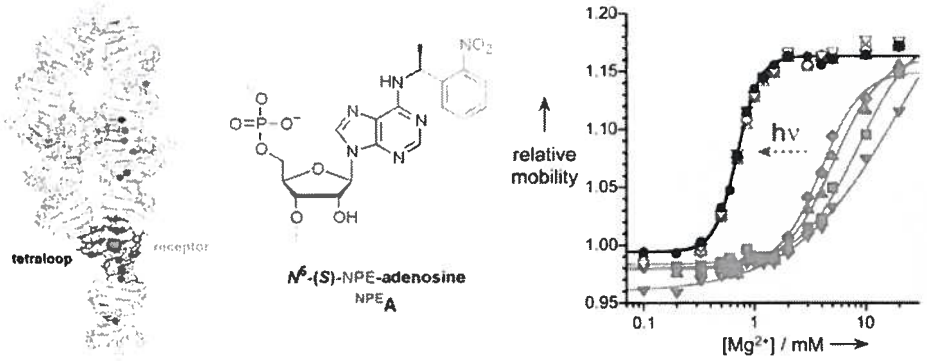
Modulation of RNA Tertiary Folding by Incorporation of Caged Nucleotides

Claudia Höbartner and Scott K. Silverman

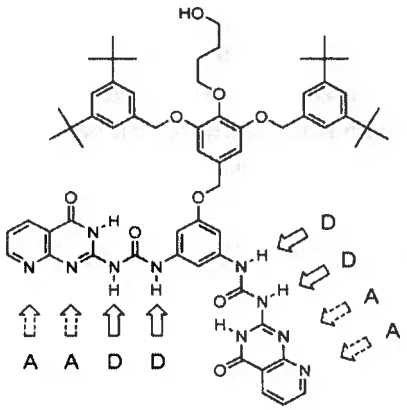
Modified phosphoramidites of all four standard RNA nucleotides were prepared with the photochemically removable (*S*)-1-(2-nitrophenyl)ethyl (NPE) caging group appended onto specific exocyclic nucleobase heteroatoms. Individual caged nucleotides were incorporated into a 160-mer RNA molecule that adopts a specific tertiary structure. The effects of nucleobase caging on RNA folding were analyzed by nondenaturing (native) PAGE and dimethyl sulfate probing experiments. Position-dependent local and global effects on RNA structures were observed, and photocleavage of the caging group was shown to restore native folding.



Hierarchical Self-Assembly of Ditopic Hydrogen Bonding Modules

Eric M. Todd and Steven C. Zimmerman

Hydroxyl functionalized bis-ureidodeazapterin (Bis-DeAP-OH) containing a ditopic self-complementary donor-donor-acceptor-acceptor (DDAA) hydrogen bonding array has been prepared and observed to preferentially self-assemble into cyclic aggregates in nonpolar solvents. The cyclic aggregates appear to further aggregate to form concentration dependent polymeric structures. Evidence for these structures will be provided by proton NMR, analytical size exclusion chromatography, and dynamic light scattering. Preliminary efforts toward incorporating Bis-DeAP-OH into polymers will also be presented, including its use as an initiator in the ring opening polymerization of *dl*-lactide and its further functionalization with α-bromoisobutyryl bromide to make it a viable atom transfer radical polymerization initiator.



Bis - DeAP - OH