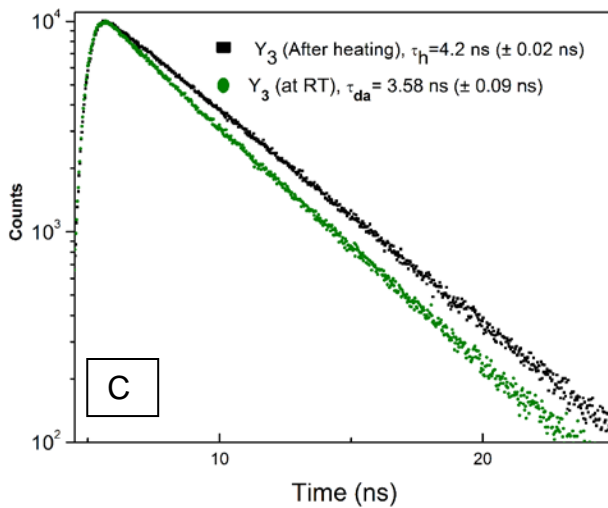
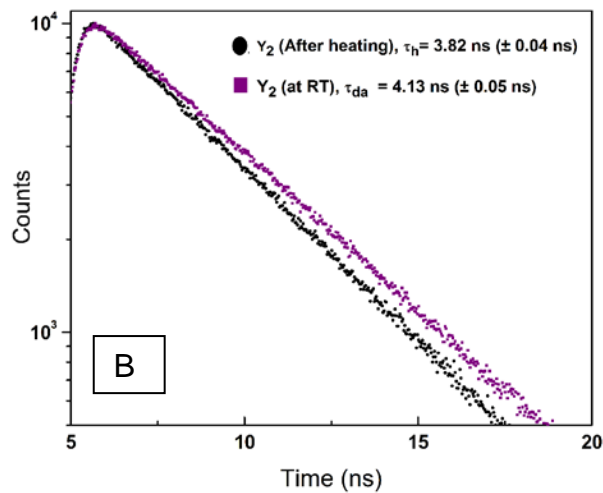
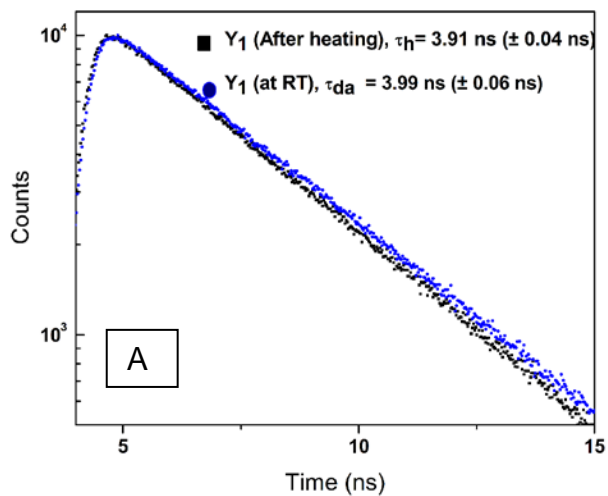
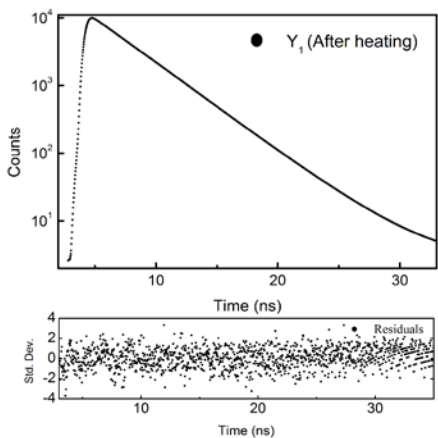


Supplemental Fig 1: Fitting of fluorescence decays of Alexa 488 associated with Y<sub>1</sub>, Y<sub>2</sub>, and Y<sub>3</sub> DNA systems to the single-exponential model, showing differences in lifetime of the fluorophore conjugated with Y-DNA systems.

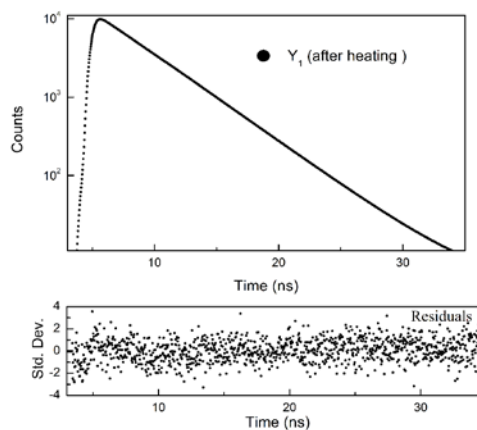


Supplemental Fig. 2 Time-resolved emission spectra of Alexa 488 showing the effect of heating on the emission dynamics of the fluorophore conjugated with Y<sub>1</sub> (A), Y<sub>2</sub> (B), Y<sub>3</sub> (C)

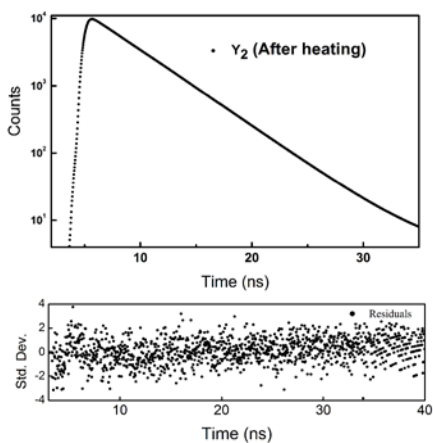
### Fitting of Fluorescence decays of $Y_1$ (A), $Y_2$ (B), $Y_3$ (C) after heating (at 40 °C)



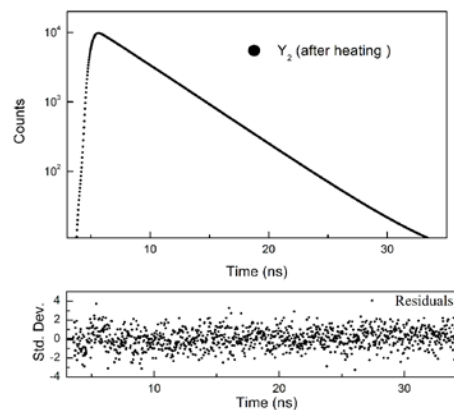
Continuous lifetime distribution model



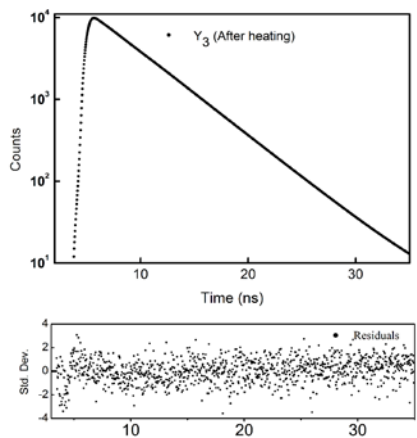
Standard single-exponential model



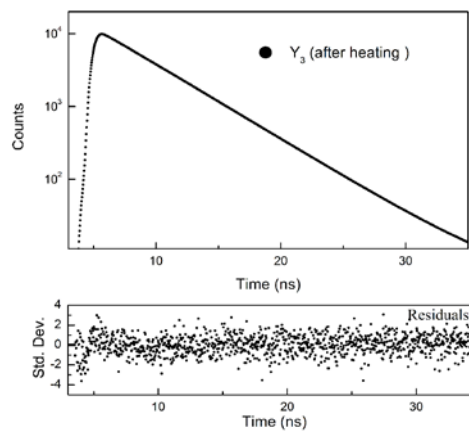
Continuous lifetime distribution model



Standard single-exponential model



Continuous lifetime distribution model



Standard single-exponential model

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(C)