

## Supporting Informations

for

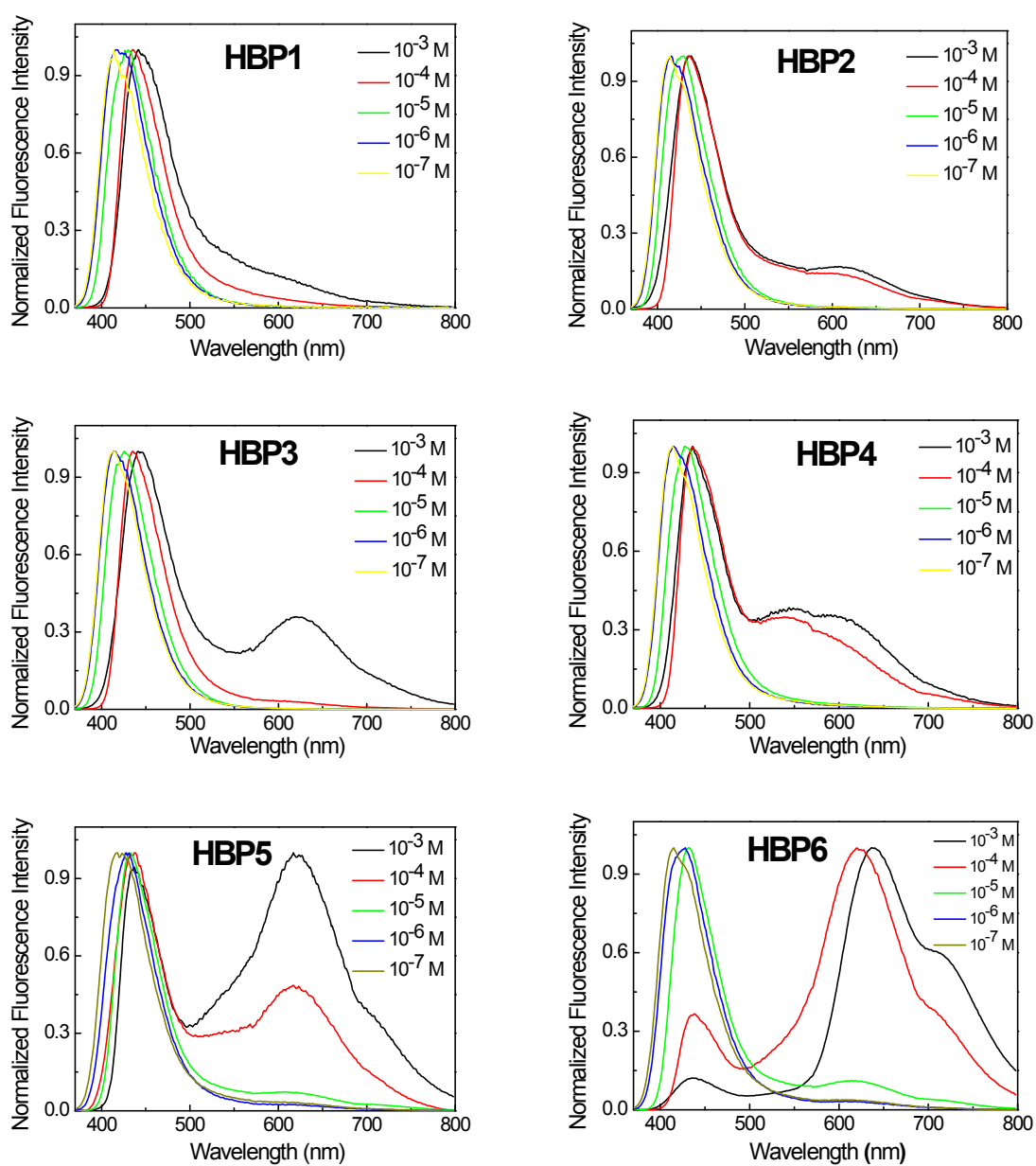
### **Synthesis of conjugated, hyperbranched copolymers for tunable multicolor emissions in light-emitting diodes**

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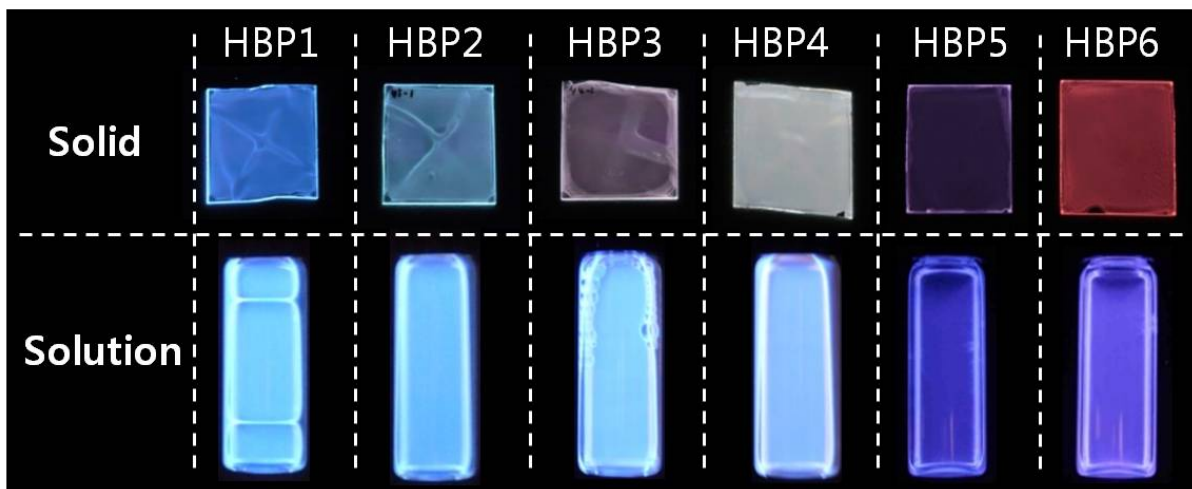
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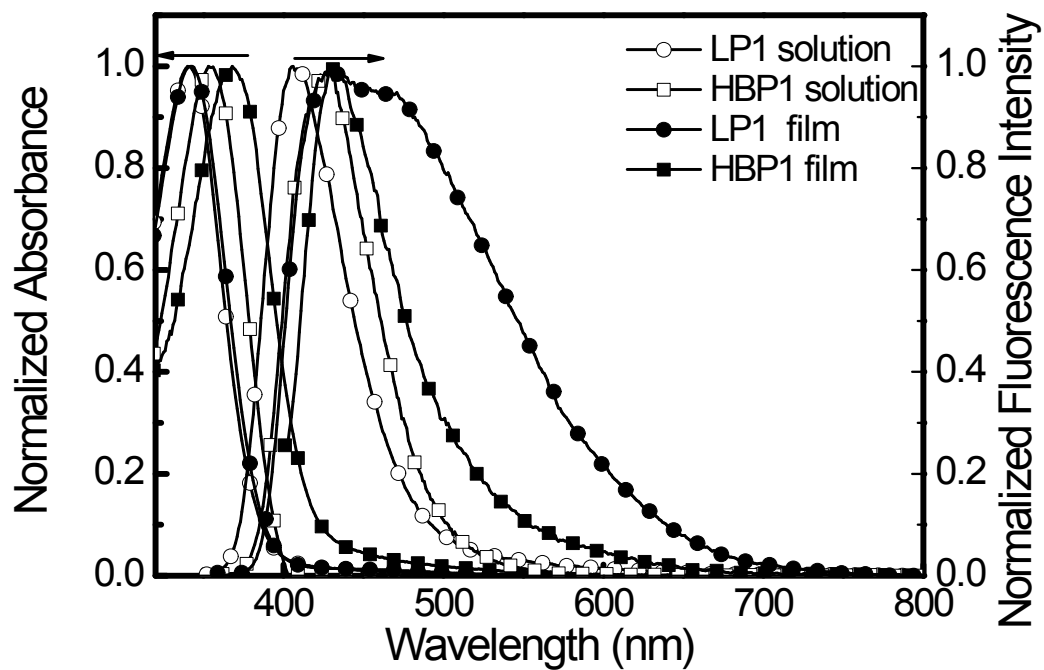
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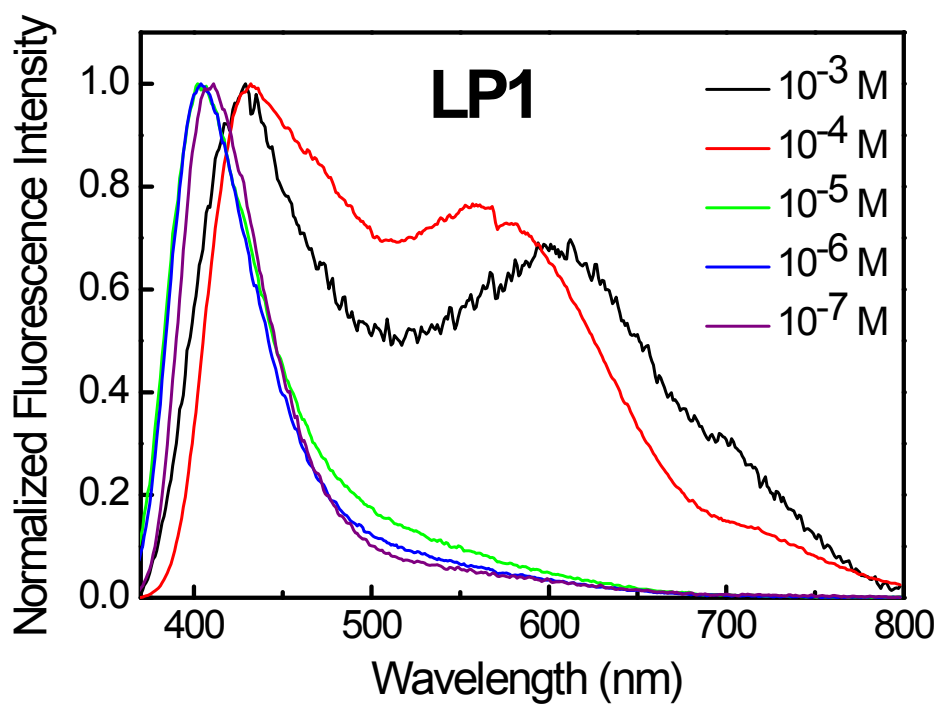
**Fig. S1.** Fluorescence spectra of HBPs in chloroform solutions with various concentrations ( $10^{-3}$  to  $10^{-7}$  M).



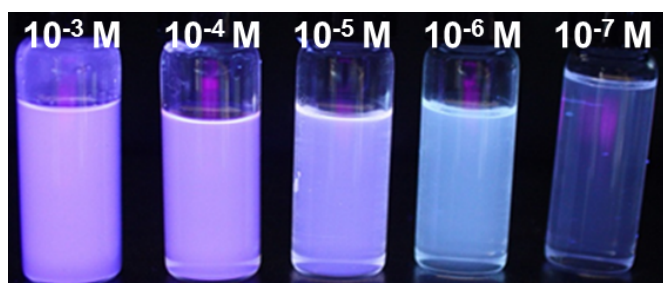
**Fig. S2.** Photographs of HBPs in chloroform solution and in the film state under UV lamp (365 nm).



**Fig. S3.** UV-vis absorption and fluorescence spectra of HBP1 and LP1 in chloroform solutions and in the film (spin-cast from 4 wt/v% chloroform solutions).

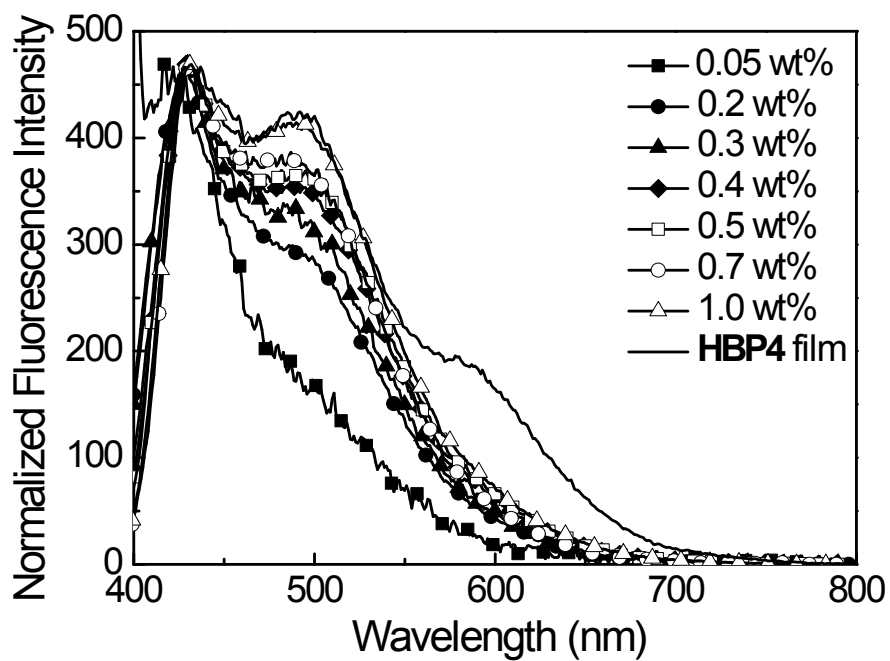


(a)



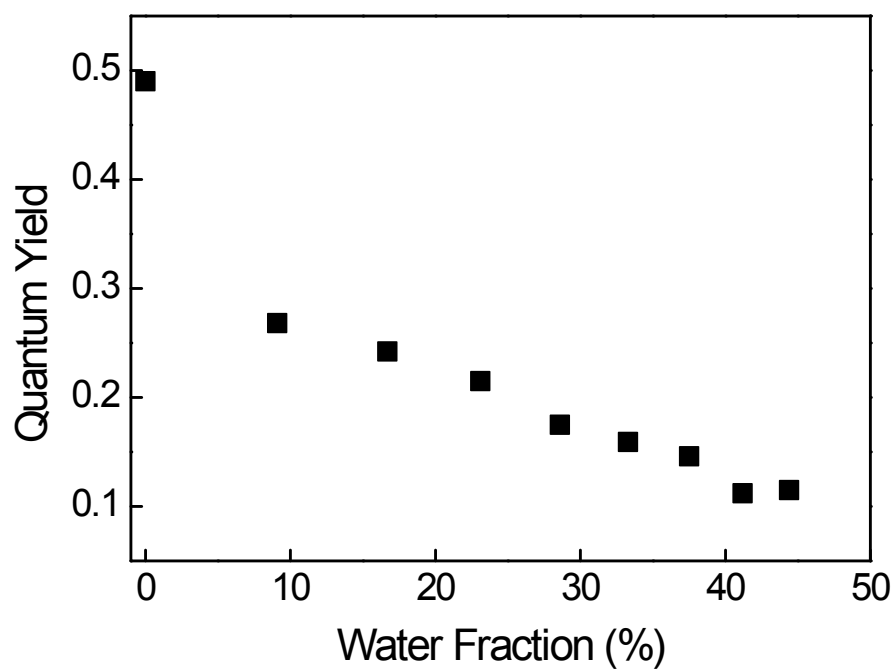
(b)

**Fig. S4.** (a) Fluorescence spectra and (b) photographs of LP1 in chloroform solutions with various concentrations ( $10^{-3}$  to  $10^{-7}$  M).



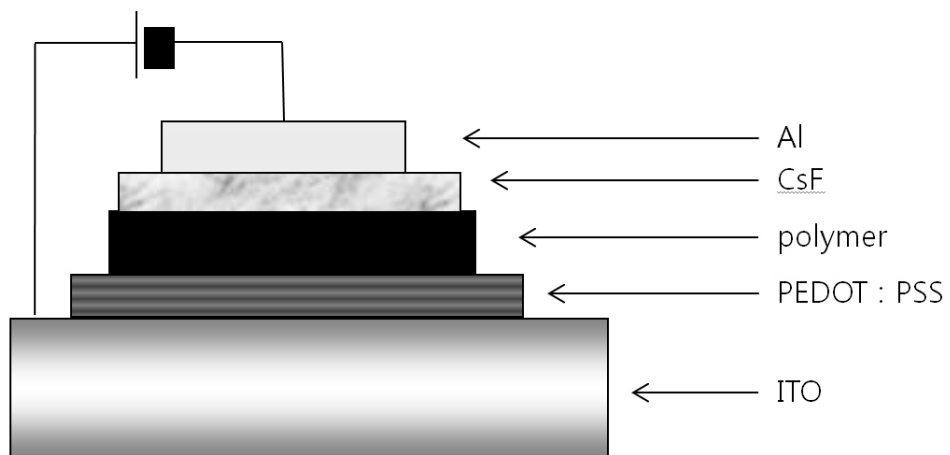
**Fig. S5.** Change in fluorescence spectra of PMMA films containing various concentrations of HBP4 (0.05 to 1 wt% of HBP4 with regard to 0.5 g PMMA).

Excitation wavelength = 368 nm.



**Fig. S6.** Relationship between QY and fraction of water in THF solution of HBP5.

QYs were determined using rhodamine B as the standard (0.65 in ethanol).



**Fig. S7.** Structure of EL device using the HBPs as emitting layers.



**Table S1.** Optical Properties of the Polymers

Polymers	Solution <sup>a</sup>		Film <sup>b</sup>	
	Abs (nm)	PL (nm)	Abs (nm)	PL (nm)
<b>HBP1</b>	348	428	360	435
<b>HBP2</b>	355	431	370	434
<b>HBP3</b>	353	428	365	440, 499, 597
<b>HBP4</b>	354	431	373	431, 500, 600
<b>HBP5</b>	355	431	365	432, 500, 600
<b>HBP6</b>	354	429	365	435, 500, 600
<b>LP1</b>	340	403	340	430, 470

<sup>a</sup> chloroform solutions ( $1 \times 10^{-7}$  M)

<sup>b</sup> spin-cast from chloroform solutions (4 wt/v%)

**Table S2. Decay times of HBP1 and LP1 in the solid states at 420 nm and at 500 nm upon excitation at 389 nm**

Polymers	420 nm			500 nm		
	$\tau_1$ (%) / ns	$\tau_2$ (%) / ns	Avg / ns	$\tau_1$ (%) / ns	$\tau_2$ (%) / ns	Avg / ns
<b>HBP1</b>	0.107 (81)	2.602 (19)	0.503	0.418 (50)	2.296 (50)	1.357
<b>LP1</b>	0.100 (83)	0.360 (17)	0.144	0.351 (63)	2.345(37)	1.089

**Table S3.** Decay times of of HBP4, HBP5 and HBP6 in solutions and in the films at 420 nm and at 500 nm upon excitation at 389 nm

Polymers	States	420 nm			500 nm		
		$\tau_1$ (%) / ns	$\tau_2$ (%) / ns	Avg / ns	$\tau_1$ (%) / ns	$\tau_2$ (%) / ns	Avg / ns
HBP4	Solution	1.293 (99)	7.078 (1)	1.351	1.026 (15)	5.819 (85)	5.100
	Film	0.101 (75)	1.119( 25)	0.356	0.981 (79)	4.662 (21)	1.754
HBP5	Solution	0.662 (70)	1.108 (30)	0.796	0.687 (40)	2.559 (60)	1.810
	Film	0.087 (98)	0.900 (2)	0.103	0.539 (45)	2.245 (55)	1.477
HBP6	Solution	0.562 (54)	0.977 (46)	0.753	0.804 (73)	3.847 (27)	1.626
	Film	0.007 (86)	0.257 (14)	0.042	0.575 (48)	2.207 (52)	1.424

**Table S4.** Decay times of HBP4 in chloroform solutions with various concentrations at 420 nm and at 500 nm upon excitation at 389 nm

Concentrations (M)	420 nm			500 nm		
	$\tau_1$ (%) / ns	$\tau_2$ (%) / ns	Avg / ns	$\tau_1$ (%) / ns	$\tau_2$ (%) / ns	Avg / ns
$10^{-7}$	1.293 (99)	7.078 (1)	1.351	1.026 (15)	5.819 (85)	5.100
$10^{-6}$	0.956 (98)	3.251 (2)	1.002	1.569 (42)	5.655 (58)	3.939
$10^{-5}$	0.958 (98)	2.446 (2)	0.988	1.043 (50)	4.053 (50)	2.548
$10^{-4}$	0.837 (94)	2.168 (6)	0.917	0.877 (62)	4.170 (38)	2.128
$10^{-3}$	0.836 (90)	1.582 (10)	0.911	0.407 (43)	3.034 (57)	1.904