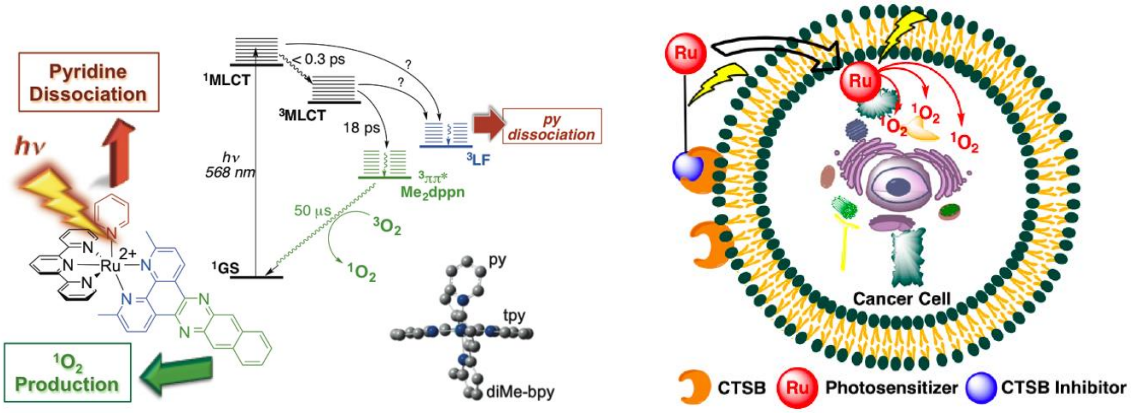
Dual Action Photoactive Transition Metal Complexes for Photochemotherapy

Claudia Turro

Department of Chemistry and Biochemistry
The Ohio State University

The use of light to activate the action of a drug has become important as mode of cancer therapy, in some cases superior to traditional treatments, because it significantly less invasive and poses low levels of systemic toxicity to the patient. Photoinduced ligand exchange, which can be used to release drugs with spatiotemporal control, together with the production of $^1O_2$, represent important reactions initiated by light with potential applications in photochemotherapy (PCT). These photoinduced reactions of Ru(II) complexes will be presented, along with their activity towards biological targets and cancer cells. Importantly, Ru(II) complexes were recently discovered to undergo multiple photochemical pathways following activation with light, and this property was used to design new dual-action compounds. These new complexes are able to both release a medically relevant compound and to produce $^1O_2$ from the same molecule. These dual-action compounds were shown to exhibit significant enhancement of activity stemming from their ability to target cancer and/or induce cell death via two different, independent pathways. New strategies developed for the photoinduced exchange of pyridine-containing drugs and methods to selectively target cancer tissue. These new dual-action complexes provide a new platform for drug delivery and enhanced therapeutic activity upon excitation with low energy light.



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