo**, TY Fan, and **Peter Edmunds** have a new paper out in *Marine Biology*: "Physiological development of brooded larvae from two pocilloporid corals in Taiwan."

Alexandra Forest, **Gordon Goldstine**, Dr. Yann Schrodi and Dr. **Sean Murray** have a new paper in *Biocatalysis and Biotransformation*: "Use of bacteria for rapid, pH-neutral, hydrolysis of the model hydrophobic carboxylic acid ester p-nitrophenyl picolinate." Forest and Goldstine were undergraduates in the Murray lab. Schrodi is a professor in the Department of Chemistry and Biochemistry.

Thesis Defense

Bansari Shah will be defending her thesis on 25 October at 9 am in room CR 5201. The title is: "An efficient non-viral vector for gene therapy."

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