**Supplementary Methods**

**High Performance Liquid Chromatography (HPLC):**

HPLC was performed on a Shimadzu HPLC system equipped with a SPD-20A prominence UV/visible detector and monitored at a wavelength at 220nm for PSMA-1-SMCC or 350nm for PSMA-1-Pc413 and PSMA-1-IR700. Preparative HPLC was achieved using Luna 5µ C18(2) 100A column (250mm×10mm×5μm, Phenomenex, Torrance, CA) at a flow rate of 2.5ml/min. Gradient A was 5%-55% acetonitrile against 0.1% trifluoroacetic acid over 30 minutes, then 55% acetonitrile for another 15 minutes. Gradient B was 60%-100% methanol against 25mM TEAA buffer (pH=7.0) over 15 minutes, then 100% methanol for another 20 minutes. Gradient C was 5%-55% methanol against 25mM TEAA (pH=7.0) over 30 minutes, then 55% methanol for another 15 minutes.

**Determination of emission spectrum of light sources:**

The emission spectra of the projector, laser diode and diode LED were measured by ASEQ Instrument LR1 with spectral range from 200-1100nm. The spectral resolution of the spectrometer was 0.3nm. The spectra of diode laser and diode LED light sources were measured by pointing the laser/LED at a sheet of paper and aiming the tip of the fiber optic cable of the spectrometer at the laser/LED spot on the white paper. The data were plotted by GraphPad PRISM 3.0.

**Determination of emission and absorbance spectra of PSMA-1-PDT agents:**

The emission and absorbance spectra of PSMA-1-PDT were measured by Tecan Infinite 200. Spectra were measured at 0.2μM of PSMA-1-PDT in water. The data collected by Tecan were plotted by GraphPad PRISM 3.0.

**Determination of radiant exposure:**

For PDT treatment, the tumor was first measured and the laser spot size or treatment area was adjusted to encompass the entire tumor. Treatment area was based off the largest diameter and calculated using the formula for area of a circle: A = π X (diameter/2)2. Black tape was used to cover the skin surrounding the flank tumor in order to prevent as much of the light as possible from reaching undesired areas. Once the treatment area was determined, the power was adjusted using the formula:

Power (W) = Irradiance (W/cm2) X Area (cm2)

in which irradiance=0.1W/cm2 for the laser light and irradiance=0.0318W/cm2 for the LED light. The calculated power was then adjusted by the power meter (PM100, Thorlabs). Once the treatment area and power were determined, the treatment time was calculated using the formula:

Therefore,

Typically, the treatment duration is 1500s or 25min for radiant exposure at150J/cm2 at 672nm for the laser light and 1572s or 26min 12s for radiant exposure at 50J/cm2 at 690nm for the LED light.