Supporting Information

Kinetic control of chirality and circularly polarized luminescence in G-quartet materials

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Experimental Section

Materials:

Guanosine 5'-monophosphate disodium salt (GMP, ≥99), thioflavin T (ThT, 65-75%) were purchased from Sigma-Aldrich and used without further purification. $Sr(NO_3)_2$ and KCl were purchased from Aladdin and used without further purification. The extinction coefficient of ThT is 36000 M^{-1} cm^{-1} at 412 nm. All aqueous solutions were prepared using ultra-pure water (18.2 MΩ, Milli-Q, Millipore).

Methods:

Preparation of GMP/Sr^{2+} nanofibers and GMP/Sr^{2+}-ThT nanofibers:

In a typical synthesis, GMP (50 mM) and dyes were dissolved in pure water (1 mL). $Sr(NO_3)_2$ solution (8 mM) was added to the mixture under slight shake. After 2 hours' incubation at specified temperatures, solid products formed. The solid products were centrifuged and purified three times to remove free small molecules. Different cooling rates were achieved using a Partier temperature controller.

Preparation of GMP/Sr^{2+}/K^+ nanofibers and GMP/Sr^{2+}/K^+-ThT nanofibers:

In a typical synthesis, GMP (50 mM), KCl (5 mM) and dyes were dissolved in pure water (1 mL). Then $Sr(NO_3)_2$ solution (8 mM) was added to the mixture under slight shake. After 2 hours' incubation at specified temperatures, solid products were formed. The mixture is centrifuged and purified three times to remove free small molecules.

Preparation of GMP/Sr^{2+}-ThT nanofibers at different cooling rates:

In a typical synthesis, GMP (50 mM) and dyes were dissolved in pure water (1 mL). $Sr(NO_3)_2$ solution (8 mM) was added to the mixture under slight shake. Then, the mixture was put into the temperature control chamber of circular dichroism chromatography. During the cooling process, the initial temperature was controlled at 25 ^oC and the end temperature was set at 4 ^oC. The cooling rate was set at 30 ^oC/min, 10 ^oC/min, 5 ^oC/min, 1 ^oC/min and 0.25 ^oC/min. Two hours after the start of cooling, the mixture is centrifuged and purified three times to remove free small molecules.

Measurements:

CD spectra were measured at 20 °C on a JASCO J-1500 spectrometer using a quartz cuvette with 0.1 mm path length. CPL spectra were carried out on a JASCO CPL-300 spectrometer at 20 °C using a quartz cuvette with 1.0 mm path length. Each spectrum was an average of three measurements. Scanning electron microscopy (SEM) was conducted on a GEMINI 300 field emission scanning microscope. Fourier transform infrared (FTIR) analyses were carried out on a Thermo Fisher Scientific NICOLET iS50 FT-IR spectrometer. X-ray diffractometer (XRD) were carried out on a Bruker D2 Phaser.

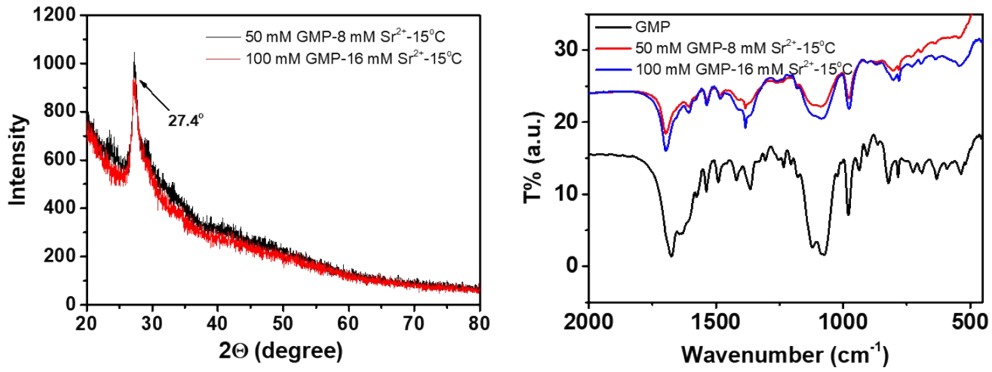

Figure S1 (A) XRD patterns and (B) FTIR spectra of Sr^{2+}-stabilized G-quartet nanofibers synthesized at different concentrations.

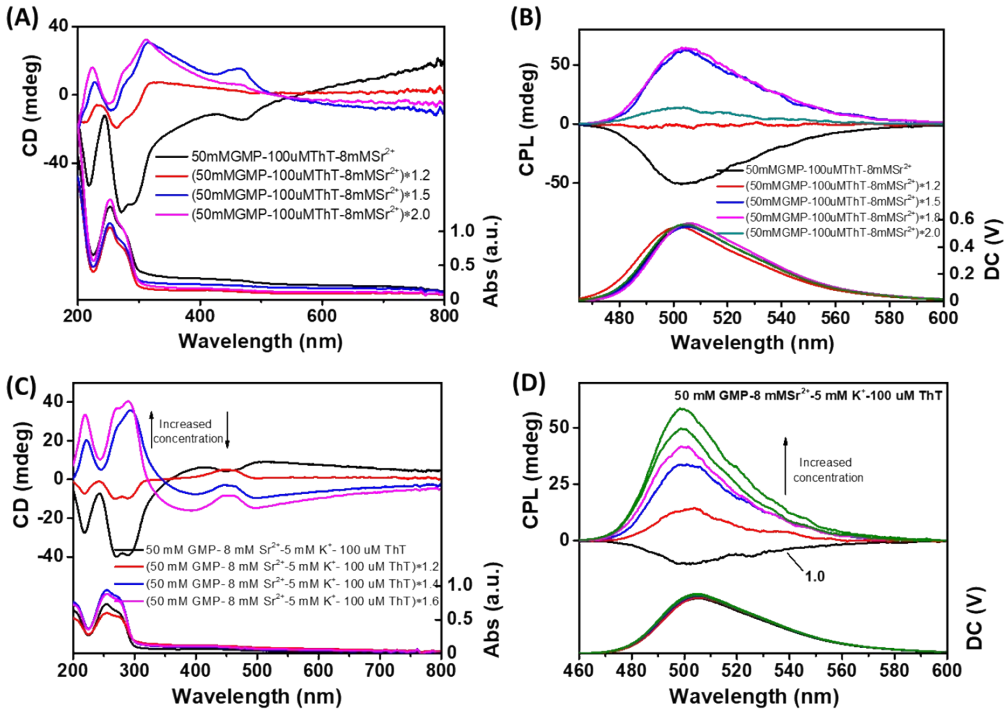

Figure S2 (A) CD and (B) CPL spectra of Sr^{2+}-stabilized ThT-doped G-quartet nanofibers synthesized at different concentrations of the reactants; (C) CD and (D) CPL spectra of Sr^{2+}/K^{+}-stabilized ThT-doped G-quartet nanofibers synthesized at different concentrations of the reactants (15 °C).