



Endocrine Disruption: confronting the most important sustainability challenge to ever engulf chemistry

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Until recent times, chemical processes and products were commercialized solely on the strength of high technical and cost performances. Today we recognize the sustainability requires that health, environment and fairness performances also be integrated into the value proposition of chemical products and processes. The foundational purpose of any field of chemistry that proposes to make the chemical enterprise sustainable must surely be, first and foremost, to protect the plenitude of life from the downsides of commercial chemicals. Such a purpose is more important in its field distinguishing qualities than advancing society by adding to the upsides of chemical commerce through the invention of less hazardous products and processes. Today, the collective chemical enterprise represents an existential threat to the sustainability of our civilization that chemists little understand. This threat is arguably even faster acting than climate change and originates primarily (to the best of our understanding) in the endocrine disrupting properties of many chemicals, including some everyday-everywhere chemicals. In this presentation, I will (i) cover facts that identify endocrine disruption as an existential threat to life on earth

(ii) show how endocrine disruptors can be identified experimentally, and (iii) touch on the iterative design process that we have used in the Institute for Green Science that I direct to develop TAML and NewTAML catalysts to destroy endocrine disruptors in water. The technical performance of NewTAMLs is unprecedented across both chemistry and biology and has given birth to the new field of Sustainable Ultradilute Oxidation Catalysis (SUDOC).

Biography

Terry Collins is the Teresa Heinz Professor of Green Chemistry and the Director of the Institute for Green Science at Carnegie Mellon University (IGS: <https://www.cmu.edu/igs/>). He holds numerous academic and public awards, has over 200 publications and has delivered over 600 public lectures. His group created TAML® and NewTAML activators, small-molecule, functional replicas of the peroxidase enzymes that mimic and outperform the enzymes with myriad demonstrated uses. He is dedicated to expanding understanding of endocrine disruption. Dr. Collins taught the first course in Green Chemistry and has been developing it iteratively since 1992.