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The metallophilic interaction between cyclometalated complexes: photobiological applications

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PROPOSITIONS (STELLINGEN)

accompanying the thesis

The Metallophilic Interaction between Cyclometalated Complexes: Photobiological Applications

1. The majority of literature claims that red light activation is better for photodynamic therapy than blue light activation. However, blue light activation can be very good for *in vivo* PDT, too. (P. Gholam, et.al., *J. Dtsch. Dermatol. Ges.*, **2018**, 16, 711-717).
2. A photosensitizer capable of performing PDT type I is more susceptible to kill hypoxic cancer cells, than photosensitizers triggering PDT type II. (S. A. McFarland, et al., *Curr. Opin. Chem. Biol.* **2020**, 56, 23-27)
3. The potential of the metal...metal interaction in d^8 and d^{10} metal complexes for phototherapeutic applications is still under-utilized. (V. W. W. Yam, et al., *Chem. Rev.* **2015**, 115, 7589-7728)
4. The current development stage of nanotechnology is not high enough to deliver drugs efficiently to tumors *in vivo*. (S. Wilhelm, et al., *Nat. Rev. Mater.* **2016**, 1, 1-12)
5. Cyclometalation is not only a feasible method to create palladium- or platinum-based photosensitizers activatable with visible light, but also a strategy to achieve metal...metal interaction. (*This thesis, Chapters 2, 3 & 5*)
6. Changing the metal center in a d^8 metal complex by another d^8 metal center can dramatically change its photophysical and photobiological properties. (*This thesis, Chapters 3 & 4*)
7. The aggregation state of a metallodrug in cell medium or in blood strongly influences its biological effects. (*This thesis, Chapters 3, 4, 5 & 6*)

8. Noble metal complexes can easily be tracked by ICP-MS in cells or organs, as they are not endogenous to these systems. (*This thesis, Chapters 3, 4, 5 & 6*)
9. The primary aim and final outcome of a fundamental research project sometimes look like two different branches in a tree.
10. If chemists cannot find their dream job in chemistry, they may also become a cook.
11. The presentation and writing skills of a PhD student provide information on whether they enjoy doing research and if they are suitable for academia.
12. Finding the appropriate cooperation either within the host institute, through conferences, or by reading published papers, can greatly save time and improve research quality.

Xuequan Zhou,

Leiden, April 2021