DNA-Directed Fluorescence Switching of Silver Clusters

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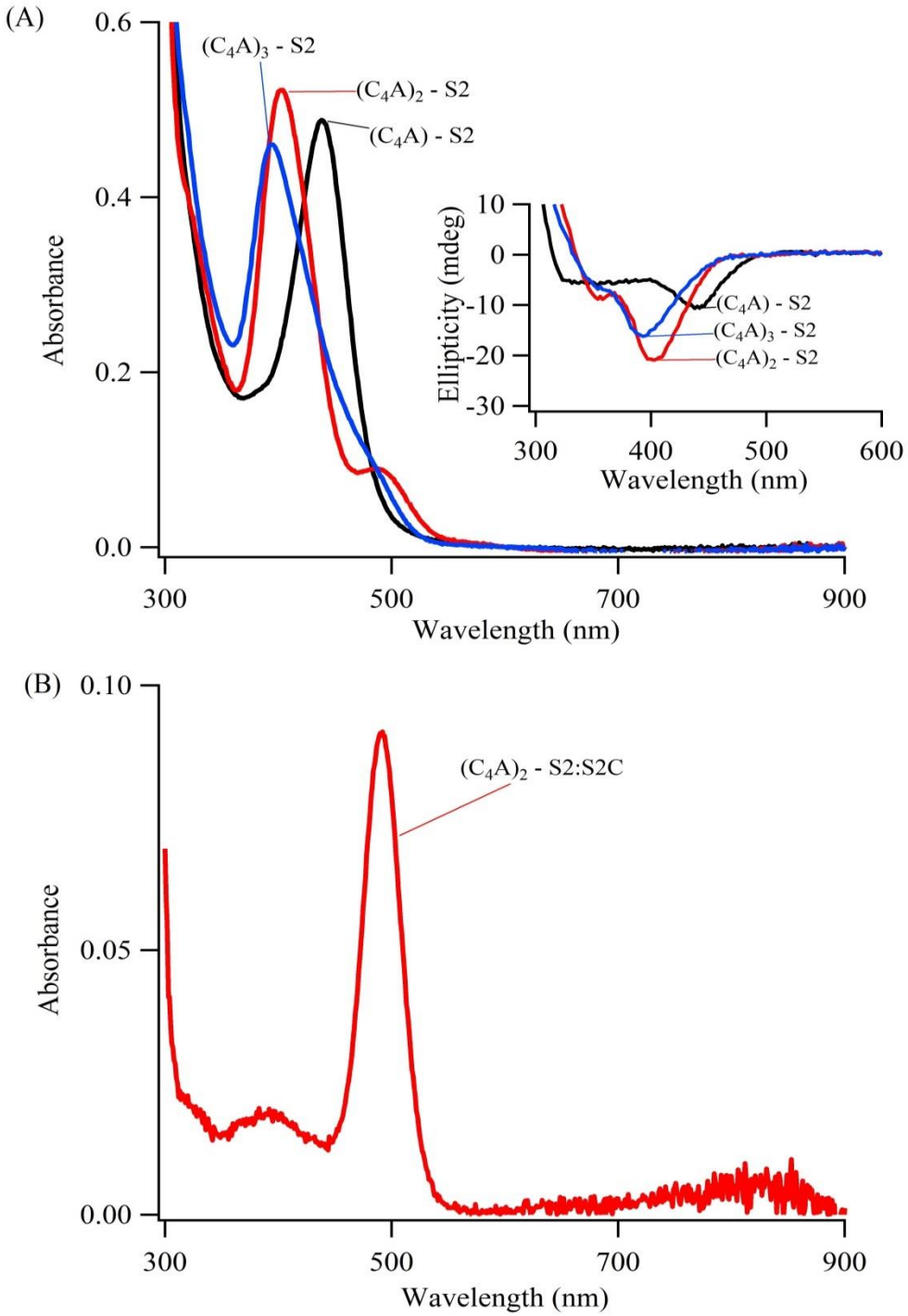

Figure S1: (A) Absorption spectra of the precursor violet clusters that form with the single-stranded S1-S2 oligonucleotides in water. The S1 cluster domains are C_4A (black), $(C_4A)_2$ (red), and $(C_4A)_3$ (blue). Similar λ_{max} for these bands suggest that the violet clusters develop in similar chemical and electronic environments. We are currently investigating the shoulder at ~500 nm. The inset shows the circular dichroism spectra of the violet cluster adducts. (B) Absorption spectra of the hybridized $(C_4A)_2$-S2:S2C construct at a lower 2 μM oligonucleotide concentration. The corresponding spectrum at 10 μM oligonucleotide (Figure 2 – red spectrum) shows two absorptions at 490 and 750 nm, whereas the above spectrum has on the 490 nm band.

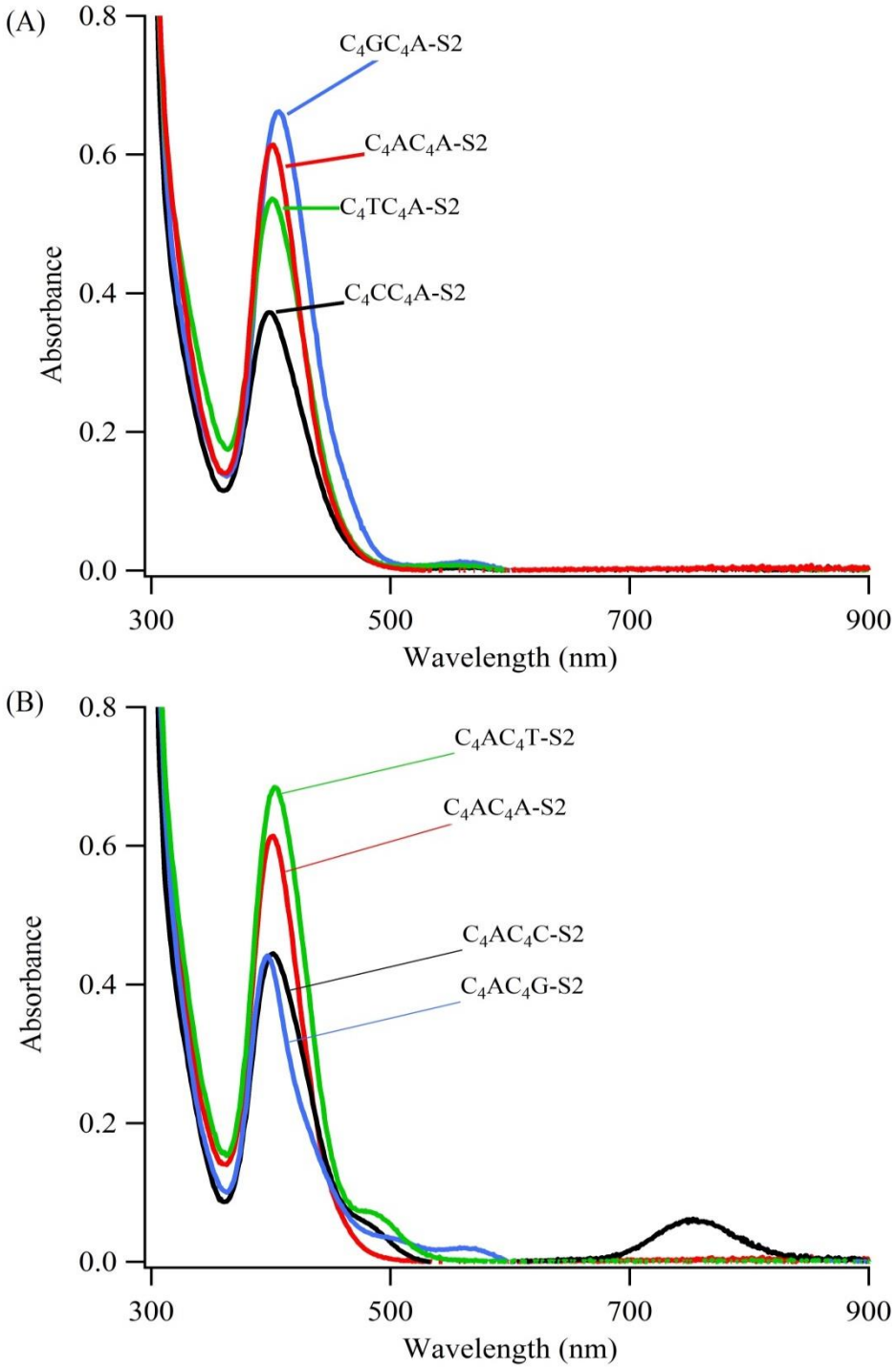

Figure S2: (A) Absorption spectra of $C_4\underline{\mathbf{X}}C_4A$-S2 oligonucleotides with **X** = adenine (red), **X** = cytosine (black), **X** = guanine (blue), and **X** = thymine (green). (B) Absorption spectra of $C_4AC_4\underline{\mathbf{Y}}$-S2 oligonucleotides with **Y** = adenine (red), **Y** = cytosine (black), **Y** = guanine (blue), and **Y** = thymine (green). Similar λ_{max} values in both sets of spectra indicate that the violet clusters developed in similar chemical and electronic environments.

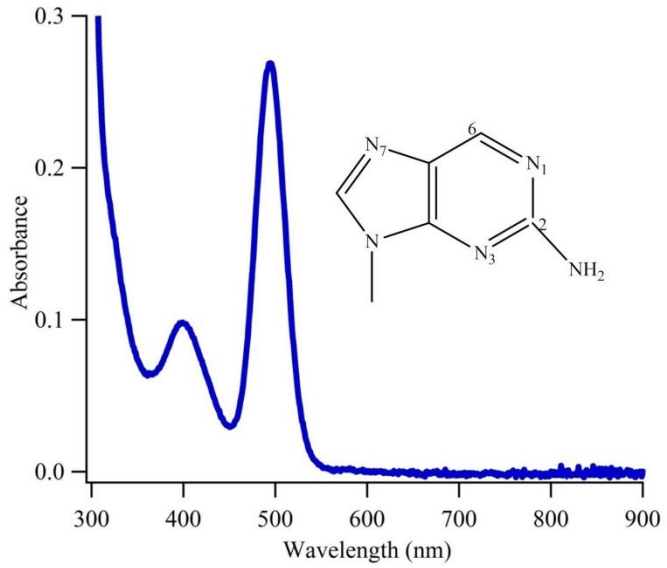

Figure S3: Absorption spectra of C_4**(2AP)**C_4T-S2:S2C construct 2-AP = 2-aminopurine. Adenine also exhibits a strong absorption at 490 nm (Figure 3A – red spectrum).

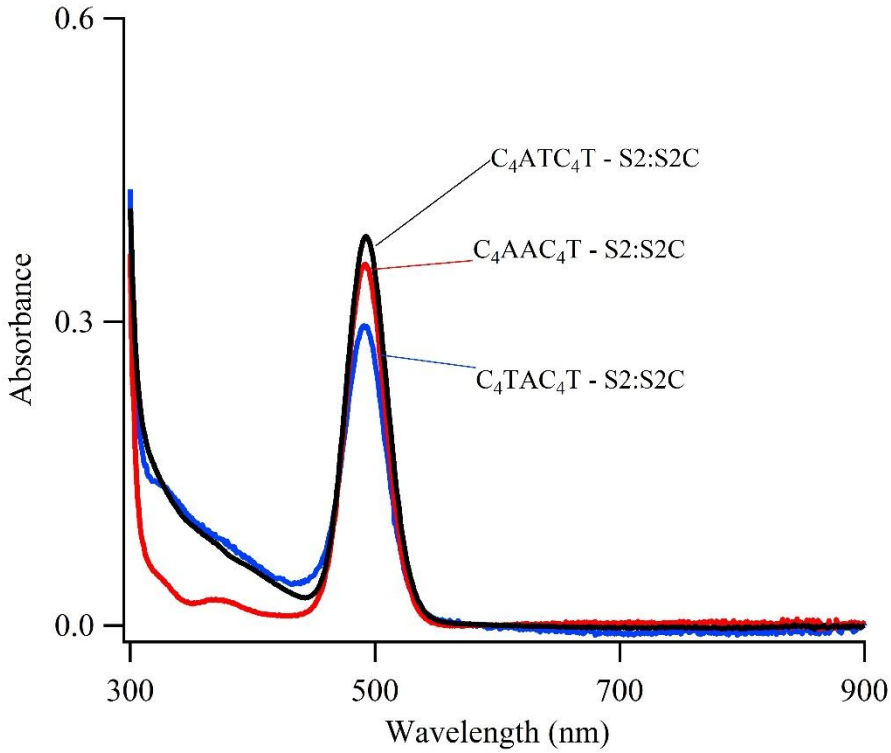

Figure S4: Absorption spectra of C_4**A**TC_4T-S2:S2C (black), C_4**A**AC_4T-S2:S2C (red), and C_4T**A**C_4T-S2:S2C (blue) constructs.

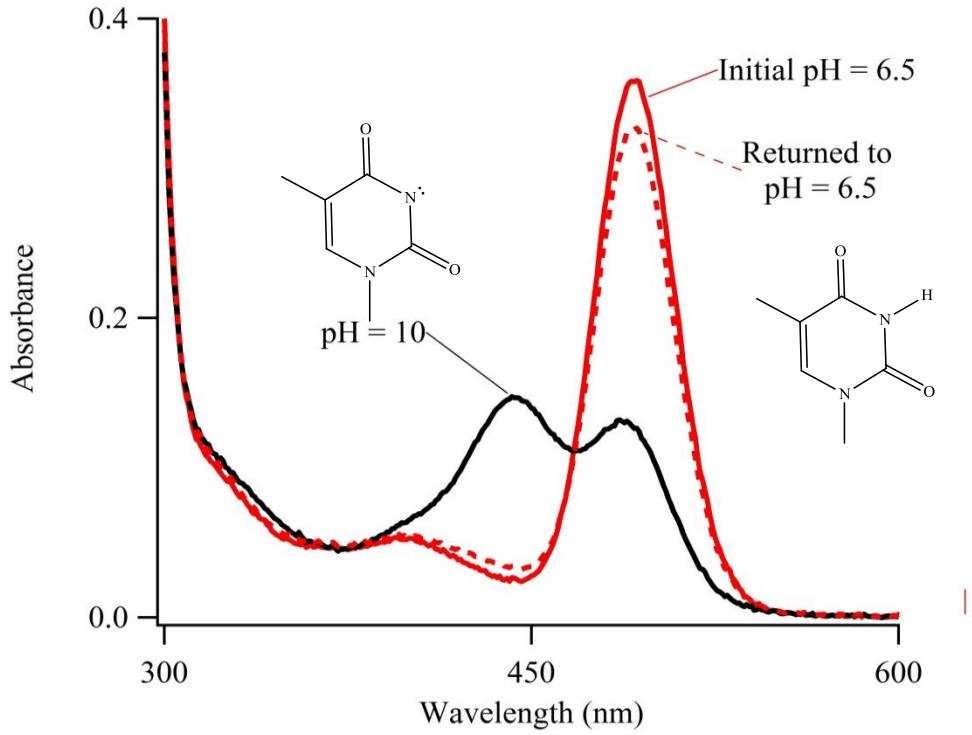

Figure S5: Absorption spectra of C_4AC_4T-S2:S2C at pH 6.5 (solid red spectrum), pH = 10 (solid black spectrum), and returned to pH = 6.5 (dotted red spectrum).

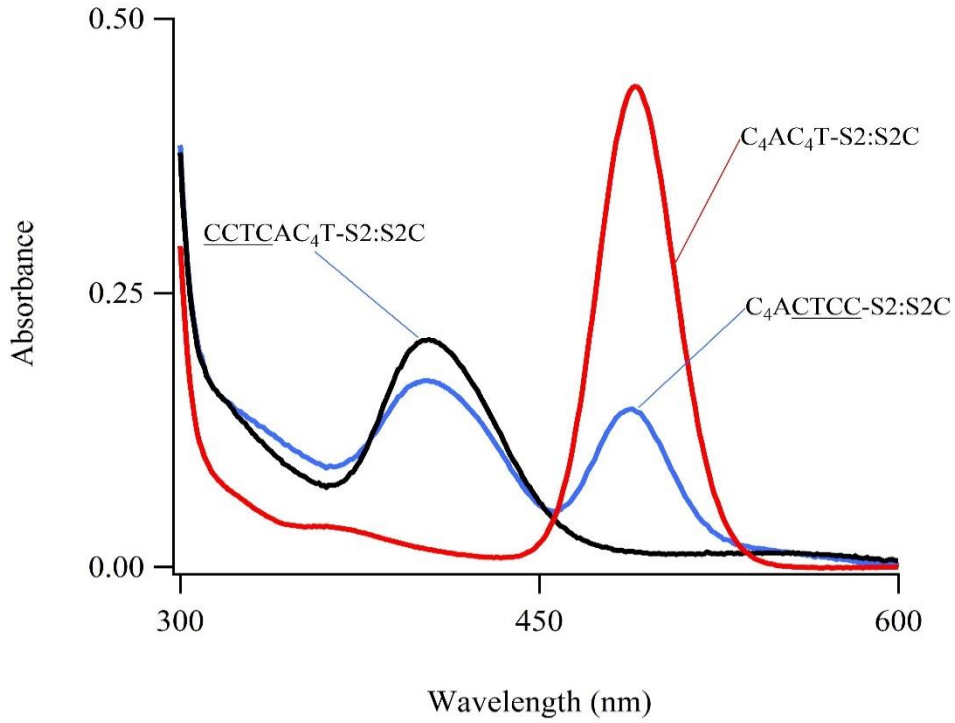

Figure S6: Absorption spectra of C_4AC_4T-S2:S2C (red), C_2TCAC_4T-S2:S2C (black), and C_4ACTC_2T-S2:S2C (blue).

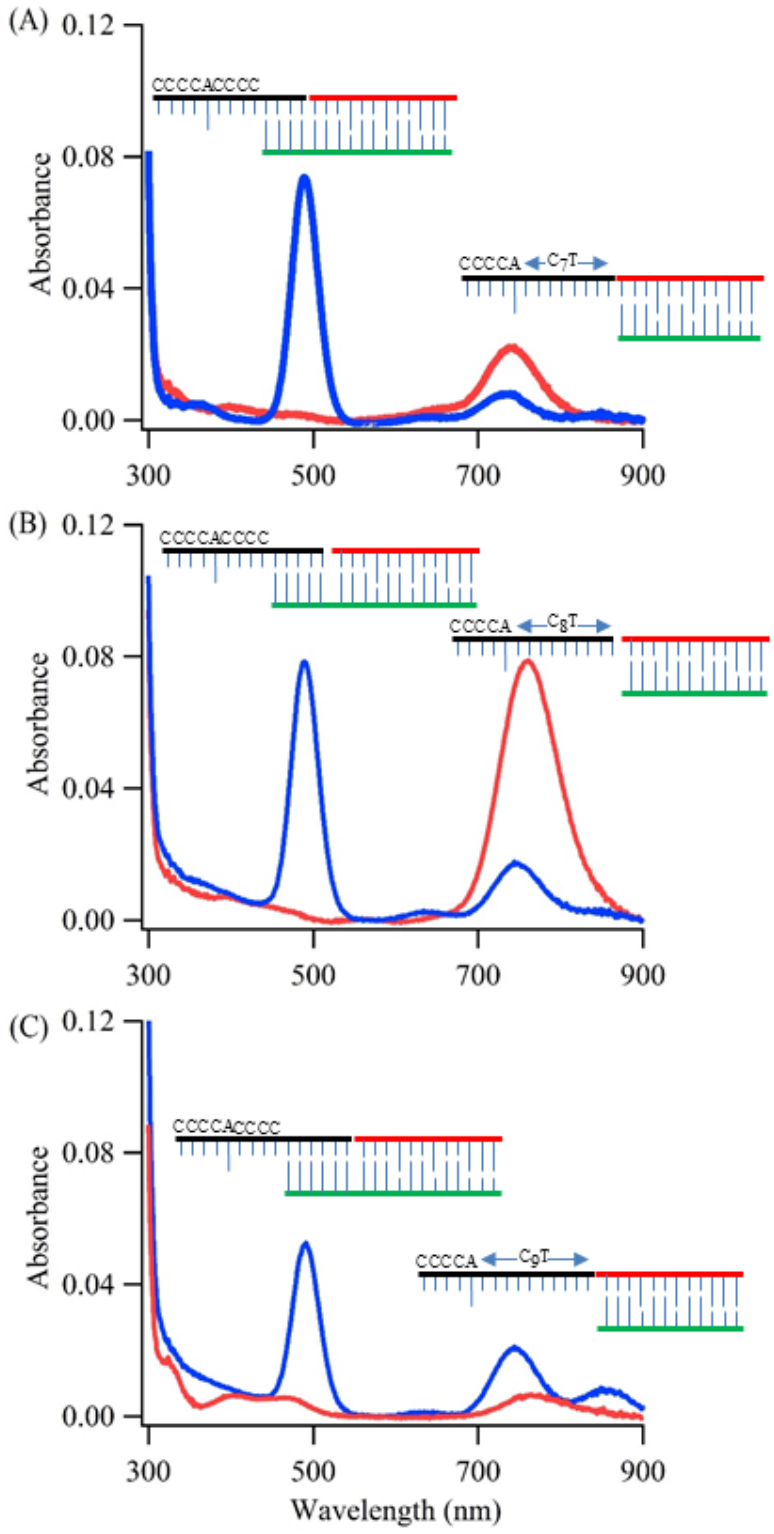

Figure S7: Absorption spectra of C_4AC_nT-S2 strands with n = 7 (A), 8 (B), and 9 (C). The 12-nucleotide S2C complements favor the near-infrared clusters (red spectra). The longer $G_{n-4}A$-S2C complements favor the blue-green cluster.