



ISOTOPICS

The Cleveland Section of the American Chemical Society

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On Deck:

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T.B.A.

May Meeting Notice

Wednesday, May 18, 2016

[Michelson and Morley Restaurant](#),
Case Western Reserve University

5:00 – 5:45 pm Social Hour
5:45 – 7:00 pm Dinner
7:00 – 8:00 pm Award Presentation

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"Targeting Cancer with Transition Metal Complexes: From Basic Science to Therapy"

Claudia Turro, Ohio State University

Abstract: The use of light to activate the action of a drug has become important as mode of cancer therapy, in some cases superior to traditional treatments, due to its low levels of invasiveness and systemic toxicity. Photoinduced ligand exchange, which can be used to release caged drugs or to induce covalent DNA binding with spatiotemporal control, together with the sensitization of $^1\text{O}_2$, represent important reactions initiated by light with potential applications in photochemotherapy (PCT). These photoinduced reactions of Ru(II) and Rh₂(II,II) complexes will be presented, along with their activity towards biological targets and cancer cells. Importantly, Ru(II) complexes were recently discovered to undergo multiple photochemical pathways following activation with light, and this property was used to design new dual-action compounds. These new complexes are able to both release a medically relevant compound and to produce $^1\text{O}_2$ and were shown to exhibit significant enhancement of activity stemming from their ability to induce cell death via two different, independent pathways. New strategies developed for the photoinduced exchange of pyridine-containing drugs and their attachment to tumor-targeting antibodies will also be presented. These new complexes provide a new platform for drug delivery and enhanced therapeutic activity upon excitation with low energy light.

DINNER RESERVATIONS REQUIRED:

Below is the dinner menu. Please indicate your dinner selection by Friday May 13 using the following link, <http://goo.gl/forms/pclgubDQGS>. At the event, we can take credit card payments, checks made out to "Cleveland ACS," or cash. The cost is \$20 for members and guests; \$10 for retirees or unemployed; and \$5 for students.

Dinner menu:

First Course

Spring Greens Salad

sliced strawberries, candied almonds,
feta cheese, white balsamic vinaigrette

Second Course

choice of the following entrees:

Pan Seared Ocean Trout

asparagus, fingerling potatoes,
wild mushroom butter sauce

Seared Airline Chicken Breast

quinoa, snow peas, sweet chili glaze

Herb-Marinated Skirt Steak

broccolini, fingerlings, shallot demi

Cremini and Fontina Ravioli

asparagus, sherry mushroom sauce

Third Course

Chef's Selection of Dessert

Other Details: The Social Hour and Dinner will be in the Michelson & Morley Restaurant in the Tinkham Veale University Center on the campus of Case Western Reserve University. Parking may be obtained in the Severance Hall garage, entrance off East Boulevard, and there is an entrance to the Tinkham Veale Center from the garage. (On street parking may also be available.) The Award Presentation and Seminar will immediately follow dinner and be in the Thwing Center located next door to the Tinkham Veale University Center.

Questions may be addressed to acsleveland@gmail.com or by calling Mike Kenney, 440-488-3035.

Speaker's Biographical Sketch:

Claudia Turro is a physical inorganic chemist, focusing her research in the areas of time-

resolved spectroscopy and bioinorganic chemistry with applications in therapeutics, diagnostics, and solar energy conversion. She received her B.S. with Honors from Michigan State University in 1987 and went on to work with Daniel G. Nocera and George E. Leroi at Michigan State University, receiving her Ph.D. in 1992. She conducted postdoctoral research funded by a Jane Coffin Childs Memorial Fund for Medical Research Postdoctoral Fellowship with Nicholas J. Turro until 1996, when she became a faculty member at The Ohio State University. She received the Early CAREER Award by the National Science Foundation in 1998, the Arnold and Mabel Beckman Foundation Young Investigator Award in 1999, was named a 2010 Fellow of the American Chemical Society, and a 2011 Fellow of the American Association for the Advancement of Science. She was elected President of the Inter-American Photochemical Society (2012-14) and Chair of the Division of Inorganic Chemistry of the American Chemical Society (2016). She received the College of Arts and Sciences inaugural Susan M. Hartmann Mentoring and Leadership Award (2014) and the 2014 Inter-American Photochemical Society Award in Photochemistry. In addition to her research scholarship, Professor Turro has demonstrated a deep commitment to teaching and mentoring of students, placing special emphasis on underrepresented minority students.

Follow-up on April's meeting

Our last local meeting was April 20, 2016 at the Ohio Aerospace Institute. Matt Mellis of NASA gave a fascinating talk about the shuttle program. It was especially interesting to learn how they figured out what happened when Columbia shuttle failed, and what they learned from it.

If you missed it or want to hear more, here is a link to his video on YouTube: <https://www.youtube.com/watch?v=W2VygfZSCs>

Announcement: NASA Open House

Ever wondered what is going on at the NASA Glenn research center in Cleveland? You can find out May 21 and 22, 2016, from 10 am to 6 pm at the Lewis Field Campus for an Open House celebrating NASA Glenn's 75th anniversary. They will have tours of their facilities, special presentations, hands-on activities for kids and more. For more info, go to website: <http://www.nasa.gov/feature/open-the-gates-nasa-glenn-invites-the-public-for-a-weekend-visit> Note: visitors need a valid driver's license and either American citizenship or Permanent Residency. Kids must be accompanied by adults.

Announcement: Microscopy Society Northeastern Ohio 60th annual may conference

The 60th Annual May Conference (SAS/MSNO/ACS/AVS) and MSNO's 50th anniversary is May 18, 2016 at John Carroll University, Dolan Science Center. For more information: <http://www.msneo.org/2016-may-meeting.html>

The Keynote Speaker is Colonel Robert J. Kraus of AFOSR and title is: "Aim High, then Aim Higher - Basic Research for the US Air Force".

Topics for the conference are:

- Microscopy/Spectroscopy
- Materials science
- Biology
- Renewable energy/sustainability
- Additive manufacture (3D printing)
- Analytical Chemistry
- Vacuum/surface techniques
- Nanomaterials/nanodevices

Announcement: National Chemistry Week

The Cleveland Section's celebration of National Chemistry Week each October consists of hands-on, fun "experiments" for children grades 3-6 and contests for grades K-12. We could use your

help with either planning or demonstrating these programs. If you have an interest in volunteering to promote and chemistry science to our youth, please contact Bob Fowler at jrfowler@cox.net. Bob will send you details on any part of the Program.

From ACS Discoveries: Recyclable, sugar-derived foam — a renewable alternative to traditional polyurethanes?

ACS Macro Letters

Polyurethanes in products from cushy sofas to stretchy spandex have made sitting, sleeping and walking more comfortable. But once they have served their purpose, most of the non-degradable materials pile up in landfills. Now scientists report in the journal ACS Macro Letters a potential way to reduce future waste: a chemically recyclable foam made using a new sugar-derived material.

Polyurethanes are highly versatile materials. In addition to furniture and clothing, manufactures use them in electronics, cars, floors and medical devices. But the materials come from petroleum, and efforts to recycle them are limited. To tackle the huge amount of waste this creates, scientists are pursuing more sustainable options. Marc A. Hillmyer and colleagues developed an efficient method to make a sugar-derived rubbery polyester compound called poly(β -methyl- δ -valerolactone), or PMVL, that can be used in new chemically-recyclable polyurethanes.

Using this new polymer, the researchers made flexible polyurethane foams that were comparable in performance to commercial analogs. To test whether the foams could be recycled, the team first added a catalyst, then heated the materials to a high temperature. Through this process, the researchers recovered up to 97 percent of the starting β -methyl- δ -valerolactone (MVL) monomer in high purity. The researchers then used what they recovered to re-make PMVL with essentially identical

properties.

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