

Behind the Scenes in Pharmacognosy

A Dragon's Tale!

by Mr. Dan Kulakowski

In the winter of 2010, the article entitled "Dragonamide E, a modified linear lipopeptide from *Lyngbya majuscula* with antileishmanial activity" by Marcy Balunas, Roger Linington, Kevin Tidgewell, Amanda Fenner, Luis-David Urena, Dennis Kyle, and Bill Gerwick was published in the 73rd volume of the *Journal of Natural Products*. The *Newsletter* interviewed ASP Member and first author Dr. Marcy Balunas, who took time out of her busy schedule to tell us more about her lab and this new marine natural product. Dr. Balunas is starting her new position as Assistant Professor of Medicinal Chemistry at the University of Connecticut. We wish her the best of luck!

How did you become interested in natural products?

It stemmed from a search in how to combine my interests in chemistry, drug discovery, ecology, and ethnobotany. Following ethnobotanical work in Brazil and a M.S. in plant ecology, my Ph.D. focused on the natural products chemistry and biological activity of terrestrial plants with activity against the aromatase enzyme, important for breast cancer chemoprevention and chemotherapy. I began my postdoctoral research in a semi-independent position in Panama, with the Panama International Cooperative Biodiversity Group (ICBG), studying marine natural products chemistry for tropical and neglected disease drug discovery, and this position has really captured all of my interests in the varied aspects of natural products drug discovery!



MS. KIM DIVER

The Balunas Lab in Panama! (left to right: Amanda Fenner, Brittany Graf, Manuel Grosso, Marcy Balunas, Jessica Schwartz, Cecilio Atencio)

Who in your laboratory carried out the research?

The majority of the research was carried out in my semi-independent laboratory in Panama. I am actually a postdoctoral fellow with Dr. Bill Gerwick at Scripps Institution of Oceanography in San Diego, California, but for the past three years I have been in Panama, running a lab of my own with students, funding, and planning. Dragonamide E was initially isolated by Dr. Roger Linington, the postdoctoral fellow in Panama prior to my arrival, now an assistant professor at the University of California Santa Cruz, Santa Cruz, California. I initially isolated herbamide B, which was then reisolated by my student, Ms. Amanda Fenner, from the University of Iowa, Iowa City, Iowa. I elucidated the structures and determined their full stereochemistry. Dr. Kevin Tidgewell, a postdoctoral fellow with Dr. Bill Gerwick, assisted on some of the stereochemical work.

Could you provide a brief explanation of the work and results in your own words?

This manuscript describes the isolation and structure elucidation of dragonamide E, a new cyanobacterial metabolite with a novel fatty acid moiety, whose structure has implications with regards to the configuration of other metabolites. Furthermore, another of the isolates, the known compound herbamide B, is described fully for the first time, including full absolute configuration. Both compounds have demonstrated *in vitro* activity against the tropical parasite *Leishmaniasis donovani*. Biosynthetic differences among marine compounds with a terminal free amide are also discussed.

What impact does this research have on natural products science?

Tropical parasitic and infectious diseases, such as leishmaniasis, pose enormous global health threats, but are largely neglected in commercial drug discovery programs. However, my research program, as part of the Panama ICBG, has focused on identifying novel treatments for malaria, Chagas' disease, and leishmaniasis. The compounds identified in this research might be appropriate for further *in vivo* evaluations, including herbamide B which was isolated as a major metabolite.

What is a favorite nonscientific activity of your lab?

We have played in the SENACYT/INDICASAT (Secretaria Nacional de Ciencia, Tecnologia e Innovacio/Instituto de Investigaciones Cientificas y Servicios de Alta Tecnologia) volleyball league for the past two years as the "Bioprospectos" - we've placed second each year but we have some nice trophies!

Editor's Note: Interested readers will want to peruse the Scripps Institution of Oceanography's Exploration e-magazine article describing Drs. Gerwick and Balunas' work in detail in the July/August 2009 issue. Please visit http://explorations.ucsd.edu/Features/2009/Discovering_Diversity/. Background photo of Mangrove roots in the Bastimentos Island National Park in Bocas del Toro, Panama, by Ms. Kim Diver.