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Ruthenium-peptide conjugates for targeted phototherapy

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Citation
Zhang, I. (2023, July 4). *Ruthenium-peptide conjugates for targeted phototherapy*. Retrieved from https://hdl.handle.net/1887/3628436

Version:	Publisher's Version
License:	Licence agreement concerning inclusion of doctoral thesis in the Institutional Repository of the University of Leiden
Downloaded from:	https://hdl.handle.net/1887/3628436

Note: To cite this publication please use the final published version (if applicable).

Stellingen

behorende bij het proefschrift

Ruthenium-Peptide Conjugates for Targeted Phototherapy

1. Peptide conjugation to anticancer metallodrugs is an effective strategy to improve their biocompatibility and tumor selectivity at low synthetic costs. (*This thesis, Chapter 2, 3, 4 & 5*).

2. When designing ruthenium-peptide conjugates for photoactivated chemotherapy, a balance should be made between steric hindrance and electronic effects to achieve both good dark stability and high photosubstitution efficiency. (*This thesis, Chapter 2*).

3. A ruthenium-based prodrug for photoactivated chemotherapy that is initially incapable of producing singlet oxygen can become a good dioxygen photosynthesizer upon reaction with biomolecules and subsequent light activation. (*This thesis, Chapter 4 & 5*).

4. *In vivo* studies using mice models are time-consuming and expensive, zebrafish models are better choices for researchers who focus primarily on the biodistribution of drugs. (*This thesis, Chapter 3, 4 & 6*).

5. Learning from the wisdom of nature is of great significance to the development of science. (Lee, L. P., *et al. Science* **310**, 1148-1150 (**2005**); Mann, J. *Nature Reviews Cancer* **2**, 143-148 (**2002**)).

6. The combination of PACT and/or PDT with other therapeutic modalities is able to provide opportunities to exploit the advantages of each of them, and offset their disadvantages. (Chen, X., *et al. Nature reviews Clinical oncology* **17**, 657-674 (**2020**); McFarland, S. A., *et al. Journal of the American Chemical Society* **144**, 9543-9547 (**2021**)).

7. Further development and novel applications of photoactivated chemotherapy requires collaborative efforts from different disciplines. (Agostinis, P., *et al.* CA: *a cancer journal for clinicians* **61**, 250-281 (**2011**); Poynton, F. E., *et al. Chemical Society Reviews* **46**, 7706-7756 (**2017**)).

8. Prolonging drug retention time is equally important as improving its accumulation efficiency in tumors. (Oku, N., *et al. Cancer letters* **167**, 49-56 (**2001**)).

9. A universal cell-viability assay for metal-based anticancer complexes is needed.

10. Better think twice and find good collaborators when performing research, as the number of experiments that can be performed during a PhD thesis is finite.

11. Medicinal chemists should read clinical articles.

12. The honor gained with a PhD degree does not only belong to yourself.

Liyan Zhang

Leiden, July 2023