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Abstract

Chemiluminescent Self-Activating Photosensitizers for Selective Anticancer Therapy †

Carla M. Magalhães [1,*], Patricia González-Berdullas [1], Joaquim C. G. Esteves da Silva [1,2] and Luís Pinto da Silva [1,2]

[1] Chemistry Research Unit (CIQUP), Institute of Molecular Sciences (IMS), Department of Geosciences, Environment and Territorial Planning, Faculty of Sciences, University of Porto, Rua do Campo Alegre s/n, 4169-007 Porto, Portugal
[2] LACOMEPHI, GreenUPorto, Department of Geosciences, Environment and Territorial Planning, Faculty of Sciences, University of Porto, Rua do Campo Alegre s/n, 4169-007 Porto, Portugal
* Correspondence: up201201533@fc.up.pt
† Presented at the 8th International Electronic Conference on Medicinal Chemistry, 1–30 November 2022; Available online: https://ecmc2022.sciforum.net/.

Keywords: chemiluminescence; self-illuminating; tumor-selective; anticancer

Cancer is a challenging disease to treat, regarding treatment efficiency and side-effects. To overcome these problems, extensive studies are exploring therapies with reduced side-effects, such as photodynamic therapy (PDT). PDT has advantages over conventional therapies; however, its dependence on light limits it to treating tumors under the skin/on the outer lining of organs [1]. We developed new photosensitizers that can self-activate intracellularly with tumor selectivity based on chemiluminescent reactions involving a cancer marker. The photosensitizer is directly chemiexcited to a triplet excited state generating singlet oxygen, without an external light source. Thus, we aimed to develop self-activating photosensitizers which can be used for light-free photodynamic therapy, eliminating its light-related restrictions [2,3]. Cytotoxicity assays with breast and prostate cell lines showed that the novel photosensitizers possess significant toxicity toward tumor cells, while not affecting normal cells. Furthermore, we compared the activity of these compounds with reference chemotherapeutic drugs, finding higher cytotoxicity [3].

Supplementary Materials: The conference presented material is available at: https://www.mdpi.com/article/10.3390/ECMC2022-13174/s1.

Author Contributions: Conceptualization, L.P.d.S.; Funding acquisition, L.P.d.S.; Investigation, C.M.M. and P.G.-B.; Supervision, J.C.G.E.d.S. and L.P.d.S.; Visualization, C.M.M. and P.G.-B.; Writing—original draft, C.M.M.; Writing—review & editing, J.C.G.E.d.S. and L.P.d.S. All authors have read and agreed to the published version of the manuscript.

Funding: The Portuguese "Fundação para a Ciência e Tecnologia" (FCT, Lisbon) is acknowledged for funding of project PTDC/QUI-QFI/2870/2020. Carla Magalhães acknowledges FCT for funding her PhD grant (SFRH/143211/2019). Luís Pinto da Silva also acknowledges funding from FCT (CEECINST/00069/2021).

Institutional Review Board Statement: Not applicable.

Informed Consent Statement: Not applicable.

Acknowledgments: The Laboratory of Computational Modelling of Environmental Pollutant-Human Interactions (LACOMEPHI) and the Materials Center of the University of Porto (CEMUP) are acknowledged.

Conflicts of Interest: The authors declare no conflict of interest.

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Citation: Magalhães, C.M.; González-Berdullas, P.; Silva, J.C.G.E.d.; Silva, L.P.d. Chemiluminescent Self-Activating Photosensitizers for Selective Anticancer Therapy. *Med. Sci. Forum* **2022**, *14*, 37. https://doi.org/10.3390/ECMC2022-13174

Academic Editor: Maria Emília Sousa

Published: 1 November 2022

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