

## Supporting Information

for

### **NIR Luminescence for the Detection of Latent Fingerprints Based on ESIPT and AIE Processes†**

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#### **Materials and instrumentation**

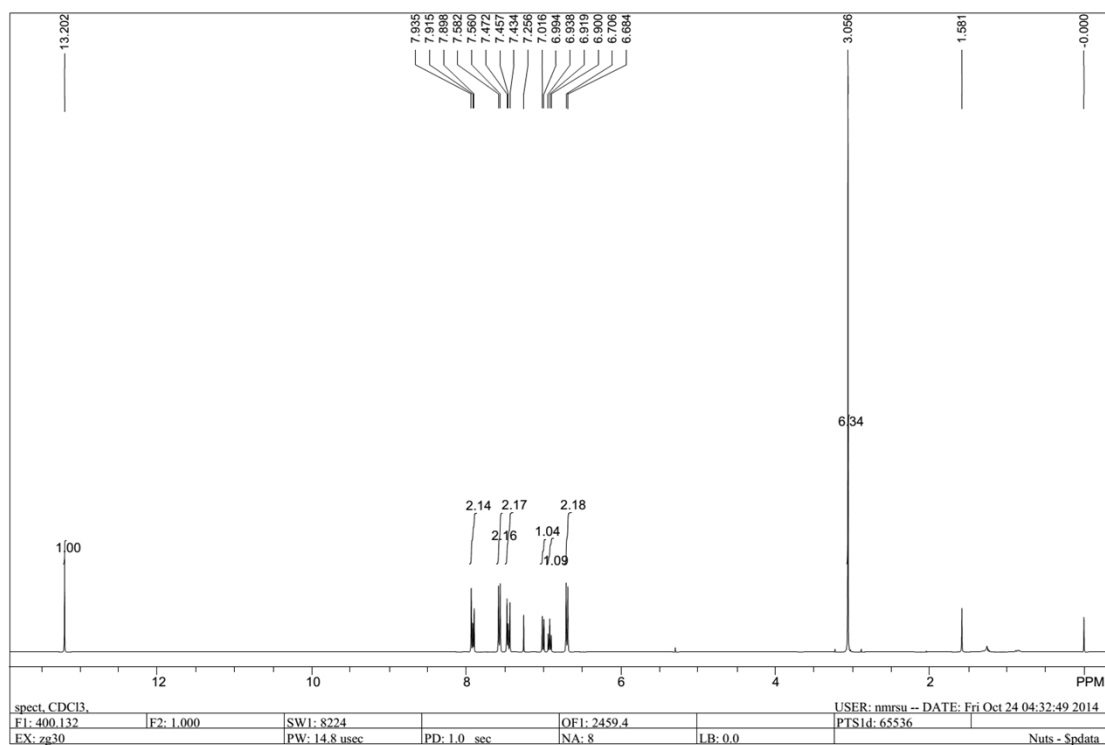
All chemicals used in this paper were obtained from commercial suppliers, and used as received without further purification. Thin layer chromatography was performed on EM Science silica gel 60 F<sub>254</sub> plates (250 μm). Visualization of the developed chromatogram was accomplished by UV lamp.

<sup>1</sup>H NMR, and <sup>13</sup>C NMR spectra were measured on a Bruker AV-400 spectrometer with chemical shifts reported in ppm (in CDCl<sub>3</sub>, TMS as internal standard). All fluorescence measurements were recorded on a Varian Cary Eclipse Fluorescence Spectrophotometer.

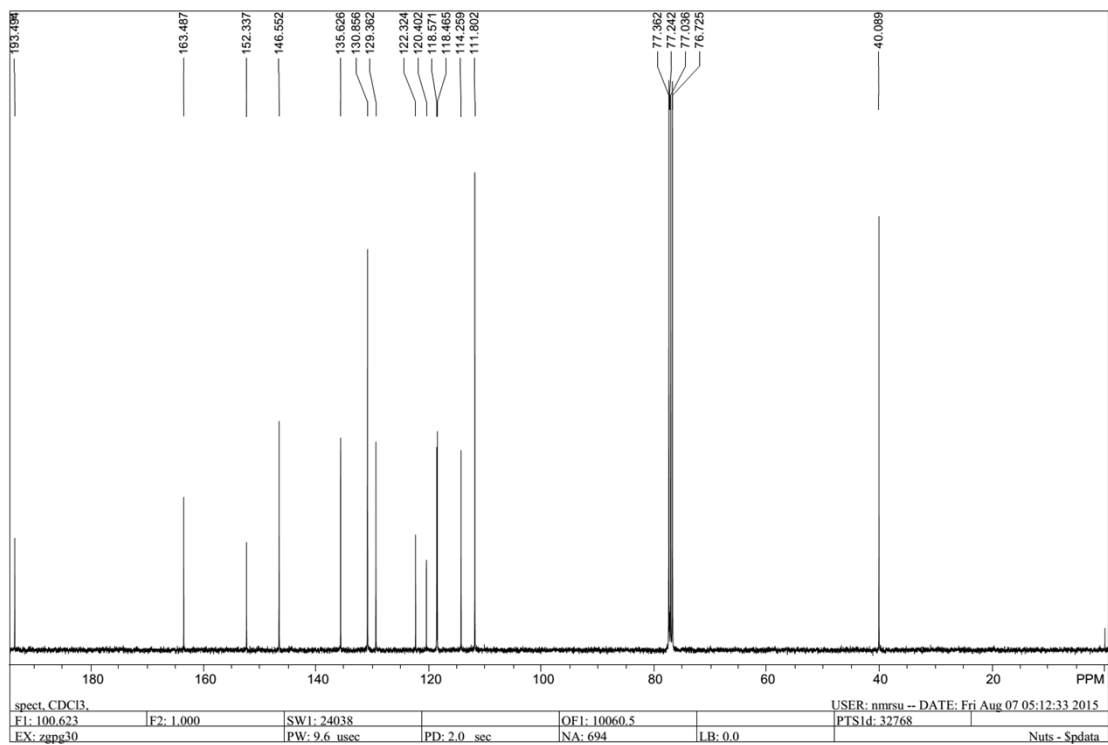
#### **Synthesis and preparation of the novel latent-fingerprint sensor NIR-LP**

*The synthesis of 4-dimethylamino-2'-hydroxychalcone (NIR-LP).* To a solution of 4-dimethylbenzaldehyde (12 mmol, 1.79 g) and 2'-hydroxyacetophenone (13.2 mmol, 1.80 g) in EtOH (30 mL), KOH (50 mmol, 2.8 g) in water was added and stirred at room temperature for 24 h. The reaction mixture was neutralized with dilute HCl until the pH value was adjusted to 7.0. The precipitates were collected through filtration and washed with ethanol three times. The obtained residue was further purified by recrystallization using ethanol to afford the desired

product (700 mg, 2.62 mmol) as deep red crystals.  $^1\text{H}$  NMR (400 MHz,  $\text{CDCl}_3$ ):  $\delta$  (TMS, ppm) 13.20 (s, 1H), 7.93–7.90 (t, 2H), 7.57 (d,  $J=8$  Hz, 2H), 7.47–7.43 (t, 2H), 7.00 (d,  $J=8$  Hz, 1H), 6.92 (t,  $J=8$  Hz, 1H), 6.69 (d,  $J=8$  Hz, 2H), 3.05 (s, 6H).  $^{13}\text{C}$  NMR (100 MHz,  $\text{CDCl}_3$ ):  $\delta$  (TMS, ppm) 193.5, 163.5, 152.3, 146.5, 135.6, 130.8, 129.4, 122.3, 120.4, 118.6, 118.4, 114.2, 111.8, 40.1.

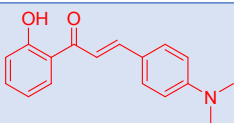
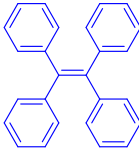
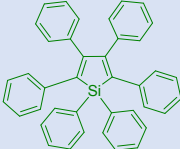
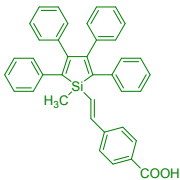
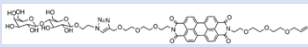
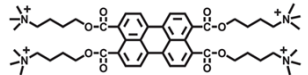


**Fig. S1**  $^1\text{H}$  NMR of NIR-LP



**Fig. S2**  $^{13}\text{C}$  NMR of NIR-LP

Table S1 Summary of the methods for the latent fingerprint detection/identification

No	Imaging moiety	LFP origin	$\lambda_{ex}/\lambda_{em}$	Incubation time	Ref
1		sebaceous	430 nm/650 nm	20 min	This work
2		sebaceous	365 nm/450-480 nm	5 min	[S1]
3		sebaceous	365 nm/460-480 nm	5 min	[S2]
4		sebaceous	365 nm/460-480 nm	5 min	
5	Antibody functionalized magnetic NPs	Not clear	~	30 min	[S3]
6	UCNPs-LBA	cocaine	980 nm/520 nm	30 min	[S4]
7		Not clear	475 nm/690 nm	5 h	[S5]
8		sebaceous	443 nm/552 nm <sup>a</sup>	5 min	[S6]
9	MPA-capped ZnxCd1-xSe QDs	sebaceous	~	30 min	[S7]

Note: <sup>a</sup> The probe-fingerprint complex have a strong fluorescent emission at 552 nm and the probe powder have a strong fluorescent emission at 602 nm.

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