MINISTERIO DE CIENCIA, INNOVACIÓN Y UNIVERSIDADES

Cofinanciado por la Unión Europea

AGENCIA ESTATAL DE INVESTIGACIÓN

CURRICULUM VITAE (CVA)

CV date	7/01/25

Part A. PERSONAL INFORMATION

First name	María del Puerto
Family name	Morales Herrero
Gender (*)	Female
Open Research and Contributor ID (ORCID)(*)	0000-0002-7290-7029

A.1. Current position

Position	Professor
Initial date	20/09/2018
Institution	Consejo Superior de Investigaciones Científicas
Departament/Center	Instituto de Ciencia de Materiales de Madrid
Country	Spain
Key words	Magnetic Nanoparticles, synthesis in solution, colloidal properties, magnetic properties, biomedical and environmental applications

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

Period	Position/Institution/Country/Interruption cause
1/5/1990-31/12/1993	Becario predoct./ ICMM, CSIC, Spain/end of the grant
1/1/1994-31/12/1995	Becario postdoct./ Uni. Wales, Bangor, UK/end of the grant
1/1/1996-30/04/1996	Researcher/ University of Wales, Bangor, UK/contract end
1/5/1996-23/12/1999	Investigador Contratado/ICMM, CSIC/Maternity leave
11/08/2000-18/08/2008	Científico titular/ICMM, CSIC, Spain/ Promotion
19/08/2008-09/2018	Investigadora/ICMM, CSIC, Spain/ Promotion

A.3. Education

PhD, Licensed, Graduate	University/Country	Year
PhD in Materials Science	Autonomous University of Madrid	1993
Licenciada en C. Químicas	Universidad de Salamanca	1989

Part B. CV SUMMARY

Maria del Puerto Morales is Professor at the Institute of Material Science in Madrid (ICMM/CSIC) since 2018, MAMBIO group leader and coordinator of the Nanomed CSIC Hub created on 2021: https://conexion-nanomed.csic.es/, with more than 200 scientists involved.

Her research activities are focused on the area of nanotechnology for biological applications. She has optimized a new methodology for the detection, identification and quantification of magnetic nanoparticles in different biosystems, found the key parameters governing the self-assembly and the formation of flower-shaped nanoparticles with improved magnetic properties and study the use of magnetic hyperthermia for efficient therapies and remote-controlled drug release.

She has authored several book chapters (14), patents (9) and more than 300 articles (h=71, >20.000 citations, scopus). From the 12 papers with more than 250 cites, 4 of them are reviews and the others are about particle size, microstructure and interactions effects on the magnetic properties of magnetic nanoparticles and its performance in biomedical applications.

In June 2022, she appears as the 66th in the Ranking of Spanish and foreign women researchers working in Spain, based on google scholar data. In 2017, I was one of the Outstanding women scientists in Physics, selected by Elsevier (https://www.elsevier.com/physical-sciences/physics/virtual-special-issue-on-women-in-physics-2017). In 2023, her work was selected and included in a web collection Celebrating International Women's Day by the Royal Society of Chemistry: Women in Nanoscience (https://pubs.rsc.org/en/journals/articlecollectionlanding?sercode=nr&themeid=8ff6ab1c-e406-4fa7-a699-5264c712f2dc).

She has been PI from the CSIC in 4 EU projects: NanoMag 2013-2017, Multifun 2011-2015, Nestor 2021-2025 and HYPELIGNUM 2022-2026, 8 National projects and 2 industrial projects with Repsol in the last five years. She has participated in other 3 EU projects (BONSAI, IMAGINE, HOTZYMES), two cost actions and 22 national projects. Important results are: New ISO 19807 standard for the characterization of magnetic nanoparticle suspensions (NanoMag) and development of the first nanoformulation based on iron oxide nanoparticles for pancreatic cancer treatment that was tested in humans in 2022 (Multifun).

She is very active in student supervision, undergraduate and graduates (4ºESO+Empresa, Erasmus +, Formación para Profesores CM), supervising 11 TFG, 11 TFM and 6 theses + 3 on going, participates in several masters (Genética y biología celular (Biologia, UAM), Nanofísica y Materiales Avanzados (Fisica, UCM), Biomateriales (Farmacia, UCM), Biomoléculas y Dinámica Celular (Biología, UAM) every year (around 5 h/year) and summer schools like the one organized by the Universidad Internacional Menéndez Pelayo (UIMP) since 2016-2023. She also participates actively in dissemination activities, with 40 invited talks in international conferences (2 semiplenary and 2 plenary) and participation in outreach activities for the general public (ciudad ciencia, ciencia en primera persona, que sabemos de nanotecnologia, festival 10^{-9}, el dia de la mujer y la niña en la ciencia…)

Part C. RELEVANT MERITS

C.1. Publications

Design strategies for shape-controlled magnetic iron oxide nanoparticles, A.G. Roca, L. Gutierrez, H. Gavilán, M.F. Brollo, S. Veintemillas., M. P. Morales. Adv. Drug Delivery Rev., 138, 68-1041, 2019. https://doi.org/10.1016/j.addr.2018.12.008

Combined Magnetoliposome Formation and Drug Loading in One Step for Efficient AC-Magnetic Field Remote Controlled Drug Release, M.Fortes Brollo, A. Domínguez-Bajo, A.Tabero, V. Domínguez-Arca, V. Gisbert, G. Prieto, C.Johansson, R. Garcia, A.Villanueva, M.C.Serrano, M.P. Morales. ACS Appl. Mater. Interfaces 2020, 12, 4, 4295. https://doi.org/10.1021/acsami.9b20603

Continuous production of magnetic iron oxide nanocrystals by oxidative precipitation, T Asimakidou; A Makridis; S Veintemillas; M.P. Morales; I Kellartzis; M Mitrakas; G Vourlias; M Angelakeris; K. Simeonidis, Chemical Engineering Journal, 393, 2020, 124593, 2020. https://doi.org/10.1016/j.cej.2020.124593

Selective Magnetic Nanoheating: Combining Iron Oxide Nanoparticles for Multi-hot-spot Induction and Sequential Regulation, J.G. Ovejero, I. Armenia, D. Serantes, S. Veintemillas, N. Zeballos, F. López-Gallego, C. Grüttner, J. M. de la Fuente, M.P. Morales and V.Grazu, Control of local temperature in iron oxide nanoheaters for multi-enzymatic reactions regulation. Nano Lett. 21, 17, 7213–7220, 2021. https://doi.org/10.1021/acs.nanolett.1c02178

Unravelling an Amine-Regulated Crystallization Crossover to Prove Single/Multicore Effects on the Biomedical and Environmental Catalytic Activity of Magnetic Iron Oxide Colloids, A. Gallo, J.G. Ovejero, A.M. Pablo-Sainz-Ezquerra, J. Cuya, B. Jeyadevan, S. Veintemillas, P.Tartaj, M.P. Morales, Journal of Colloid and Interface Science, 608, 2022, pp 1585-1597. https://doi.org/10.1016/j.jcis.2021.10.111

Cubic Mesocrystal Magnetic Iron Oxide Nanoparticle Formation by Oriented Aggregation of Cubes in Organic Media: A Rational Design to Enhance the Magnetic Hyperthermia Efficiency, Egea D.; Díaz-Ufano, C.; Gallo, Á.; Palomares, F. J.;Cuya Huaman, J. L.;Barber, D. F.;Morales, M. P.;Balachandran, J., ACS Appl. Mater. Interfaces 15, 27, 32162–32176,2023. https://doi.org/10.1021/acsami.3c03254

Magnetic Induction Heating-assisted synthesis of biodiesel using an alumina/iron oxide nanocatalyst, B. Corrales-Pérez, G. Vicente, M.P. Morales, A.Gallo-Cordova, Fuel, 368, 15 2024, 131659, https://doi.org/10.1016/j.fuel.2024.131659

Alternative Metallic Fillers for the Preparation of Conductive Nanoinks for Sustainable Electronics, B.Corrales-Pérez, C. Díaz-Ufano, M. Salvador, A. Santana-Otero, S.Veintemillas-Verdaguer, V. Beni and M.P. Morales, Advanced Functional Materials, 2024, 2405326 (1 of 12) https://doi.org/10.1002/adfm.202405326

C.2. Congress

Invited presentations to internationally conferences.

JEMS´04, **Plenary**, Dresden, 2004; Intermag'06, **Semiplenary**,San Diego, USA; Congreso de la Sociedad Española de Bioquímica y Biología Molecular, Alicante, 2006 and Santander 2019; Nanax 3, Leche (Italy), 2008; II encontró nacional do INCT de Nanobiotecnologia, **Plenary**, Rio Branco (Brasil), 2011; SPIE 2012, San Francisco, USA; ICM, Barcelona 2015; Nanocom, Brno, 2015; Intermag 2017, Dublin; QUIES 2018 Tenerife and 2019 Aveiro; TNT 2019 San Sebestian; IMA 2019 and 2021, Grecee; IBCM21 Kaliningrad, NALS2022, ICFPM2022 (Japan), ICMF2023 (Granada, **Plenary**).

Organisation of International conferences

Chair: Workshop on Magnetic Nanosystems for biotechnology and medicine, Madrid 2007. First joint CSIC-CNRS Workshop "Nanomaterials for Health", Madrid, Nov.2013. International conference on the Polyol process, Madrid June 2018, 100 participants. SBAN 2018, 2019, Madrid, 100 pax face to face; 300 pax on line (2020, 2021), 2022. Scientific and Clinical Applications of Magnetic Carriers 2024, Barcelona.
Scientific committee: ICFPM-2010, Uppsala; Intermag 2010, Washington; ICFPM-2013, Perpignan; Frontiers in Biomagnetic Particles, Telluride, USA 2015, MMM_Intermag 2016, NALS 2022, RICI 2022; Symposium Organizer: Intermag 2010, Washington; Euromat 2011, Montpelier; E-MRS 2013 Strasbourg, France, EMRS 2016 Lyon, JEMS 2023 Madrid, ICM Boloña 2024. **Program committee Chair**: ICFPM2019, Oviedo.

C.3. Research projects on-going

1. H2umidity®-PLUS, Programa 4 (IDEA), Ref: PR-H2CVAL4-C2-2023-000052, 1.940.951,8 €, 523.742,77 € CSIC, PI ICMM: M.P.Morales (300.000 €). 36 meses, Sep 24-27.

2. Conversión de energía renobable en productos químicos mediante la producción de Hidrógeno acoplada con la captura y conversión de CO2, TED2021-130191B-C43, Coordinador ITQ, 34 months, Dic 2022-2025, 262.660 € for ICMM. PI CSIC: M.P. Morales

3. Nanomedicinas teranosticas basadas en hidrogeles y nanoparticulas magneticas con capacidad para regeneracion neural, PI: M. C.Serrano, PID2023-150170OB-I00, 200.000€, Sep 2024-2027.

4. Piezo-driven theramesh: A revolutionary multifaceted actuator to repair the injured spinal cord, PATHFINDER EU, 101098597, Piezo4Spine, 48 months, 1-1- 23-2026, Costs: 3.537.121,00€; 1.067.476,0€ ICMM, PI: C. Serrano

5 Exploring wooden materials in hybrid printed electronics: a holistic approach towards functional electronics with net zero carbon emissions, 101070302, HyPELignum, HORIZON-CL4-2021-DIGITAL-EMERGING-01, 48 months, Oct 2022-26, 4,942,968.50 €, ICMM 336.368€. PI CSIC: M.P. Morales

6. Nanomaterials for Enzymatic Control of Oxidative Stress Toxicity and Free Radical Generation (NESTOR) H2020-MSCA-RISE-2020, 101007629, PI: G. Goya, U. Zaragoza, 2021-2025, 150.000 € for CSIC, PI CSIC: M. P. Morales.

C.4. Contracts, technological or transfer merits

Patents

1. Iron oxide nanoparticles with antiviral activity against SARS and MERS coronavirus, EP21382973. October 28th 2021, CSIC.
2. Iron oxyhydroxide nanoparticles with antiviral activity against SARS and MERS coronavirus, EP21382974. October 28th 2021, CSIC.
3. Nanoparticles for the control of one-pot multienzimatic reactions, EP21382585, Date of application: July, 1st, 2021, CSIC.
4. Cement and method of hardening a slurry thereof, Application number: EP19383090 / P5003EP00, Date of application: December, 9th, 2019, REPSOL. Accepted in USA.

Contracts

1. Design of a water cleaning plant using magnetic nanoparticles, Acuerdo de colaboración, **Jayim Mayim**, 2012-2016, IP: Dra. M.P. Morales y Dr. Sabino Veintemillas, 60000€., **Jayim Mayim and Acciona**, 2012-2017, 60000€; IP: Dra. M.P. Morales y Dr. S. Veintemillas
3. Synthesis and charectizaction of magnetic nano-microparticles and/or solid surfaces followed by an oriented immobilization of antibodies", 20161128, **BRIO APPS ALPHASISP**, S.L., 2015-2018, 12.000 €; IP: M.P. Morales
4. Nanopartículas magneticas para hipertermia en aplicaciones en la industria energética, **Repsol**, 2018-2020, 55.252 €. IP: M.P. Morales
5. Characterisation of magnetic nanoparticles, particles size analysis, **Micromod Partikeltechnologie GmbH**, 2019-2024, IP: M.P. Morales

OTHER MERITS:

Internacionalization, joint research units, excellence networks :

JOINT RESEARCH UNIT ICMM-IMA and JOINT RESEARCH UNIT ICMM-Hospital Nacional de Parapléjicos; NATIONAL/INTERNATIONAL NETWORKS OF EXCELLENCE: NanoBioAp 2016-2018; NANO-CARE 2019-2021; COST action: Magnetic Particle Imaging (CA23132, 2024).

Theses supervised in the past five years

2. María Eugenia F. Brollo, "Magnetoliposomes: effect of aggregation and spatial distribution of magnetic nanoparticles on their magnetic performance for biomedical applications", UAM (Spain). PhD advisor: M. P. Morales. Date of defense: 17/07/2019, Apto Cum Laude.

3. Alvaro Gallo Córdova. "Magnetic nanoreactors for environmental applications such as water remediation". Directora: Mª del Puerto Morales Herrero, Centro/ Instituto CSIC: ICMM-2019-2022, 25 Marzo 2022 Defense, Apto Cum Laude (Winner of four prizes, UAM extraordinary doctoral award, Margarita Salas asccessit, Premios Talento y Tecnología 2023 del Ayuntamiento de Madrid, mejor tesis del Capítulo Español de IEEE Mag.Soc.).