Electronic Supplementary Information

Luminescent fluorinated chiral liquid crystalline oligomers containing Eu(III) complexes

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4'-(undec-10-enoyloxy)-[1,1'-biphenyl]-4-yl-4-fluorobenzoate (M_1)

4,4-dihydroxybiphenyl (400 mmol, 74.4 g) was dissolved in pyridine (18.0 ml) and THF(250 ml), undecenoyl chloride (80 mmol, 16.2 g) was added dropwise to above solution at 25°C. The mixture was stirred at room temperature under dry air for 4 hours, refluxed for 18 hours, and poured into 1000 ml of ice water. 22.8 g of white solid 4'-hydroxy-biphenyl-4-yl undec-10-enoate (compound 1) was obtained after several recrystallizations from acetone.

Compound 1 (30 mmol, 10.6 g) and pyridine (1.0 ml) were dissolved in 50.0 ml of THF to form a solution. 4-Fluoro-benzoyl chloride was synthesized according to previous reports [1], 4-Fluoro-benzoyl chloride (35 mmol, 5.5 g) was added dropwise to the solution and refluxed for 16 hours. The mixture was cooled, and poured into 500 ml of cold water. The precipitated crude product was filtered and recrystallized from ethanol and dried overnight at 85°C under vacuum to obtain a white powder of product M_1.

[1] Meng FB, Lian J, Zhang BY, et al. Chiral side-chain liquid crystalline polysiloxanes bearing fluorinated mesogens and cholesteryl groups. Eur Polym J. 2008;44:504–513.

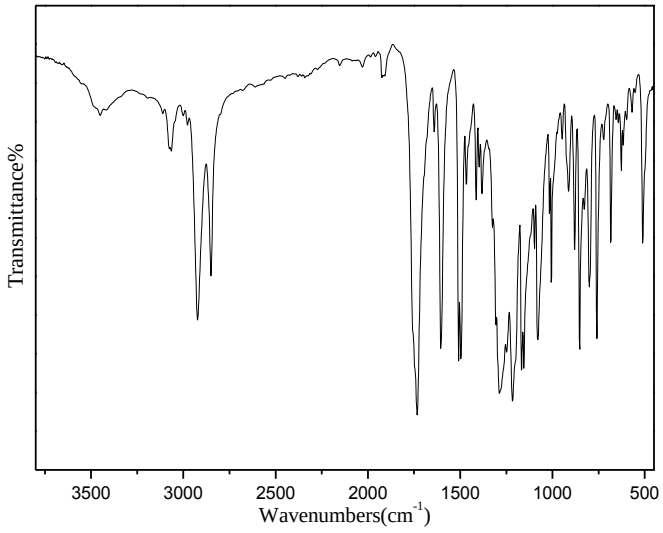

Figure S1 FT-IR spectrogram of M_1

Figure S2. ^{1}H NMR spectrum of M_1 (600 MHz, $CDCl_3$)

Cholesteryl 4-(allyloxy)benzoate (M_2)

4-hydroxybenzoic acid (0.6 mol, 83g) was dissolved in ethyl alcohol (200 ml), potassium hydroxide (1.42 mol, 80g) and potassium iodide (0.02 mol, 3.5g) dissolved in water (100ml) was added above solution at room temperature. After cooled to room temperature, 3-Bromopropene (0.75 mol, 90g) was added dropwise to the mixture. The mixture was stirred at room temperature under dry air for 2 hours, refluxed for 18 hours, and poured into 1000 ml of ice water. Washed with diluted hydrochloric acid and filtrated, boiled in hot water, recrystallized from ethanol and dried overnight at 45°C under vacuum to obtain compound 2.

Sulfoxide chloride (20 ml) was added to compound 2 (17.8 g, 0.1 mol) at room temperature. The reaction mixture was stirred at room temperature for 2h and then 55 °C for 8 h. Vacuum distillation to remove excess of sulfoxide chloride and abtain the compound 3.

Cholesterol (38.67 g, 0.1 mol) was dissolved in 100 ml THF and 6 ml Py at room temperature to abtain the solution. Compound 3 was dissolved in 150 ml THF and then added dropwise to the solution at room temperature. The reaction mixture was stirred and refluxed for 18 h. The mixture was poured into 1,000 ml cold water. The precipitated crude product was filtered, boiled in water and recrystallized in alcohol, isolated by filtration, and dried at 45 °C in a vacuum oven to obtain M_2.

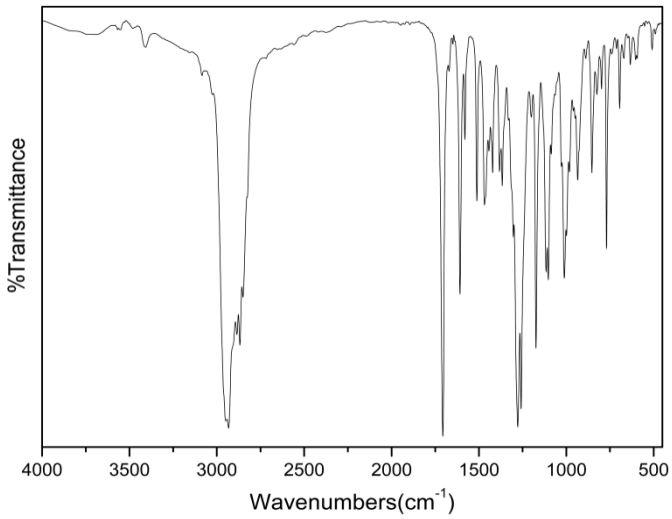

Figure S3 FT-IR spectrogram of M_2

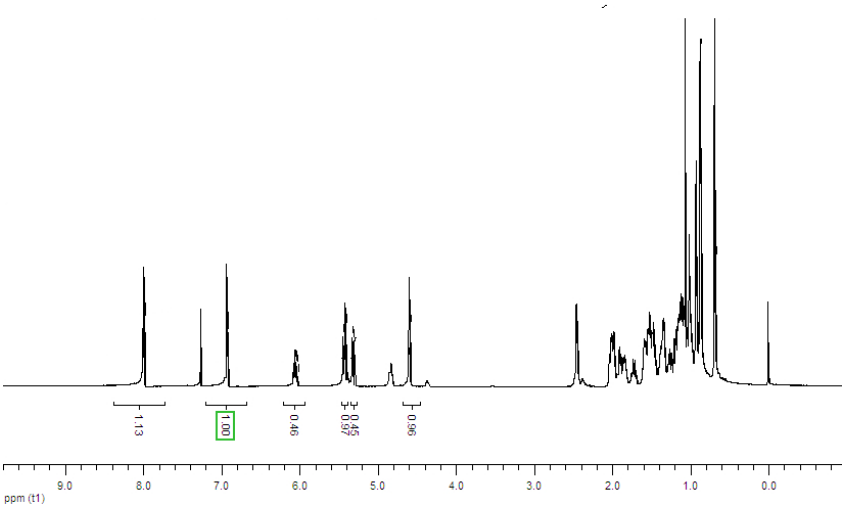

Figure S4. ^1H NMR spectrum of M_2 (600 MHz, $CDCl_3$)

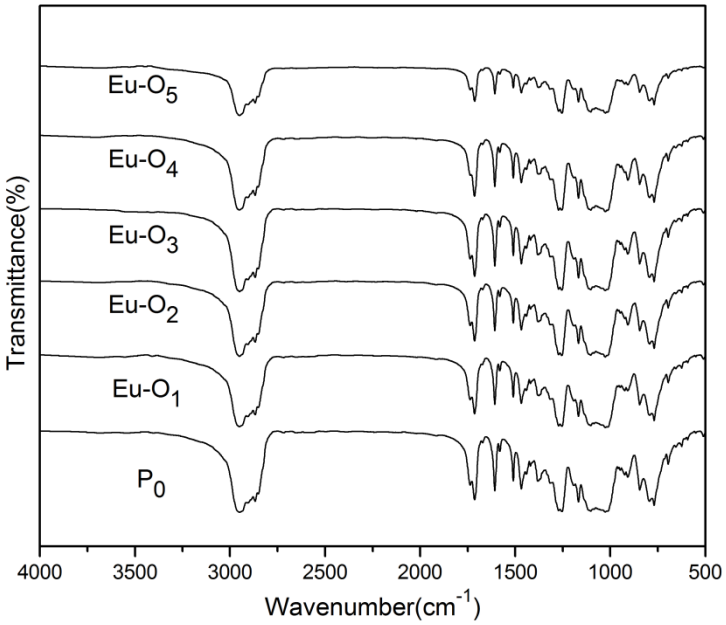

Figure S5. FT-IR spectrogram of oligomers