

CV Date	16/09/2021
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## Part A. PERSONAL INFORMATION

First Name *	Mirian		
Family Name *	Domenech Lucas		
Sex *	Female	Date of Birth *	19/05/1982
ID number Social Security, Passport *	02281161K	Phone Number	(0034) 91 3944963 - 4963
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Researcher's identification number	Open Researcher and Contributor ID (ORCID)*	0000-0002-0942-8180	
	Researcher ID	G-2561-2018	
	Scopus Author ID	35078398100	

\* Mandatory

### A.1. Current position

Job Title	PROFESOR AYUDANTE DOCTOR		
Starting date	2021		
Institution	Universidad Complutense de Madrid		
Department / Centre	GENÉTICA, FISIOLÓGIA Y MICROBIOLOGÍA. UNIDAD DOCENTE MICROBIOLOGÍA / CIENCIAS BIOLÓGICAS		
Country	Spain	Phone Number	(0034) 913944963 - 4963
Keywords	Natural sciences and health sciences		

### A.3. Education

Degree/Master/PhD	University / Country	Year
Microbiology and Parasitology doctorate official program	Universidad Complutense de Madrid / Spain	2012
Bachelor Thesis	Universidad Complutense de Madrid / Spain	2006
Biology bachelor degree (Biotechnology speciality)	Universidad Complutense de Madrid	2005

## Part B. CV SUMMARY

My experience in the research began at the Department of Microbiology of UCM where I did a Tesina project. I was involved in the development of a rapid detection system for mycotoxin fungi, such as *P. brevicompactum* and later contributing to the biocontrol of another fungus that produces rot in pip fruit with yeasts and produces toxins. As a consequence, I published two manuscripts and one book chapter. Later, I started the Ph.D. working in a research line on biofilms of human respiratory pathogens in which I have developed the majority of my scientific career. In this field we have demonstrated the importance of the formation of biofilms in the response of the immune response during the interaction of *S. pneumoniae* with the host (Domenech M, 2013). In addition, the importance of biofilm formation in pneumococcal epidemiology has been confirmed and the extracellular matrix of the pneumococcal biofilm has been characterized (Domenech, 2013. ). The relationship between the capsular serotype and the ability to form biofilms in *S. pneumoniae* has also been studied (Domenech, 2009. *Environ Microbiol*; 2014. *Environ Microbiol*; 2015. *PLoS One*). The binding capacity to DNA containing several binding proteins has also been extended including its importance in the formation of biofilms by pneumococcus (Domenech, 2013. *Environ Microbiol*; 2015. *Environ Microbiol Rep*). We also have tested the presence of nucleic acids and a  $\beta$ -glucan in the in vitro biofilm matrix of NTHi and developed an in vitro biofilm system with uncapped strains

of *S. pneumoniae* and NTHi using polystyrene or glass bottom plates. Subsequently, we have studied that this simple and robust protocol of mixed biofilms is very useful to study the antimicrobial properties of some drugs; specifically, two well-known antioxidants have been used, which have an important use in the clinical context, such as NAC and cysteamine and others drugs as EBAs. In addition, we have developed a system to detect *S. pneumoniae* against other pathogens that occupy a niche, such as NTHi. Finally, I have worked in other aspects of biofilms related to the development of novel chemotherapy strategies to destroy and eradicate bacterial species causing biofilms. An additional important aspect of my scientific production has been associated to different studies based on the host-pathogen interaction. In this sense, I have participated in others works of respiratory pathogens and biofilms. In 2019 and 2020 I worked at the Pneumococcal Unit of the CNM of ISCIII, establishing the line of investigation of pneumococcal biofilms and dual biofilm (*Sp-S. aureus*) and collaborating in the epidemiological surveillance of the human pathogen *S. pneumoniae*. I have been an honorary collaborator of the UCM (since 2007) and also as an honorary professor (2019-2021). In 2020, I've been the principal investigator of two research projects funded by a pharmaceutical company and I have participated in COVID project at IMDEA nanociencia. Currently, I'm a teaching and research staff at the Microbiology Unit at the UCM.

h-index: 17, 511 citations (SCOPUS)

**Scientific production:** 42 scientific publications: 35 scientific paper (34 indexed), 4 bibliographic reviews, 1 article of disclosure and 2 chapter of a book. 20 of them as first author and 7 as first author and author of correspondence from 2014.

**Teaching production:** Co-director of 7 final masters project and 3 final degree project. In process: co-director of a doctoral thesis

## Part C. RELEVANT ACCOMPLISHMENTS

### C.1. Publications.

AC: corresponding author. (n° x / n° y): position / total authors. If applicable, indicate the number of citations

- 1 Scientific paper.** Julio Sempere; Mirella Llamosí; Fernando González-Camacho; Federico Román; Jose Yuste; (AC). (6/6). 2021. Clearance of mixed biofilms of *Streptococcus pneumoniae* and methicillin susceptible/resistant *Staphylococcus aureus* by antioxidants cysteamine and N-acetyl-L-cysteine Virulence.
- 2 Scientific paper.** Bruno Corsini; Leire Aguinagalde; Susana Ruiz; (AC); Jose Yuste Lobo. (4/5). 2021. Vaccination with LytA, LytC, or Pce of *Streptococcus pneumoniae* Protects against Sepsis by Inducing IgGs That Activate the Complement System Vaccines. 9-186.
- 3 Scientific paper.** Aida González-Díaz; Miguel P. Machado; Jordi Cámara; et al; ;. (6/18). 2020. A double multi-fragment recombination event originated the  $\beta$ -lactam-resistant serotype 11A Spain9V-ST156 pneumococcal clone that is spreading in Southwest Europe Eurosurveillance. 25-16, pp.1900457.
- 4 Scientific paper.** Miriam Victoria Valenzuela; Mirian Domenech; Patricia Marteos; Fernando González-Camacho; Adela González de la Campa; María Teresa García. (2/6). 2020. Antibacterial activity of a DNA topoisomerase I inhibitor versus fluoroquinolones in *Streptococcus pneumoniae* PLoS One. 15-11, pp.e0241780.
- 5 Scientific paper.** Julio Sempere García; Sara de Miguel; Fernando González Camacho; Jose Yuste Lobo; (AC). (5/5). 2020. Clinical relevance and molecular pathogenesis of the emerging serotypes 22F and 33F of *Streptococcus pneumoniae* in Spain Frontiers in Microbiology, DOI: 10.3389/fmicb.2020.00309. 11, pp.11:309.

- 6 **Scientific paper.** Santiago Alfayate; Genoveva Yague; Ana I. Menasalvas; et al; ;. (5/19). 2020. Impact of Pneumococcal Vaccination in the Nasopharyngeal Carriage of Streptococcus pneumoniae in Healthy Children of the Murcia Region in Spain Vaccines. MDPI. 9-14. ISSN 2076-393X.
- 7 **Scientific paper.** Sara de Miguel; Mirian Domenech Lucas; Julio Sempere García; et al;. (1/10). 2020. Nationwide trends of invasive pneumococcal disease in Spain (2009-2019) in children and adults during the pneumococcal conjugate vaccine era Clinical Infectious Diseases, DOI: 10.1093/cid/ciaa1483.pp.ciaa1483.
- 8 **Scientific paper.** Raquel Tarancón; Jorge Domínguez-Andrés; Santiago Uranga; et al; ;. (6/11). 2020. New live attenuated tuberculosis vaccine MTBVAC induces trained immunity and confers protection against experimental lethal pneumonia PLoS Pathogens. 16-4, pp.e1008404.
- 9 **Scientific paper.** Mirian Domenech; Ernesto García. (1/2). 2020. The N-acetylglucosaminidase LytB of Streptococcus pneumoniae is involved in the structure and formation of biofilms Applied and Environmental Microbiology, DOI:10.1128/AEM.00280-20. 86-10, pp.e00280-20.
- 10 **Scientific paper.** María Jose Ferrandiz; María Cercenado; Mirian Domenech; et al;. (3/9). 2019. An Uncharacterized Member of the Gls24 Protein Superfamily Is a Putative Sensor of Essential Amino Acid Availability in Streptococcus pneumoniae Microbial Ecology. 77-2, pp.471-487. ISSN 0095-3628.
- 11 **Scientific paper.** Emma Roig-Molina; Mirian Domenech; María de Gracia Retamosa; et al;. (1/9). 2019. Widening the antimicrobial spectrum of esters of bicyclic amines: In vitro effect on Streptococcus pneumoniae and non-typeable Haemophilus influenzae biofilms. Biochimica et Biophysica Acta (BBA) General Subjects DOI: 10.1016/j.bbagen.2018.10.001. 1863-1, pp.96-104. ISSN 0304-4165.
- 12 **Scientific paper.** Mirian Domenech; Ernesto García. 2018. Autolysin-independent DNA Release in Streptococcus pneumoniae In vitro Biofilms Clinical Infectious Diseases: Open Access. 2-3, pp.1-8.
- 13 **Scientific paper.** Wai Ting Chan; Mirian Domenech; Inmaculada Moreno-Córdoba; Verónica Navarro-Martínez; Concha Nieto; Miriam Moscoso; Ernesto García; Manuel Espinosa. (2/8). 2018. The Streptococcus pneumoniae yefM-yoeB and relBE Antitoxin-Toxin Operons Participate in Oxidative Stress and Biofilm Formation Toxins. ISSN 2072-6651.
- 14 **Scientific paper.** Roberto Vázquez; Mirian Domenech; Manuel Iglesias-Bexiga; Pedro García; Margarita Menéndez. (2/5). 2017. Csl2, a novel chimeric bacteriophage lysin to fight infections caused by Streptococcus suis, an emerging zoonotic pathogen Scientific Reports. 7-1, pp.16506.
- 15 **Scientific paper.** Mirian Domenech; Ernesto García. (1/2). 2017. Fluorescence Imaging of Streptococcus pneumoniae with the Helix pomatia agglutinin (HPA) As a Potential, Rapid Diagnostic Tool. Frontiers in Microbiology, DOI: 10.3389/fmicb.2017.01333.
- 16 **Scientific paper.** (AC); Ernesto García López. (1/2). 2017. N-Acetyl-L-cysteine and Cysteamine: New Strategies Against Mixed Biofilms of Non-encapsulated Streptococcus pneumoniae and Non-typeable Haemophilus influenzae. Antimicrobial Agents Chemother, DOI:10.1128/AAC.01992-16. pp.61:e01992-16.
- 17 **Scientific paper.** Loreine Agulló; María Jose Romero-Silva; Mirian Domenech; Michael Seeger. (3/4). 2017. p-Cymene promotes its catabolism through the p-cymene and the p-cumate pathways, activates a stress response and reduces the biofilm formation in Burkholderia xenovorans LB400 PLoS One. 12-1, pp.e0169544. ISSN 1932-6203.
- 18 **Scientific paper.** Roberto Díez-Martínez; Esther García-Fernandez; Miguel Manzano; Ángel Martínez; Mirian Domenech; María Vallet-Regí; Pedro García. (5/7). 2016. Auranofin-loaded nanoparticles as a new therapeutic tool to fight streptococcal infections Scientific Reports. Nature.
- 19 **Scientific paper.** (AC); Elena Pedrero-Vega; Alicia Prieto; Ernesto García. (1/4). 2016. Evidence of the presence of DNA and  $\beta$ -glucan in the intercellular matrix of non-typeable Haemophilus influenzae in vitro biofilms Scientific Reports, DOI: 10.1038/srep36424. 2-6. ISSN 2045-2322.

- 20 **Scientific paper.** Bruno Corsini; Leire Aguinagalde; Susana Ruiz; et al; ;. (4/9). 2016. Immunization with LytB protein of *Streptococcus pneumoniae* activates complement-mediated phagocytosis and induces protection against pneumonia and sepsis Vaccine. 34-50, pp.6148-6157.
- 21 **Scientific paper.** Elisa Ramos-Sevillano; Ana Urzainqui; Belén de Andrés; et al; ;. (5/10). 2016. PSGL-1 on Leukocytes is a Critical Component of the Host Immune Response against Invasive Pneumococcal Disease PLOS Pathogens. 12-3. ISSN 1553-7366.
- 22 **Book chapter.** Mirian Domenech; Fernando González-Camacho; Julio Sempere; Jose Yuste Lobo. (1/4). 2019. Enfermedad neumocócica invasiva. Situación actual, predicción de serotipos emergentes y futuras vacunas. Vacunas 2019. Undergraft. pp.113-128. ISBN 978-84-09-15297-1.
- 23 **Review.** Julio Sempere; Mirella Llamosí; Idoia del Rio Menéndez; Beatriz López Ruiz; (AC); Fernando González-Camacho. (5/6). 2021. Pneumococcal Choline-Binding Proteins Involved in Virulence as Vaccine Candidates Vaccines. 9-181.
- 24 **Bibliographic review.** Mirian Domenech; Julio Sempere; Sara De Miguel; Jose Yuste. (1/4). 2018. Combination of antibodies and antibiotics as a promising strategy against multidrug-resistant pathogens of the respiratory tract Frontiers in Immunology. ISSN 1664-3224.
- 25 **Scientific paper.** Elena Mata; Raquel Tarancón; Santiago Uranga; et al; ;. (6/12). 2021. Pulmonary BCG induces activation of lung macrophages which confer long-term protection against tuberculosis Science Immunology. Science.

### C.3. R&D and innovation projects and contracts

- 1 **Project.** Evolution of Invasive Pneumococcal Disease in Spain with special focus on the pathogenesis of serotypes 3, 8, 11A, 19A, 22F and 33F. Merck Sharp & Dohme USA. Jose Yuste Lobo. (Centro Nacional de Microbiología (ISCIII)). 01/09/2020-01/09/2023. 128.260 €.
- 2 **Project.** Impact of clinical isolates of serotypes 22F and 33F in the epidemiology and pathogenesis of *S. pneumoniae*. MISP#57320 / MVE213/18. Merck Sharp & Dohme España, S.A.. MISP CALL.. Jose Yuste Lobo. (CNM-ISCIII). 01/01/2018-31/12/2020. 157.604 €.
- 3 **Project.** Mechanisms of pathogenicity and protection in Gram-positive bacteria causing respiratory disease and bacteremia. SAF2017-83388-R / MPY299/18. MIMECO. Jose Yuste Lobo. (CNM-ISCIII). 01/01/2018-31/12/2020. 145.200 €.
- 4 **Contract.** The Effectiveness Of 13-Valent Pneumococcal Conjugate Vaccine (PCV13) Against Vaccine Type Pneumococcal Hospitalised Community Acquired Pneumonia (CAP) in Adults 60 Years and Older Using A Test Negative Design Study in A Well-Defined Area of the South of Madrid Region Pfizer S.L.U, Spain. Angel Gil. (Instituto de Salud Carlos III). 01/10/2020-01/10/2025. 168.000 €.
- 5 **Contract.** Estudio y caracterización de la patogenicidad de cepas invasivas de neumococo circulantes Merck Sharp & Dohme España, S.A.. Mirian Domenech. (Instituto de Salud Carlos III). 01/09/2020-01/09/2023. 117.999 €.
- 6 **Contract.** Anti-biofilm therapy of respiratory pathogens Tedec Meiji Farma, S.A.. Mirian Domenech Lucas. (Instituto de Salud Carlos III). 20/07/2020-20/07/2021. 5.500 €.
- 7 **Contract.** Characterization of susceptibility to cefditoren investigating penicillin resistant clinical isolates of *Streptococcus pneumoniae* Tedec Meiji Farma, S.A.. Mirian Domenech Lucas. (Instituto de Salud Carlos III). 11/07/2020-11/07/2022. 76.517 €.
- 8 **Contract.** Caracterización del papel de LytB y el ADN extracelular en la arquitectura del patógeno respiratorio *Streptococcus pneumoniae* CIBERES. Mirian Domenech Lucas. (INVESTIGACION Y PROYECTOS MICROBIOLÓGICOS SL). 09/01/2017-09/05/2017. 17.325 €.
- 9 **Contract.** Study of various compounds for the treatment of mixed biofilms formed by respiratory pathogens such as *Streptococcus pneumoniae* and nontypeable *Haemophilus influenzae* CIBERES. Mirian Domenech Lucas. (INVESTIGACION Y PROYECTOS MICROBIOLÓGICOS SL). 01/01/2016-01/07/2016. 17.999 €.

### C.4. Activities of technology knowledge transfer and results exploitation