

**A. PERSONAL INFORMATION**

**Name:** Pedro J. Pérez      **Age:** 61  
**Institution:** Universidad de Huelva  
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**URL:** <https://uhu-ciqso.es/homogeneous-catalysis-laboratory/>  
**Open Researcher and Contributor ID (ORCID):** 0000-0002-6899-4641

**A.1. Current position**

Position	Full Professor		
Initial date	April 1st 2005		
Institution	Universidad de Huelva		
Departament/Center	Departamento de Química – Centro de Investigación en Química Sostenible		
Country	SPAIN	Phone number	+34 959 219956
Key words	Homogeneous catalysis –organometallic chemistry		

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

Period	Position/Institution/Country/Interruption cause
April /2005-today	Full Professor / Univ. Huelva / Spain
Dic 1995-March 2005	Associate Professor / Univ. Huelva / Spain
Jun 1994 – Sept 1994	Visiting Researcher Dupont Exp.Station /Wilmington DE / USA
Sept 1993 - Nov 1995	Assistant Professor /Univ. Huelva/Spain
March 1993 – Aug 1993	Assistant Professor /Univ. Sevilla/Spain
Oct 1991 – Feb 1993	Postdoctoral Fellow, Fulbright Scholar / University of North Carolina at Chapel Hill/ USA
Ene 1989 – Sep 1991	Graduate Student, FPI fellow / Univ. Sevilla/ Spain
Oct 1987 – Dic 1988	Graduate Student, CAYCIT fellow / Univ. Sevilla / Spain

**A.3. Education**

PhD, Licensed, Graduate	University/Country	Year
Chemistry B Sc Degree	Sevilla/Spain	1987
Chemistry Ph. D.	Sevilla/Spain	1991

**Part B. CV SUMMARY**

**1. Scientific contributions.** Throughout my three decades independent career, my main research focus has been the development of catalytic systems for the valorisation of available hydrocarbons as raw materials, whether saturated or unsaturated. I have placed particular emphasis on highly inert alkanes through metal-catalysed carbon–hydrogen bond functionalisation processes. A brief description of the main research achievements in the last 10-15 years is given below.

a) Carbene transfer reactions to methane and other alkanes. We have developed families of catalysts based on Cu or Ag for carbene transfer reactions (using diazo compounds as carbene source), acquiring the knowledge to finally reach the most inert C-H bonds of these molecules, methane, using supercritical carbon dioxide as the reaction media (*Science* **2011**, 332, 835). With this methodology we have provided a nucleophilic scale for alkanes, based on methane (*ACIE* **2018**, 57, 13848) as well as a model to predict such reactivities (*ACIE* **2020**, 59, 3112). Methane trifluoroethylation has also been achieved (*JACS* **2024**, 146, 34014). We also disclosed the first Ag-catalyzed regioselective transformation of secondary C-H bonds in linear alkanes (*JACS* **2022**, 144, 13275).

b) Hydrocarbon modification by nitrene or oxo incorporation. Using Cu- or Ag-based catalysts, we have disclosed unknown reactions involving the incorporation of nitrene groups to hydrocarbons, including the amidation of methane (*ACIE*, **2021**, 60, 18467; *JACS* **2026**, 148, 9057). Those transformations are the following: conversion of furans into 1,2-dihydropyridines (*JACS* **2010**, 132, 4600); direct synthesis of oxazoles from alkynes and carbonyl azides (*JACS* **2011**, 133, 191); selective aziridination of dienols (*ACIE* **2010**, 49, 7092 and *JACS* **2014**, 136, 5342); direct formation of aminimides (*JACS* **2017**, 139, 2216); alkyne conversion into sulfinamines and isothiazoles (*ACIE* **2017**, 56, 12842); intermolecular allene nitrene incorporation (*JACS* **2020**, 142, 13062); silane Si-H amidation (*JACS* **2022**, 144, 10608); 1,3-enyne functionalization by nitrene addition (*Chem. Catalysis* **2024**, 4, 100865); aziridination of

fluorinated olefins (*ACIE* **2025**, *64*, e202419188); aziridination of polyolefins (*ACIE* **2025**, *64*, e22659). Of note the mechanistic interpretation we provided for the olefin aziridination reaction, which has been considered the model for this transformation since its publication (*JACS* **2013**, *135*, 1338). The copper catalyzed transfer of oxo moieties to alkanes, which also promotes a dehydrogenation process, was also developed in our laboratory (*JACS* **2013**, *135*, 3887). Other oxo transfer reactions involved benzene oxidation into phenol (*Chem. Sci.* **2017**, *8*, 8373; *Chem. Commun* **2011**, *47*, 8154),

c) Carbene stoichiometric reactions. The isolation of a copper-carbene complex from diazo compound (*JACS* **2021**, *143*, 4837) has led to a stable carbene transmetallating reagent which transmit the :C(H)Net<sub>2</sub> moiety to many transition metals (*Chem.* **2024**, *10*, 1576). This carbene is as nucleophilic as NHC ligands but with a significantly reduced size, affecting catalytic properties.

d) We have provided several alternative reaction media for alkane chemistry as supercritical fluids, micelles in water, or water itself, in the search for cleaner and safer condition (We have also discovered water as reaction medium for condensed alkane catalytic modification (*ACS Catal.* **2017**, *7*, 4265; *Chem. Commun.* **2019**, *55*, 11243; *ACIE* **2024**, *63*, e202314773).

**2) Funding.** Nine in-a-row funded Grants by “Plan Nacional/Estatal de I+D) since 2000, where PJP acted as PI. Also, three grants have been received from the Regional Government along those years. Grants for specific scientific equipment have also been obtained.

**3) Current Collaborations.** Collaborative work is currently developed with: John Hartwig (UC Berkeley), Feliu Maseras (ICIQ), Ainara Nova (U. Oslo), Martin Albrecht (Univ. Bern, Switzerland), Agusti Lledós (UAB), Bas de Bruin (U. Amsterdam), Jose Mata (UIJ), Marta Mosquera (UAH), Miquel Costas (UdG), J. L. Mascareñas (USC), Ana Albeniz (UVall), Maria Besora (URV), Anna Pla-Quintana (UdG), Jesus Campos (IIQ-CSIC), Juan Cámpora (USe), M. Carmen Nicasio (USe), Fernando Cossío (UPV), Javier Carreras (UAH), Antonio Echavarren (ICIQ).

**4) Technology transfer.** Several patents have been filed derived from our work. Some of them resulted from projects directly funded by some private companies, which whom a number of contracts have been developed. See below for a list of patents and such projects.

**5) Contribution to the careers of other researchers.** Public sector: M. C. Nicasio Professor U. Sevilla; T. R. Belderrain Professor U. Huelva; M. M. Díaz-Requejo Professor U. Huelva; A. Caballero, M. R. Fructos, J. Urbano, J. M. Muñoz-Molina, Senior Lecturers U. Huelva; J. Carreras Senior Lecturer, U. de Alcalá, I. Rivilla Senior Researcher, UPV; A. Olmos Senior Lecturer, U. Valencia. In the private sector: E. Haldón, Aptuit (Oxford); Patricia Pérez-Galán, *Origenis GmbH* (Germany); A. Pereira, *Autoneum Magnagement AG* (Geneve); Álvaro Beltrán, Riccardo Gava, *Bioplagen* (Sevilla); Silvia G. Rull, *Moeve*, J. D. Pizarro, *Moeve*.

**6) Leadership.** PJP is well-considered within those working in the field of C-H bond activation, as well as in organometallic reactions involving carbene, nitrene or oxo ligands, among others. See awards & recognitions received below. PJP currently leads the OASIS Network, with the participation of 48 research groups within the Organometallic Chemistry field ([www.netwoasis.com](http://www.netwoasis.com)).

## Part C. RELEVANT MERITS

### C.1. Selected Publications (2020-)

For a list of selected publications follow [this link](#).

(1) *Methane Catalytic Amidation via a Plausible Copper-Nitrene Intermediate*. Martínez-Laguna, J.; Cholewinska, A.; Borrego, E.; Besora, M.; Álvarez, M.; Caballero, A.; Pérez, P. J. *J. Am. Chem. Soc.* **2026**, *148*, 9057. (2) *Functionalization of Polyolefins via Catalytic Nitrene Addition*. Pérez-Ruiz, J.; Ramírez, M. R.; Rentero, C.; Sessini, V.; Mosquera, M. E. G.; Díaz-Requejo, M. M.; Pérez, P. J. *Angew. Chem. Int. Ed.* **2025**, *64*, e202419188. (3) *Introducing the Aziridination of Fluorinated Olefins by Metal-Catalyzed Nitrene Transfer*. J. Pérez-Ruiz, A. Rosales Martínez, M. M. Díaz-Requejo, P. J. Pérez. *Angew. Chem. Int. Ed.* **2025**, *64*, e202419188. (4) *Alkanes C1–C6 C–H Bond Activation via a Barrierless Potential Energy Path: Trifluoromethyl Carbenes Enhance Primary C–H Bond Functionalization*. J. Martínez-Laguna, J. Altarejos, M. Á. Fuentes, G. Sciortino, F. Maseras, J. Carreras, A. Caballero, P. J. Pérez. *J. Am. Chem. Soc.* **2024**, *146*, 34014. (5) *Molecular Dynamic Simulations of Aqueous Micellar Organometallic Catalysis: Methane Functionalization as a Case Study*. A. Matamoros-Recio, E. Alonso-Rueda, E. Borrego, A. Caballero, P. J. Pérez, Sonsoles Martín-Santamaría. *Angew. Chem. Int. Ed.* **2024**, *63*, e202314773. (6) A copper-masked monosubstituted carbene as a general transmetalating agent toward stable carbene complexes. *CHEM* **2024**, *10*, 1576. (7) *Carbene-Controlled Regioselective Functionalization of Linear Alkanes under Silver Catalysis*. M. Álvarez, F. Molina, P. J. Pérez. *J. Am. Chem. Soc.* **2022**, *144*, 23275-23279. (8) *Introducing the Catalytic Amination of Silanes via Nitrene*

*Insertion*. A. M. Rodríguez, J. Pérez-Ruiz, F. Molina, A. Poveda, R. Pérez-Soto, F. Maseras, M. M. Díaz-Requejo, P. J. Pérez. *J. Am. Chem. Soc.* **2022**, *144*, 10608-10614. **(9)** *Copper-Catalyzed Dehydrogenative Amidation of Light Alkanes*. M. A. Fuentes, R. Gava, N. I. Saper, E. A. Romero, A. Caballero, J. F. Hartwig, P. J. Pérez. *Angew. Chem. Int Ed.* **2021**, *60*, 18467-18471. **(10)** *Two Copper-Carbenes from One Diazo Compound*. M. Álvarez, M. Besora, F. Molina, F. Maseras, T. R. Belderrain, P. J. Pérez. *J. Am. Chem. Soc.* **2021**, *143*, 4837-4843. **(11)** *Intermolecular Allene Functionalization by Silver-Nitrene Catalysis*. M. R. Rodríguez, M. Besora, F. Molina, F. Maseras, M. M. Díaz-Requejo, **P. J. Pérez**. *J. Am. Chem. Soc.* **2020**, *142*, 13062-13071. **(12)** *A Quantitative Model for Alkane Nucleophilicity Based on C-H Bond Structural/Topological Descriptors*. Besora, A. Olmos, R. Gava, B. Noverges, G. Asensio, A. Caballero, F. Maseras, **P. J. Pérez**. *Angew. Chem. Int Ed.* **2020**, *59*, 3112-3116.

## C.2. General indicators

1996–2025 Supervision of 30 PhD Students (25 already graduated, 5 currently at Graduate School); 15 Post-doctoral associates; 14 Master Students; 8 International students/postdocs.

Publications in JCR-listed Journals: 205 (181 as independent Group Leader since 1996; 24 from pre- and postdoctoral periods). As Group Leader, more than 90% of the articles have appeared in Journals located at top 25% (Q1) in JCR listings. The overall (full career) citation number is ca>10.000 (Scopus), for an average of cites per article of ca. 50 and an h index of 57.

PJP has already obtained six consecutive positive evaluations for his research activity (1988-2023), and one additional positive evaluation in the field of Knowledge Transfer. Continuous funding from the Spanish National Program for R&D has been obtained (nine 3-year-Grants in a row, 2000-2027). Seven patents have also been filed. He has also edited twenty-four books and written several book chapters.

## C.3. Selected invited presentations at scientific meetings (2016-).

2025- Biennial meeting RSEQ Bilbao; 2023- 34th Symp. Carbene and Nitrene Chemistry, Amsterdam; XXV Euchems Conference on Organometallic Chemistry Alcala Henares; Barluenga Conference, Oviedo; 2022- Intl. Symp. Homogeneous Catalysis, Lisbon; Int. Conf. Coordination Chemistry, Rimini; LX Reunión del GEQO, Barcelona; Spring ACS Meeting San Diego; 2020 3rd Symposium Carbene and Nitrene Chemistry; 2019 E-WisPOC-19; UK-Spain Organometallic Chemistry Symposium; ACS Fall Meeting San Diego, USA; 2018: OM&Cat2018, ICOMC 2018; 2017: XVI International Symposium on Homogeneous Catalysis. 2017: I German-Spanish Meeting Frontiers of Chemistry, XXII Euchems Conference on Organometallic Chemistry, Swiss Chemical Society Meeting; 2016: 6th Euchems Meeting, 9th Asian-European on Metal-Mediated Efficient Organic Synthesis, 11th Spanish-Italian Symposium in Organic Chemistry, Dalton RSC Meeting, 4th Lower Saxonian Catalysis Symposium (NiKaS);

## C.4. Invited presentations at research institutions (2014-).

2023- U. Granada, U. Rovira I Virgili; 2022 U. Complutense; 2021 U. Sevilla; 2020 U. Emory, U. Basel; 2019 U. Bern, U. Valladolid; 2018: U. North Carolina, Chapel Hill; U. California-Berkeley; Caltech; 2017: CIQUS- U. Santiago; 2016: U. Zurich, U. Sussex, U. Oxford, Imperial College London, U. Autónoma (Madrid), U. Bern; 2015: U. North Carolina-Chapel Hill; 2014: U. Valencia, U. Complutense Madrid, U. Barcelona, U. Jaime I (Castellón); 2013: U. Autónoma (Barcelona).

## C.5. Research grants – (2014-)

**(1)** Soluciones catalíticas para desafíos sintéticos derivados de la funcionalización de enlaces de alta energía o no activados. AEI; 2025-2027; 310.000 €; PID2023-146946NB-I00. **(2)** Desarrollo de complejidad molecular mediante la formación de enlaces C-X (X = C, Si, N, O); MICCIN/ AEI; 2021-2024; 300.000 €; PID2020-113797RB-C21. **(3)** Toward green methanol: alternative paths for not-green syngas technologies. MICCIN/AEI; 2021-2023 (2 years); 194.200,00 €:TED2021-130077B-I00. **(4)** Grafeno como soporte activo en reacciones de funcionalización de hidrocarburos. Universidad de Huelva; 2022-2023 (2 years); 40.000,00€; UHU-202024. **(5)** Nuevas Metodologías Catalíticas para el Aprovechamiento de Metano y otros Alcanos como Materias Primas; Junta de Andalucía; 2018-2021; 134.750€; P18-RT-1536. **(6)** Desarrollo de sistemas catalíticos y estequiométricos basados en metales de transición para la funcionalización de enlaces carbono hidrógeno de hidrocarburos y sus derivados; MINECO/ AEI; 2018-2020; 320.000 €; CTQ2017-82893-C2-1-R. **(7)** Oxidación catalítica biomimética de metano a metanol. MINECO/DGI; 2015-2017; 56.000 €; CTQ2014-62234-EXP. **(8)** Valorización de materias primas asequibles: desarrollo de sistemas basados en metales para la activación y funcionalización de dióxido de carbono, hidrocarburos y dinitrógeno; MINECO/DGI; 2015-2017; 284.000 €; CTQ2014-52769-C3-1-R. **(9)** Strategies for the catalytic functionalization of non-activated

carbon-hydrogen bonds and other organic substrates; MINECO/DGI; 2012-2014; 263.000 €; CTQ2011-28942-C02-01.

#### C.6. Research Contracts with Industry (2016-).

(1) Title: Estudios mecanísticos de la actividad desinfectante de los diferentes tipos de ingredientes activos empleados en la actualidad. Company: BIOPLAGEN. Period: 2023-2026 (three years). Amount: 137.925,76 €. (2) Title: Estudios Cinéticos de Materiales Sorbentes para Corrientes de Dióxido de Azufre. Company: ATLANTIC COPPER. Period: 2022-2024 (two years). Amount: 134.529,41 €. (3) Title: Estudio de materiales para la absorción de dióxido de azufre. . Period: 2019-2020. Amount: 74.306,00. (4) Title: Desarrollo de un proceso flexible de valorización de residuos para la producción de biocombustibles. Company: BIOOILS. Period: 2019-2020. Amount: 42.350 €. (5) Title: Desarrollo de sistemas catalíticos para la funcionalización de cauchos saturados e insaturados mediante la incorporación selectiva de grupos polares. Company: DYNASOL ELASTÓMEROS. Period: 2018-2020. Amount: 213.814,11 €. (6) Title: Contrato de Arrendamiento de Servicios de Consultoría. Company: DYNASOL ELASTÓMEROS. Period: 2018-2019. Amount: 21.380,00 €.

#### C.7. Patents (2020-)

(1) Title: Macroporous materials containing calcium hydroxide and their use in processes of retention of SO<sub>2</sub> (2025) EP4474044B1. Owner: ATLANTIC COPPER. (2) Title: Functionalized rubbers. WO2020136223A1. Owner: DYNASOL SLU.

#### C.8. Awards and recognitions

**International:** European Academy of Science (2023), Chemistry Europe Fellow (2019), Member of the Academia Europaea (2018); Homogeneous Catalysis Award, Royal Society of Chemistry, UK (2015). Fellow of the Royal Society of Chemistry, UK (2014). **National:** Medal Award of the Royal Chemical Society of Spain (RSEQ) (2016); Member of the National Academy of Sciences of Spain (Corresponding, National) (2014); Inorganic Chemistry Award of RSEQ (2007). **At Univ Huelva:** University Medal (2026); Distinguished Professor Faculty of Experimental Sciences (2022); AIQBE-UHU Research Award (2018); Distinguished Researcher Faculty of Experimental Sciences (2017). Member of the Academy of Science arts and Humanities of Huelva since 2018. Elected President in 2026.

#### C.9. Services to scientific journals

- Editor of *Advances in Organometallic Chemistry* (Elsevier) 2014-2025. Scientific Advisory Board of *Organometallics* (2013-2015) and *Eur. J. Inorg. Chem.* (2011-13); Editorial Board of *Chem. Eur. J* (2019-2022), *Eur. J. Inorg. Chem.* (2014-2018) and *ChemistryEurope* (2024-).

#### C.10. Commissions of Trust

**R&D Evaluation:** 2006-2008 & 2015-2018, Program Officer, Inorganic Chemistry Area, Spanish National Agency for evaluation; 2006-2011, Program Officer, Chemistry, Andalusian Agency for Evaluation, Spain; Since 2009, Frequent Member of the Review Panel for the National Research Program, Spain.

**Others:** 2020-2021 Member of Chemistry Europe Council. 2016-2018 Member, Board of the EuChemS Division of Organometallic Chemistry. 2012-2020 Member, Scientific Advisory Board of Institute of Chemical Research of Catalonia (ICIQ). 2012-2014 Secretary General RSEQ 2012-2014. 2010-2014 President of the Organometallic Division RSEQ.

#### C.11. Chairman of Scientific Meetings

2025 5<sup>th</sup> International Symposium on Carbene and Nitrene Chemistry.  
2016 National Meeting of the Organic Division of the Royal Chemical Society of Spain.  
2016 EuCheMS Organic Division 8th Young Investigator's Workshop.  
2010 National Meeting of the Organometallic Division of the Royal Chemical Society of Spain.

#### C.12. Conference Committees

- Member of committee of International Carbene and Nitrene Consortium (since 2022).  
- Member of the Advisory Board of the International Conference on Organometallic and Catalysis (since 2017)  
- Member of the Scientific Committee of the Biennial Meetings of the Royal Spanish Chemical Society (2013, 2015, 2019, 2022)  
- Member of Scientific Committee of the National Meeting of the Organometallic Division of the Royal Chemical Society of Spain (2012, 2014, 2018, 2026).