Hypoxia-responsive light-absorbers for switchable phototherapeutic approaches

MARTA ERMINIA ALBERTO[1]

[1]*Dipartimento di Chimica e Tecnologie Chimiche (CTC), Università della Calabria, Via P. Bucci, 87036, Rende (CS) Italy*
marta.alberto@unical.it

ABSTRACT

Ru(II) and Os(II) are attracting an increasing interest as potential candidates for several light-mediated approaches, including Photodynamic Therapy (PDT). The unprecedented hypoxia activity displayed by new Os(II)- and Ru(II)-compounds bearing quaterthiophene chains proposed and characterized in joint experimental and theoretical studies [1] are herein presented. DFT and TDDFT results provide fundamental insights into their dual normoxia/hypoxia activity, demonstrating that *i)* it does not rely on a photoinduced ligand loss mechanism as the better-known photoactivated cancer therapy (PACT or PCT) and that *ii)* the excited-state dynamics of the most active compounds (n=4) is governed in large part by the ^{3}ILCT state hence questioning the generally accepted correlation between the hypoxia phototoxicity and the population of ^{3}MC dissociative states.

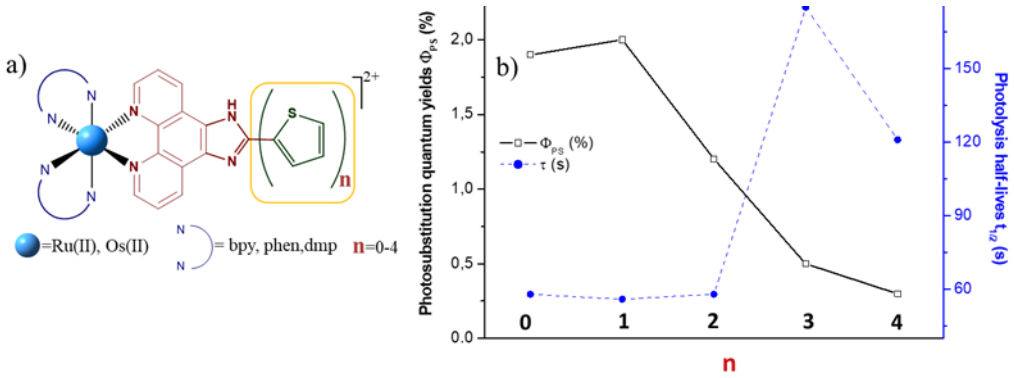

Figure 1 : a) Hypoxia-Active PS; b) Photosubstitution quantum yields (%) and half-lives (s)

References

(1) Alberto, M. E.; Cameron, C. G.; McFarland, S. A. et al. *Inorg Chem* **2023,** *62*, 21181−21200; *J Am Chem Soc* **2022**, *144*, 8317–8336; *Inorg Chem* **2020**, *59*, 16341–16360; *Chem Sci* **2020**, *11*, 9784–9806.