Supporting Information

Synthesis and evaluation of new 5-aminolevulinic acid derivatives as prodrugs of protoporphyrin for photodynamic therapy

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**Synthesis and characterization**

$^1$H, $^{13}$C NMR spectra were measured on a Bruker 400 MHz spectrometer. Chemical shifts were reported as in units of parts per million (ppm), and J-values are in Hz. ESI-MS spectra were recorded on a Micromass triple quadrupole mass spectrometer. HRMS spectra were recorded on a Brucker Daltonics APEXIII 7.0 tesla FT mass spectrometer.

**Figure S1-1.** $^1$H NMR (DMSO-$d_6$, 400 MHz) of 5a

**Figure S1-2.** $^{13}$C NMR (DMSO-$d_6$, 100 MHz) of 5a
Figure S1-3. HRMS (MALDI-TOF) of 5a

Figure S2-1. $^1$H NMR (CDCl$_3$, 400 MHz) of 5b
Figure S2-2. $^{13}$C NMR (CDCl$_3$, 100 MHz) of 5b

Figure S2-3. HRMS (MALDI-TOF) of 5b
Figure S3-1. $^1$H NMR (CDCl$_3$, 400 MHz) of 5c

Figure S3-2. $^{13}$C NMR (CDCl$_3$, 100 MHz) of 5c
Figure S3-3. HRMS (MALDI-TOF) of 5c

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Figure S4-1. ¹H NMR (CDCl₃, 400 MHz) of 5d
Figure S4-2. $^{13}$C NMR (CDCl$_3$, 100 MHz) of 5d

Figure S4-3. HRMS (MALDI-TOF) of 5d
Figure S5-1. $^1$H NMR (CDCl$_3$, 400 MHz) of 6a

Figure S5-2. $^{13}$C NMR (CDCl$_3$, 100 MHz) of 6a
Figure S5-3. HRMS (MALDI-TOF) of 6a

Figure S6-1. ¹H NMR (CDCl₃, 400 MHz) of 7a
Figure S6-2. $^{13}$C NMR (CDCl$_3$, 100 MHz) of 7a

Figure S6-3. HRMS (MALDI-TOF) of 7a
Figure S7-1. $^1$H NMR (CDCl$_3$, 400 MHz) of 9a

[Image: H NMR spectrum of 9a]

Figure S7-2. $^{13}$C NMR (CDCl$_3$, 100 MHz) of 9a

[Image: C NMR spectrum of 9a]
Figure S7-3. HRMS (MALDI-TOF) of 9a

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Figure S8-1. ¹H NMR (CDCl₃, 400 MHz) of 9b
Figure S8-2. $^{13}$C NMR (CDCl$_3$, 100 MHz) of 9b

Figure S8-3. HRMS (MALDI-TOF) of 9b

Elemental composition search on mass 469.23

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Figure S9-1. $^1$H NMR (CDCl$_3$, 400 MHz) of 9c

Figure S9-2. $^{13}$C NMR (DMSO-$d_6$, 100 MHz) of 9c
Figure S9-3. HRMS (MALDI-TOF) of 9c

Figure S10-1. $^1$H NMR (CDCl$_3$, 400 MHz) of 11a
Figure S10-2. $^{13}$C NMR (CDCl$_3$, 100 MHz) of 11a

Figure S10-3. HRMS (MALDI-TOF) of 11a
Figure S11-1. $^1$H NMR (CDCl$_3$, 400 MHz) of 11b

Figure S11-2. $^{13}$C NMR (CDCl$_3$, 100 MHz) of 11b
Figure S11-3. HRMS (MALDI-TOF) of 11b

Elemental composition search on mass 435.25

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Figure S12-1. $^1$H NMR (CDCl$_3$, 400 MHz) of 11c
Figure S12-2. $^{13}$C NMR (DMSO-$d_6$, 100 MHz) of 11c

Figure S12-3. HRMS (MALDI-TOF) of 11c
Figure S13-1. $^1$H NMR (CDCl$_3$, 400 MHz) of 13a

Figure S13-2. $^{13}$C NMR (DMSO-d$_6$, 100 MHz) of 13a
**Figure S13-3.** HRMS (MALDI-TOF) of 13a

**Figure S14** Efficacy of 11c against sarcoma cell in Kunming mice bearing S 180 cells. Images of mice bearing S 180 tumors at 15 mg/kg before and following PDT at 1 h, 3 h, 5 h, and 7 h on the 5th day.

**Figure S15** Efficacy of 9c against sarcoma cell in Kunming mice bearing S 180 cells. Images of mice bearing S 180 tumors at 15 mg/kg before and following PDT at 1 h, 3 h, 5 h, and 7 h on the 5th day.
**Figure S16** Efficacy of 11b against sarcoma cell in Kunming mice bearing S 180 cells. Images of mice bearing S 180 tumors at 15 mg/kg before and following PDT at 1 h, 3 h, 5 h, and 7 h on the 5th day.

**Figure S17** Efficacy of 9b against sarcoma cell in Kunming mice bearing S 180 cells. Images of mice bearing S 180 tumors 15 mg/kg before and following PDT at 1 h, 3 h, 5 h, and 7 h on the 5th day.