DEPARTMENT OF CHEMISTRY AND ENVIRONMENTAL SCIENCE
SEMINAR SERIES
FALL 2022

WEDNESDAY, SEPTEMBER 21, 2022
TIERNAN HALL – LECT. HALL 1
1:00PM-2:20PM

GUEST SPEAKER

Terrence J. Collins, PhD
Teresa Heinz Professor of Green Chemistry
Director, Institute for Green Science
Carnegie Mellon University
Pittsburgh, PA

TOPIC

Chemistry and Sustainability: how can we reinvent chemical education, research and development to pursue a sustainable future

ABSTRACT

Most unfortunately, the vast chemical dimension of our civilization, the Chemical Enterprise (CE), is the source of three clear existential threats to the sustainability of our civilization. These are climate change, nuclear mishap or misadventure, and the low dose adverse effects (lodafs) of everyday-everywhere chemicals.

We will focus in this talk on lodafs where the suite of underlying mechanisms we know most about is called *endocrine disruption*. I will convey evidence on why endocrine disruption represents a fast-acting existential threat. And then I will describe what we are doing in the Institute for Green Science at CMU to build a curriculum, research space, public outreach program, and entrepreneurial accomplishments as a model for how chemists can be helpful in moving the CE away from endocrine disruption lodafs.

Walt Kelly in a 1971 comic strip, had his Pogo Possum character assert "We have met the enemy and he is us." We academicians of the older generations have been catastrophically failing you of the younger generations when it comes to lodafs. Our universities have been AWOL. I am delighted to learn that the NJIT administrators and faculty are getting ever more serious about leading an evolution (or is it revolution) away from lodaf chemicals. Let's all think together in my presentation and surrounding discussions about what we have to do as university professors, students and administrators to redirect chemical and allied education to become competent in addressing the most significant challenges our species has ever had to face.

BIO

Terrence J. Collins, Teresa Heinz Professor of Green Chemistry and Director, Institute for Green Science, Carnegie Mellon University

A champion of green science, Terry Collins is the Teresa Heinz Professor of Green Chemistry and the Director of the Institute for Green Science at Carnegie Mellon University in Pittsburgh, Pennsylvania. Terry received his undergraduate and doctoral degrees from the University of Auckland where he is a Distinguished Alumnus and Honorary Professor. He first learned of the insidious health damage caused by commercial chemicals while a student at Auckland. He began teaching the first course in Green Chemistry starting in 1992, that is today entitled *Chemistry and Sustainability*. The extensive scholarship involved in developing this course has led Terry to comprehend that the barriers to building a sustainable chemical enterprise are not only massively technical, but also massively cultural. And the cultural barriers are the most difficult and deadly. He regularly articulates this insight publicly. In his research career, Terry has created TAML® activators over decades with the help of his brilliant students and collaborators. TAML®s are the highest performing oxidation catalysts across both chemistry and biology with, among many other things, demonstrated potential for safely avoiding and eliminating pollutants and pathogens in water and soil. Terry's extensive multidisciplinary academic, educational and entrepreneurial programs are aimed at providing solutions for dealing with the low dose and low concentration adverse effects (lodafs and locafs) of certain everyday-everywhere chemicals. Typically consequent to endocrine disruption mechanisms, lodafs are fast-acting threats to all higher lifeforms and are, for example, rapidly sterilizing highly chemicalized human societies. Terry is the creator-founder of Sudoc, LLC, a brilliant company that is commercializing TAML® catalyst applications while developing a working example of what a sustainable chemical corporation must actually come to look like. Sudoc was recently named a *Top 10 Startup to Watch* by *Chemistry and Engineering News* and received one of the Fast Company's World Changing Ideas Award. Terry has received over 20 career awards.

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