



# ISOTOPICS

The Cleveland Section of the American Chemical Society

Volume 93 Issue 3

March 2017

## On Deck:

Education Night

04/19/2017

Balwin Wallace University

## Cleveland ACS Officers

### Chair:

Lisa Ponton  
Baldwin Wallace University  
(440) 826-2314  
lponton@bw.edu

### Chair-Elect:

Michael Levy  
mjlevy34@gmail.com

### Treasurer:

Bhagya Gunasekera  
Cleveland State U.  
m.gunasekera@csuohio.edu

### Secretary:

Drew A. Meyer  
Case Western Reserve U.  
dam135@case.edu

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## Isotopics

### Editor:

Geneviève Sauvé  
Case Western Reserve U.  
(216) 368-3665  
genevieve.sauve@case.edu

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### Cleveland Section Web Site:

[http://www.csuohio.edu/sciences/dept/cleveland\\_acs/](http://www.csuohio.edu/sciences/dept/cleveland_acs/)

## March Meeting Notice

Meeting-in-Miniature (MIM)

Monday, March 13, 2017

Cleveland State University

|                |   |
|----------------|---|
| 1:00 pm        | Registration opens – Main Classroom, 2 <sup>nd</sup> floor    |
| 2:00-5:00 pm   | Contributed talks – Main Classroom, various rooms             |
| 5:15 – 6:15 pm | Plenary Talk – Main Classroom, TBD                            |
| 6:15 – 7:00 pm | Reception – Student Center, 3 <sup>rd</sup> floor Rms 311 A&B |
| 7:00           | Dinner and Awards Presentation                                |

### Plenary Talk

#### “History of explosives”

*Dr. James Short*

Abstract: The 1000 year history of explosives will be traced from the first observation of explosive phenomena in China. Travel of the knowledge from the Old World along the Silk Road to Europe. The several accidental & initially unrecognized discoveries of new explosive materials in Europe. The enormous wealth that came to people that figured out how to safely manufacture and handle explosives. Why explosive knowledge and innovation crossed the Atlantic into the New World. The crucial contribution of university research to the advancement of explosive (and propellant) chemistry. Why the world's largest manufacturer of photographic film became the world's largest manufacturer of explosives. How Walt Disney and President Kennedy moved America into Outer Space. And how mistakes and errors along the way led to successful explosives safety research programs.

### DINNER RESERVATIONS REQUESTED:

Please RSVP to Dr. David Ball ([d.ball@csuohio.edu](mailto:d.ball@csuohio.edu)) with the names and number of people in your party by 5:00 pm on Thursday, March 9. The menu will be a southern BBQ with brisket and chicken, cole slaw, roasted potatoes, chips & salsa, and a corn relish with cookies & brownies for dessert. We can take credit cards, checks made out to “Cleveland ACS”, or cash. The cost is \$20 for members and guests, \$5 for students, and FREE for student presenters and volunteers.

## Bibliography

Dr James Short went from a Sputnik era rocket scientist to become the advocate inside the Pentagon for the Army, Navy & Air Force science & engineering laboratories. His received his undergraduate degrees from Syracuse University and his PhD from the University of California at Berkeley. He spent 26 years working for a Navy science & engineering laboratory, the Naval Surface Warfare Center. There he contributed to the design of a warhead for what was to become the Tomahawk Cruise Missile. He also contributed to the design of a warhead for a Navy torpedo you have never heard of because the Navy has not yet needed to use the torpedo during the 35 years it has been carried on Navy ships. At the Pentagon he was responsible for DoD research policy including the role of foreign born students & professors in on-campus defense-related research and the policy governing publication of DoD sponsored research in the scientific literature. He has been at the University of Maryland College of Engineering for the past 10 years. He is currently on loan from the University to the Department of Transportation's Federal Highway Administration Turner-Fairbank Highway Research Center. Prior to that the University loaned him back to the Pentagon. While waiting for the Senate to confirm an Obama appointee to be the Deputy Secretary of Defense for Operational Energy, he was responsible for Pentagon Policy concerning energy use in places including Iraq & Afghanistan. He is editor of the Journal of Energetic Materials.

### Parking:

Parking has been arranged in the Central Garage, labeled CG. Entrance to the garage is off Chester Avenue and down East 19<sup>th</sup> Street (see map). You MUST have the visitor parking permit (available from David Ball at [d.ball@csuohio.edu](mailto:d.ball@csuohio.edu)) to enter and leave the garage; otherwise, you will have to pay for parking at some other facility.

The talks will be in the Main Classroom building, labeled MC. The reception and dinner

will be held in the Student Center (labeled SC) on the third floor.



## Meeting-in-Miniature 2017: Abstract deadline extended to March 10<sup>th</sup>.

Meeting-in-Miniature (MIM) of the Cleveland Section is a great opportunity for researchers in Cleveland and Northeast Ohio region to present their findings. Many graduate and undergraduate, students, postdoctoral and industrial researchers use this opportunity as a stepping stone for presenting their work. The 2017 MIM is closely followed by the 253rd ACS Spring National Meeting to be held in San Francisco from April 2-6. ACS National Meetings are amongst the most competitive technical expositions yet one of the friendliest gatherings of scientists in the world. MIM has been instrumental throughout, providing necessary exposure for local participants, especially students from area institutions who present in ACS National Meetings. MIM also provides a great opportunity for undergraduate and graduate students, postdoctoral research fellows and industry professionals to network among the scientific community.

The 2017 MIM of will be held on Monday, March 13th at Cleveland State University (CSU). Stemming from a strategic planning initiative, ACS Cleveland Section is on a mission to expand the breadth of chemistry research showcased at MIM 2017. Local area students

from a number of community colleges, and researchers from area industries will also be invited to present at this year's conference.

The half day program of MIM 2017 starting early afternoon will accommodate oral presentations of 15min and 5min questions by audience in each of its sections. The sessions will be held in the main classroom building of CSU. A map of CSU campus can be found at [https://www.csuohio.edu/sites/default/files/media/about\\_csu/documents/campusmap.pdf](https://www.csuohio.edu/sites/default/files/media/about_csu/documents/campusmap.pdf)

Graduate and undergraduate presentations will be recognized with certificates and monetary awards of \$400.00 (Graduate) and \$350.00 (Undergraduate). This year's plenary speaker is Dr. James Short, the retired Deputy Director of the Center for Energetic Concepts Development at the University of Maryland Energy Research Center and the current editor of the Journal of Energetic Materials. Plenary lecture on "The History of Explosives" is followed by dinner buffet and award ceremony.

Submission of abstracts is now open. The registration is free for this event. Please limit your abstract to 250 words and include names and affiliations of all authors. Abstracts should be submitted through the online submission system; <http://goo.gl/forms/EQCo7TRkXC>. The deadline for submission is March 10<sup>th</sup>.

### **GO-CHEM Family Retreat**

Thank you to everyone who came out to the first all-Ohio family retreat. The convention center space at Kalahari is a great meeting space and there was plenty of fun activities in the arcade and waterpark for our younger family members. There truly was something for everyone. Mark Laskovics from the Cincinnati section held a resume and interview seminar. We had five students who shared their research with us over lunch. The Baldwin Wallace University student crew had their hands full with the outreach activities in the lobby. Kalahari had us perfectly placed right next to the check-in line in the main lobby during peak check-in. Those not

participating in the outreach had time to play in the waterpark in the afternoon before joining us for dinner where we learned about the unique musculature of sloths. They are truly fascinating creatures and we thank Dr. Mike Butcher from Youngstown State University for his engaging presentation. Thank you to all of our attendees and all the of the ACS local sections in Ohio and OMNOVA Solutions for supporting this different ACS event!

### **From ACS Discoveries: Antimicrobial substances identified in Komodo dragon blood**

*Journal of Proteome Research*

In a land where survival is precarious, Komodo dragons thrive despite being exposed to scads of bacteria that would kill less hardy creatures. Now in a study published in the *Journal of Proteome Research*, scientists report that they have detected antimicrobial protein fragments in the lizard's blood that appear to help them resist deadly infections. The discovery could lead to the development of new drugs capable of combating bacteria that have become resistant to antibiotics.

The world's largest lizard, Komodo dragons live on five small islands in Indonesia. The saliva of these creatures contains at least 57 species of bacteria, which are believed to contribute to the demise of their prey. Yet, the Komodo dragon appears resistant to these bacteria, and serum from these animals has been shown to have antibacterial activity. Substances known as cationic antimicrobial peptides (CAMPs) are produced by nearly all living creatures and are an essential part of the innate immune system. So, Barney Bishop, Monique van Hoek and colleagues at the College of Science at George Mason University wondered whether they could isolate CAMPs from Komodo dragon blood, as they previously had done with alligator blood to expand the library of known CAMPs for therapeutic studies.

The team used an approach known as bioprospecting. They incubated Komodo dragon

blood with negatively charged hydrogel particles that they developed to capture the peptides, which are positively charged. With this method, they identified and sequenced 48 potential CAMPs with mass spectrometry. All but one of these was derived from histone proteins, which are known to have antimicrobial activities. Eight were synthesized and tested against *Pseudomonas aeruginosa* and *Staphylococcus aureus*. Seven of the peptides showed significant potency against both bacteria. The eighth was only effective against *P. aeruginosa*. The researchers conclude that Komodo dragon blood plasma contains a host of potentially viable antimicrobial peptides that could help lead to new therapeutics.

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