

Part A. PERSONAL INFORMATION

CV date 12/01/2017

First and Family name	Miguel Torres Sánchez		
Social Security, Passport, ID number	NIF: 5387327Z	Age	53
Researcher numbers	Researcher ID	A-7388-2013	
	Orcid code	0000-0003-0906-4767	

A.1. Current position

Name of University/Institution	Centro Nacional de Investigaciones Cardiovasculares (CNIC)		
Department	Cell and Developmental Biology Area		
Address and Country	Melchor Fdez Almagro 3, 28029 Madrid, Spain		
Phone number	E-mail	mtorres@cnic.es	
Current position	Full Professor. Group leader.	From	January 2007
Espec. cód. UNESCO	2415 Molecular Biology; 2407 Cell Biology; 2409 Genetics		
Palabras clave	Developmental Biology, Cardiac Development, Organogenesis, Mouse Genetics, Homeodomain, Stem Cell Biology, Apoptosis		

A.2. Education

PhD in Biochemistry and Molecular Biology	Universidad Autónoma de Madrid	1991
Msc in Biology	Universidad Complutense de Madrid	1986

A.3. JCR articles, h Index, thesis supervised...

Research sexennials: 4; 1989-1995; 1996-2000; 2001-2006; 2007-2012

Doctoral theses directed in the last 10 years: 5 completed; 8 ongoing

Total number of publications with IF: 75 publications; 66 in Q1 (88%) and 33 in D1 (44%).

Of the total 75 publications in the WOS, 71 (95%) are original articles and reviews and he's main author in 53% of them. The mean IF for all his publications is 9.380 and 9.909 for all the publications in which he's main author.

Total number of citations: 5020 (66.93 per document).

Average number of citations during the last five years: During the period 2012-2016, the total number of documents received 1467 citations (293.4 per year).

H-index: 34

Part B. CV SUMMARY (max. 3500 characters, including spaces)

My research career has focused on understanding the regulation of embryonic developmental and organogenesis. My fundamental contributions have dealt with the understanding of how gene activity regulates the processes of regionalization and tissue / regeneration homeostasis. During my PhD (CIB-CSIC) I was trained in the Drosophila model, and during the postdoctoral period (MPI-Germany) I majored in vertebrate development and the use of mouse genetics methodology. In 1996 I started my independent group, which has since contributed with important work for understanding processes of regionalization of the limb and vertebrate heart, some of which have been modified concepts rooted in the field of developmental biology for decades (Nature 1998 and 1999; Development 2000 and 2014; Science 2011) and are relevant for understanding process of organ regeneration (Development 2005). A large part of our work on organogenesis has been based on the study of genes encoding homeodomain transcription factors, area in which we have contributed generation and description of new mutants and mapping binding sites in the genome (Dev Biol.2005; Circ. Res 2010; Cell Reports 2013). Likewise, we have made important contributions for understanding the conservation of cell death pathways in metazoans (EMBO J 1998; 2002). We have provided the first evidence of endogenous cell competition in vertebrates (Nature 2013; Cell Reports 2014), and we have described new relationships and restrictions on vertebrate lineages (Development 2007, Blood 2014). In the last decade, our work has expanded to the understanding of how cell behaviour determines morphogenesis processes and tissue homeostasis, which led us to the implementation of new techniques, including new genetic tools and new methodologies in vivo using time-lapse 3D video microscopy and computerized analysis of organogenesis.

In the last 10 years my research activity has combined with scientific management, first in CNB, where I assumed the leadership of the Department of Immunology and Oncology (2005-6) and then in the CNIC, as founding director of the Department of Cardiovascular Development and Repair in 2007. As Director of Department, I have been responsible for the recruitment and design of the scientific strategy. In addition, I assumed in 2009 the position of Deputy Director of the Center, acting until 2015 as the *in situ* scientific head of the institution and contributing to the recruitment of scientists, design of infrastructures and scientific strategy.

Along with Dr. Valentin Fuster, General Director of CNIC, I am the co-IP of the project awarded with the CNIC Severo Ochoa in the first call of this program (2011).

Part C. RELEVANT MERITS

C.1. Selected Publications

1. Torres M (2016) Regeneration: Limb regrowth takes two. *Nature*. 19: 328-30. IF:38.188
2. Claveria C, Torres M (2016) Cell Competition: Mechanisms and Physiological Roles *Annu Rev Cell Dev Biol*. 32: 411-439. IF: 12,755
3. Marcos S, González-Lázaro M, Beccari L, Carramolino L, Martín-Bermejo MJ, Amarie O, Mateos-San Martín D, Torroja C, Bogdanović O, Doochan R, Puk O, Hrabě de Angelis M, Graw J, Gomez-Skarmeta JL, Casares F, Torres M*, Bovolenta P.* (2015) Meis1 coordinates a network of genes implicated in eye development and microphthalmia. *Development*. 142:3009-20.* Co-corresponding authors. IF: 6,059
4. Padrón-Barthe L., Temiño S, Villa del Campo C., Carramolino L., Isern J., Torres M. (2014) Clonal analysis identifies hemogenic endothelium as the source of the blood–endothelial common lineage in the mouse embryo. *Blood*, 124, 2523-2532. IF: 10,452
5. Villa del Campo C., Clavería C., Sierra R. and Torres M. (2014). Cell competition promotes phenotypically silent cardiomyocyte replacement in the mammalian heart. *Cell Reports* 8, 1741-1751. IF: 8,358
6. Clavería C, Giovinazzo G, Sierra R, Torres M (2013). Myc-driven endogenous cell competition in the early mammalian embryo. *Nature*. 500, 39-44. Full article and issue cover. IF: 42,351
7. Roselló-Díez A, Ros MA, Torres M. (2011) Diffusible signals, not autonomous mechanisms, determine the main proximodistal limb subdivision. *Science* 332:1086-8. IF: 31,201
8. Carramolino L., Fuentes J, García-Andrés C, Azcoitia V, Riethmacher D, and Torres M. (2010). Platelets play an essential role in separating the blood and lymphatic vasculatures during embryonic angiogenesis. *Circulation Research* 106, 1197-201. IF: 9,504
9. Clavería C., Albar J.P., Serrano A, Buesa, J.M., Barbero J.L., Martínez-A C., Torres M. (1998). *Drosophila grim* induces apoptosis in mammalian cells. *EMBO J.*, 17, 7199-7208.
10. Clavería C., Caminero E., Martínez-A C., Campuzano S., Torres M. (2002). GH3, a novel proapoptotic domain in *Drosophila Grim*, promotes a mitochondrial death pathway. *EMBO J*. 21, 3327-3336. IF: 10.4
11. Mercader N., Leonardo E., Azpiazu N., Serrano A., Morata G., Martínez-A C., **Torres M.** (1999). Conserved regulation of proximodistal limb axis development by Meis1/Hth. *Nature*, 402, 425-429. **IF: 41.4**

C.2. Research projects and grants (7 grants selected out of 23 as PI)

- 1- “Computerized 4-Dimensional Clonal Analysis of the Developing Mouse Limb”. Human Frontiers Science Program, RGP8/2004, 2004-2007. PI and Coordinator: M.Torres.
- 2- "Integrated technologies for in-vivo molecular imaging” EU FP6, ref LSHG-CT-2003-5032259. 2003-2008. PI: M.Torres (Coordinator, E N Economou, FORTH, Crete).
- 3- “COST Action: on HOX and TALE transcription factors in Development and Disease. Agency: COST European Cooperation in the field of Scientific and Technical Research. EU FP7-BM0805, 2009-2013, PI and elected Chair of 32 groups from 18 countries: M. Torres. € 320.000 for the whole network.

- 4- “Red de terapia celular RETICS” TerCel. Agency: FIS, ISCIII, Ref: RD16/0011/0019, 2017-2021, PI: M. Torres (Coordinator: J.M. Moraleda, Hospital U. Virgen de la Arrixaca, Murcia)
- 5- “Marie Sklodowska-Curie Innovative Training Networks (ITN) (H2020-MSCA-ITN-2016) 4DHeart. PI and Coordinator: M.Torres.
- 6- “Control transcripcional del desarrollo cardíaco y su impacto en las enfermedades y mecanismos de reparación del corazón”. Agency: MINECO. Ref: BFU2015-71519-P. 2016-2018. PI: M. Torres.
- 7- “Severo Ochoa Award to CNIC” Ministerio de Economía y Competitividad. Ref. SEV-2011-0052. 2012-2015. Co-PIs: Valentín Fuster and M. Torres

C.3. Participation in Research, Development and Innovation Contracts

- 1992-1996** Agreement for financing the project “genetic screening with gene trapping. Financial entity: Amgen.. PI: Peter Gruss
- 2003-2006** Agreement for financing the Immunology and Oncology Department. CNB-CSIC. Financial entity: Pfizer. PI Carlos Martinez-A
- 2007-** Agreement for CNIC support. Financial entity: Fundación ProCNIC. PI: Valentín Fuster

C.4. Patents

INVENTORS (in order of authorship): P.Bonaldo, K.Chowdhury, P.Gruss, A.Stoykova, M.Torres.
TITLE: Identifizierung eines Säuger-Gens dessen partieller Ausfall (Mutation) zur verstärkten Körperfettbildung führt (Identification of a mammalian gene whose partial mutation causes increased production of body fat)
APPLICATION FORM No: 2-621-0707-2103. PRIORITY COUNTRY: Germany
HOLDER ENTITY: Max-Planck Society. COMPANIES THAT ARE LICENSING IT: AMGEN, Thousand Oaks, CA, USA (license expired)

C.5 Awards and other distinctions

- 1988** Predoctoral Fellowship from the Spanish Ministry of Education and Science, Spain
- 1992** Postdoctoral Fellowship, European Molecular Biology Organization
- 1993** Postdoctoral Fellowship, European Union
- 2001** Member “Faculty of 1000”
- 2003** Member of the Editorial Board of Developmental Dynamics
- 2004-8** Member of the Scientific Advisory Board of the biotechnology company Oncostem Therapeutics
- 2009** Elected Chair of the COST Action BM0805 “HOX and TALE transcription factors in Development and Disease”
- 2011-** Member of the Editorial Board of Developmental Biology
- 2011-** Member of the Scientific Committee selected to organise the 2014 Weinstein Meeting on Cardiovascular Development in Madrid
- 2011** Scientific co-director of the CNIC application that obtained the Severo Ochoa Award
- 2012** Shortlisted for the “La Vanguardia” price “Scientific breakthrough of the year”
- 2012-** Member of the Editorial Board of the International Journal of Developmental Biology
- 2014-** Pfizer Price for the best basic science publication in Spain (Nature. 500, 39-44)

C.6 Selected International Invited talks

- 2010** Gordon Research Conference on " Molecular Mechanisms In Lymphatic Function & Disease", Barga, Italy
- 2011** EMBO Workshop - Lineage Commitments: Emphasis on Extraembryonic-Embryonic Interfaces, Leuven, Belgium
- 2012** 12th International Conference on Limb Development & Regeneration Meeting: HoxA cluster epigenetic regulation underlies cell-autonomous generation of late limb proximodistal pattern. Quebec, Canada
- 2012** 45th Annual New York Cardiovascular Symposium: Major Topics in Cardiology Today: Embryogenic Development of the Heart: Implications for Stem Cell Regeneration in the Adult. NY, USA
- 2012** "Cell competition in the mammalian epiblast eliminates cells with lower Myc levels". Cornell University, NY, USA
- 2013** Hox-related and unrelated functions of TALE-homeodomain transcription factors during mammalian organogenesis. International Conference: Hox and TALE Transcription factors in Development and Disease. Egmond aan Zee, The Netherlands
- 2013** "Cell Competition in Mammalian Organogenesis". Second Meeting of the Portuguese

Society for Developmental Biology. Lisbon, Portugal

2013 46th Annual New York Cardiovascular Symposium: Major Topics in Cardiology Today: Embryonic Development of the Heart: The Competitive Nature of Cardiac Development. NY, USA

2014 Cell competition and tissue homeostasis in Mammals. Max-Planck Center for Molecular Cell Biology and Genetics. Dresden, Germany

2014 Cell Competition in Mammalian Development and Tissue Homeostasis. 47th Meeting of the Japanese Society for Developmental Biology. Nagoya. Japan

2014 Cell Competition in Mammalian Development and Tissue Homeostasis. The 2014 Santa Cruz Developmental Biology Meeting, UCSC, USA

2014 Jonah Platt Stem Cell Lecture Series. Eli and Edythe Broad Center of Regeneration Medicine and Stem Cell Research, UCSF, USA

2014 Role of Anabolism Regulation in Cardiac Development and Homeostasis. American Heart Association Scientific Sessions 2014, Chicago, USA

2015 Keynote speaker at the Congress of the Society for Cell Biology, Spain

2015 Speaker at the Presidential symposium at the Congress of the Society for Developmental Biology, USA

2016 Organizer and Speaker. Simposio Internacional: Competición celular, apoptosis y cáncer. Fund. Ramón Areces

2016 Heart Failure Winter Meeting. ESC. Les Diablerets, Suiza

2016 Myology 2016. Lyon, France

2016 39th Annual Meeting of the Molecular Biology Society of Japan. Mishima, Japan

2017 Speaker at 14th International Conference on Limb Development and Regeneration, UK

C.7 Management Positions

2005-2006: Director of the Immunology and Oncology Department. CNB-CSIC.

2007- 2015: Director of the Cardiovascular Development and Repair Department at CNIC

2009- 2011: CNIC Associate Director

2012- 2015: CNIC Scientific Director

C.8 Other

1995- Organizer of 18 International meetings and workshops

1998- Director of 17 doctoral thesis

1996- External Ad-Hoc reviewer for National and International Agencies: ANEP (Spain), CAM (Madrid), NSF (USA), DFG, Germany, FONCYT (Argentina), Chilean Government, FCT (Portugal), SFI (Ireland), the European Research Council (ERC, EU), the Human Frontiers Science Program (HFSP) and others

2001- Six-times member of the evaluation panels of the Spanish National Research Grants.

1996- Reviewer for various international research journals, including Nature, Science, EMBO J, Cell Reports, Plos Biology, Development, Developmental Biology, Mechanisms of Development, Developmental Dynamics and others.

1991- Teacher in 14 graduate courses in Spanish Universities

2015- Coordinator of the “Fundamental and Systems Biology” area in the National Agency for Evaluation and Prospection (ANEP).