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RUTHENIUM Metal Complexes for ARTIFICIAL METALLOENZYMES

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PURPOSE OF THE ABSTRACT

Nature employs metalloenzymes to catalyze some of the most remarkable biological processes with high activity and selectivity under mild conditions. In the past decades, much effort has been made to design novel metalloenzymes capable of performing reactions that are not found in nature´s repertoire.[1] In this context, enzyme promiscuity has long been recognized as a critical feature in discovering new activities. Incorporation of an abiotic catalytically active transition metal complex into a host biomacromolecule, also known as artificial metalloenzymes (ArMs), represents an alternative mechanism of enzyme promiscuity. This strategy allows us to combine the broad scope of reactions catalyzed by transition metal catalysts with the high selectivity, biorthogonality, and mild conditions achieved by enzymatic catalysis.

Here, we will present a novel artificial metalloenzyme based on the supramolecular anchoring of a series of ruthenium (II) and (IV) piano-stool complexes to the hydrophobic pocket of the promiscuous protein LmrR. [2] These hybrid catalysts will be tested in the uncaging reaction of different prodrug compounds.

FIGURES

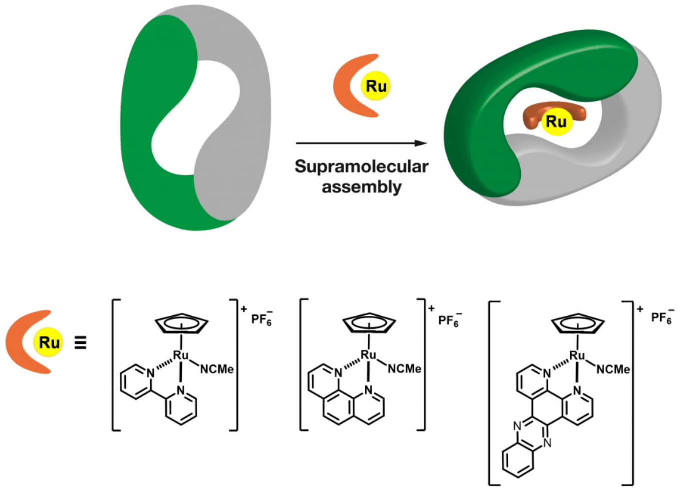

FIGURE 1

Ruthenium based artificial metalloenzymes

Schematic representation of an artificial enzyme based on the supramolecular assembly of different ruthenium metal complexes into the hydrophobic pocket of a protein.

FIGURE 2

KEYWORDS

artificial metalloenzymes | supramolecular assembly | ruthenium catalysis | deallylation reaction

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