Electronic Supplementary Information (ESI) for:

# Ambidextrous Circular Dichroism and Circularly Polarised Luminescence from Poly(9,9-di-*n*-decylfluorene) by Terpene Chirality Transfer

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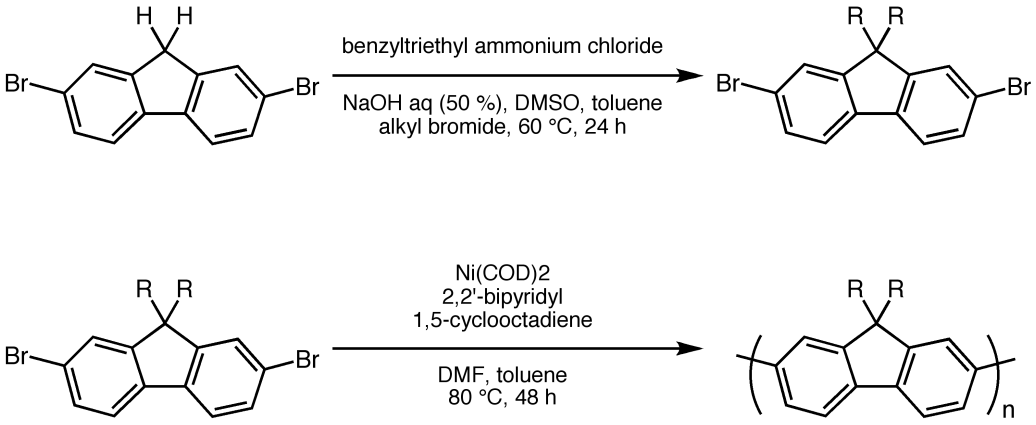



**Scheme S1** Synthetic scheme of poly(9,9-di-*n*-alkylfluorene) derivatives.

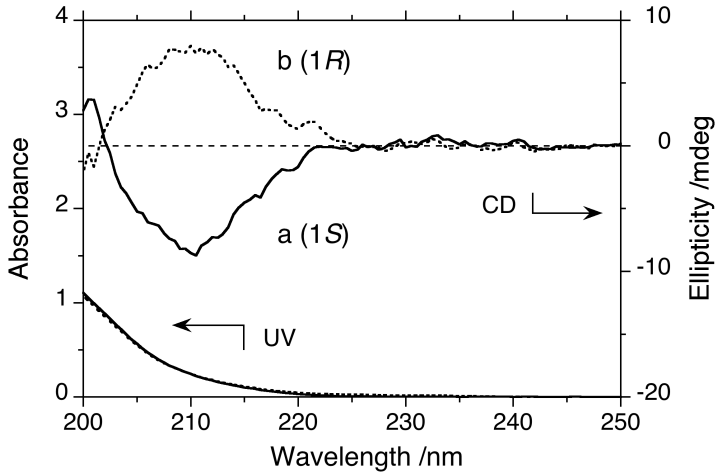



**Fig. S1** CD and UV spectra of **1*S*** (solid line) and **1*R*** (dotted line) in *n*-hexane at 25°C.

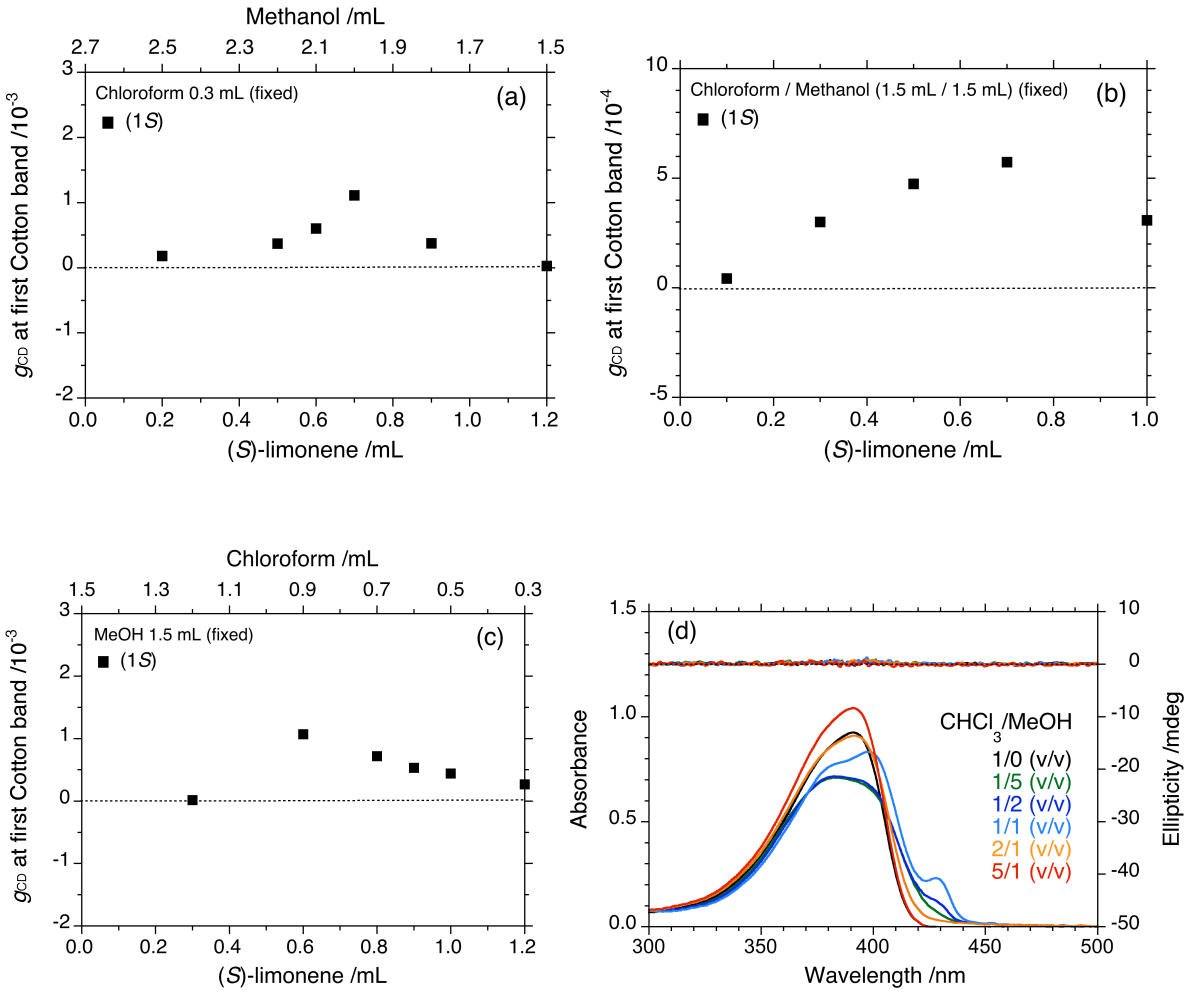



**Fig. S2** A combinatorial approach to produce CD-active **PF10-150K** ($M_w$ = 1.5 x $10^5$, $M_w/M_n$ (*PDI*) = 3.6) in a mixture of **1*S*** (as received), methanol, and chloroform tersolvent systems with stirring at 800 rpm (CW) at 25°C. (a) Chloroform/(limonene + methanol) = 0.3 (fixed)/ 2.7 (v/v). (b) Chloroform/methanol = 1.5 (fixed)/1.5 (fixed) (v/v) + limonene (0.0–1.0 mL) (c) (Chloroform + limonene)/methanol =1.5 /1.5 (fixed) (v/v). (d) UV-vis and CD spectra of **PF10-150K** produced in chloroform/methanol = 1/0, 1/5, 1/2, 1/1, 2/1, 5/1 (v/v), [FL repeating unit] = 2.5 x $10^{-5}$ mol/L.

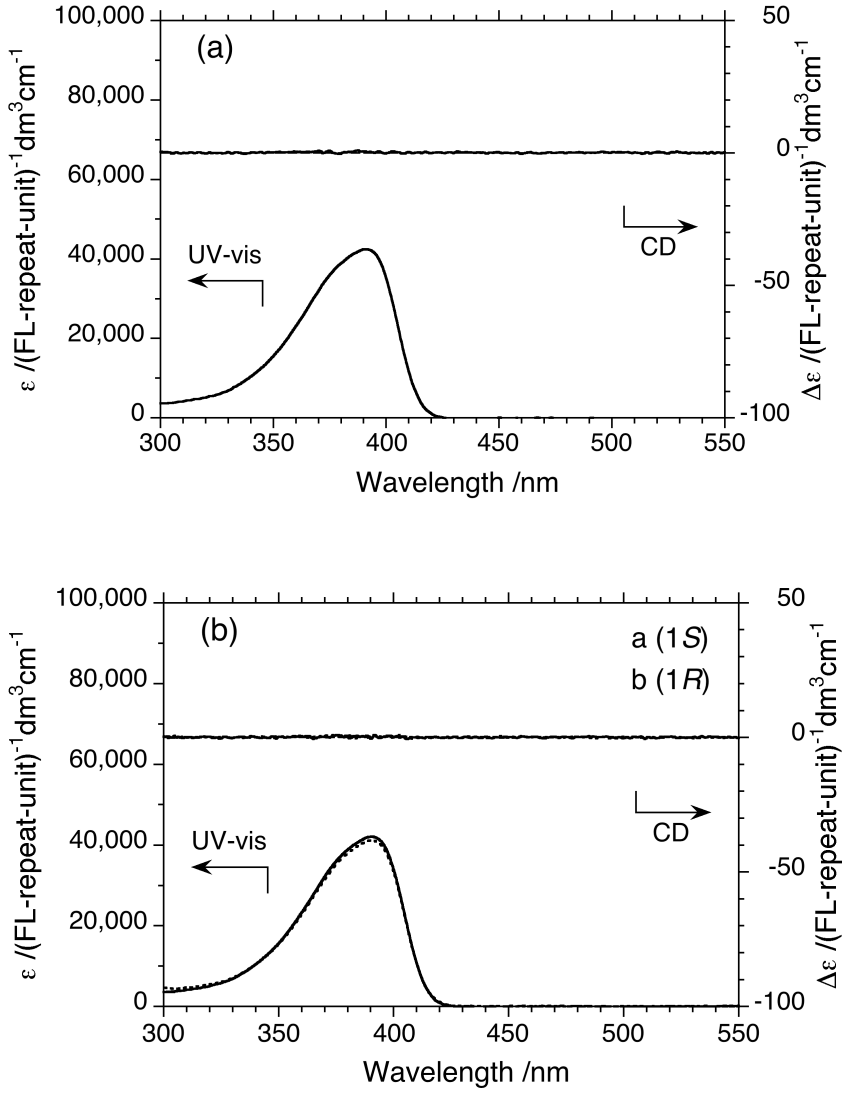



**Fig. S3** UV-vis and CD spectra of **PF10-150K** in (a) chloroform and (b) chloroform/ limonene (= 2.3/0.7 (v/v)) (solid line, **1*S***; dotted line, **1*R***). [FL repeating unit] = 2.5 x $10^{-5}$ mol/L at 25°C.

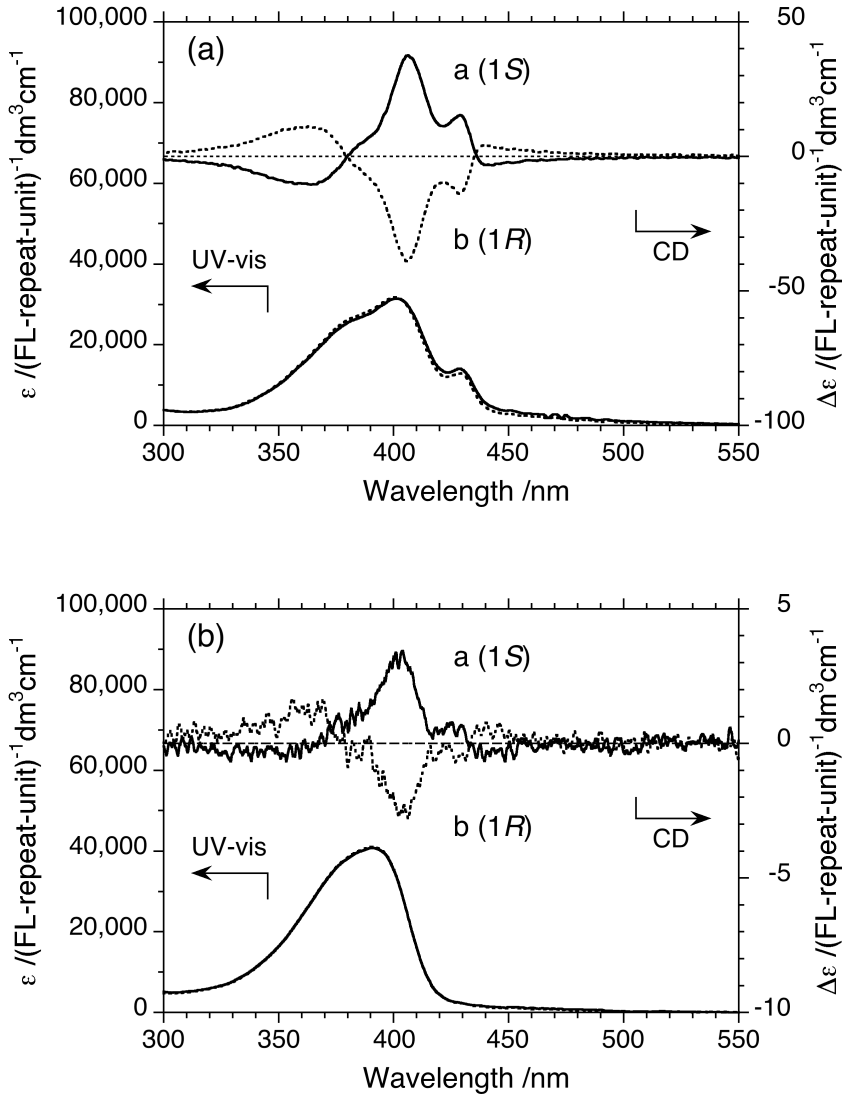



**Fig. S4** UV-vis and CD spectra (solid line, **1*S***; dotted line, **1*R***) of **PF10-150K** in (a) limonene/THF/methanol (0.7/0.3/2.0 (v/v/v)) and (b) limonene/toluene/methanol (0.7/0.3/2.0 (v/v/v)). [FL repeating unit] = 2.5 x $10^{-5}$ mol/L with stirring at 800 rpm (CW) at 25°C.

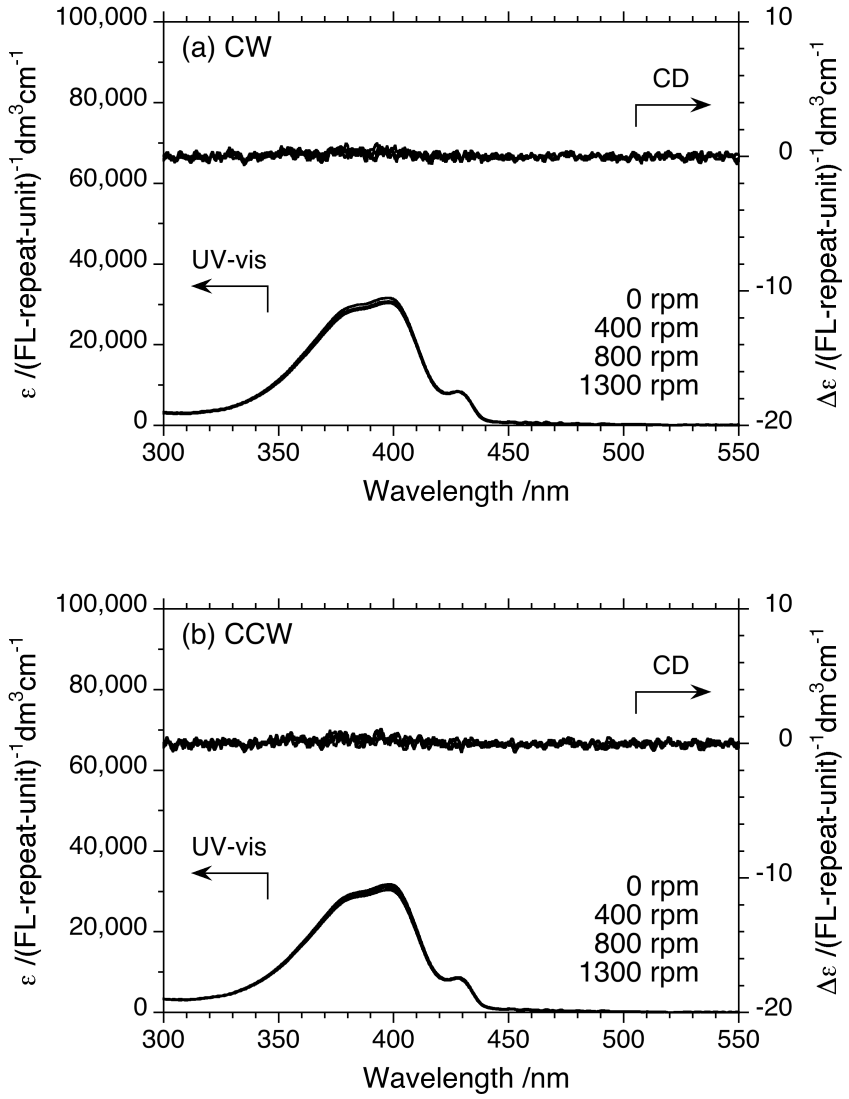



**Fig. S5** CD/UV-vis spectra of a chloroform/methanol (1.5/1.5 (v/v)) solution (3.0 ml) of **PF10- 150K** in a 10x10x40 $mm^3$ quartz cuvette at 25°C upon bottom rotary stirring at various speeds in the clockwise (CW) and counterclockwise (CCW) directions using a 4.0x5.0 $mm^3$ PTFE-coated magnetic stirring bar, and without stirring. [FL repeating unit] = 2.5 x $10^{-5}$ mol/L.

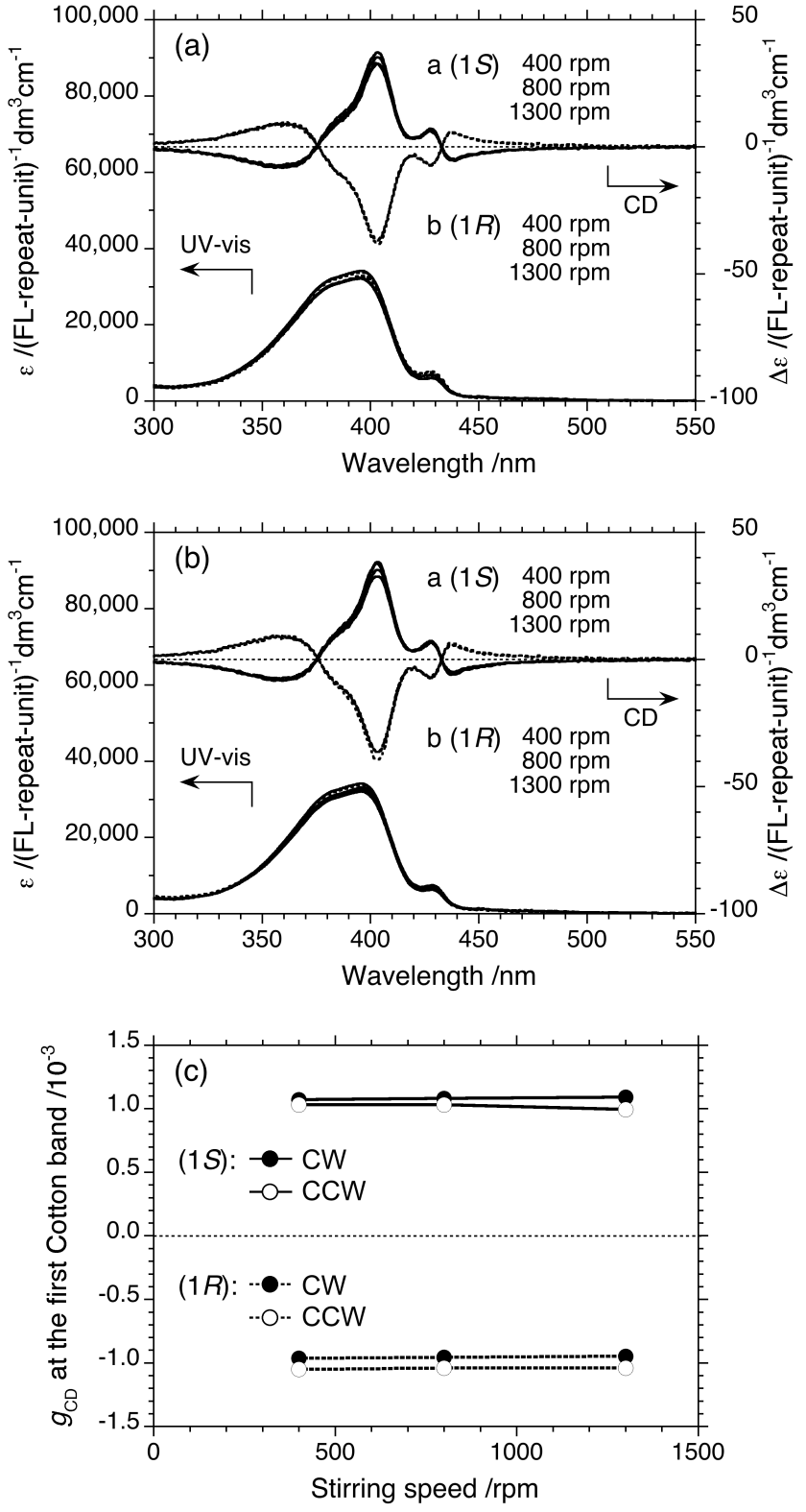



**Fig. S6** CD/UV-vis spectra (solid line, **1*S***; dotted line, **1*R***) of **PF10-150K** in limonene/ chloroform/methanol (0.7/0.3/2.0 (v/v/v)) solution (3.0 ml) in a 10x10x40 $mm^3$ quartz cuvette at 25°C by varying stirring speed of magnetic bar in the (a) CW and (b) CCW directions, [FL repeating unit] = 2.5 x $10^{-5}$ mol/L. (c) Plots of the $g_{CD}$ value (filled circles, CW; open circles, CCW) at 428 nm as a function of stirring speed with CW and CCW operations.

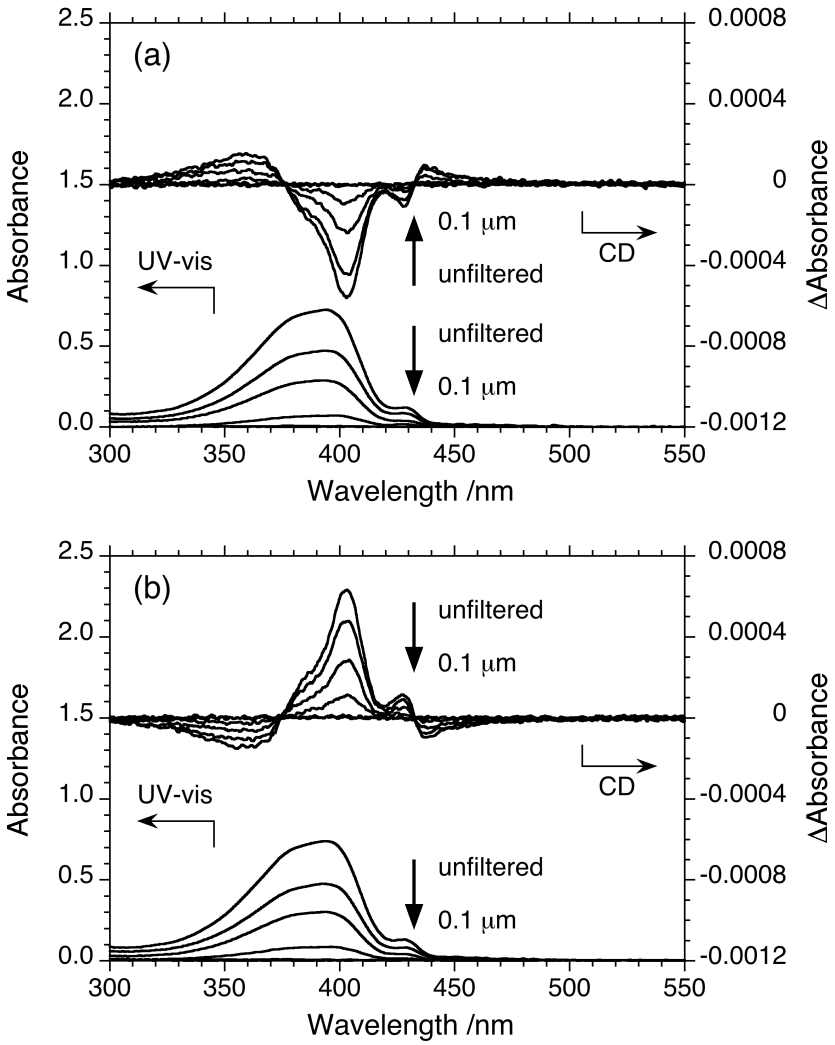
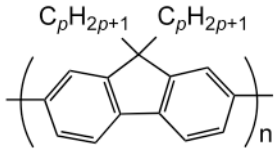



**Fig. S7** Changes in CD/UV-vis spectra of **PF10-150K** aggregates at 25°C, with stirring at 800 rpm (CW), as a function of membrane filter pore size, formed in (a) **1*R***/chloroform/methanol (0.7/0.3/2.0 (v/v/v)) and (b) **1*S***/chloroform/methanol (0.7/0.3/2.0 (v/v/v)).

| $p$ | 6 | 7 | 8 | 10 | 12 | 16 | 18 |
|---|---|---|---|---|---|---|---|
| $M_w$ /$10^5$ | 2.72 | 2.99 | 0.69 | 1.48 | 2.61 | 0.75 | 1.05 |
| $M_w/M_n$ | 2.44 | 2.57 | 4.25 | 3.58 | 2.70 | 2.33 | 2.01 |

Evaluated by GPC 0.01wt% in chloroform. (vs PSt standards)



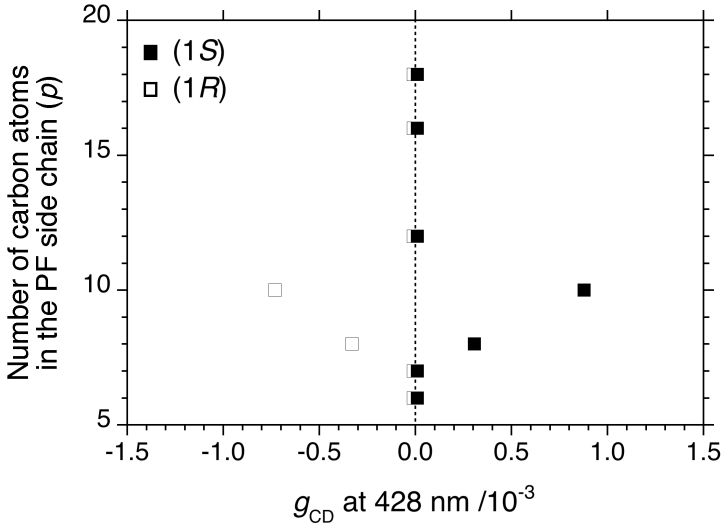




**Fig. S8** The $g_{CD}$ values (filled squares, **1*S***; open squares, **1*R***) of poly(9,9-di-*n*-alkylfluorene)s aggregates produced in limonene/chloroform/methanol (0.7/0.3/2.0 (v/v/v)) at 25°C as a function of *n*-alkyl side chain length.

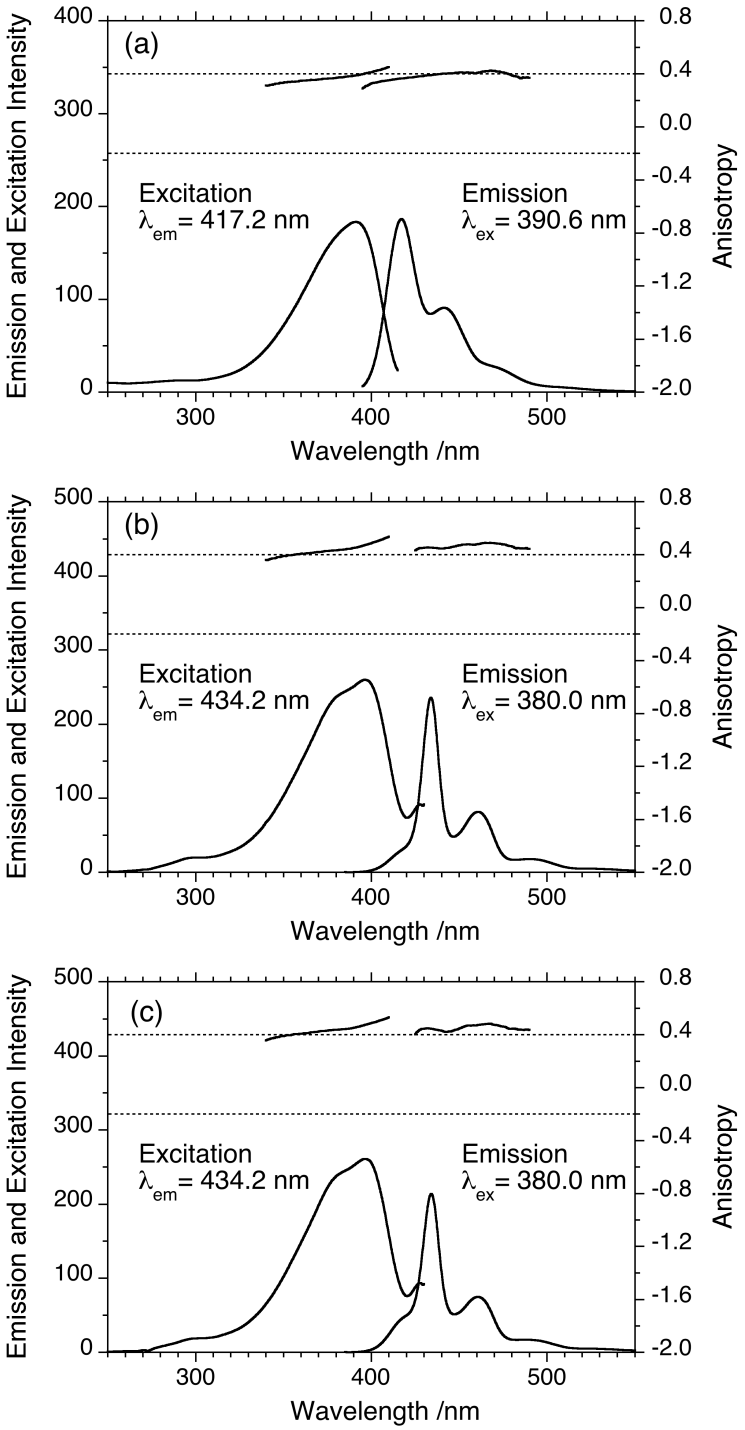



**Fig. S9** Fluorescence anisotropy and fluorescence excitation anisotropy spectra of (a) **PF10-150K** dissolved in chloroform (excited at 390.6 nm and monitored at 417.2 nm), [FL repeating unit] = 2.5 x $10^{-6}$ mol/L, (b) **PF10- 150K** aggregates dispersed in **1*R***/chloroform/ methanol (0.7/0.3/2.0 (v/v/v)) (excited at 380.0 nm and monitored at 434.2 nm), [FL repeating unit] = 5.0 x $10^{-6}$ mol/L, and (c) **PF10-150K** aggregates dispersed in **1*S***/ chloroform/methanol (0.7/0.3/2.0 (v/v/v)) (excited at 380.0 nm and monitored at 434.2 nm). [FL repeating unit] = 5.0 x $10^{-6}$ mol/L with stirring at 800 rpm (CW) at 25 °C.

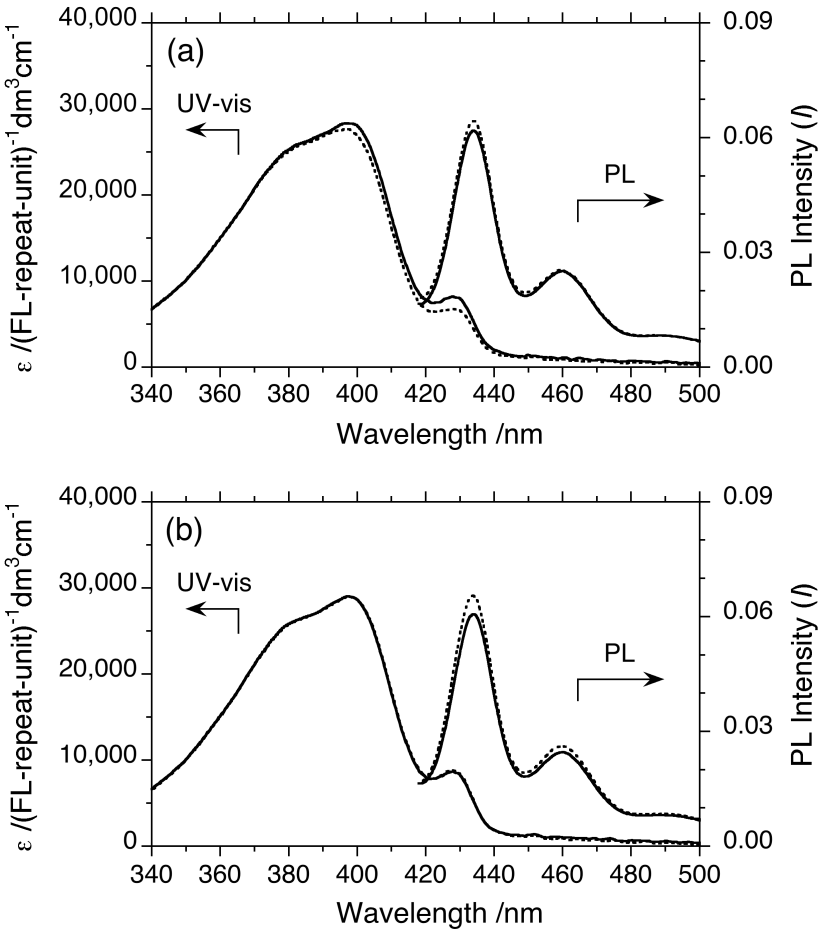



**Fig. S10** UV-vis and PL spectra (solid line, **1*S***; dotted line, **1*R***) of **PF10-150K** aggregates produced in limonene/chloroform/methanol (0.7/0.3/2.0 (v/v/v)) at 800 rpm (CW) and 25°C. (a) UV-vis and PL, addition order of first limonene and then methanol, (b) UV-vis and PL, addition order of first methanol and then limonene. For the UV-vis measurement, [FL repeating unit] = 2.5 x $10^{-5}$ mol/L and for the PL measurement, [FL repeating unit] = 5.0 x $10^{-6}$ mol/L.