

Supramolecular Metalloporphyrins: From Electrocatalysis
to Photodynamic Therapy Agents

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When thinking of metalloporphyrins one often considers the metal coordinated in the center of the porphyrin macrocycle. This is very often the case, and as potential electrocatalysts or photosensitizers this type of metal insertion into the porphyrin core enhances both their electrocatalytic and the photophysical properties when compared to the free base porphyrin. This can be observed by shifts in light absorption moving to either higher or lower energy depending on the metal. Another rapidly growing field of inorganic porphyrin chemistry involves peripheral coordination of metal complexes to porphyrin macrocycles. This technique often involves many synthetic steps; however, the result can add a great deal of versatility to the use of the metal porphyrin as an electrocatalyst for fuel cells or photosensitizer for photodynamic therapy. This presentation will describe recent advances in metalloporphyrin chemistry through peripheral coordination of ruthenium(II) polypyridyl complexes and the effect of these substitutions on their ability to electrocatalytically reduce oxygen and their ability to photocleave DNA as potential PDT agents.