

Carla Hernández-Cabanyero

Nationality: Spanish
Date and Place of Birth: 24th of June 1991, in Albacete (Spain)
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Profile: MSc PhD in Biomedicine and Biotechnology. Specialized as microbiologist with a strong interest in infectious diseases and the role of host-microbe and microbe-microbe interactions in the outcome of diseases. Passionate about teaching and popularizing science.

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Education

22/10/2014 – 07/02/2020:

PhD in Biomedicine and Biotechnology (Institute of Biotechnology and Biomedicine, Universidad de Valencia, Spain). FPI Scholarship by the Spanish Ministry of Science, Innovation and Universities. Thesis title: “Transcriptomic analysis of the host-pathogen relationship in *Vibrio vulnificus*”. Defended on the 7th of February 2020. PhD advisor: Carmen Amaro González. “Outstanding Cum Laude” (highest distinction).

09/09/2013 – 29/09/2014:

MSc in Molecular Biology, Cellular Biology and Genetics (Universidad de Valencia, Spain). Master project realized under the supervision of Prof. Carmen Amaro González, from February to September 2014 (Pathogens in Aquaculture group, Institute of Biotechnology and Biomedicine, Universidad de Valencia, Spain).

14/09/2009 – 30/07/2013:

Bachelor in Biology, Medical Biology specialization (Science in Biology Faculty, Universidad de Valencia, Spain).

Employment history

03/06/2024 – present:

Postdoctoral Researcher, MSCA postdoc fellow (Interactions Pathogens-Host-Environment Research Unit, IFREMER, Montpellier, France). MSCA postdoctoral project “Exploring the role of copper resistance in host niche specialization of the oyster emerging pathogen *Vibrio aestuarianus*”. Advisor: M. Agnès Travers.

01/01/2022 – 31/05/2024:

Postdoctoral Researcher (Microbiota-targeted interventions group, Department of Fundamental Microbiology, University of Lausanne, Switzerland). NCCR project “Molecular mechanisms involved in the interplay of the small intestinal microbiome with inflammation and nutrient absorption”. Advisor: Pascale Vonaesch.

24/01/2021 – 31/12/2021:

Postdoctoral Researcher (Pathogens in Aquaculture group, Institute of Biotechnology and Biomedicine, Universidad de Valencia, Spain). IGUSOL ADVANCE SA research grant “Efficacy trials of functional diets in shrimp in terms of resistance to pathologies caused by *Vibrio parahaemolyticus* /other bacteria”. Advisor: Belén Fouz Rodríguez.

01/06/2020 – 31/12/2020:

Postdoctoral Researcher (Pathogens in Aquaculture group, Institute of Biotechnology and Biomedicine, Universidad de Valencia, Spain). Spanish Ministry research grant “Study of the relationship host-pathogen in *Vibrio vulnificus*: one-gen and omics studies (III)”. Advisor: Carmen Amaro González.

01/12/2015 – 30/11/2019:

Predoctoral Researcher (Pathogens in Aquaculture group, Institute of Biotechnology and Biomedicine, Universidad de Valencia, Spain). Spanish Ministry research grant “Study of the relationship host-pathogen in *Vibrio vulnificus*: one-gen and omics studies”. Advisor: Carmen Amaro González.

21/10/2014 – 31/12/2014:

Researcher (Pathogens in Aquaculture group, Institute of Biotechnology and Biomedicine, Universidad de Valencia, Spain). Spanish Ministry research grant “Study of the relationship host-pathogen in *Vibrio vulnificus* under transcriptomics perspective”. Advisor: Carmen Amaro González.

01/10/2014 – 10/10/2014:

Water quality technician (Town Hall, Almansa, Spain).

Publications (Citations: 103, H index: 4)

- **Hernández-Cabanyero, C.,** and Vonaesch, P. (2024) Ectopic colonization by oral bacteria as an emerging theme in health and disease *FEMS Microbiology Reviews*. 1;48(2):fuae012. doi: 10.1093/femsre/fuae012. Q1 Microbiology//Impact factor: 11.3.
- **Hernández-Cabanyero, C.,** Sanjuán, E., Mercado, L., and Amaro, C. (2023) Evidence that fish death after *Vibrio vulnificus* infection is due to an acute inflammatory response triggered by a toxin of the MARTX family. *Fish & Shellfish Immunology*. 142(1):109131. doi: 10.1016/j.fsi.2023.109131. D1 Veterinary Sciences//Impact factor: 4.622. Citations: 1.
- **Hernández-Cabanyero, C.,** Carrascosa, E., Jiménez, S., and Fouz, B. (2023) Exploring the effect of phytobiotic compounds in whiteleg shrimp: resistance to disease caused by *Vibrio parahaemolyticus*. *Animals*. 13: 1354. doi:10.3390/ani13081354. Q1 Veterinary Sciences//Impact factor: 3.231. Citations: 4.
- **Hernández-Cabanyero, C.,** Sanjuán, E., Vallejos-Vidal, E., Reyes-López, F.E., Tort, L., and Amaro, C. (2022) A transcriptomic study reveals that fish vibriosis due to *Vibrio vulnificus* is an acute inflammatory disease in which erythrocytes may play an important role. *Frontiers in Microbiology*. 13:852677. doi: 10.3389/fmicb.2022.852677. Q2 Microbiology//Impact factor: 5.2. Citations: 3.
- **Hernández-Cabanyero, C.,** and Amaro, C. (2020) Phylogeny and life cycle of the zoonotic pathogen *Vibrio vulnificus*. *Environmental Microbiology*. doi: 10.1111/1462.2920.15137. Q1 Microbiology//Impact factor: 5.491. Citations: 19.
- **Hernández-Cabanyero, C.,** Sanjuán, E., Fouz, B., Pajuelo, D., Vallejos-Vidal, E., Reyes-

López, F.E., and Amaro, C. (2020) The effect of the environmental temperature on the adaptation to host in the zoonotic pathogen *Vibrio vulnificus*. *Frontiers in Microbiology*. 11:489. doi: 10.3389/fmicb.2020.00489. Q1 Microbiology//Impact factor: 5.640. Citations: 21.

- **Hernández-Cabanyero, C.**, Lee, C.T., Tolosa-Enguis, V., Sanjuán, E., Pajuelo, D., Reyes-López, F., Tort, L. and Amaro, C. (2019) Adaptation to host in *Vibrio vulnificus*, a zoonotic pathogen that causes septicemia in fish and humans. *Environmental Microbiology*. 21: 3118–3139. doi:10.1111/1462-2920.14714. Q1 Microbiology//Impact factor: 4.933. Citations: 24.
- Pajuelo, D., **Hernández-Cabanyero, C.**, Sanjuán, E., Lee, C.T., Silva-Hernández, F. X., Hor, L.I., MacKenzie, S. and Amaro, C. (2016), Iron and Fur in the life cycle of the zoonotic pathogen *Vibrio vulnificus*. *Environmental Microbiology*. 18: 4005-4022. doi:10.1111/1462-2920.13424. Q1 Microbiology//Impact factor: 5.395. Citations: 31.

Scientific communications

- **Keystone Symposia 2024.** Symposium in Epithelial Barrier Immunity in Banff, Canada. February 2024. “Deciphering *Streptococcus salivarius*’s impact on small intestinal inflammation in stunted children” (Oral presentation).
- **Keystone Symposia 2024.** Symposium in Epithelial Barrier Immunity in Banff, Canada. February 2024. “Deciphering *Streptococcus salivarius*’s impact on small intestinal inflammation in stunted children” (Poster).
- **LIMNA 2023.** Symposium Lipids as mediators of cellular and organismal function in Lausanne, Switzerland. September 2023. “Stunted child growth is associated with small intestinal colonization by oral bacteria driving lipid malabsorption and inflammation in vitro” (Poster).
- **SSM 2023.** Swiss Society for Microbiology Annual Congress in Lausanne, Switzerland. August 2023. “Disentangling the role of the oral commensal *Streptococcus salivarius* in small intestinal inflammation in the context of childhood malnutrition” (Oral presentation).
- **FEMS 2023.** 10th Congress of European Microbiologists in Hamburg, Germany. July 2023. “A two-step duplex PCR for rapid detection of *Vibrio harveyi* strains hazardous to fish” (Poster).
- **SACMA 2023.** VIII Simposio científico de alumnos de la Facultad de Ciencias del Mar y Ambientales in Cádiz, Spain. May 2023. “Jóvenes investigadores de la Sociedad Española de Acuicultura SEA” (Poster).
- **NCCR Microbiomes 2023.** NCCR Microbiomes Annual Meeting in Kandersteg, Switzerland. April 2023. “Role of *Streptococcus salivarius* in lipid malabsorption and inflammation in the context of child malnutrition” (Poster).
- **CNA 2022.** XVIII Congreso Nacional de Acuicultura in Cádiz, Spain. November 2022. “Explorando el efecto de compuestos fitobióticos en camarón patiblanco: resistencia a la patología causada por *Vibrio parahaemolyticus*” (Poster).
- **MMA-SEM 2022.** XIII Reunión científica del Grupo de Microbiología del Medio Acuático de la SEM in Granada, Spain. September 2022. “Vibriosis en peces por *Vibrio vulnificus*: una enfermedad inflamatoria letal en la que la interacción entre los glóbulos rojos y la toxina RtxA1 es crucial” (Oral presentation).
- **FEMS 2022.** FEMS Conference on Microbiology 2022 in Belgrade, Serbia. July 2022.

“*Vibrio vulnificus* T6SS exhibits anti-eukaryotic effect but not anti-bacterial properties and contributes to virulence” (Oral presentation).

- **FEMS 2022.** FEMS Conference on Microbiology 2022 in Belgrade, Serbia. July 2022. “A two-step protocol for the detection and isolation of *Vibrio vulnificus* dangerous in public and/or animal health” (Poster).
- **NCCR Microbiomes 2022.** NCCR Microbiomes Annual Meeting in Kandersteg, Switzerland. April 2022. How *Streptococcus salivarius* promotes lipid malabsorption in the small intestine and contributes to stunting? (Poster).
- **SEM 2021.** XXVIII Spanish Microbiology Society Congress, online. June 2021. “La toxina RtxA1 del patógeno zoonótico *Vibrio vulnificus* induce una respuesta inflamatoria atípica y desregulada relacionada con muerte del hospedador” (Poster).
- **WMF 2021.** World Microbe Forum, online conference ASM-FEMS associated. June 2021. “*Vibrio vulnificus* MARTX Toxin Triggers Death in its Host by Causing a Strong Inflammatory Response in Which Erythrocytes Play an Important Role” (Poster).
- **Vibrio 2019.** 8th International Conference on *Vibrio*: The biology of Vibrios on Montreal, Canada. November 2019. “Temperature and host-adaptation response in the zoonotic pathogen *Vibrio vulnificus*” (Poster, **Awarded**).
- **CJIB 2017.** II National Congress of Young Researchers in Biomedicine - IV Valencian Congress of pre-doctoral Biomedical Researchers on Valencia, Spain. November 2017. “Role of iron in serum resistance in the zoonotic serovar of *Vibrio vulnificus*” (Poster).
- **Vibrio 2017.** ASM Conference on *Vibrio*: The Biology of Vibrios on Chicago, USA. November 2017. “Resistance to serum in the zoonotic serovar of *Vibrio vulnificus*: a transcriptomic and single gene approach” (Poster).
- **Vibrio 2016.** International Conference on *Vibrio* on Roscoff, France. March 2016. “Iron and Fur in the life cycle of the zoonotic pathogen *Vibrio vulnificus*”. (Poster).

Teaching activities

01/01/2022 – present:

Theoretical and Practical teaching (University of Lausanne, Switzerland).

- Supervision of Master Students thesis (2 students).
- Biotic interactions (BSc in Biology): practical teaching in in vitro techniques to study host-microbe interactions.
- Molecular Biology (BSc in Biology): practical teaching in molecular biology techniques applied to microbiology.

01/09/2021– 31/12/2021:

Preparation of topics and recording of virtual classes (Centro Europeo de Másteres y Posgrados (CEMP), Spain).

- Bacteriology (MSc in Clinical Analysis)
- Virology (MSc in Clinical Analysis)
- Micology (MSc in Clinical Analysis)

12/09/2016 – 31/12/2021:

Theoretical and Practical teaching (University of Valencia, Spain).

- Supervision of Master and Bachelor Students thesis (5 students).
- Pathology and immunology (MSc in Aquaculture): lecture lessons and laboratory

practices to identify and diagnose bacterial and viral infections in aquaculture contexts.

- Immunology (BSc in Biology): Immunoassays, ELISA.
- Immunology and immunopathology (BSc in Biochemistry and Biomedicine): quantification of the phagocytic and microbicidal capacity of human blood.
- Diagnosis and control of diseases (MSc in Aquaculture): laboratory techniques for diagnosis and control of bacterial and viral disease in aquaculture contexts.
- Microbial pathogenesis (BSc in Biochemistry and Biomedicine; BSc in Biology): isolation, purification and identification of bacterial pathogens from clinical samples; laboratory techniques to identify the pathogenicity potential of bacterial strains.
- Environmental microbiology (BSc in Environmental Sciences): laboratory techniques to isolate and identify microorganisms from a variety of environments.
- Microbiology (BSc in Biochemistry and Biomedicine; BSc in Biology): laboratory techniques to microorganism's identification: bacteria and fungi culture, staining techniques, optic microscopy, bacterial counting, microbial activities.

Participation in Founded Projects

- THINKINAZUL/2021/027 funded by MCIN (Ministerio de Ciencia e Innovación de España), European Union NextGeneration EU (PRTR-C17.I1) and GV (Generalitat Valenciana).
- NCCR Microbiomes, National Centre of Competence in Research, funded by the Swiss National Science Foundation Grant No. 180575.
- Eficacia de dietas funcionales en camarón en términos de resistencia a patologías causadas por *Vibrio parahaemolyticus* / otras bacterias (Phytoaqua: Fitobióticos para la mejora de la salud, rendimiento productivo y reducción en el uso de antibióticos en acuicultura). PI: Dr. Belén Fouz. Founder: Ministerio de Ciencia e Innovación/IGUSOL SA.
- Relación hospedador-patógeno en *Vibrio vulnificus*: aproximación de gen simple y ómica (III). PI: Dr. Carmen Amaro. Founder: Ministerio de Industria y Competitividad.
- Relación hospedador-patógeno en *Vibrio vulnificus* aproximación de gen simple y ómica II. PI: Dr. Carmen Amaro. Founder: Ministerio de Industria y Competitividad.
- Estudio de la relación hospedador-patógeno en *Vibrio vulnificus* utilizando una perspectiva transcriptómica. PI: Dr. Carmen Amaro. Founder: Ministerio de Ciencia e Innovación.

Research internships

13/09/2021-01/10-2021:

Invited fellow (HPE group, IFREMER, Montpellier, France). Advisor: Agnès Travers.

01/09/2018 – 30/11/2018:

PhD Internship (Laboratory of Molecular Microbiology, Swiss Federal Institute of Technology in Lausanne (EPFL), Switzerland). Advisor: Melanie Blokesch. Issue: training in amoeba culture, confocal microscopy and study of T6SS in *V. vulnificus* prey-predator relationship.

15/05/2016 – 15/07/2016:

PhD Internship (Animal Physiology Unit. Department of Cell Biology, Physiology and Immunology, Faculty of Biosciences, Universitat Autònoma de Barcelona, Spain). Advisor: Lluís Tort Bardolet. Issue: training in microarray technology and microarray data analysis.

01/02/2013 – 30/06/2013:

Student Intern (Agrochemical and Food Technology Institute (IATA), Valencia, Spain).

Advisor: Rosa Aznar. Issue: Collaboration in the project “Molecular identification and molecular typification of lactic bacteria from Andean fermented products”.

Fellowships and Awards

13/01/2021:

MSCA postdoctoral fellowship (European Commission).

13/01/2021:

IFREMER Scientific Cooperation Funding for visiting IHPE at IFREMER, Montpellier, France as an invited fellow (Amount: 1,466.67 € plus travel expenses).

20/11/2019:

Student Poster Competition Award (3rd Place) in 8th International Conference on *Vibrio*: The biology of Vibrios on Montreal, Canada. Awarded from Canadian Microbiology Society (Amount: 200 CAD).

12/11/2015:

PhD Scholarship for 4 years from the Spanish Ministry of Science, Innovation and Universities (Amount: 92,750 €).

Scientific committees

Scientific Committee in the oral communications and posters competition:

- **CIB 2024.** X Congress of Biomedical Research. February 2022. Valencia, Spain.
- **CIB 2022.** X Congress of Biomedical Research. February 2022. Valencia, Spain.
- **CIB 2021.** IX Congress of Biomedical Research. March 2021. Valencia, Spain.
- **CIB 2020.** VIII Congress of Biomedical Research. February 2020. Valencia, Spain.
- **CIB 2019.** VII Congress of Biomedical Research. February 2019. Valencia, Spain.

Leadership

- **Biomedicine Mentor**, International Mentoring Program IMFAHE (2023-2024).
- **Biomedicine Mentor**, International Mentoring Program IMFAHE (2022-2023).

Organization of conferences

- **FEMS 2017.** FEMS Microbiology Congress on Valencia, Spain. July 2017: Volunteer of the organizing committee.

Entrepreneurship and innovation

- **Innosuisse Business Concept Training, Spring 2024.** 2nd Award team.
- **IMFAHE's Idea Competition-Nodal Award/Shark Tank Edition 2023.** Finalist Team.

Reviewer activities

Present:

Ad hoc reviewer for:

- Frontiers in Cellular and Infection Microbiology.
- Animals.
- Microbial Pathogenesis.
- Fishes.

Science outreach

Science outreach papers:

- Amaro, C., and **Hernández-Cabanyero, C.** (2023) *Vibrio vulnificus* and Rising Ocean Temperatures: A Threat to Human and Marine Life. *Scientia*. doi: 10.33548/SCIENTIA942.
- Fouz, B, and **Hernández-Cabanyero, C.** (2024) Challenging shrimp bacterial diseases with phytobiotics. *Research Outreach*. doi: 10.32907/RO-139-5913059270.

April 2022 - present:

Copy writer in the Science Communication Blog Microbacterium (<https://microbacterium.es/autor/carla-hernandezcabanero/>):

- Día Mundial del Microbioma 2023: microbios y alimentos.
- Infección de orina: por qué ocurre y cómo evitarla.
- La reproducción de las anguilas: un misterio que las pone en riesgo de extinción.

2022-2023:

Girls4STEM Expert. Dissemination of STEM careers for women.

May 2022:

Collaborator in Les Mystères de l'UNIL. Open doors activities at University of Lausanne, Switzerland (<https://wp.unil.ch/mysteres/>).

Trainings

07/09/2015 – 04/07/2016:

Biomedicine Mentee at International Mentoring Foundation for the Advancement of Higher Education (IMFAHE). Advisor: M. Pilar Martínez Viedma.

01/10/2012 – 31/01/2013:

Internship in Clinical Analysis Laboratory Hematology, Biochemical, Immunology and Microbiology at Valencian Oncology Institute (IVO), Valencia, Spain. Advisor: Eduardo Aznar.

Scientific society memberships

- Spanish Microbiology Society (SEM).
- Federation of European Microbiological Societies (FEMS).
- Spanish Immunology Society (SEI).
- Spanish Aquaculture Society (SEA).

Languages

- Spanish: Native.
- English: C1 (Escuela Oficial de Idiomas, Spain, 2018).
- Valencian: C1 (Junta Qualificadora de Coneixements de Valencià, 2017).
- French: Basic understanding and communication.

Continuous education (Postgraduate courses and others)

- FELASA accredited course 038/12F for EU Functions A+C+D (Laboratory Animal Science) (2022). Lausanne, Switzerland. 40 h.
- Fire safety training course (2022). University of Lausanne, Switzerland. 2 h.
- Introduction to RNA-SEQ DATA ANALYSIS (2022). Functional Genomics Center Zurich, Switzerland. 1 credit ECTS.
- Human microbiome and health (2021). Spanish Microbiology Society (SEM). 4 credits ECTS on-line.
- Visible thinking for teaching (2021). University of Valladolid, Spain. 20 hours on-line.
- I Covid-19 National Congress (2020). Commission for Continuous Training of the Health Professions of the Community of Madrid, Spain. 116 hours on-line.
- COVID-19: Epidemiology, Microbiology, and Research in Pandemic Surveillance and Control Strategies (2020). International University Menéndez Pelayo. 15 hours on-line.
- Animal Experimentation. Fish Specialization (2019). University of Valencia/Conselleria de Medi Ambient, Valencia, Spain. 75 hours.
- Prevention and control of emerging viruses (2020). Spanish Microbiology Society (SEM). 4 credits ECTS, on-line.
- XVIII Workshop Rapid methods and automatization in Food Microbiology (2019). Facultad de Veterinaria, Universidad Autónoma de Barcelona.
- Biosecurity and Risk Prevention in Microbiology Laboratories (2019). Spanish Microbiology Society (SEM). 4 credits ECTS on-line.
- Fluorescence and confocal microscopy (2018). Zeiss, Spain. 10 hours.
- An introduction to Python for animal genetics (2018). Polytechnic University of Valencia, Spain. 20 hours.
- Animal Experimentation. Function A+B+C+D (2018). University of Valencia/Conselleria de Medi Ambient, Valencia, Spain. 175 hours.
- Introduction to NGS analyses (2016). Polytechnic University of Valencia, Spain. 32 hours.
- Use and maintenance of sharks Course (2011). Oceanogràfic de Valencia, Spain. 20 hours.
- Biology, recovery and preservation of marine turtles Course (2011). Oceanogràfic de Valencia, Spain. 12 hours