Electronic Supplementary Material (ESI) for Materials Chemistry Frontiers.

A highly sensitive and selective two-photon fluorescent probe for real-time sensing of cytochrome P450 1A1 in living systems

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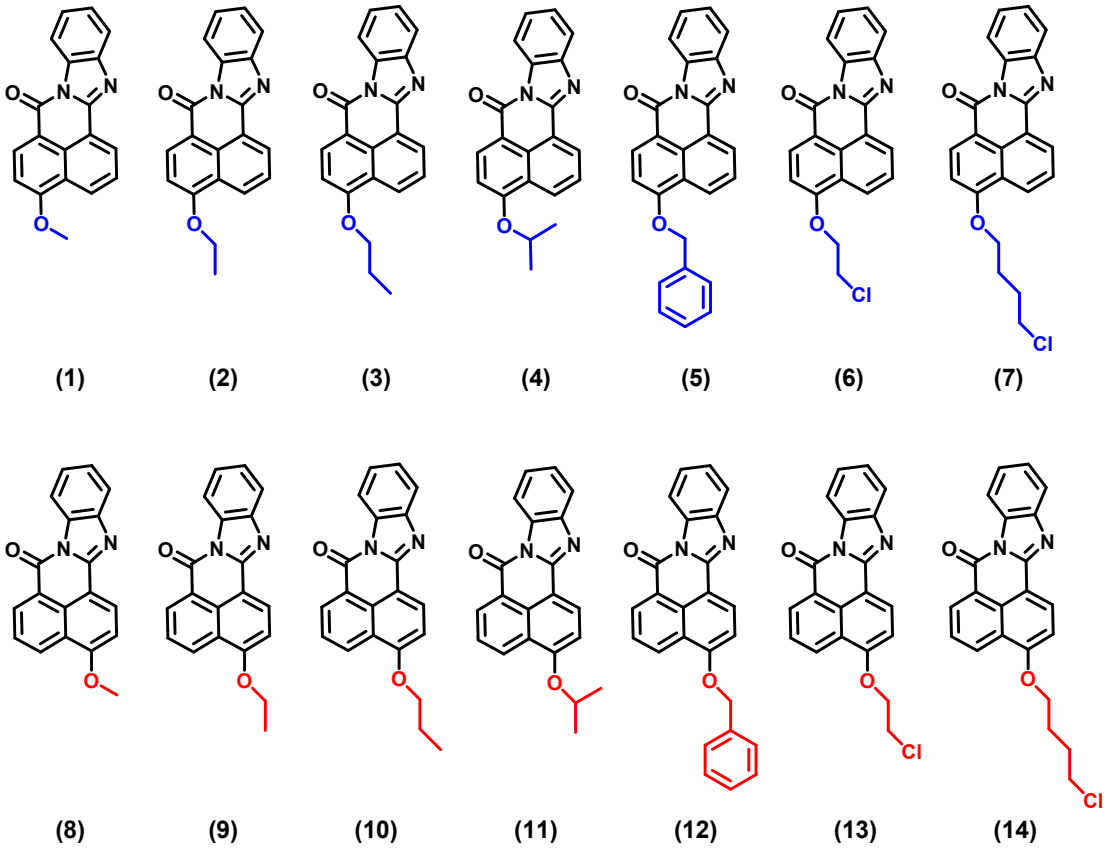
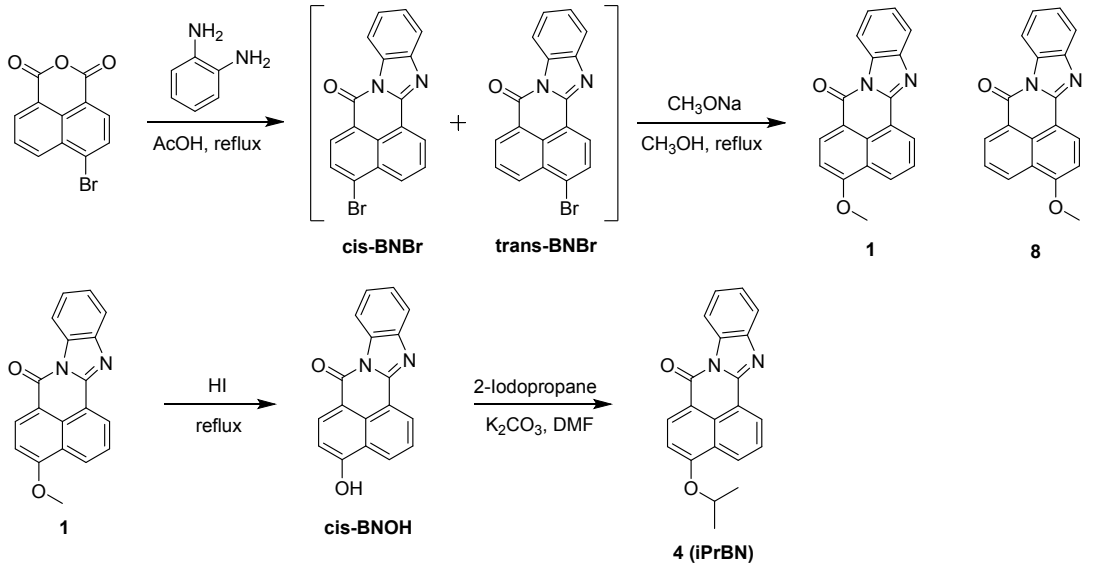


Fig. S1 Chemical structures of **HBN** derivatives used in this study.

Synthesis of iPrBN



Scheme S1. The synthesis procedure of **iPrBN**.

Synthesis of probe **1** and probe **8**.

To an acetic acid solution (50 mL) of 4-bromo-1,8-naphthalenedicarboxylic anhydride (5.52 g, 20 mmol) was added o-phenylenediamine (2.20 g, 20 mmol), and the mixture was refluxed for 4 h. After the reaction was completed by TLC analysis, the mixture was poured into ice water (100 mL). The resulting precipitate was filtered to afford the pure mixtures of **cis-BNBr** and **trans-BNBr**. The isomeric mixture were used directly in the next step without further purified.

To a solution of the mixture of **cis-BNBr** and **trans-BNBr** (3.48 g, 10 mmol) in CH_3OH (200 mL), was added CH_3ONa (10.80 g, 200.0 mmol) and $CuSO_4 \cdot 5H_2O$ (0.30 g, 1.3 mmol), and the mixture were refluxed for 24 h. Then the solvent was evaporated under reduced pressure and residue obtained was dissolved in CH_2Cl_2. The organic layers were washed with water, dried with $MgSO_4$, filtered, and the solvent was evaporated under reduced pressure. The crude mixture was purified by flash chromatography on silica gel using CH_2Cl_2 as the mobile phase to afford probe **1** (0.77 g, 25.7% yield) as a green yellow solid and probe **8** (0.46 g, 15.3% yield) as a yellow solid.

Probe **1**: ^{1}H NMR (500 MHz, $CDCl_3$) δ 8.71 (dd, *J* = 7.3, 1.0 Hz, 1H), 8.58 (d, *J* = 8.3 Hz, 1H), 8.51 (dt, *J* = 5.5, 3.1 Hz, 1H), 8.36 (dd, *J* = 8.4, 1.0 Hz, 1H), 7.85 (dt, J = 3.3, 2.9 Hz, 1H), 7.65 (dd, *J* = 8.2, 7.4 Hz, 1H), 7.49 – 7.41 (m, 2H), 6.94 (d, *J* = 8.3 Hz, 1H), 4.03 (s, 3H). ^{13}C NMR (125 MHz, $CDCl_3$) δ 161.65, 160.36, 149.55, 143.76, 133.99, 131.90, 128.23, 127.40, 126.27, 126.26, 125.45, 125.03, 123.91, 120.10, 119.73, 115.87, 115.29, 105.22, 56.19. HRMS (ESI positive) calcd for $[M+H]^+$ 301.0972, found 301.0965.

Probe **8**: ^{1}H NMR (500 MHz, $CDCl_3$) δ 8.73 (d, *J* = 7.2 Hz, 1H), 8.69 (d, *J* = 8.2 Hz, 1H), 8.61 (d, *J* = 8.3 Hz, 1H), 8.52 (d, *J* = 7.3 Hz, 1H), 7.82 (d, *J* = 7.2 Hz, 1H), 7.73 (t, *J* = 7.8 Hz, 1H), 7.48 – 7.39 (m, 2H), 7.03 (d, *J* = 8.3 Hz, 1H), 4.08 (s, 3H). ^{13}C NMR (125 MHz, $CDCl_3$) δ 160.98, 159.23, 149.53, 143.92, 131.97, 131.69, 129.80, 128.94, 128.24, 125.92, 125.60, 124.64, 124.34, 122.67, 119.40, 115.77, 112.87, 105.67, 56.13. HRMS (ESI positive) calcd for $[M+H]^+$ 301.0972, found 301.0968.

Synthesis of **cis-BNOH**.

A mixture of compound **1** (0.60 g, 2.0 mmol) and 57% (*v*/*v*) hydroiodic acid (30 mL) was refluxed for overnight until the starting material was consumed. After cooling, the mixture was poured into water (100 mL), the precipitate was filtered and washed with water. The crude compound were further purified by a silica gel column chromatograph using CH_2Cl_2/CH_3OH (10/1 *v*/*v*) as the mobile phase to afford **cis-BNOH** as a red solid (0.48 g, yield: 84.0%). ^{1}H NMR (500 MHz, DMSO-*d6*) δ 8.74 (dd, *J* = 7.2, 0.8 Hz, 1H), 8.57 (d, *J* = 8.2 Hz, 1H), 8.49 (dd, *J* = 8.3, 0.8 Hz, 1H), 8.47 – 8.41 (m, 1H), 7.87 – 7.79 (m, 2H), 7.50 – 7.44 (m, 2H), 7.24 (d, *J* = 8.2 Hz, 1H). ^{13}C NMR (125 MHz, DMSO-*d6*) δ 161.52, 159.93, 149.29, 143.29, 134.44, 131.49, 128.35, 127.25, 126.72, 125.96, 125.22, 124.67, 122.91, 119.65, 119.51, 115.25, 112.99, 110.28. HRMS (ESI negative) calcd for $[M-H]^-$ 285.0670, found 285.0681.

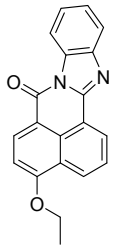
Synthesis of **trans-BNOH**.

trans-BNOH was synthesized according to the same procedure as that used for **cis-BNOH**. ^{1}H NMR (500 MHz, DMSO-*d6*) δ 8.75 (d, *J* = 7.2 Hz, 1H), 8.71 (d, *J* = 8.3 Hz, 1H), 8.64 (d, *J* = 8.1 Hz, 1H), 8.45 (d, *J* = 7.4 Hz, 1H), 7.93 – 7.88 (m, 1H), 7.81 (d, *J* = 7.3 Hz, 1H), 7.46 (dq, *J* = 7.3, 6.2 Hz, 2H), 7.26 (d, *J* = 8.2 Hz, 1H). ^{13}C NMR (100 MHz, DMSO-*d6*) δ 160.93, 159.84, 149.81, 142.44, 132.61, 131.33, 130.86, 130.55, 128.57, 126.37, 126.17, 124.90, 123.76, 122.55, 118.85, 115.76, 111.06, 110.05. HRMS (ESI negative) calcd for $[M-H]^-$ 285.0670, found 285.0686.

Synthesis of probe **4 (iPrBN)**.

To a solution of **cis-BNOH** (57.2 mg, 0.2 mmol) in 10 mL DMF under an argon atmosphere, was added K_2CO_3 (27.6 mg, 0.2 mmol) and 2-Iodopropane (169.9 mg, 1.0 mmol), and the reaction mixture was stirred at 100 ˚C until the starting material was consumed. Then the reaction mixture was diluted with H_2O and extracted with CH_2Cl_2. The organic phase was dried over anhydrous $MgSO_4$ and concentrated under reduced pressure. The crude compound were further purified by a silica gel column chromatograph using CH_2Cl_2 as the mobile phase to afford probe **4 (iPrBN)** as a

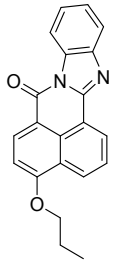
green yellow solid (49.6 mg, 75.6% yield). Other probes were synthesized with the similar method. ^{1}H NMR (500 MHz, $CDCl_3$) δ 8.77 (d, *J* = 7.3 Hz, 1H), 8.65 (d, *J* = 8.3 Hz, 1H), 8.56 – 8.51 (m, 1H), 8.46 (d, *J* = 8.3 Hz, 1H), 7.85 (dd, *J* = 5.9, 2.6 Hz, 1H), 7.67 (t, *J* = 7.8 Hz, 1H), 7.48 – 7.40 (m, 2H), 7.02 (d, *J* = 8.3 Hz, 1H), 4.90 (dt, *J* = 12.0, 6.0 Hz, 1H), 1.53 (d, *J* = 6.0 Hz, 6H). ^{13}C NMR (125 MHz, $CDCl_3$) δ 160.52, 160.32, 149.69, 143.83, 134.06, 131.97, 128.67, 127.42, 126.67, 126.03, 125.39, 124.95, 124.66, 120.23, 119.73, 115.87, 114.76, 106.70, 71.59, 21.88. HRMS (ESI positive) calcd for $[M+H]^+$ 329.1285, found 329.1285.



2

Synthesis of Probe **2.**

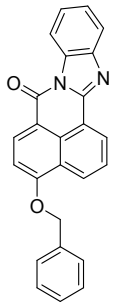
Probe **2** was synthesized with **cis-BNOH,** K_2CO_3 and Iodoethane as the raw materials. The product was isolated as a green yellow solid (72.3% yield). ^{1}H NMR (500 MHz, $CDCl_3$) δ 8.86 (dd, *J* = 7.3, 1.0 Hz, 1H), 8.73 (d, *J* = 8.3 Hz, 1H), 8.62 – 8.56 (m, 1H), 8.54 (dd, *J* = 8.4, 0.9 Hz, 1H), 7.93 – 7.85 (m, 1H), 7.76 (dd, *J* = 8.2, 7.5 Hz, 1H), 7.50 – 7.42 (m, 2H), 7.08 (d, *J* = 8.3 Hz, 1H), 4.37 (q, *J* = 7.0 Hz, 2H), 1.63 (t, *J* = 7.0 Hz, 3H). ^{13}C NMR (125 MHz, $CDCl_3$) δ 161.29, 160.68, 149.79, 143.88, 134.25, 132.03, 128.57, 127.53, 126.56, 126.29, 125.50, 125.08, 124.21, 120.38, 119.80, 115.92, 115.30, 106.01, 64.89, 14.59. HRMS (ESI positive) calcd for $[M+H]^+$ 315.1128, found 315.1121.



3

Synthesis of Probe **3.**

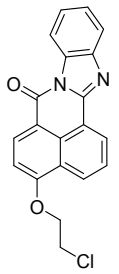
Probe **3** was synthesized with **cis-BNOH,** K_2CO_3 and 1-Iodopropane as the raw materials. The product was isolated as a green yellow solid (74.2% yield). ^{1}H NMR (500 MHz, $CDCl_3$) δ 8.79 (dd, *J* = 7.3, 0.8 Hz, 1H), 8.66 (d, *J* = 8.3 Hz, 1H), 8.58 – 8.52 (m, 1H), 8.47 (dd, *J* = 8.3, 0.8 Hz, 1H), 7.87 (dd, *J* = 5.8, 2.9 Hz, 1H), 7.74 – 7.67 (m, 1H), 7.50 – 7.42 (m, 2H), 7.01 (d, *J* = 8.3 Hz, 1H), 4.19 (t, *J* = 6.4 Hz, 2H), 1.99 (dd, *J* = 14.0, 6.8 Hz, 2H), 1.17 (t, *J* = 7.4 Hz, 3H). ^{13}C NMR (125 MHz, $CDCl_3$) δ 161.23, 160.43, 149.62, 143.80, 134.09, 131.94, 128.33, 127.37, 126.34, 126.14, 125.40, 124.97, 124.04, 120.15, 119.73, 115.87, 115.02, 105.86, 70.55, 22.36, 10.58. HRMS (ESI positive) calcd for $[M+H]^+$ 329.1285, found 329.1276.



5

Synthesis of Probe **5**.

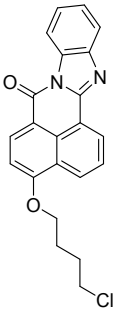
Probe **5** was synthesized with **cis-BNOH,** K_2CO_3 and benzyl bromide as the raw materials. The product was isolated as a green yellow solid (72.6% yield). ^{1}H NMR (500 MHz, $CDCl_3$) δ 8.88 (d, *J* = 6.4 Hz, 1H), 8.76 (d, *J* = 8.3 Hz, 1H), 8.65 – 8.53 (m, 2H), 7.93 – 7.85 (m, 1H), 7.81 – 7.75 (m, 1H), 7.55 (d, *J* = 7.3 Hz, 2H), 7.46 (ddd, *J* = 21.8, 12.3, 4.5 Hz, 5H), 7.20 (d, *J* = 8.3 Hz, 1H), 5.41 (s, 2H). ^{13}C NMR (125 MHz, $CDCl_3$) δ 160.89, 160.63, 149.75, 143.89, 135.48, 134.10, 132.04, 128.91, 128.64, 127.61, 126.59, 126.51, 125.57, 125.17, 124.38, 120.51, 119.85, 115.93, 115.83, 106.67, 71.05. HRMS (ESI positive) calcd for $[M+H]^+$ 377.1285, found 377.1281.



6

Synthesis of Probe **6**.

Probe **6** was synthesized with **cis-BNOH,** K_2CO_3 and 1-Chloro-2-iodoethane as the raw materials. The product was isolated as a green yellow solid (65.4% yield). ^{1}H NMR (500 MHz, $CDCl_3$) δ 8.82 (dd, *J* = 7.3, 0.8 Hz, 1H), 8.68 (d, *J* = 8.3 Hz, 1H), 8.58 – 8.53 (m, 1H), 8.51 (dd, *J* = 8.4, 0.8 Hz, 1H), 7.92 – 7.84 (m, 1H), 7.79 – 7.73 (m, 1H), 7.51 – 7.43 (m, 2H), 7.02 (d, *J* = 8.3 Hz, 1H), 4.50 (t, *J* = 5.6 Hz, 2H), 3.99 (t, *J* = 5.6 Hz, 2H). ^{13}C NMR (125 MHz, $CDCl_3$) δ 160.40, 160.14, 149.59, 143.85, 133.79, 131.98, 128.47, 127.68, 126.66, 126.35, 125.60, 125.21, 124.06, 120.40, 119.86, 116.18, 115.91, 106.05, 68.75, 41.46. HRMS (ESI positive) calcd for $[M+H]^+$ 349.0738, found 349.0733.

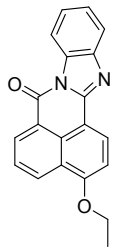


7

Synthesis of Probe **7**.

Probe **7** was synthesized with **cis-BNOH,** K_2CO_3 and 1-Chloro-4-iodobutane as the raw materials. The product was isolated as a green yellow solid (65.6% yield). ^{1}H NMR (400 MHz, $CDCl_3$) δ 8.82 (d, *J* = 7.2 Hz, 1H), 8.69 (d, *J* = 8.3 Hz, 1H), 8.59 – 8.51 (m, 1H), 8.47 (d, *J* = 8.2 Hz, 1H), 7.92 – 7.82 (m, 1H), 7.74 (t, *J* = 7.8 Hz, 1H), 7.51 – 7.39 (m, 2H), 7.04 (d, *J* = 8.3 Hz, 1H), 4.30 (t, *J* = 5.7 Hz, 2H), 3.69 (t, *J* = 6.1 Hz, 2H), 2.24 – 2.03 (m, 4H). ^{13}C NMR (100 MHz, $CDCl_3$) δ 160.97, 160.56, 149.68, 143.83,

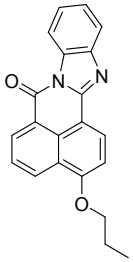
134.13, 131.99, 128.48, 127.54, 126.43, 126.30, 125.55, 125.14, 124.10, 120.39, 119.81, 115.91, 115.51, 105.99, 68.28, 44.55, 29.32, 26.43. HRMS (ESI positive) calcd for $[M+H]^+$ 377.1051, found 377.1048.



9

Synthesis of Probe **9**.

Probe **9** was synthesized with **trans-BNOH,** K_2CO_3 and Iodoethane as the raw materials. The product was isolated as a yellow solid (71.6% yield). ^{1}H NMR (400 MHz, $CDCl_3$) δ 8.82 (d, *J* = 7.3 Hz, 1H), 8.77 (d, *J* = 8.3 Hz, 1H), 8.73 (d, *J* = 8.4 Hz, 1H), 8.56 (d, *J* = 7.3 Hz, 1H), 7.84 (d, *J* = 6.9 Hz, 1H), 7.79 (t, *J* = 7.8 Hz, 1H), 7.50 – 7.40 (m, 2H), 7.09 (d, *J* = 8.3 Hz, 1H), 4.36 (q, *J* = 6.9 Hz, 2H), 1.62 (t, *J* = 7.0 Hz, 3H). ^{13}C NMR (125 MHz, $CDCl_3$) δ 161.05, 158.67, 149.63, 144.01, 131.96, 131.73, 129.93, 129.03, 128.32, 125.81, 125.58, 124.59, 124.44, 122.69, 119.40, 115.78, 112.66, 106.31, 64.64, 14.64. HRMS (ESI positive) calcd for $[M+H]^+$ 315.1128, found: 315.1130.

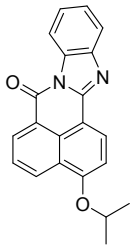


10

Synthesis of Probe **10**.

Probe **10** was synthesized with **trans-BNOH,** K_2CO_3 and 1-Iodopropane as the raw materials. The product was isolated as a yellow solid (70.3% yield). ^{1}H NMR (500 MHz, $CDCl_3$) δ 8.79 (dd, *J* = 7.3, 1.1 Hz, 1H), 8.74 (d, *J* = 8.2 Hz, 1H), 8.70 (dd, *J* = 8.3, 1.1 Hz, 1H), 8.55 (d, *J* = 7.3 Hz, 1H), 7.86 – 7.81 (m, 1H), 7.80 – 7.74 (m, 1H), 7.45 (ddt, *J* = 15.1, 7.4, 3.7 Hz, 2H), 7.07 (d, *J* = 8.3 Hz, 1H), 4.23 (t, *J* = 6.4 Hz, 2H), 2.06 – 1.98 (m,

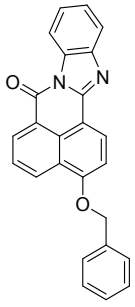
2H), 1.18 (t, *J* = 7.4 Hz, 3H). ^{13}C NMR (125 MHz, $CDCl_3$) δ 160.96, 158.72, 149.55, 143.96, 131.86, 131.68, 129.79, 128.99, 128.20, 125.74, 125.54, 124.54, 124.38, 122.59, 119.36, 115.75, 112.50, 106.25, 70.41, 22.45, 10.64. HRMS (ESI positive) calcd for $[M+H]^+$ 329.1285, found 329.1284.



11

Synthesis of Probe **11**.

Probe **11** was synthesized with **trans-BNOH,** K_2CO_3 and 2-Iodopropane as the raw materials. The product was isolated as a yellow solid (71.6% yield). ^{1}H NMR (500 MHz, $CDCl_3$) δ 8.81 (d, *J* = 7.3 Hz, 1H), 8.77 (d, *J* = 8.3 Hz, 1H), 8.72 (d, *J* = 8.3 Hz, 1H), 8.60 – 8.53 (m, 1H), 7.84 (d, *J* = 7.1 Hz, 1H), 7.78 (t, *J* = 7.8 Hz, 1H), 7.49 – 7.40 (m, 2H), 7.11 (d, *J* = 8.3 Hz, 1H), 4.94 (dt, *J* = 12.1, 6.0 Hz, 1H), 1.55 (s, 3H), 1.54 (s, 3H). ^{13}C NMR (125 MHz, $CDCl_3$) δ 161.09, 157.77, 149.68, 144.02, 131.97, 131.72, 130.19, 129.00, 128.57, 125.69, 125.56, 125.09, 124.54, 122.70, 119.37, 115.78, 112.32, 107.25, 71.37, 21.97. HRMS (ESI positive) calcd for $[M+H]^+$ 329.1285, found: 329.1284.

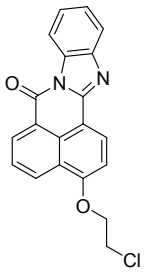


12

Synthesis of Probe **12**.

Probe **12** was synthesized with **trans-BNOH,** K_2CO_3 and benzyl bromide as the raw materials. The product was isolated as a yellow solid (69.6% yield). ^{1}H NMR (500 MHz,

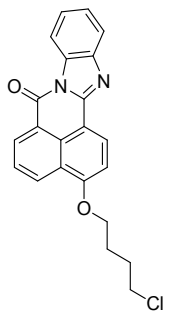
$CDCl_3$) δ 8.83 (dd, *J* = 7.3, 1.1 Hz, 1H), 8.78 (d, *J* = 8.2 Hz, 1H), 8.76 (dd, *J* = 8.3, 1.1 Hz, 1H), 8.58 – 8.53 (m, 1H), 7.88 – 7.83 (m, 1H), 7.80 (dd, *J* = 8.2, 7.4 Hz, 1H), 7.55 (d, *J* = 7.2 Hz, 2H), 7.45 (ddt, *J* = 18.4, 14.6, 7.3 Hz, 5H), 7.21 (d, *J* = 8.3 Hz, 1H), 5.38 (s, 2H). ^{13}C NMR (125 MHz, $CDCl_3$) δ 161.08, 158.35, 149.59, 144.00, 135.73, 132.12, 131.77, 130.04, 128.91, 128.86, 128.56, 128.47, 127.64, 126.09, 125.66, 124.74, 124.65, 122.88, 119.48, 115.82, 113.29, 107.00, 70.91. HRMS (ESI positive) calcd for $[M+H]^+$ 377.1285, found 377.1278.



13

Synthesis of Probe **13**.

Probe **13** was synthesized with **trans-BNOH,** K_2CO_3 and 1-Chloro-2-iodoethane as the raw materials. The product was isolated as a yellow solid (60.1% yield). ^{1}H NMR (500 MHz, $CDCl_3$) δ 8.78 (d, *J* = 7.2 Hz, 1H), 8.74 – 8.65 (m, 2H), 8.54 (d, *J* = 7.3 Hz, 1H), 7.84 (d, *J* = 7.4 Hz, 1H), 7.78 (t, *J* = 7.8 Hz, 1H), 7.50 – 7.40 (m, 2H), 7.04 (d, *J* = 8.2 Hz, 1H), 4.50 (t, *J* = 5.5 Hz, 2H), 4.00 (t, *J* = 5.5 Hz, 2H). ^{13}C NMR (125 MHz, $CDCl_3$) δ 160.90, 157.62, 149.37, 143.95, 132.18, 131.74, 129.79, 128.60, 128.35, 126.25, 125.69, 124.83, 124.36, 122.81, 119.53, 115.81, 113.68, 106.53, 68.68, 41.62. HRMS (ESI positive) calcd for $[M+H]^+$ 349.0738, found 349.0729.



14

Synthesis of Probe **14**.

Probe **14** was synthesized with **trans-BNOH,** K_2CO_3 and 1-Chloro-4-iodobutane as the raw materials. The product was isolated as a yellow solid (63.7% yield). ^{1}H NMR (500 MHz, $CDCl_3$) δ 8.80 (dd, *J* = 7.3, 1.1 Hz, 1H), 8.75 (d, *J* = 8.2 Hz, 1H), 8.67 (dd, *J* = 8.3, 1.1 Hz, 1H), 8.59 – 8.51 (m, 1H), 7.87 – 7.82 (m, 1H), 7.82 – 7.76 (m, 1H), 7.45 (pd, *J* = 7.3, 1.4 Hz, 2H), 7.08 (d, *J* = 8.3 Hz, 1H), 4.32 (t, *J* = 5.8 Hz, 2H), 3.71 (t, *J* = 6.2 Hz, 2H), 2.22 – 2.07 (m, 4H). ^{13}C NMR (125 MHz, $CDCl_3$) δ 161.05, 158.46, 149.59, 143.99, 132.07, 131.75, 129.76, 128.96, 128.39, 126.03, 125.66, 124.71, 124.46, 122.85, 119.45, 115.81, 113.04, 106.39, 68.13, 44.56, 29.39, 26.51. HRMS (ESI positive) calcd for $[M+H]^+$ 377.1051, found 377.1044.

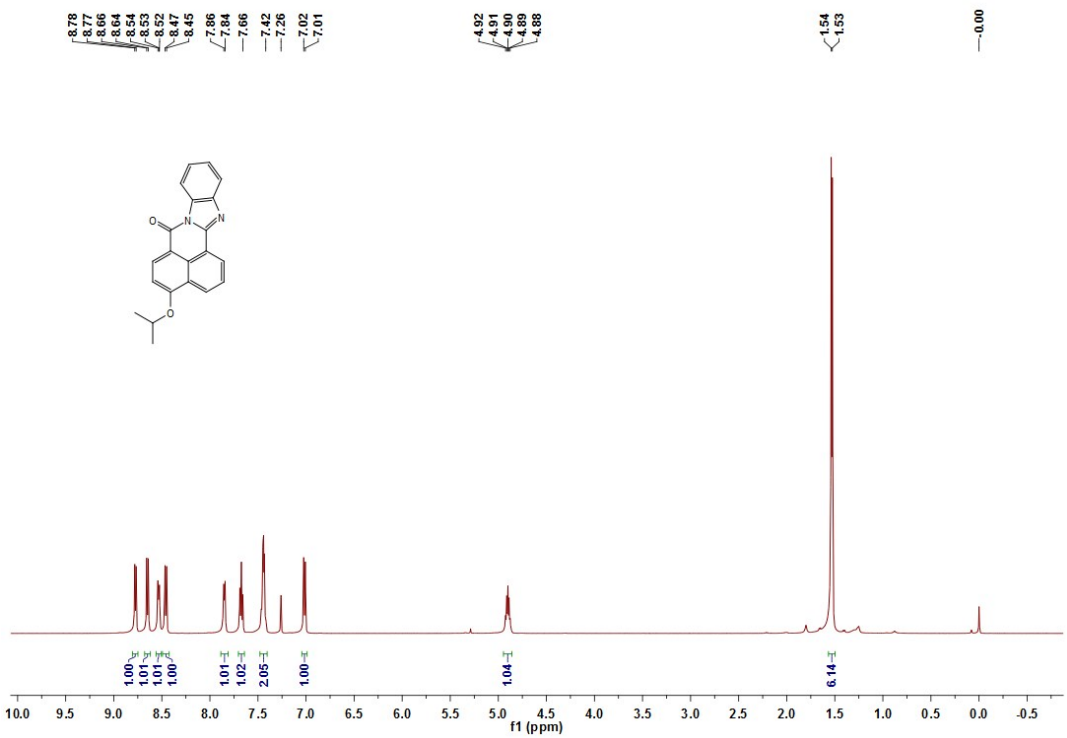


Fig. S2. ^{1}H NMR (500 MHz, $CDCl_3$) spectrum of **iPrBN**.

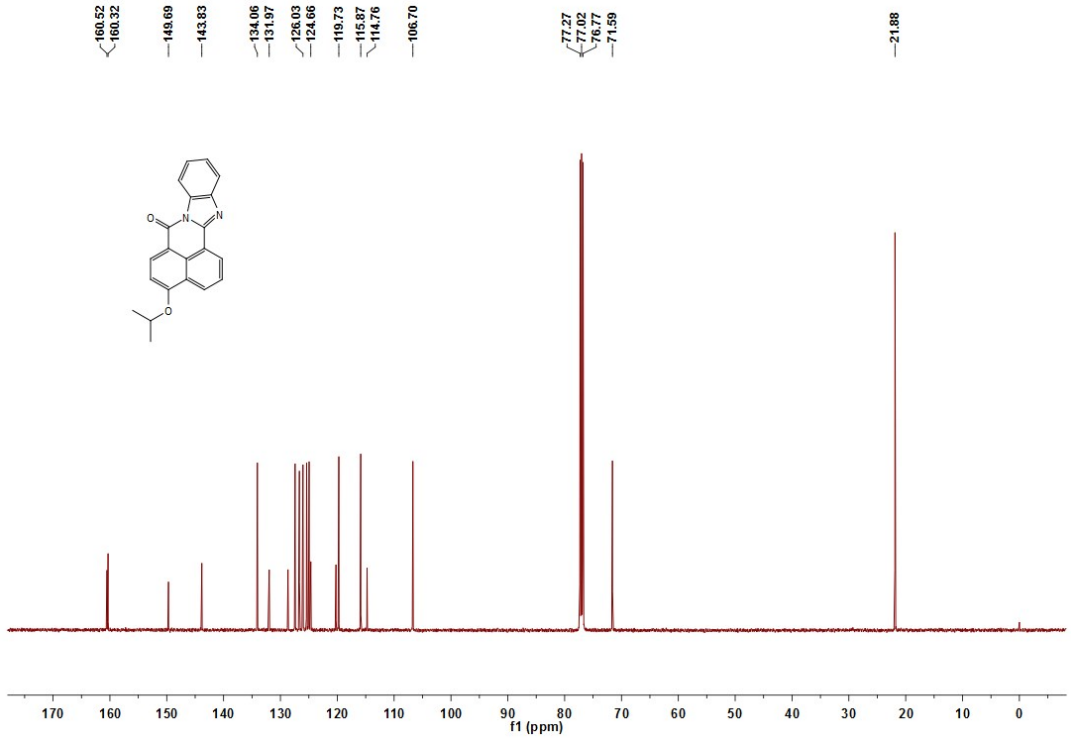


Fig. S3. ^{13}C NMR (125 MHz, $CDCl_3$) spectrum of **iPrBN**.

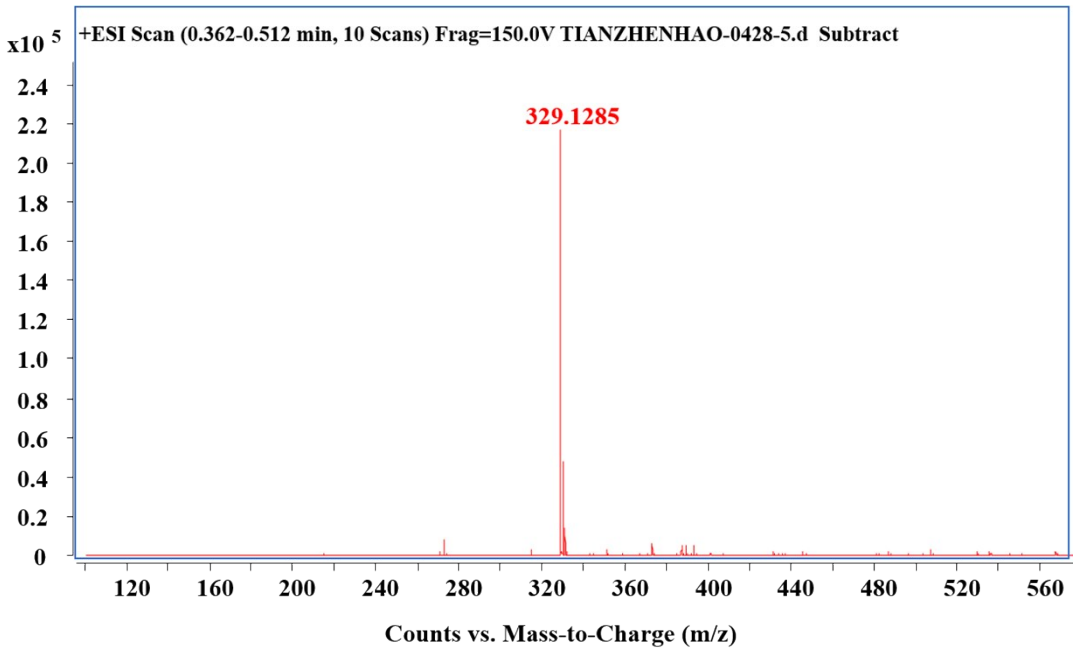


Fig. S4. HRMS of **iPrBN**.

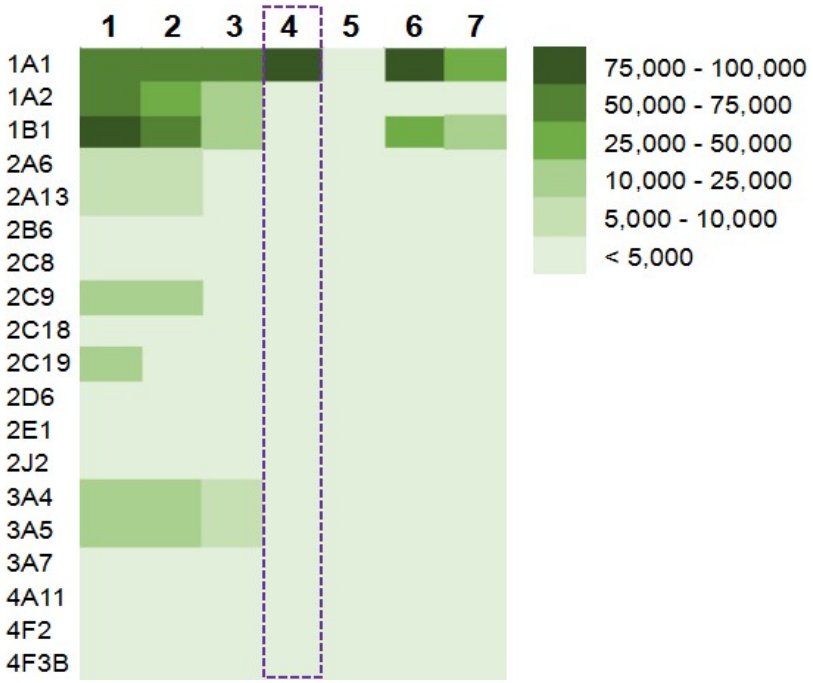


Fig. S5. Isozyme specificity of **HBN** derivatives used in this study. Fluorescence responses of **iPrBN** and other **HBN** derivatives to CYP isoforms. The results are expressed as the mean SD (n = 3). $\lambda_{ex}/_{em}$ = 470/525 nm.

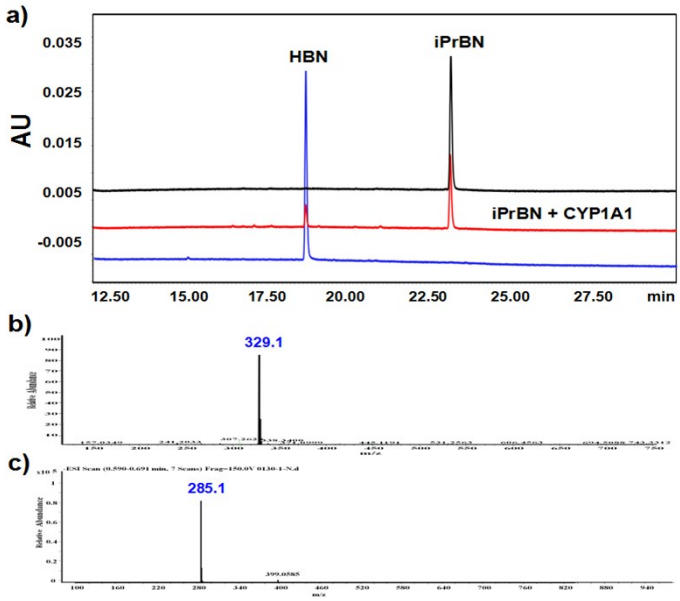


Fig. S6. Representative LC-UV chromatograms of **iPrBN** (10 μM) incubation samples at 37 °C, UV detector was set at 470 nm (a). Mass spectra of **iPrBN** with the quasi-molecular ion peak *m*/*z* = 329 (b), and its hydrolyzed product BAN with the quasi-molecular ion peak m/z = 285 (c) monitored under positive and negative mode, respectively. The concentration of CYP1A1 used was 5 nM.

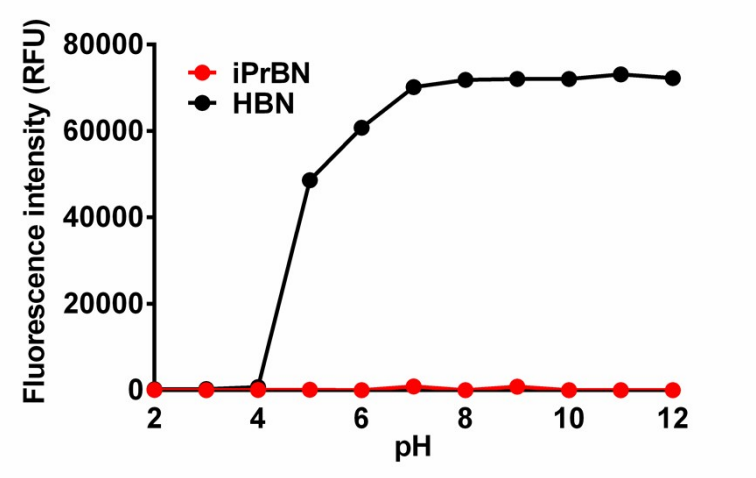


Fig. S7 The effects of pH values on the fluorescence intensity of **iPrBN** and **HBN** (10 μM). The measurements were performed in KCl-HCl buffer with different pH values adjusted by KOH (**HBN**, Gain 75).

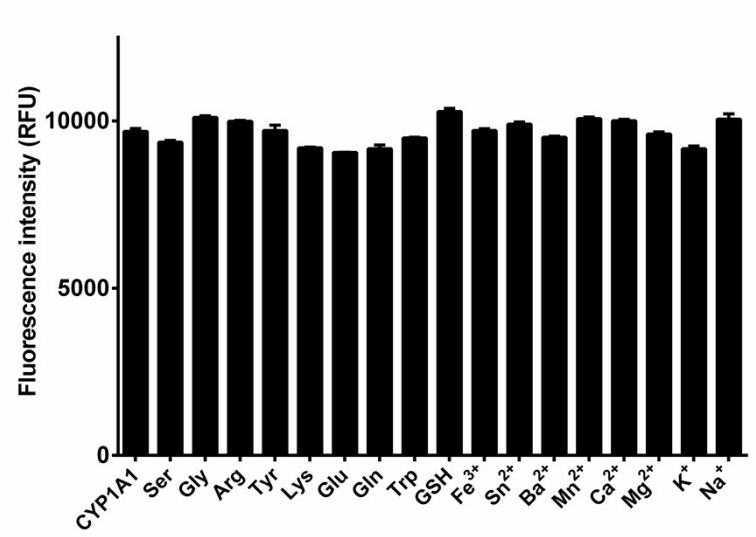


Fig. S8 Fluorescence responses of **iPrBN** (10 μM) towards CYP1A1 in the presence of various analytes in reaction system.

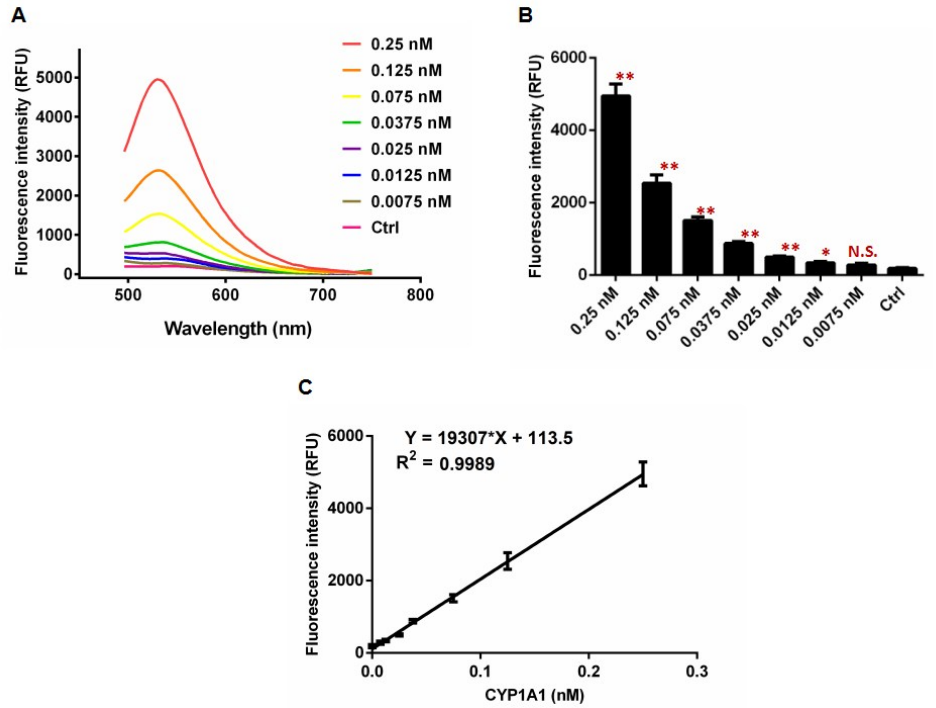


Fig. S9 (A) Fluorescence spectra of **iPrBN** (10 μM) upon the addition of increasing concentrations of CYP1A1 (0-0.25 nM) in reaction system incubated for 30 min. λ_{ex} = 470 nm. (B) Detection limit of CYP1A1 with **iPrBN** as the substrate. λ_{em} = 525 nm. Data are shown as mean ± SD (n = 5). * indicates $p < 0.05$, ** indicates $p < 0.005$ and N. S. means no significant, versus the control group without enzyme (one-sided Student's t-test). (C) Fluorescence intensity of **iPrBN** at 525 nm upon the addition of increasing concentrations of CYP1A1 (0-0.25 nM) in reaction system incubated for 30 min.

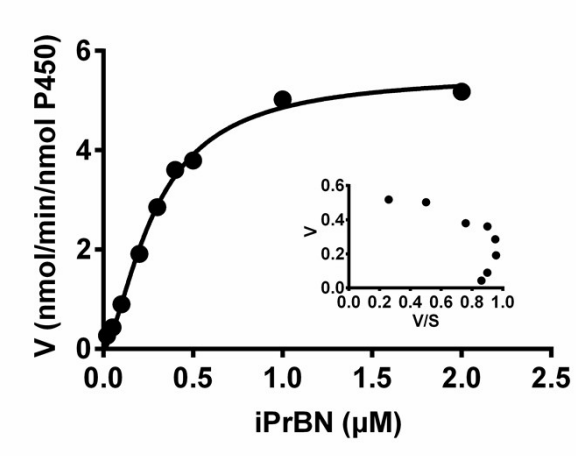


Fig. S10 Kinetic plots of **iPrBN** deisopropylation in CYP1A1. The formation of **HBN** upon addition of CYP1A1 was determined by monitoring the fluorescence intensity at λ_{em} = 525 nm (λ_{ex} = 470 nm).

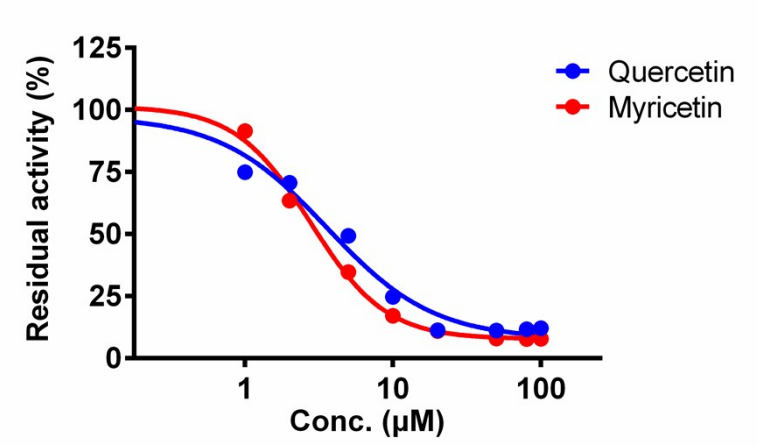


Fig. S11. Dose-inhibition curves of quercetin (0 - 100 μM) and myricetin (0 - 100 μM) on **iPrBN** deisopropylation in CYP1A1. IC_{50} = 4.12 μM, 2.79 μM, respectively.

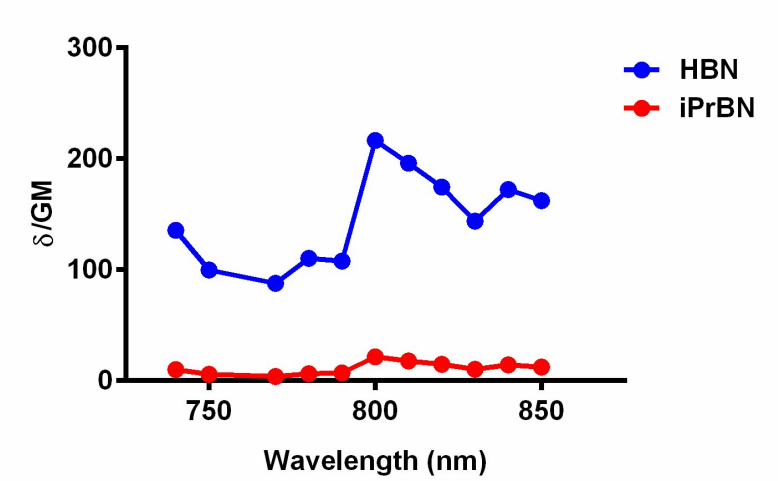


Fig. S12. Two-photon action spectra of **HBN** and **iPrBN** in PBS (100 mM, pH 7.4).

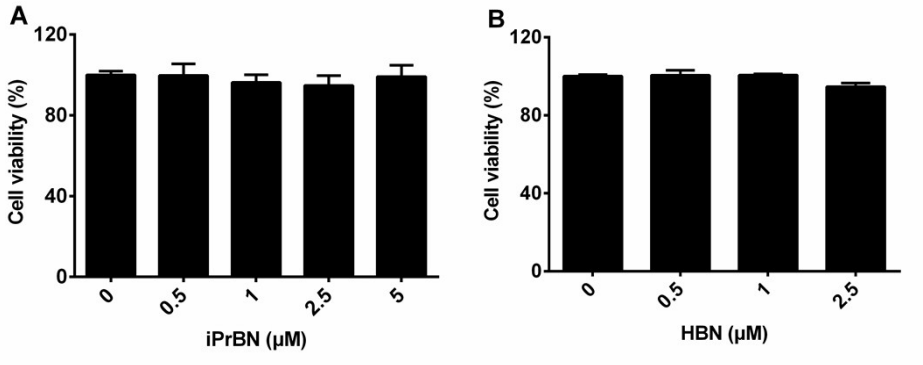


Fig. S13. Cell toxicity of **iPrBN** (A) and **HBN** (B) in A549 cells.

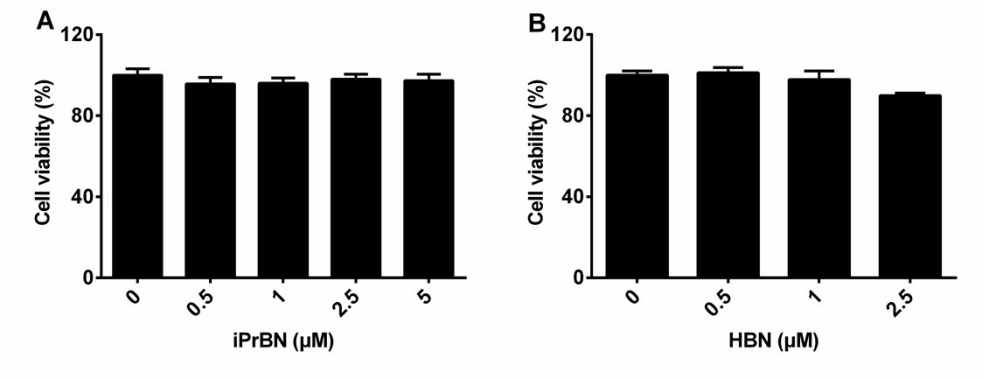


Fig. S14. Cell toxicity of **iPrBN** (A) and **HBN** (B) in MCF-7 cells.