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Conference Abstract

7th Irish Institute for Metal Based Drugs, DIT, 25th November, 2016

Metal Drugs for Multimodal Applications

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Over the past decade a structured synthetic approach to the design and development of Ruthenium (II) polypyridyl complexes has been carried out at the DIT.^{1,2} Initial studies commenced with the design and synthesis of the ligands and the complexes themselves in the form of $[\text{Ru}(\text{L}_1)_2\text{L}_2]^{2+}$, where L_1 is 2,2'-bipyridine, 1, 10-phenanthroline or 2,2'-biquinoline and L_2 is the main ligand with varying electronegativity properties. Ru (II) complexes are known to mimic iron in biological media and are really coming to the forefront in areas such as anticancer and antimicrobial applications.³⁻⁵ The photophysical characterisation of the complexes has been studied to determine a mechanism for optimising the luminescent yield and lifetimes of the complexes with the view of light activation applications in the future.⁶ The regioisomer complexes of the L_2 ligand and DNA intercalation studies were also carried out.⁷ More recently the biological evaluation has commenced of the complexes and some promising results have been observed against certain cell lines. The most promising candidates have shown ROS activity, selectivity for A549 cell lines and activity against two strains of yeast cells (*Saccharomyces cerevisiae*) wild type (BY4741) and a deficient strain in superoxide dismutase 1 (sod1). At present the complexes are undergoing further mechanistic studies to determine their mode of action. In parallel to this work the complexes are also being investigated for their potential antimicrobial behaviour.

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