

Trifluoromethyl-Substituted Iridium(III) Complexes: From Photophysics to Photooxidation of a Biological Target

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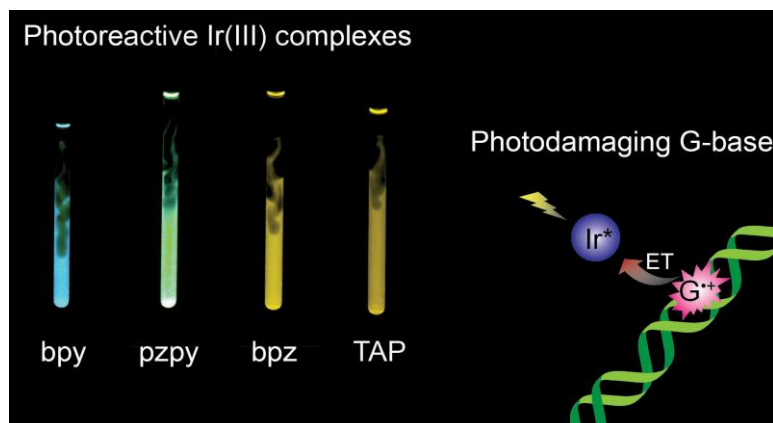
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Photodynamic therapeutic agents are of key interest in developing new strategies to develop more specific and efficient anti-cancer treatments. Compared to classical chemotherapeutic agents, the activity of photodynamic therapeutic compounds can be finely controlled thanks to the light-triggering of their photoreactivity. Development of Type-I photosensitizing agents, which do not rely on the production of ROS, is highly desirable. In this context, we developed new iridium(III) complexes which are able to photoreact with biomolecules; namely, our Ir(III) complexes can oxidize guanine residue under visible light irradiation. We report the synthesis and the extensive photophysical characterization of four new Ir(III) complexes. In addition to an extensive experimental and theoretical study of the photophysics of these complexes, we characterize their photoreactivity towards model redox-active targets and the relevant biological target, the guanine base. We demonstrate that photo-induced electron transfer takes place between the excited Ir(III) complex and guanine which leads to the formation of stable photoproducts, indicating that the targeted guanine is irreversibly damaged. These results pave the way to the elaboration of new Type-I photosensitizers for targeting cancerous cells.



[1] Bevernaegie *et al.*, *Inorg. Chem.*, **2018**, 57(3). 1356-1367.