Biographical Sketch

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Background:

Maria-Elena did her undergraduate studies at the Faculty of Sciences of the UNAM, Mexico and obtained her PhD at the Institut Pasteur, Paris in 2002. She was a postdoctoral fellow at The Gurdon Institute, University of Cambridge, UK between 2002 and 2006 and then worked as a staff scientist with Laszlo Tora. She started her own lab at the IGBMC in Strasbourg, France, and has been leading her group since December 2008. The lab moved to the Institute of Epigenetics and Stem Cells in Munich, which she is directing, in January 2016. Her research group is focused on studying the epigenetics and cell fate in early mammalian development. In mammals, epigenetic reprogramming, the acquisition and loss of totipotency, and the first cell fate decision all occur within a three-day window after fertilization of the oocyte. Molecularly, these processes are poorly understood, yet this knowledge is an essential prerequisite to uncover principles of stem cells, chromatin biology and thus regenerative medicine. Specifically, the Torres-Padilla Lab investigates the dynamics of *de novo* heterochromatin formation in mammalian embryos; nuclear organisation and chromatin remodelling mechanisms and their impact on totipotency establishment and maintenance.

Selected publications of the past five years:

Rodriguez-Terrones D. Gaume X. Ishiuchi T. Weiss A. Kopp A. Kruse K. Penning A. Vaquerizas JM. Brino L & Torres-Padilla ME. 2018. A molecular roadmap for the emergence of early-embryonic-like cells. ***Nature Genetics,*** Jan; 50(1): 106-119.

Jachowicz J. Bing X. Pontabry J. Boskovic A. Rando O & Torres-Padilla ME. 2017. LINE-1 activation after fertilization regulates global chromatin accessibility in the early mouse embryo. ***Nature Genetics,*** Aug 28. doi: 10.1038/ng.3945.

Eid A. Rodriguez-Terrones D. Burton A & Torres-Padilla ME. 2016. Suv4-20 activity in the pre-implantation mouse embryo controls timely replication. ***Genes & Development,*** 30 (22):2513-2526.

Ishiuchi T, Enriquez-Gasca R, Mizutani E, Bošković A, Ziegler-Birling C, Rodriguez-Terrones D, Wakayama T, Vaquerizas JM & Torres-Padilla ME. 2015. Early embryonic-like cells are induced by down-regulating replication-dependent chromatin assembly. ***Nature Structural & Molecular Biology,*** Sep;22(9):662-71.

Boskovic A. Eid A. Pontabry J. Ishiuchi T. Spiegelhalter C. Ram EVSR. Meshorer E. & Torres-Padilla ME. 2014. Higher chromatin mobility supports totipotency and precedes pluripotency in vivo. ***Genes & Development***, May 15; 28(10):1042-7.

Jachowicz J. Santenard A. Bender A. Muller J. & Torres-Padilla ME. 2013. Heterochromatin establishment at pericentromeres depends on nuclear position. ***Genes & Development***, Nov 15; 27:2427-2432.

Burton A. Muller J. Tu S. Padilla-Longoria P. Guccione E. & Torres-Padilla ME. Single cell profiling of epigenetic modifiers identifies Prdm14 as an inducer of cell fate in the mammalian embryo.***Cell Reports***, Nov 14; 5 (3): 687–701.

Miyanari Y. Ziegler-Birling C & Torres-Padilla ME. 2013. Live visualization of chromatin dynamics using fluorescent TALEs. ***Nature Structural & Molecular Biology,*** 20(11):1321-4. doi: 10.1038/nsmb.2680.

Fadloun A. Le Gras S. Jost B. Ziegler-Birling C. Takahashi H. Gorab E. Carninci P & Torres-Padilla ME. Chromatin signatures and retrotransposon profiling in mouse embryos reveal regulation of LINE-1 by RNA. ***Nature Structural & Molecular Biology,*** 2013 Jan 27. doi: 10.1038/nsmb.2495.

Miyanari, Y. Torres-Padilla ME. 2012. Control of ground state pluripotency through allelic regulation of Nanog. ***Nature,*** 2012 Feb 12;483(7390):470-3. doi: 10.1038/nature10807.