

## CURRICULUM VITAE (CVA)

**IMPORTANT – The Curriculum Vitae cannot exceed 4 pages. Instructions to fill this document are available in the website.**

Con form

<b>Part A. PERSONAL INFORMATION</b>		<b>CV date</b>	01/30/2022
First name	M <sup>a</sup> Carmen		
Family name	Thomas Carazo		
Gender (*)	Female	Birth date (dd/mm/yyyy)	
Social Security, Passport, ID number			
e-mail	mcthomas@ipb.csic.es	URL Web	www.ipb.csic.es
Open Research and Contributor ID (ORCID)(*)	<a href="https://orcid.org/0000-0003-3586-9657">0000-0003-3586-9657</a>		

(\*) Mandatory

### A.1. Current position

Position	Senior Researcher at IPBLN-CSIC, Head of laboratory, head of Molecular Biology department		
Initial date	June 1, 2004		
Institution	National Research Council (Institute of Parasitology and Biomedicine “López Neyra”)		
Department/Center	Molecular Biology		
Country	Spain	Teleph. number	34 958 181662
Key words	Trypanosoma cruzi, Chagas disease, gene expression, vaccine, immunology		

### A.2. Previous positions (research activity interruptions, art. 45.2.b))

Period	Position/Institution/Country/Interruption cause
1990-1994	FPU fellowship, Junta de Andalucía
1994 Oct-Dic	Postdoctoral Researcher at University of San Francisco, California
1997–2000	Fellowship “Perfeccionamiento de doctores ISCIII- FIS” at IPBLN-CSIC
2001-2003	Senior Researcher FIS- UMIM., Hospital Universitario S. Cecilio SAS
2004 Jan-May	Ramón y Cajal Researcher at IPBLN-CSIC

### A.3. Education

PhD, Licensed, Graduate	University/Country	Year
Licensed in Pharmacy	University of Granada	Sep 1989
PhD in Pharmacy	University of Granada	July 1994

### Part B. CV SUMMARY (max. 5000 characters, including spaces)

My scientific objectives focus on the study of infectious agents that cause diseases in humans from the knowledge of the molecular and immunological bases that mediate the infection processes to those involved in protection against the pathogens under study. The results obtained are reflected in 122 scientific publications (109 included in SCI). I have recognized 4 sexenios and 1 technological sexenio.

I have been 32 years working on science and as principal investigator of grants for the last 21 years. I am senior scientific researcher of the National Research Council (CSIC) and head of a laboratory at the Institute of Parasitology and Biomedicine “López Neyra” in Granada, Spain, which is one out the four laboratories of reference for Chagas disease in Spain. For 32 years, my research is focused on molecular biology of parasites, especially *Trypanosoma cruzi* and *Leishmania*. I have been involved in the study of DNA mobile elements in trypanosomatids. We have identified and characterized the Pr77 dual system, which bears promoter activity (at DNA level) and HDV-like ribozyme activity (at RNA level). We have shown the existence of functional viral sequences that as part of mobile genetic

elements are also present in several infectious agents, which convert to these fosile/rubbish DNAs in functional tools that regulate gene expression in these infectious agents.

I have isolated and characterized at molecular level several antigens of *T. cruzi* and *Leishmania* which as recombinant proteins are useful tools in determining the degree of pathology of Chagas disease and treatment efficacy. That is the case of KMP11 and PFR2 proteins and 3973 peptide. Together to clinicians of several Hospitals in Spain, mainly those from the Hospital Virgen de la Arrixaca in Murcia, we are following- up more than 1000 treated patients. This has allowed us to generate relevant information to control the sickness, such as that the treated women do not transmit the parasite to their children. The results obtained indicate that these molecules can determine the degree of pathology of patients with ChD after treatment, thus facilitating patient follow-up. Part of our effort and possibilities is directed to demonstrate this fact. The NIH has awarded us a project to evaluate different treatment regimens for patients with ChD and monitor the treatment efficacy by follow up the patients using PCR and 5 biomarkers (4 of them developed in the Laboratories of Dr. MC López and Dr. MC Thomas).

I am Head of the IPBLN Molecular Biology Department since April 2018. I have coordinated the IPBLN Genomics Unit for 9 years. I am Academic of the Ibero-American Academy of Pharmacy since 2012. In the last 10 years, I have been a Member of the Scientific Committee and Organizing Committee of 19 National and International Congresses and Workshops of the specialty. I am reviewer of research projects assigned by different National and International research entities.

I am a member of the Cooperative Research Network on Tropical Diseases (RICET); of the “la Plataf. Atlántica para el Control e Investig. de Enferm Tropicales“, in which Institutions from Brazil, Venezuela, Colombia, Argentina, etc, Africa (South Africa, Cape Verde, Uganda, etc), Portugal and Spain participate. I am Member of the Ibero-American Network NHEPACHA (New Tools for the diagnosis and the evaluation of patients with CHAgas diseases). With these networks, we annually organize courses and scientific meetings such as those that take place within the framework of the Society of Tropical Medicine and International Health, biannual participation in Campus Africa, and the annual meeting of the NHEPACHA network and the Chagas Workshop, respectively. I am a member of the Editorial Committee of the BioMed Research International Journal and the Universitas Scientiarum ISSN 0122-7483 journal, as well as a reviewer for different scientific journals.

I have supervised 11 Doctoral Theses and 8 Master's Thesis. I am a professor of different Doctorate courses and Masters in different Spanish Universities as well as different national and international specialization courses. I have directed the work of 6 foreign doctoral students through stays in my laboratory, the work carried out in all cases have been published. I am a tutor for students for their training, both graduates and technicians. Most of the doctoral students have continued their scientific career and carried out postdoctoral stays in prestigious laboratories abroad. Currently, two of them are group leaders with projects as Principal Investigators.

I participate in scientific outreach events with talks and workshops to high school students who want to be scientists, in events such as "European Night of Researchers", "I investigate", and two TV programs in the Andalusian TV (ConCiencia).

### **Part C. RELEVANT MERITS** (sorted by typology)

#### **C.1. Most important publications in books and journals with "peer review" and in conferences .-**

.- Macías F, Afonso-Lehmann R, Carreira P, **Thomas MC.(AC)** (4/4) (2021). “TBP and SNAP50 transcription factors bind specifically to the Pr77 promoter sequence from trypanosomatid non-LTR retrotransposons”. *Parasites and Vectors*. 14(1):313. DOI: [10.1186/s13071-021-04803-5](https://doi.org/10.1186/s13071-021-04803-5)

.- Gómez, I., **Thomas, M.C. (AC)**, ..., López, M.C. (2/10) (2021) “Differential Expression of Immune Response Genes in Asymptomatic Chronic Chagas Disease Patients Versus Healthy Subjects”. *Frontiers in cellular and infection microbiology*. 11:722984. <https://doi.org/10.3389/FCIMB.2021.722984>

- Alonso-Padilla J, López MC, Esteva M,... ,**Thomas MC (AC)**, Pinazo MJ (13/14). (2021) “Serological reactivity against *T. cruzi*-derived antigens: Evaluation of their suitability for the assessment of response to treatment in chronic Chagas disease”. *Acta Tropica*, 221:105990.
- Gómez, I, López, MC, Rastrojo, A, Lorenzo-Díaz, F, Requena, JM, Aguado, B, Valladares, B, **Thomas, MC (AC)**. (8/8) (2021) “Variability of the Pr77-hallmark dual system among six *T. cruzi* strains belonging to different discrete typing units (DTUs)”. *Acta Tropica*, 222:106053.
- Egui A., López MC, Gómez I, Simón M, Segovia M, **Thomas MC (AC)**. (6/6) (2020) “Differential phenotypic and functional profile of epitope-specific cytotoxic CD8+ T cells in benznidazole-treated chronic asymptomatic Chagas disease patients”. *BBA Molecular Basis of Disease* Mar 1;1866(3):165629. doi: 10.1016/j.bbadis.2019.165629.
- Egui A, **Thomas MC (AC)**, Fernández-Villegas A.,..., López MC (2/14) (2019) “A parasite biomarker set for evaluating benznidazole treatment efficacy in patients with chronic asymptomatic *Trypanosoma cruzi* infection”. *Antimicrobial Agents and Chemotherapy*. 63(10) 1-17.
- Egui A, Ledesma D, Pérez-Antón E., ..., López MC, **Thomas MC (AC)** (9/9) (2018) “Phenotypic and functional profiles of antigen-specific CD4<sup>+</sup> and CD8<sup>+</sup> T cells associated with infection control in patients with cutaneous leishmaniasis”. *Frontiers in Cellular and Infection Microbiology*. 8(393):1-15, doi: 10.3389/fcimb.2018.00393. doi: 10.3389/fcimb.2018.00393.
- Fernandez-Orgiler, A., Martínez-Jimenez, M., Alonso, A.,..., L.; Larraga, V. (6/8) (2016) “A putative *Leishmania* DNA polymerase theta protects the parasite against oxidative damage” *Nucleic Acids Research*, 44(10):4855-70. doi: 10.1093/nar/gkw346.
- Macías F, López MC, **Thomas MC(AC)** (3/3) (2016) “The trypanosomatid Pr77-hallmark contains a downstream promoter element essential for transcription activity of the *Trypanosoma cruzi* L1Tc retrotransposon”. *BMC Genomics* 3/3. 17:105 DOI 10.1186/s 12864-016-2427-6. 2016.
- Sanchez-Luque F, López MC, Carreira P, Alonso C, **Thomas MC (AC)** (5/5) (2014) “The wide expansion of HDVlike ribozyme through trypanosomatid genomes is linked to the spreading of the L1Tc/ingi clade mobile element. *BMC Genomics*, 15:340 Doi:10.1186/1471-2164-15-340.

## C.2. Congress.

Presentation of results in 18 invited conferences in international Congresses and Meetings; 3 oral communications in national and international Congresses and 7 Posters.

## C.3. Projects or research lines in which you have participated.

- “Control de la leishmaniosis: perfil funcional, fenotípico y de expresión génica de la respuesta inmunológica celular asociada al control de la infección por *Leishmania infantum*”. Proyectos de Excelencia PAIDI 2020-convocatoria 2021. Junta de Andalucía. 12/2022-12/2025. Ref: ProyExcel\_00852. IP: M<sup>a</sup> Carmen Thomas Carazo y MC López.
- Development and Manufacturing of vaccines for alleviation and preparedness for the anti-microbial resistance global health crisis. AMReady. Convocatoria de Líneas Estratégica en colaboración público-privada. Programa Estatal de I+D+i Orientado a los Retos de la Sociedad. AIE-MINECO (6/2021-5/2024). Ref. PLEC2021-00878. IP: MC López..
- Avances en el conocimiento inmunológico y molecular para el control de la enfermedad de Chagas. Programa Estatal de I+D+i Orientada a Retos de la Sociedad (Plan Estatal de Investigación Científica y Técnica y de Innovación): AEI-MINECO Ref PID2019-109090RB-100 (1/06/2020-31/05/2023) IP: MCThomas y MC López

.- “New chemotherapy regimens and biomarkers for Chagas disease”. Entidad financiadora: National Institutes of Health (USA). Grant Number 1U01AI129783-01A1. FAIN U01AI129783. 09/2018-10/2023. M.C. Thomas: Investigator, Co-IP- CSIC.

.- “Validación de Biomarcadores de Eficacia Terapéutica frente a la Enfermedad de Chagas”. Estudio multicéntrico. Red iberoamericana NHEPACHA. IPs: M Carmen Thomas Carazo y M<sup>a</sup> Jesus Pinazo. 2016-2019. 130.000 €.

.- “Study of the genomic context of retrotransposons in the *T. cruzi* genome and relationship of their functional sequences with the gene expression regulation processes”. Ministerio de Economía y competitividad (Programa Estatal de I+D+I Orientada a los Retos de la Sociedad). (Enero/2017 a Diciembre/2019). Expte: SAF2016-80998-R. IP. M<sup>a</sup> Carmen Thomas Carazo.

.- “Study of the promoter (DNA)/ribozyme (RNA) dual function of the L1Tc-Pr77 hallmark and its implication in the regulation of gene expression in *Trypanosomatids* and *Leishmania*”. Plan Nacional de I+D+I. Ref. SAF2012-35777. 1/11/2013 a 31/XII/2015. PI: M.C. Thomas. .

#### **C.4. Participation in technology/knowledge transfer activities and exploitation of results. Patentes y licencia de patentes:**

**.-Inventors:** MC Thomas; A Egui; MC López. **Title:** Biomarcadores de la enfermedad de Chagas; **Holder Entity:** CSIC; **Patent in Spain:** P201230846. **Date:** VI/2012; **Licensed Patent to:** Praxis Biopharm Research Institute, S.L. and Biokilab S.L. I/2013.

**.-Inventors:** MC Thomas; MC López; D Ledesma. **Title:** Molécula quimérica útil en inmunoterapia frente a la leishmaniasis, que comprende un fragmento de proteína PFR1 de *Leishmania infantum* con epítopes específicos inmunodominantes; **Holder Entity:** CSIC; **Patent in Spain:** P201131257 **Date:** VII/2011; **International Patent:** PCT/ES2012/070541. **Date:** VII/2012.; **Patent extension: European Patent** No EP12815090. II/2014, **Brazilian Patent** No BR112014001086. VII/2012; **Chinese Patent** CN80045285, VII/ 2014 and **US Patent** No US14/234075, II/2014 and granted on III/ 2018; **Licensed Patent:** ADL Bionatur Solutions, S.A., October 5, 2013.

**.-Inventors:** M.C. Thomas; M.C. López; C. Marañón; A. Fernandez Villegas; M. Segovia. **Title:** Método de diagnóstico diferencial de la enfermedad de Chagas; **Holder Entity:** CSIC (85%) and Fundación para la Formación e Investigación Sanitaria de la Región de Murcia (15%); **Patent in Spain:** P201031097. **Date:** 16 de Julio 2010; **International Patent:** PCT/ES2011/070501. **Date:** July 8, 2011; **Patent in Mexico** No 000638, January 18,2013; **Patent No in Colombia,**13-031096 february 15,2013; **Licensed Patent:** Patent Licensed to Praxis Biopharmaceutical Research Institute, S.L. and Biokilab S.L. Jaenuary 10, 2013.

**.-Inventors:** M.C. López; M.C. Thomas; A. Fernández Villegas; C. Marañón. M. Segovia. **Title:** Método de obtención de datos útiles para el diagnóstico diferencial de la enfermedad de Chagas y para evaluar la respuesta al tratamiento. **Holder Entity:** CSIC (80%) y Fundación para la Formación e Investigación Sanitaria de la Región de Murcia (20%). **know-How Licence:** Praxis Biopharmaceutical Research Institute, S.L. and Biokilab S.L. January, 13, 2013-.

#### **Contratos, méritos tecnológicos o de transferencia**

“BNT005: Innovación y desarrollo avanzado de Biotecnologías para el diagnóstico y tratamiento del mal de Chagas – INNOCHAG. Programa Estatal de I+D+I Orientada a los retos de la Sociedad (MEC). Participantes: BOKILAB SL., Praxis e IPBLN (CSIC). Ref.: RTC-2014-2130-1. Fecha: Nov/2014 a XII/2017. IP-IPBLN- M.C. Thomas. .

“Inmunidad celular para la prevención y tratamiento de la leishmaniasis en humanos. Investigación para el desarrollo de una vacuna innovadora con elevado potencial comercial internacional”. Programa Estatal de I+D+I Orientada a los Retos de la Sociedad.I/2017-XII/2019. Ref. RTC-2016-5005-1. Participantes: ADL Bionatur S.A. e IPBLN- CSIC. IPs: MC Thomas.