Leopoldina
Nationale Akademie
der Wissenschaften

Curriculum Vitae Professor Dr Maria-Elena Torres-Padilla

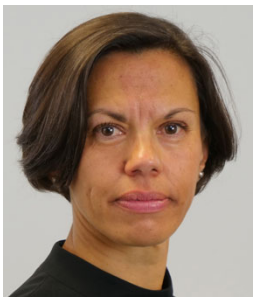

Image: Helmholtz Munich

Name: **Maria-Elena Torres-Padilla**
Born: **4 October 1975**

Research Priorities: Epigenetics, stem cells, reprogramming, cellular plasticity, developmental biology

Maria-Elena Torres-Padilla is a Mexican-French biologist, who studies the mechanisms that underlie the plasticity of cells. Her focus is foremost on epigenetic principles, which are the cellular processes that influence the activity of genes. Maria-Elena Torres-Padilla elucidated the role histones, a class of core proteins, play during cell differentiation, as well as other regulatory processes. Her discoveries considerably deepened the understanding of totipotency, which is the ability of cells to form a complete organism. The research of Maria-Elena Torres-Padilla can be of importance for cell therapies.

Academic and Professional Career

since 2021	Head, Stem Cell Center, Helmholtz Zentrum Munich, Munich, Germany
since 2020	Director of Biomedicine, Helmholtz Pioneer Campus, Helmholtz Zentrum Munich, Munich, Germany
since 2016	Director, Institute of Epigenetics and Stem Cells, Helmholtz Zentrum Munich, Munich, Germany
since 2016	Chair of Stem Cell Biology, Faculty of Biology, Ludwig-Maximilians-Universität Munich (LMU), Munich, Germany
2010 - 2012	Deputy Director, Developmental Biology and Stem Cell Department, Institut de génétique et de biologie moléculaire et cellulaire (IGBMC), Illkirch-Graffenstaden, France
2012	Director of Research, Institut national de la santé et de la recherche médicale (INSERM), France
2009	Independent Group Leader, IGBMC, Illkirch-Graffenstaden, France
2007	Chargée de Recherche, INSERM, France

2006 - 2008	Senior Scientist, IGBMC, Illkirch-Graffenstaden, France
2002 - 2006	EMBO Postdoctoral Fellow, The Gurdon Institute, University of Cambridge, Cambridge, UK
2001	Visitor, University of California (UC) Riverside, Riverside, USA
1998 - 2002	Ph.D.-Student, Universität Paris V, Paris, France
1994 - 1998	Studies in Biology, Faculty of Sciences, National Autonomous University of Mexico (UNAM), Mexico-City, Mexico

Functions in Scientific Societies and Committees

since 2023	Member, Scientific Advisory Board, Centre for Integrative Genomics, University of Lausanne (UNIL), Lausanne, Switzerland
2022 - 2024	Member, Selection Committee “Cell and Developmental Biology”, Academia Europaea
since 2022	Member, Editorial Board, EMBO Reports
since 2021	Member, Editorial Board, Science
since 2021	Member, Editorial Board, Cell Stem Cell
since 2021	Member, Peer Review Panel “Starting Grants”, European Research Council (ERC)
since 2022	Member, Centre for Molecular Biology Severo Ochoa, Madrid, Spain
since 2021	Member, UK Dementia Research Institute, Imperial College London, London, UK
since 2020	Member, Kuratorium and Brain Trust, BIOTOPIA – Naturkundemuseum Bayern, Botanical Institute, Munich, Germany
since 2019	Member, Editorial Board, Development
since 2018	Member, Steering Committee, Single Cell Omics Germany, Germany
2018 - 2021	Member, Editorial Board, Journal of Cell Biology
2018 - 2019	Member, Award-Committee, ATIP-Avenir Program, INSERM / Centre national de la recherche scientifique (CNRS), France
2017 - 2019	External Scientific Advisor, 4D Nucleome Project, National Institutes of Health (NIH), Bethesda, USA
since 2017	Member, Center for Integrative Biology, Toulouse, France
2017	Co-Chair, Annual Meeting “Summer Davos”, World Economic Forum
since 2016	Member, Editorial Board, Genes and Development

Project Coordination, Membership in Collaborative Research Projects

2021 - 2025	Vice-Speaker, Collaborative Research Centres (SFB) 1064 “Chromatin Dynamics”, German Research Council (DFG), Germany
2020 - 2024	Member and Awardee, 4D Nucleome Project, NIH, Bethesda, USA
2020 - 2021	Member, Global Future Council on Data Policy, World Economic Forum
2020	Pioneers of Change Summit “Frontier Technologies”, World Economic Forum
2019 - 2026	Member, Board, International Helmholtz-Edinburgh Research School for Epigenetics “EpiCrossBorders“, Helmholtz Zentrum Munich, Munich, Germany
2019 - 2020	Leader, Work Package, LifeTime European Initiative
2019 - 2020	Founding Member, LifeTime European Initiative
since 2018	Member, Think Tank, Helmholtz Association, Germany
2018 - 2026	Co-Coordinator, Networks “EpiGene2Sys” and “EpiGene3Sys”, Germany
2018 - 2023	Member, COST Action “International Nucleome Consortium” (INC), COST Association, Brussels, Belgium
2012 - 2015	Founder and Coordinator, Nuclear Dynamics & Signalling Programme, IGBMC, Illkirch-Graffenstaden, France
2011	Starting Grant, European Research Council (ERC)
2011	Elected RISE1 Member, Network of Excellence “EpiGeneSys”, 7th Framework Programme for Research (FP7), European Union

Honours and Awarded Memberships (Selection)

since 2023	Member, German National Academy of Sciences Leopoldina, Germany
2023	Member, Latin American Academy of Sciences (ACAL)
2021	Member, Academia Europea
2019	Honorary Professor, Aarhus University, Aarhus, Denmark
2018	Awardee, German Stem Cell Network (GSCN) Award, Max Delbrück Center (MDC), Berlin, Germany
2015	Member, European Molecular Biology Organization (EMBO)
2015	Outstanding Young Scientist, World Economic Forum
2014	Award, Fondation Schlumberger pour l’Education et la Recherche, Paris, France
2014	Prix du Cercle Gutenberg, Fondation Université de Strasbourg, Straßburg, France

2011	Young Investigator, EMBO
2009	Avenir Grant for Group Leaders, INSERM
2003 - 2005	Postdoc Fellow, EMBO

Research Priorities

Maria-Elena Torres-Padilla is a Mexican-French biologist, who studies the mechanisms that underlie the plasticity of cells. Her focus is foremost on epigenetic principles, which are the cellular processes that influence the activity of genes. Maria-Elena Torres-Padilla elucidated the role histones, a class of core proteins, play during cell differentiation, as well as other regulatory processes. Her discoveries considerably deepened the understanding of totipotency, which is the ability of cells to form a complete organism. The research of Maria-Elena Torres-Padilla can be of importance for cell therapies.

To replace diseased cells with healthy ones in cell regeneration or replacement therapy, it must first be understood how new cells are generated. In this context, Maria-Elena Torres-Padilla is concerned with the reprogramming of cells. Her working group combines high-resolution microscopy with approaches from genomics to study the epigenetic principles that underlie cellular reprogramming on early embryos as well as stem cells models.

Her team's research is focused foremost on deciphering the mechanisms of cellular plasticity and the establishment of totipotency and pluripotency during mammalian early embryon development: In this state, cells posses the ability to generate all cell types of the body. The group is devoted specifically to find out how cellular plasticity is controlled by epigenetic processes. Their research contributed to the discovery of key determinants and chromatin regulators of totipotency. Thelater are proteins that control the material of which chromosomes are formed.

An understanding of this significant transition during development is essential to understand how a stem cell can generate differentiated cells. These insights can be useful in future cell therapies.