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Methods to Explore Cellular Uptake of Ruthenium Complexes

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Abstract:

The cellular uptake of a series of dipyrrophenazine (dppz) complexes of Ru(II) was examined by flow cytometry. The complexes, owing to their facile synthesis, stability, and luminescence, provide a route to compare and contrast systematically factors governing cellular entry. Substituting the ancillary ligands in the dppz complexes of Ru(II) permits variation in the overall complex charge, size, and hydrophobicity. In HeLa cells, cellular uptake appears to be facilitated by the lipophilic 4,7-diphenyl-1,10-phenanthroline (DIP) ligand. Despite the large size of Ru(DIP)₂dppz²⁺ (20 Å diameter), this complex is readily transported inside the cell compared to smaller and more hydrophilic complexes, such as Ru(bpy)₂dppz²⁺. Accumulation in the cellular interior is confirmed by confocal microscopy.