

PERSONAL INFORMATION

First name	CASAS DELGADO
Family name	MARTA

Current position

Position	Profesor Titular de Universidad
Institution	University of Seville (Spain)
Department	Pharmacy and Pharmaceutical Technology
Keywords	Controlled drug delivery systems, percolation theory, 3D printing, critical points, smart polymers

Scientific career and main scientific and technical achievements obtained

She graduated in Pharmacy with the best academic record (mean qualification: 3.58 / 4) and she received the Extraordinary Prize, Real Maestranza de Caballería Prize and City Council Award. She has obtained 2 predoctoral fellowships. Her Doctoral Thesis with European Mention, defended in 2009, obtained the Extraordinary Doctorate Award. Her main line of research focuses on the design and optimization of controlled drug delivery systems obtained by new manufacturing technologies. She has experience on the application of percolation theory to the design of these systems to understand the internal structure and predict the critical points.

She has participated in 6 competitive research projects, 4 of them working on the design, development and statistical optimization of controlled drug delivery systems in the gastrointestinal tract, obtained through new technologies, such as 3D printing techniques. She has also made 3 stays abroad, at the University of Parma (Italy), where new hydrophobic polymers were applied to gastroretentive floating systems. She has participated in more than 20 scientific conferences, and she has been part of Scientific and Organizing Committees of national and international conferences. She has been recognized for 2 six-year research periods by the National Committee for the Evaluation of Research Action (CNEAI) and she is reviewer of scientific articles in pharmaceutical journals indexed in the JCR.

She is currently Tenured Professor at the University of Seville. All her teaching activity has been favorably evaluated by the Andalusian Evaluation Agency, obtaining the highest rating in some subjects and she has actively participated in 3 Teaching Innovation Projects and 3 conferences aimed at training university professors. She also has extensive capacity in the training of young researchers, having directed 3 Doctoral Theses, 16 Final Degree Projects and 6 Final Master's Projects.

In terms of technology transfer, she is the inventor of 2 national patents and has participated in contracts with companies, 2 of them with the Technological Institute of Individualized Medicine, promoted by the Association of Formulators of Andalusia, working for the unification of criteria in pediatric Magistral Formulation. She also has professional activity as a research support technician at the Health Quality Agency of Andalusia where she worked for 7 months in the Knowledge Management Department. Likewise, she is a delegate of the Technology Transfer network of the Ibero-American-Swiss Chair of Drug Development, which aims to organize and develop Technology and Process Transfer within a framework of International Cooperation. In addition, she has experience in institutional responsibilities, being Academic Secretary of the Department of Pharmacy and Pharmaceutical Technology of the University of Seville from 2020-2024.

Description of merits and most relevant contributions

Fruit of her research work in this field are **26 international papers**, most in top journals (Q1), 1 chapter of book and 2 national patents. The most relevant contributions of the last 10 years are described below:

- **3D Printing Direct Powder Extrusion in the Production of Drug Delivery Systems: State of the Art and Future Perspectives.** 2024, *Pharmaceutics*, 16(4), 437 (Impact factor: 4.9, Q1)
- **Stereolithographic 3D printing: Formulation design based on percolation thresholds.** 2023, *Journal of Drug Delivery Science and Technology*, 90: 105099 (Impact factor: 5.0, Q1)
- **Extrusion-based technologies for 3D printing: a comparative study of the processability of thermoplastic polyurethane-based formulations.** 2023, *Pharmaceutical Development and Technology*, 28(10): 939–947 (Impact factor: 3.4, Q2)
- **3D Printed Fractal-like Structures with High Percentage of Drug for Zero-Order Colonic Release.** 2022, *Pharmaceutics*, 14(11), 2298 (Impact factor: 6.525, Q1)
- **Redox-Responsive Polymersomes as Smart Doxorubicin Delivery Systems.** 2022, *Pharmaceutics*, 14(8), 1724 (Impact factor: 6.525, Q1)
- **Critical points for predicting 3D printable filaments behaviour.** 2021. *Journal of Drug Delivery Science and Technology*, 66, 102933 (Impact factor: 3.981, Q2)
- **3D printed systems for colon-specific delivery of camptothecin-loaded chitosan micelles.** 2021, *European Journal of Pharmaceutics and Biopharmaceutics*, 167, pp. 48–56 (Impact factor: 5.571, Q1)
- **3D printed drug delivery systems based on natural products.** *Pharmaceutics*, 2020, 12(7), pp. 1–20, 620 (Impact factor: 6.321, Q1)
- **Thermoplastic polyurethane as matrix forming excipient using direct and ultrasound-assisted compression.** 2019. *European Journal of Pharmaceutical Sciences*, 136, 104949 (Impact factor: 3.616, Q2)
- **Achieving high excipient efficiency with elastic thermoplastic polyurethane by ultrasound assisted direct compression** 2019. *Pharmaceutics*, 11(4), 157 (Impact factor: 4.421, Q1)
- **Printfills: 3D printed systems combining fused deposition modeling and injection volume filling. Application to colon-specific drug delivery** 2019. *European Journal of Pharmaceutics and Biopharmaceutics*, 134, pp. 138–143. (Impact factor: 4.604, Q1)
- **First study of the evolution of the SeDeM expert system parameters based on percolation theory: Monitoring of their critical behavior.** 2016 *European Journal of Pharmaceutics and Biopharmaceutics*, 109: 158-164 (Impact factor: 4.159, Q1)
- **Towards a rational basis for selection of excipients: Excipient Efficiency for controlled release,** 2015, *International Journal of Pharmaceutics*, 494: 288-295 (Impact factor: 3.994, Q1)
- **Critical points and phase transitions in polymeric matrices for controlled drug release,** *Handbook of Polymers for Pharmaceutical Technologies*, 2015, 1: 125-176, John Wiley & Sons, ISBN 978-1-119-04134-4.
- **Synthesis and characterization of a novel chitosan-N-acetyl-homocysteine thiolactone polymer using MES buffer.** 2014, *Carbohydrate Polymers*, 111: 125–132 (Impact factor: 4.074, Q1)

RESEARCH PROJECTS

Title: **Aplicación de tecnologías innovadoras de impresión 3D para elaborar sistemas personalizados de liberación de fármacos para el tratamiento de enfermedades del tracto gastro-intestinal**

- Reference: US-1380923
- Funding entity: Junta de Andalucía (Consejería de Economía, Conocimiento, Empresas y Universidad)
- Announcement: Proyectos I+D+i FEDER Andalucía 2014-2020
- Affiliation Entity: Universidad de Sevilla

-Duration: from: 01/01/2022 until: 31/12/2022

Title: **Sistemas de Liberación de Fármacos Basados en Materiales Poliméricos Avanzados para el Tratamiento de Enfermedades del Tracto Gastro-Intestinal**

- Reference: RTI2018-095041-B-C31

- Funding entity: Ministerio de Ciencia, Innovación y Universidades

- Announcement: Plan Estatal 2017-2020 Retos - Proyectos I+D+i

- Affiliation Entity: Universidad de Sevilla

-Duration: from: 01/01/2019 until: 30/09/2022

- Amount: 90000 €

Title: **Polímeros de Fuentes Renovables para Aplicaciones Farmacéuticas. Diseño de Sistemas Avanzados para Liberación Prolongada y Localizada de Fármacos**

- Reference: MAT2016-77345-C3-3-P

- Funding entity: Ministerio de Economía and Competitividad

- Announcement: Plan Estatal 2013-2016 Excelencia -Proyectos I+D

- Affiliation Entity: Universidad de Sevilla

-Duration: from: 30/12/2016 until: 29/12/2018

- Amount: 90000 €

Title: **Bioplásticos derivados de carbohidratos and biopolímeros microbianos para aplicación en envasado y farmacia**

-Reference: MAT2012-38044-C03-02

- Funding entity: Ministerio de Economía and Competitividad

- Announcement: Nacional

- Affiliation Entity: Universidad de Sevilla

-Duration: from: 01/01/2013 until: 31/12/2015

-Amount: 64350€