Supporting Information for

Photoactivated full-API nanodrug (FAND): Harnessing Transition Metal Complexes and MTH1 Inhibitor for Enhanced DNA Damage in Cancer Cells

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Fig. S1 TEM images (a), SEM images (b) and DLS analysis (c) of Ru-T FANDs with feed ratio 1:2 and 1:3.

Fig. S2 Standard curve of RuDPB (a) and TH287 (b) by using UV-Vis spectrum and HPLC.

Fig. S3 The PDI changes of Ru-T FANDs in 7 days.
**Fig. S4** Absorption spectrum changes of RuDPB (10 μM) in water after standing in the dark for 4 h at room temperature.

**Fig. S5** AMDA bleaching (at 399 nm) in the presence of Ru-T FANDs or [Ru(bpy)$_3$]$^{2+}$ in water upon irradiation at 410 nm.

**Fig. S6** CLSM images of A549 cells treated with RuDPB, Ru+T mix, or Ru-T FANDs after irradiation at different time. Red fluorescence signals were from the uncaged DPB. (b) The cellular internalization efficiencies were quantified at different time using CLSM images.
**Fig. S7** Cell viability of A549 cells incubated with gradient concentrations of RuDPB, TH287, Ru+T mix, or Ru-T FANDs in the dark.

**Fig. S8** Flow cytometry quantification of the apoptotic percentage of A549 cells with different treatments.

**Fig. S9** Live/dead cell staining analysis of Movas cells after treatment with Ru-T FANDs.
**Fig. S10** The results of hemolysis experiment on Ru-T FANDs with different concentrations (5, 10, and 20 μM).

**Fig. S11** The quantification for expressions of (a) Bcl-2 and (b) BAX in Hela cells after different treatments.

**Fig. S12** Cell viability of Hela cells incubated with gradient concentrations of RuDPB, TH287, Ru+T mix, or Ru-T FANDs in the dark.
**Fig. S13** Flow cytometry quantification of the apoptotic percentage of Hela cells with different treatments.

**Fig. S14** The image of the full gel and blot for Fig 4d.
**Fig. S15** The image of the full gel and blot for Fig 6c.