

**DEPARTMENT OF CHEMISTRY AND ENVIRONMENTAL
SCIENCE
VIRTUAL SEMINAR SERIES
SPRING 2021**

DATE: WEDNESDAY, FEBRUARY 17

TIME: 12:30-1:50pm

LOCATION:

<https://njit.webex.com/njit/j.php?MTID=mdfe4f718778e9a7ffb4eefa8ea5acb98>

Meeting number: 1202085541

Meeting password: yaP9itPpR74

Join by video system:

Dial [1202085541@njit.webex.com](tel:1202085541)

You can also dial 173.243.2.68 and enter your meeting number

Join by phone:

1-650-479-3207 Call-in toll number (US/Canada)

GUEST SPEAKER

Elizabeth T. Papish, Professor

Department of Chemistry and Biochemistry

University of Alabama

Tuscaloosa, AL

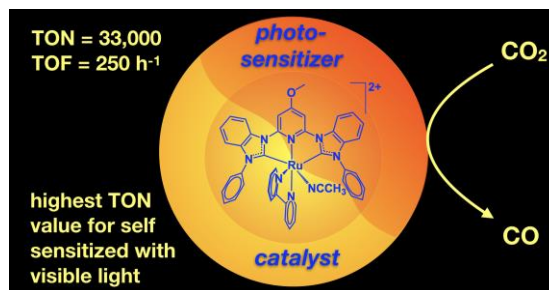
TOPIC

The Big Impact of One Small Remote Group in Transition Metal Complexes for Carbon Dioxide Reduction Catalysis and Protic Anticancer Compounds

ABSTRACT

We aim to apply bioinorganic and organometallic chemistry to problems that relate to green chemistry and sustainability. In particular, we are interested in exploring how protic and electron donor groups impact catalysis. We have pursued reactivity inspired by the need for energy storage, specifically carbon dioxide reduction. Recently, we designed a new pincer ligands using N-heterocyclic carbene (NHC) and pyridinol rings that can change their properties by protonation and deprotonation, rather than lengthy synthesis. The most active transition metal catalysts with these pincers use methoxy groups which balance electron donor ability with stability. This has allowed for formation of ruthenium and nickel complexes that perform catalytic and light driven carbon dioxide reduction, as shown by our collaborator Delcamp. We have also demonstrated that the OH derivatives can be switched on or off for catalysis with acid concentration

One of our ruthenium complexes is record setting in terms of reaction rates and selectivity. CO₂ reduction is of fundamental importance to the impending global energy crisis, and carbon dioxide reduction (when coupled with water oxidation) can allow for a sustainable method of energy storage in solar fuels.



Furthermore, we have studied our hydroxyl substituted bipyridine ligands as a part of ruthenium based anticancer metallo-prodrugs. The ruthenium complexes are light activated and show selective toxicity towards cancer cells (vs. normal cells). With collaborator Kim, we are studying the mode of action of these complexes towards cancer cells.

BIO



Elizabeth T. Papish was born and raised in Long Island, NY. She studied chemistry at Cornell University (BA, 1997) and Columbia University (PhD, 2002). She has taught at Franklin & Marshall College (2002-3), Salisbury University (Asst. Prof. 2003-2007), Drexel University (Asst. Prof. 2007-2012, Assoc. Prof. 2012-2013), and at the University of Alabama (Assoc. Prof. 2013-2019, Full Prof. 2019-present). Her research group studies bioinorganic and organometallic chemistry with an emphasis on designing new organic ligands for the use of transition metal complexes in energy related catalysis applications and for metal based therapies for health applications. She is the recipient of an NSF CAREER award (2009) and has been honored with the "Outstanding Research Mentor of the Year Award" at Salisbury University in 2007 and with the "College of Arts and Sciences Teaching Award" for excellence in teaching and mentorship from Drexel University in 2012. In 2013, Papish and her student received the "Division of Inorganic Chemistry Award for Undergraduate Research" from the American Chemical Society. Her research is currently supported by NSF and NIH.

Committee members:

Professor Michael Eberhart – michael.s.eberhart@njit.edu

Professor Farnaz Shakib – farnaz.a.shakib@njit.edu