

CURRICULUM VITAE ABREVIADO (CVA)

IMPORTANT – The Curriculum Vitae cannot exceed 4 pages. Instructions to fill this document are available in the website.

Part A. PERSONAL INFORMATION

First name	Gema		
Family name	de la Torre Ponce		
Open Researcher and Contributor ID (ORCID) (*)	0000-0002-4585-9746		

(*) Mandatory

A.1. Current position

Position	Full Profesor (5 SEXENIOS)		
Initial date	2022-10-17		
Institution	Universidad Autónoma de Madrid		
Department/Center	Organic Chemistry Department	Faculty of Science	
Country	Spain		
Key words	Organic Chemistry – Molecular Materials- Porphyrinoids – Metallo-supramolecular Systems – Biomedical Applications		

A.2. Previous positions (research activity interruptions, indicate total months)

Period	Position/Institution/Country/Interruption cause
14/05/2008 - 17/10/2022	Associate Professor
1/10/1997 - 14/05/2008	Assistant Professor

A.3. Education

PhD, Licensed, Graduate	University/Country	Year
Bachelor degree (Chemistry)	Universidad Autónoma de Madrid	1992
Master degree (Chemistry)	Universidad Autónoma de Madrid	1993
PhD (Chemistry)	Universidad Autónoma de Madrid	1998

Part B. CV SUMMARY (max. 5000 characters, including spaces)

I defended my PhD in 2008 with the maximum mark and awarded with a special mention. During my PhD, I acquired a solid knowledge on the synthesis of phthalocyanines and related macrocycles able to self-organize in liquid crystals and thin films, which exhibited non-linear optical properties. During the period 2000-2002, I combined my teaching duties as Assistant Professor with two postdoctoral stays of one year each: in the group of Prof. W. Blau (Trinity College, Ireland, 2000-2001) on the preparation of carbon-nanotube phthalocyanine ensembles; and with Prof. N. Martín (Universidad Complutense de Madrid, 2001-2002), on the synthesis of multicomponent systems based on porphyrins and conjugated oligomers. Both stays were relevant for the progress of my future research. Since then, I have been working in the Organic Chemistry Department at UAM, in the framework of the Nanoscience and Molecular Materials group. My scientific activity has been focused on the synthesis and study of molecular materials based on **phthalocyanines and other porphyrinoids able to absorb light and trigger a variety of photophysical processes for different applications**. In particular, I have developed multicomponent donor-acceptor ensembles as models to study photoinduced electron transfer processes, and as photoactive materials for solar cells (*Angew. Chem. Int. Ed.* **2012**, *51*, 4375; *Angew. Chem. Int. Ed.* **2015**, *54*, 7688; *Chem. Sci.* **2015**, *6*, 3018-3025; *Angew. Chem. Int. Ed.* **2019**, *58*, 4056). Particularly, in the field of dye-sensitized solar cells, record energy conversion efficiencies were obtained, which still stand among the highest values obtained with this type of molecules. Worth mentioning are the pioneering works on the covalent and non-covalent functionalization of carbon nanotubes (*J. Am. Chem. Soc.* **2010**, *132*, 16202; *J. Am. Chem. Soc.*, **2008**, *130*, 11503; *J. Am. Chem. Soc.* **2010**, *132*, 16202) and graphene (*Angew. Chem. Int. Ed.* **2012**, *51*, 4375; *Chem. Sci.*, **2013**, *4*, 4035; *J. Am. Chem. Soc.* **2014**, *136*, 4593; *Chem. Sci.* **2014**, *5*, 3432) with phthalocyanines, which were published in high-impact journals and are still cited as reference nanostructured materials. Always focused on the use of light to trigger useful chemical processes, in the last years I have

embarked on the development of novel porphyrinoid photosensitizers for biomedical applications, in collaboration with Prof. S. Nonell. (*Eur. J. Med. Chem.* **2020**, *187*, 111957; *Chem. Eur. J.* **2021**, *27*, 4955; *Adv. Therap.* **2023**, 2300116). More recently, I have started a new research line focused on the development of porphyrinoid capsules that, for the first time, give rise to photocatalyzed reactions over fullerene species within the confined cavity (*Chem. Sci.* **2022**, *13*, 9249), and on the preparation of water-soluble metallo-organic cavities that perform as catalytic containers for cycloaddition reactions (*Angew. Chem. Int. Ed.* **2023**, *62*, e202311255; *Adv. Synth. Cat.* **2024**, DOI: 10.1002/adsc.202301336) together with other metallo-supramolecular assemblies for biomedical applications (*J. Med. Chem.* **2023**, *66*, 3448). Overall, my research work has led to **103 publications**, most of them in high impact journals (74 in Q1), **four book chapters** and **two patents**. With **ca. 9000 citations**, I have an **H-index of 39** (Scopus, April 2025). Apart from the literature revisions, I have 10 research articles in the range of 100-300 citations, which is also indicative of the impact of my research. Many of the works have been developed in collaboration with international researchers who are reference in the area (Dirk M. Guldi, Michael Grätzel, Dennis K. P. Ng). I have participated in **37 I+D national and international projects and has led (PI) a collaborative (Spain-USA) project (2010-2013), two national projects (2015-2017, 2021-2024) and a contract with the pharmaceutical company Neuropharma**. I have supervised several degree and master students, **eight doctoral thesis (two of them ongoing)**, five postdocs and several foreigner students doing short stays. Four out of the five thesis already defended resulted in 7-8 publications, which is indicative of the successful scientific training of the doctorates. All of them are developing scientific careers, either at scientific institutes or in private companies. I have imparted **24 invited talks** and participated in **38 national and international conferences**. Also, I have organized five international symposia and a national Molecular Materials School. I was invited editor for a special number of *Journal of Porphyrins and Phthalocyanines*. I have participated in the evaluation of project proposals for ANEP and DEVA, and in the evaluation of "Ramón y Cajal" grants. I am a regular referee for different scientific journals (ACS, RSC, Wiley, Elsevier). Currently, I am Coordinator of the Doctorate Program in Organic Chemistry at UAM.

Part C. RELEVANT MERITS (sorted by typology)

C.1. Publications

1. I. Paramio, G. Dai, T. Torres, D. K. P. Ng, G. de la Torre, "Self-assembled nanoparticles of glycosylated AABB-type phthalocyanines for selective photodynamic therapy" *Bioorg. Chem.* **2026**, *169*, 109376.
2. A. Salazar Pollo, J. Labella, S. Kumar, T. Torres, **G. de la Torre*** "Acceleration of the Diels-Alder reaction between 9-functionalized anthracenes and C60/C70 in the cavity of a water soluble subphthalocyanine cage" *Adv. Synth. Cat.* **2024**, 366, 934-941.
3. I. Paramio, P. Merino, T. Torres, G. de la Torre* "Subphthalocyanine metallo-organic cage as catalytic molecular photoreactor for the functionalization of fullerenes" *Supramolecular Chemistry* **2024**, *34*, 427-435. DOI: 10.1080/10610278.2024.2395912.
4. I. Paramio, T. Torres, **G. de la Torre*** "Controlling the reactivity of phthalonitriles for the efficient synthesis of chiral phthalocyanines with self-assembly abilities" *Org. Chem. Front.* **2024**, *11*, 60 - 66.
5. A. Salazar Pollo, S. Kumar, M. Moreno-Simoni, J. Labella, T. Torres, **G. de la Torre*** "Supramolecular Subphthalocyanine Cage as Catalytic Container for the Functionalization of Fullerenes in Water", *Angew. Chem. Int. Ed.* **2023**, *62*, e202311255.
6. I. Paramio, A. Salazar, M. Jordà-Redondo, S. Nonell, T. Torres, **G. de la Torre,*** "Nanostructured AABB Zn (II) Phthalocyanines as Photodynamic Agents for Bacterial Inactivation" *Adv. Therap.* **2023**, 2300116.
7. G. Durán-Sampedro, E. Y. Xue, M. Moreno-Simoni, C. Paramio, T. Torres, D. K. P. Ng, **G. de la Torre*** "Glycosylated BODIPY- Incorporated Pt(II) Metallacycles for Targeted and Synergistic Chemo-Photodynamic Therapy" *J. Med. Chem.* **2023**, *66*, 3448-3459.
8. M. Moreno-Simoni, T. Torres, **G. de la Torre*** "Subphthalocyanine capsules: molecular reactors for photoredox transformations of fullerenes" *Chem. Sci.* **2022**, *13*, 9249-9255.
9. I. Paramio, T. Torres, **G. de la Torre*** "Self-Assembled Porphyrinoids: One-Component Nanostructured Photomedicines" *ChemMedChem* **2021**, *16*, 2441-24

10. G. Bottari, **G. de la Torre**, D. M. Guldi, T. Torres, "An exciting twenty-year journey exploring porphyrinoid-based photo- and electro-active systems", *Coord. Chem. Rev.* **2021**, 428, 213605
11. M. A. Revuelta-Maza, E. de las Heras, M. Agut, S. Nonell, T. Torres, **G. de la Torre*** "Self-assembled binaphthyl-bridged amphiphilic AABB phthalocyanines: nanostructures for efficient antimicrobial photodynamic therapy" *Chem. Eur. J.* **2021**, 27, 4955.
12. M. Á. Revuelta-Maza, P. González-Jiménez, C. Hally, M. Agut, S. Nonell, **G. de la Torre***, T. Torres, "Fluorine-substituted tetracationic ABAB-phthalocyanines for efficient photodynamic inactivation of Gram-positive and Gram-negative bacteria", *Eur. J. Med. Chem.* **2020**, 187, 111957.
13. M. A. Revuelta-Maza, T. Torres, **G. de la Torre*** "Synthesis and aggregation studies of functional binaphthyl-bridged chiral phthalocyanines", *Org. Lett.* **2019**, 21, 8183.
14. M. A. Revuelta-Maza, S. Nonell, **G. de la Torre*** T. Torres, "Boosting the singlet oxygen photosensitization abilities of Zn(II) phthalocyanines through functionalization with bulky fluorinated substituents" *Org. Biomol. Chem.* **2019**, 17, 7448.
15. O. Langmar, E. Fazio, P. Schol, **G. de la Torre**, R. D. Costa, T. Torres, D. M. Guldi, "Controlling Interfacial Charge Transfer and Fill Factors in CuO-based Tandem Dye-Sensitized Solar Cells" *Angew. Chem. Int. Ed.* **2019**, 58, 4056.
16. M. A. Revuelta-Maza, C. Hally, S. Nonell, **G. de la Torre***, T. Torres, "Crosswise phthalocyanines with collinear functionalization: new paradigmatic derivatives for efficient singlet oxygen photosensitization", *ChemPlusChem* **2019**, 84, 673.
17. M. Urbani, **G. de la Torre**, M. K. Nazeeruddin, T. Torres, "Phthalocyanines and porphyrinoid analogues as hole- and electron-transporting materials for perovskite solar cells" *Chem. Soc. Rev.* **2019**, 48, 2738.
18. E. Fazio, K. A. Winterfeld, A. López-Pérez, T. Torres, D. M. Guldi, **G. de la Torre*** "Synergy of light harvesting and energy transfer as well as short-range charge shift reactions in multicomponent conjugates" *Nanoscale* **2018**, 10, 22400.
19. E. Fazio, C. J. E. Haynes, **G. de la Torre***, J. R Nitschke, T. Torres, "Giant M_2L_3 metallo-organic helicate based on phthalocyanines as a host for electroactive molecules", *Chem. Commun.* **2018**, 54, 2651.
20. D. E. Meza Rojas, K. T. Cho, Y. Zhang, M. Urbani, N. Tabet, **G. de la Torre***, M. K. Nazeeruddin, T. Torres, "Tetrathienoanthracene and tetrathienylbenzene derivatives as hole-transporting materials for perovskite solar cell" *Adv. Energy Mat.* **2018**, 180068.
21. **G. de la Torre**, G. Bottari, T. Torres, "Phthalocyanines and Subphthalocyanines: Perfect Partners for Fullerenes and Carbon Nanotubes in Molecular Photovoltaics" *Adv. Energy Mater.* **2017**, 1601700.
22. O. Langmar, C. R. Ganivet, A. Lennert, R. D. Costa, **G. de la Torre**, T. Torres, D. M. Guldi Título: "Combining Electron-Accepting Phthalocyanines and Nanorod-like CuO Electrodes for p-Type Dye-Sensitized Solar Cells" *Angew. Chem. Int. Ed.* **2015**, 54, 7688–7692.
23. K. B. Ørnsø, J. M. Garcia-Lastra, **G. de la Torre**, F. J. Himpsel, A. Rubio, K. S. Thygesen "Design of two-photon molecular tandem architectures for solar cells by ab initio theory" *Chem. Sci.* **2015**, 6, 3018-3025.
24. A. Roth, M.-E. Ragoussi, L. Wibmer, G. Katsukis, **G. de la Torre***, T. Torres, D. M. Guldi "Electron-accepting phthalocyanine-pyrene conjugates: towards liquid phase exfoliation of graphite and photoactive nanohybrid formation with graphene", *Chem. Sci.* **2014**, 5, 3432-3438.
25. E. Fazio, J. Jaramillo-García, **G. de la Torre***, T. Torres "Efficient Synthesis of ABAB Functionalized Phthalocyanines" *Org. Lett.* **2014**, 16, 4706-4709.
26. M.-E. Ragoussi, G. Katsukis, A. Roth, J. Malig, **G. de la Torre***, D. M. Guldi, T. Torres "Electron-donating behaviour of few-layer graphene in covalent ensembles with electron-accepting phthalocyanines" *J. Am. Chem. Soc.* **2014**, 136, 4593–4598.

C.2. Congress

1. "Nanostructured amphiphilic phthalocyanines and metallo-supramolecular porphyrinoid assemblies for targeted phototherapy", 20th Congress of the European Society for Photobiology, Bari, Italy, August 2025. **Invited talk.**
2. "Exploiting the photosensitizing and molecular recognition abilities of metallo-supramolecular porphyrinoid cavities" XL Reunión Bienal de la Real Sociedad Española de Química, Bilbao, 30 Junio-3 julio 2025. **Oral communication**

3. "Metallosupramolecular subphthalocyanine cages: molecular containers for reactions on guest fullerenes", XIII International Conference on Porphyrins and Phthalocyanines (ICPP-13), Buffalo, USA, July 2024. **Invited talk.**
4. "Metallosupramolecular subphthalocyanine cages: molecular containers for reactions on guest fullerenes" International Symposium on Macrocyclic and Supramolecular Chemistry (ISMSC 2023), Reikiavik, Islandia, June 2023. **Oral communication**
5. "Metallosupramolecular subphthalocyanine cages: molecular reactors for photoredox and cycloaddition reactions on fullerenes", XXXVIII Reunión Biental de la Sociedad Española de Química, Granada, España, June 2022. **Oral communication**
6. "Phthalocyanine and subphthalocyanine cages: molecular flasks for chemical reactions over fullerenes", Twelve International Conference on Porphyrins and Phthalocyanines (ICPP12), Madrid, July 2022. **Invited talk.**
7. "Metallosupramolecular Assemblies of Phthalocyanines, Subphthalocyanines and Bodipys: Photosensitizers for Visible-Light Induced Processes", 241st ECS Meeting, Vancouver, Canadá, May-June 2022. **Invited talk.**
8. "Self-assembly of Chiral Phthalocyanine Amphiphiles", Eleventh International Conference on Porphyrins and Phthalocyanines (ICPP-11), Online Conference, July 2021. **Invited talk.**
9. "Versatile zinc(II) phthalocyanines for n-type and p-type dye-sensitized solar cells", OrgEnergy Symposium IMDEA Nanociencia, Madrid, January 2019. **Invited talk.**
8. "Phthalocyanine-based metallorganic M2L3 helicate as host for electroactive molecules", Tenth International Conference on Porphyrins and Phthalocyanines (ICPP10), Munich, Alemania, July 2018. **Invited talk.**
10. "Phthalocyanine-based metallorganic M2L3 helicate as host for electroactive molecules", XVII Escuela Nacional de Materiales Moleculares, Torremolinos, Málaga, February 2018. **Invited talk.**
11. "New multicomponent, phthalocyanine-based ensembles for energy conversion schemes" IX International Conference on Porphyrins and Phthalocyanines, Nanjing, China, July 2016. **Invited talk.**
12. "New Push-Pull Multicomponent Phthalocyanine-Based Photosensitizers for DSSC", 227th ECS Meeting, Chicago, EEUU, May 2015. **Invited talk.**

C.3. Research projects

- 1- Ref. PID 2023-149483NB-C21. Nuevas estrategias para superar el reto de la hipoxia en terapia fotodinámica. Síntesis de cajas metalo-orgánicas y biohíbridos de porfirinoides. MICIIN, Duration 1.09.2024 - 31.08.2027. Funding: 159.375 euros. **Participation: PI**
- 2- Ref. PID2020-115801RB-C21, Nanosistemas auto-ensamblados multifuncionales para aplicaciones fototeranósticas. Síntesis y caracterización supramolecular, MICIIN, Duration 1.09.2021 - 31.08.2024. Funding: 121.00 euros. **Participation: PI**
- 3- Ref. PCI2019-111889-2, Carbon Based Perovskite Solar Cells with UNI-Directional Electron Bulk Transport: in the QUES of a Short Time to Market " (UNIQUE), ERA-NET/Cofund, MINECO, Duration: 01.09.2019 - 1.08.2022. Funding: Financiación: 148.000 Euros. IP: Tomás Torres. Participation: Researcher
- 43- Ref. CTQ2017-85393-P "Ftalocianinas y compuestos relacionados: sistemas multicomponente, química en superficies, y aplicaciones en fotovoltaica molecular y terapia fotodinámica" (PTHALOPHOTO), MINECO. Duration 1/01/2018- 31/12/2020. Funding 369.050 Euros. IP: Tomás Torres. Participation: Researcher.
- 4- Ref. CTQ2015-71936-REDT "Modificación química del grafeno para nuevas propiedades y aplicaciones" (GRAPAS), MINECO. Coordinator of the network: Fernando Langa (Instituto de Nanociencia, Nanotecnología y Materiales Moleculares, Universidad de Castilla-La Mancha). Duration: 1/12/2015- 30/11/2017. Funding: 30.000 Euros. **Participation: PI**
- 5- Ref: 310337-2 CosmoPHOS CP-IP "Novel nanotechnology-enabled system for endovascular in vivo near-infrared fluorescence molecular imaging and endovascular near-infrared targeted photodynamic therapy of atherosclerotic heart disease" (CosmoPHOS)" EU, Programme "Nanosciences, Nanotechnologies, Materials and New Production Technologies ", FP7-NMP-2012-LARGE-6. IP UAM: Tomás Torres. Duration: 2013–2016. Funding: 679.426 Euros. Participation: Researcher

C.4. Contracts, technological or transfer merits,

Two Patents in 2011