




## Photodiagnosis and Photodynamic Therapy

Volume 41, March 2023, 103447

---

# Gemini imidazolium gels enhance the photodynamic performance of porphyrins

Kavya ANGULURI<sup>1</sup>, Saman BAGHERPOUR<sup>1,2</sup>, Thais ABELHA<sup>1</sup> , Lluïsa PÉREZ-GARCÍA<sup>1,2</sup>

<sup>1</sup> Departament de Farmacologia, Toxicologia i Química Terapèutica, Universitat de Barcelona, Spain


<sup>2</sup> Institut de Nanociència i Nanotecnologia UB (IN2UB), Universitat de Barcelona, Spain

Available online 27 March 2023, Version of Record 27 March 2023.

Show less 

 Share  Cite

---

<https://doi.org/10.1016/j.pdpdt.2023.103447> 

[Get rights and content](#) 

---

### ABSTRACT

Photodynamic therapy (PDT) successful clinical use has led to an emerging interest in the development of improved delivery systems for photosensitizers. Amongst different formulations, gels have the advantage of being easier to apply, providing greater adhesion to the affected region and allowing light penetration. Importantly, we have previously reported that by incorporating porphyrin into a bisimidazolium gelator matrix there is an increased reactive oxygen species (ROS) generation compared to the photosensitizer in solution [1]. Motivated by this, we report further assessment on the photosensitizing capabilities of porphyrins in a gel structure. In this work, we evaluated effect of varying the chemical structures of porphyrins on their photosensitizing capabilities whilst embedded within a supramolecular hydrogel based on gemini imidazolium amphiphiles. The investigated porphyrins presented enhanced singlet oxygen ( $^1O_2$ ) within the hydrogel matrix compared to solution and showed negligent release in relevant biological media. Rheological measurements revealed that porphyrin hydrogels presented desirable viscoelastic properties as a functional delivery system for PDT.

**ACKNOWLEDGEMENT:** This work was supported with funds from the Spanish Government Grant PID2020-115663GB-C32 funded by MCIN/AEI/10.13039/501100011033. We also thank the Universitat de Barcelona, the Spanish Ministry of Universities, the NextGenerationEU plan, the European Union and the Spanish national Recovery, Transformation and Resilience plan.

---

### Section snippets

## REFERENCES

1. Mario Samperi, David Limón, David B. Amabilino, Lluïsa Pérez-García (2020) Enhancing Singlet Oxygen Generation by Self-Assembly of a Porphyrin Entrapped in Supramolecular Fibers, Cell Reports Physical Science, 1:3-100030, <https://doi.org/10.1016/j.xcrp.2020.100030>...

...

## References (0)

## Cited by (0)

## Recommended articles (6)

Research article

**Detection of random vapour concentrations using an integrating diamond gas sensor**

Sensors and Actuators B: Chemical, Volume 195, 2014, pp. 603-608

[Show abstract](#) ✓

Research article

**Multivariate analysis of heavy metals in pharmaceutical wastewaters of National Industrial Zone, Rawat, Pakistan**

Physics and Chemistry of the Earth, Parts A/B/C, Volume 130, 2023, Article 103398

[Show abstract](#) ✓

Research article

**Twinking electrical and magnetic properties of Al–Ni co-doped ZnO nanopowders**

Ceramics International, Volume 40, Issue 9, Part B, 2014, pp. 14927-14932

[Show abstract](#) ✓

Research article

**Profit maximization in cache-aided intelligent computing networks**

Physical Communication, Volume 58, 2023, Article 102065

[Show abstract](#) ✓

Research article

**A study on the effects of natural resource abundance and foreign direct investment on regional eco-efficiency in China under the target of COP26**

Resources Policy, Volume 82, 2023, Article 103529

[Show abstract](#) ✓

Research article

## Investigating the sensitization of the ytterbium(III) NIR emission by non-sandwich type Yb(III)-porphyrin coordination compounds

Journal of Molecular Structure, Volume 1285, 2023, Article 135499

[Show abstract](#) 

---

[View full text](#)

Copyright © 2023 Published by Elsevier B.V.



Copyright © 2023 Elsevier B.V. or its licensors or contributors.  
ScienceDirect® is a registered trademark of Elsevier B.V.

