

## Supporting Information

### **A Ratiometric Photoacoustic Imaging Approach for Semi-Quantitative Determination of Aggregation Efficiency in vivo**

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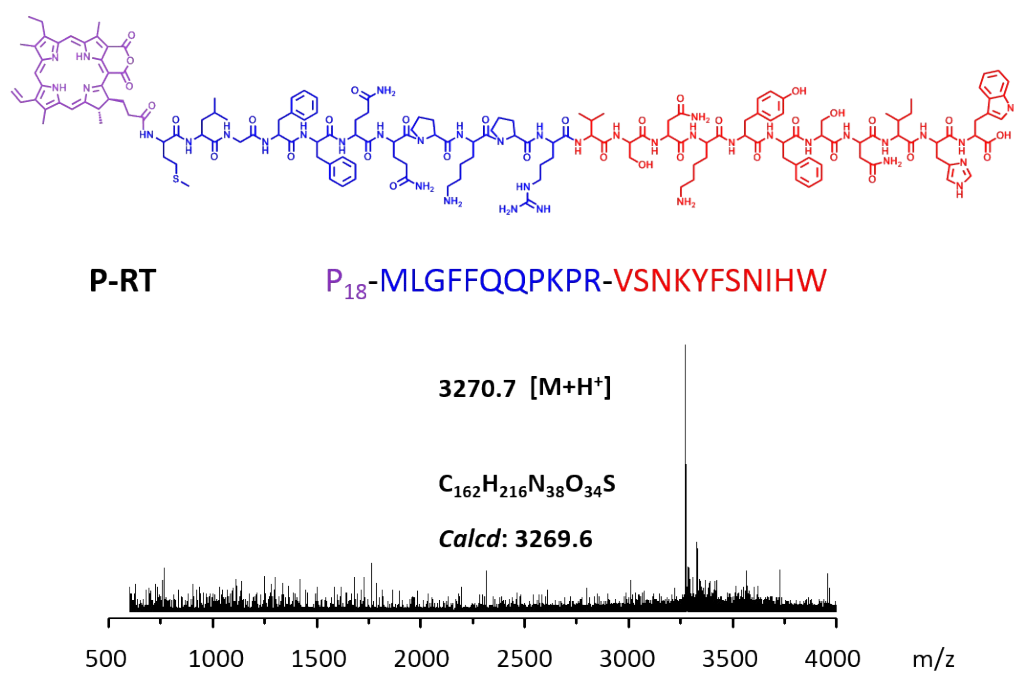
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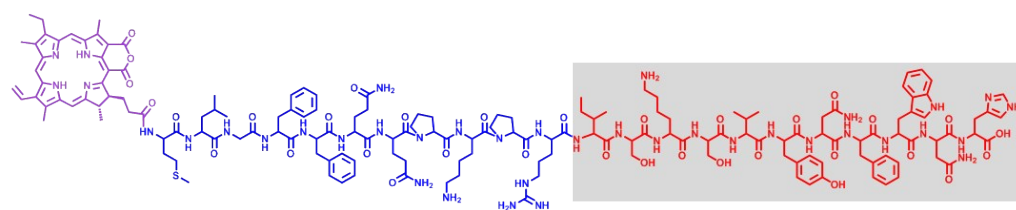
Keywords: Peptide, Chlorophyll, Photoacoustic Bioimaging, Aggregation Efficiency, Pancreatic tumor

## ***Materials***

Fmoc-amino acids and Wang resins were purchased from GL Biochem (Shanghai). Purpurin-18 (P<sub>18</sub>), amiloride,  $\beta$ -Cyclodextrin ( $\beta$ -CD), and hypertonic sucrose were purchased from Shanhai Xianhui Pharmaceutical Co. Ltd. 2,5-dihydroxybenzoic acid (DHB), and trifluoroacetic acid (TFA) were purchased from Sigma-Aldrich Chemical Co. Cathepsin E was obtained from Biopike Co. Ltd (Beijing, China). Dulbecco's Modified Eagle Medium (DMEM) penicillin, fetal bovine serum (FBS), streptomycin and trypsin were obtained from Wisent Inc. (Nanjing, China). Cell counting kit-8 assay (CCK-8) (Beyotime Institute of Biotechnology, China) were used without further purification. Other solvents and reagents were used as received. Miapaca-2 cell line was purchased from the cell culture center of Institute of Basic Medical Sciences, Chinese Academy of Medical Sciences (Beijing, China). Female BALB/c nude mice were purchased from Vital River laboratory animal technology Co., Ltd. (Beijing, China).

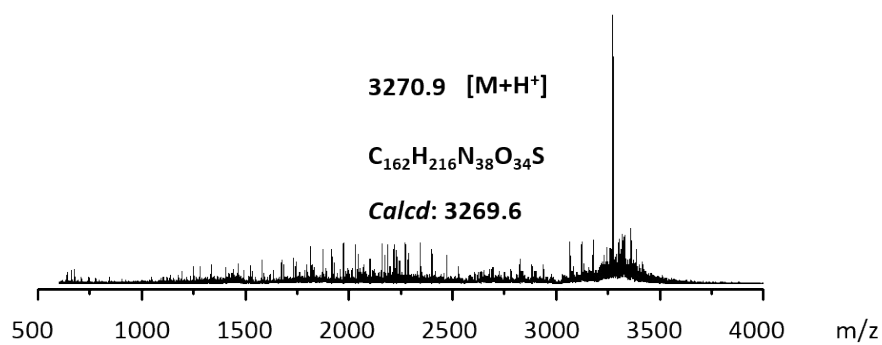


**Fig. S1.** The chemical structure of **P-RT** and its MALDI-TOF-MS.

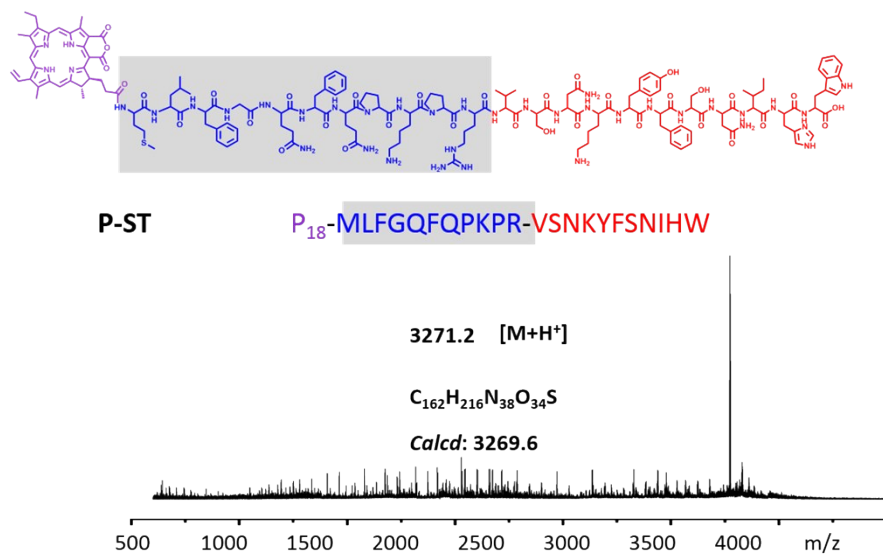


**P-RS**

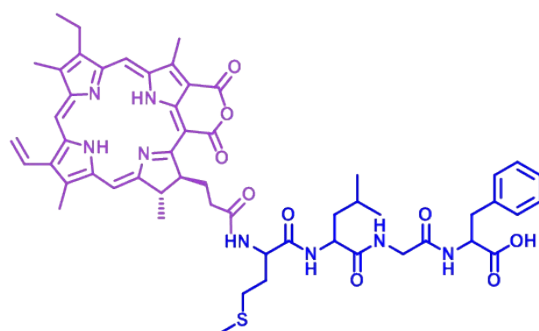
**P<sub>18</sub>-MLGFFQQPKPR-ISKSVYNFWNH**



**Fig. S2.** The chemical structure of **P-RS** and its MALDI-TOF-MS.

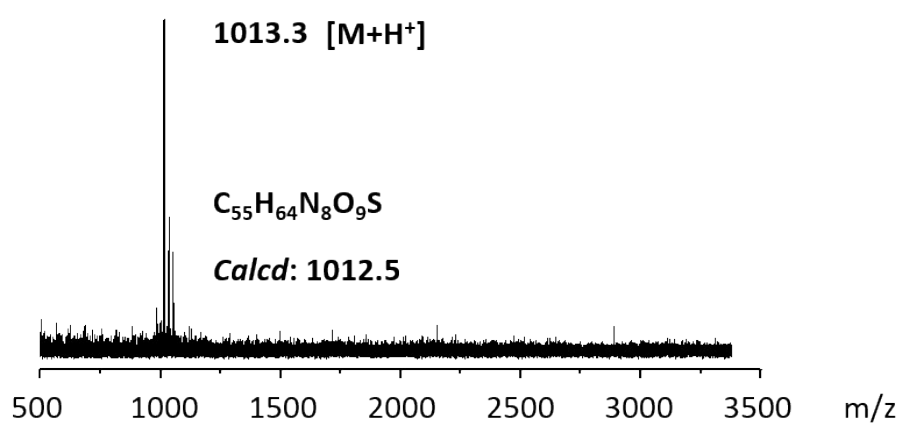


**Fig. S3.** The chemical structure of **P-ST** and its MALDI-TOF-MS.

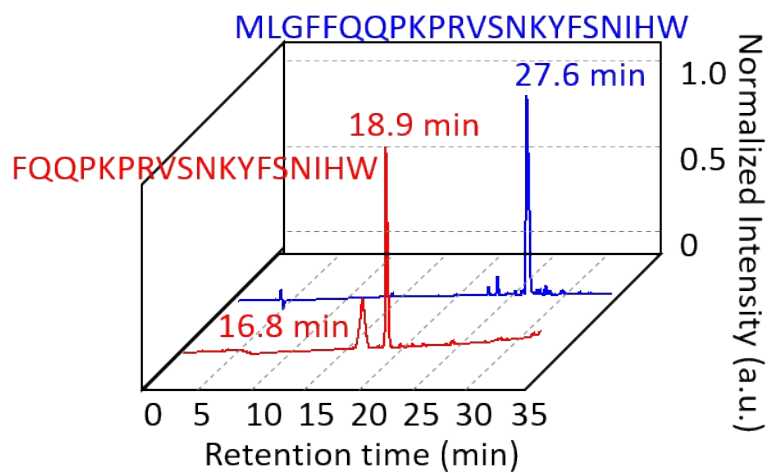


**P-Res**

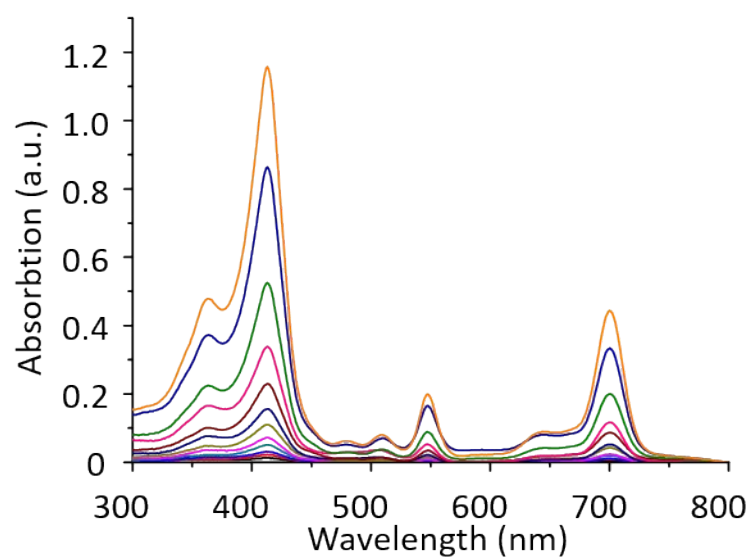
**P<sub>18</sub>-MLGF**



**Fig. S4.** The chemical structure of **P-Res** and its MALDI-TOF-MS.

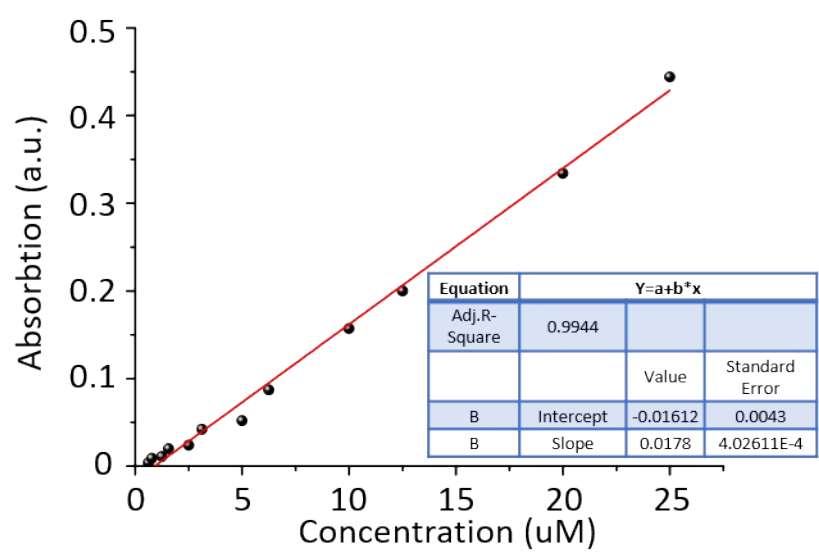


**Fig. S5.** The high performance liquid chromatography (HPLC) profiles of peptide residue of **P-RT** (MLGFFQQPKPRVSNKYFSNIHW) and after tailored by Cathepsin E.

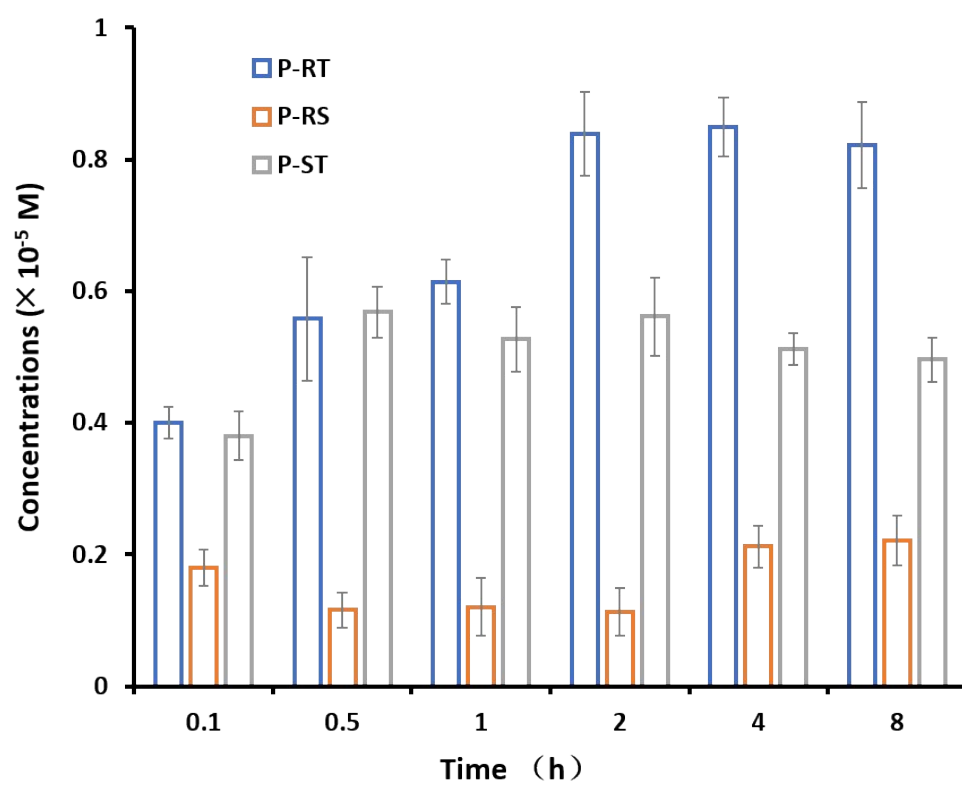


**Fig. S6.** Concentration-dependent UV/Vis absorption spectra of P18 (0-25  $\mu\text{M}$ ) dissolved in DMSO.

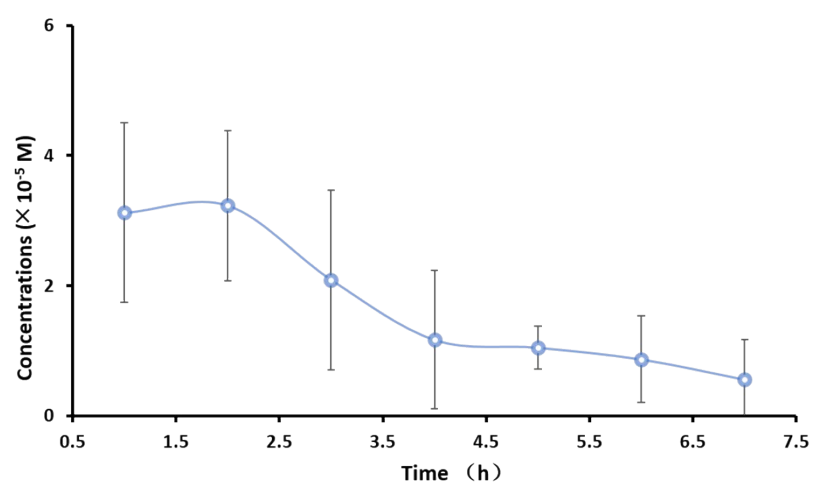




**Fig. S7.** UV/Vis absorption standard curve of P18 dissolved in DMSO.



**Fig. S8.** The time-dependent accumulation of molecules in cells.



**Fig. S9.** The time-dependent accumulation of **P-RT** *in vivo*.