Light-Induced Formation of Metal-Mediated Base Pairs

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Metal-mediated base pairs may be considered conjugates of nucleic acids and metal complexes. They are formed by formally replacing hydrogen bonds within a base pair by coordinate bonds. As a result, metal ions are introduced into the nucleic acid duplex along its helical axis. The ability to decorate nucleic acids site-specifically with transition metal ions allows interesting applications in nucleic acid nanotechnology, in sensors, and in responsive nucleic acid systems. We recently introduced caged nucleosides into metal-mediated base pairing. They allow the triggering of metal-mediated base pair formation by light (see Figure), thereby expanding the ability to create responsive nucleic acid systems. Selected examples of light-induced metal-mediated base pair formation will be presented.

Schematic representation of the light-triggered formation of a Hg(II)-mediated base pair.3a