

Abstract Submitted
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Stabilization of fluorescent silver clusters by RNA homopolymers and their DNA analogs: C,G vs A,T(U) Dichotomy DANIELLE SCHULTZ, ELISABETH GWINN, UCSB — We show that single-stranded RNA stabilizes fluorescent silver nanoclusters (Ag:RNAs) in aqueous solution, analogous to previously studied Ag:DNAs. To determine whether the different canonical nucleosides play similar roles in stabilizing fluorescent silver species in RNA and DNA hosts, we compare RNA homopolymers of rA,rC,rG and rU to their DNA counterparts, and observe the same base-dependent dichotomy: visible- to IR-emitting silver complexes are stabilized by C and G homopolymers, but not by A or T(U) homopolymers at neutral pH. Shifts in emission wavelengths between Ag:RNA and Ag:DNA analogs show that both base and sugar influence populations of fluorescent species. The data indicate a minimum binding-pocket size of roughly five C or G bases for fluorescent species. These findings open the scope of silver cluster fluorophores to the diversely structured and functional arena of RNA and have implications for rational designs of nucleic acid hosts. Supported by NSF CHE-0848375.

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