

An invitation
To celebrate the recognition of the
2025 Maryland Chemist of the Year

John P. Toscano

Professor in the Department of Chemistry, Johns Hopkins University

**“For his outstanding contributions to
organic chemistry and chemical biology”**

His research focuses on the generation and study of
reactive intermediates of both fundamental and biological importance.



Award Lecture:

**Reactive Intermediates and Bioactive Signaling Agents:
From Carbenes to NO/HNO and H₂S/RSSH**

This presentation will focus on our studies of fundamental organic reactive intermediates and small molecule bioactive signaling agents, including nitric oxide (NO), nitroxyl (HNO), hydrogen sulfide (H₂S), and related hydropersulfides (RSSH). Our early work utilized nano/microsecond time-resolved infrared (TRIR) spectroscopy to provide structural and mechanistic insight into fleeting intermediates such as carbenes, nitrenes, and nitrocarbonyls. Subsequent studies that aimed at developing novel photochemical precursors to NO led to the investigation of NO's redox cousin, HNO, and its potential application as a novel therapeutic for the treatment of heart failure. HNO's mechanism of action, with particular emphasis on thiol modification of important regulatory proteins and the development of donor molecules required for the generation of HNO in situ, will be highlighted. More recently, our research has centered on the chemistry and biochemistry of H₂S and related reactive sulfur species, particularly RSSH, reactive intermediates that also require donor molecules for their administration and study. RSSH are newly discovered in vivo species that protect cells from damaging agents and toxins. They appear to be especially adept at mitigating inflammation and oxidative stress, processes that when uncontrolled underlie numerous pathologies, including cardiovascular and neurodegenerative diseases. Initial efforts using our newly developed RSSH donors to elucidate their biologically relevant chemistry and to assess their potential efficacy in physiological applications, such as mitigating anthracycline-induced cardiotoxicity and Friedreich's ataxia, will be discussed.

**Wednesday, February 4, 2026
6:00 P.M. Ceremony & Reception**

The Great Hall in Levering Hall
3400 N Charles Street, Baltimore MD 21218
Parking is available see [Campus map](#)