Electrogenerated chemiluminescence, also called electrochemiluminescence (ECL), is the generation of light triggered by an initial electrochemical reaction. Electron-transfer (ET) is at the core of ECL phenomenon since it occurs at the electrode surface following an heterogeneous ET step. Also, the population of the excited state of the luminophore involves homogeneous redox reactions. The modern history of ECL started in the mid-1960s with the electrochemical investigation of radical ions of aromatic hydrocarbons in organic solvents. Studying highly exergonic recombination reactions of these radical ions enabled to understand some of the most fundamental questions relating to ECL. Over the last 5 decades, the topic underwent a continuous transformation to achieve practical applications for ultrasensitive analytical detection. It has been successfully commercialized in the healthcare diagnostic market for the detection of biomarkers. In this seminar, we will discuss the molecular basics of ECL and also the development of new ECL-active dyes. The ECL capability of a series of organic luminophores based on stable carbocations will be rationalized by combining electrochemical and spectroscopic characterization.

Everyone is cordially invited

Lorenzo Di Bari