

BIOGRAPHICAL SKETCH

| | | |
|--|---|---|
| NAME Michael Andrés Cortázar Osorio | CONTACT INFORMATION eMAIL Michael.CortazarOsorio@ucdenver.edu |  |
| | PHONE +1 (720) 514-0560 | |
| INSTITUTION AND LOCATION University of Colorado Anschutz Medical Campus 13001 E. 17th Place Aurora, Colorado Room L18-10401B | DEGREE Ph.D. | FIELD OF STUDY Molecular Biology |

A. STATEMENT

Michael Cortázar obtained his Bachelor of Science in Chemistry in 2011 from Universidad del Valle (Colombia), and his Ph.D. in Molecular Biology in 2018 from University of Colorado Denver, Anschutz Medical Campus. Michael has focused investigations on transcription by RNA polymerase II. Throughout his work, Michael has studied RNA biogenesis from different angles via the implementation of a variety of deep sequencing techniques such as Bromouridine Sequencing BrUseq, Chromatin Immunoprecipitation, ChIP-Seq, DNA-RNA Immunoprecipitation DRIP-Seq, and also developed a novel technique that allows for mapping of 5'-monophosphorylated ends of nascent RNA transcripts genome-wide (5'-Bruseq). A significant tool that Michael has used to analyze high throughput sequencing data has been the Python programming language to efficiently create novel programs that answer specific, relevant questions in his research.

Current objectives in Michael Cortázar's research are to understand how the transcription process by RNA polymerase II is terminated at 3' ends of genes and to test the hypothesis that premature termination is a common phenomenon on human genes. For this purpose, a set of diverse molecular biology tools and techniques have been employed throughout the course of his research, which include: mammalian tissue culture, the CRISPR technology for genome editing, stable and inducible protein knock-down systems and libraries for high-throughput sequencing.

B. RESEARCH AND PROFESSIONAL EXPERIENCE

Aug 2011 – 2018 Molecular Biology Graduate Student: “*Termination of RNA polymerase II transcription by the 5'-3' exonuclease Xrn2*” (Laboratory of Dr. David Bentley) University of Colorado, Anschutz Medical Campus, Aurora-Colorado, USA.

Jun 2012 – Aug 2012 Rotation Student: “*Investigating the Molecular Mechanism of Basal Body Assembly in Tetrahymena*” (Laboratory of Dr. Chad Pearson) University of Colorado, Anschutz Medical Campus, Aurora-Colorado, USA.

Feb 2012 – May 2012 Rotation Student: “*Elucidating the Role of PHD1 and PHDIII domains in the JARID1B Histone Demethylase*” (Laboratory of Dr. Tatiana Kutateladze) University of Colorado, Anschutz Medical Campus, Aurora-Colorado, USA.

Nov 2011 – Feb 2012 Rotation Student: “*The Role of Negative Elongation Factor (NELF) in Human RNA Polymerase II Transcription*” (Laboratory of Dr. David Bentley) University of Colorado, Anschutz Medical Campus, Aurora-Colorado, USA.

Aug 2011 – Nov 2011 Rotation Student: “*The role of Sloppy Paired in the developing compound eye of Drosophila*” (Laboratory of Dr. Steve Britt) University of Colorado, Anschutz Medical Campus, Aurora-Colorado, USA.

Jan 2010 – Jan 2011 Undergraduate Thesis Research Student: “*Correlation analysis between serum iron levels and oxidative stress in healthy patients from Cali Colombia*” (Laboratory of Metabolism and Nutrition, Dr. Cecilia de Plata) Valle State University, Cali, Colombia.

May 2010 – Aug 2010 Summer Research Student: “*Study of the role of FXR and LXR in renal disease of metabolic syndrome and aging*”. (Laboratory of Dr. Moshe Levi, MD). Department of Renal Disease and Hypertension, School of Medicine, University of Colorado, Anschutz Medical Campus, Aurora-Colorado, USA.

Jun 2007 – Sep 2007 Summer Research Student: “*The role of Claudins in kidney osmotic stress*” (Laboratory of Dr. Thomas Berl, MD). Department of Renal Disease and Hypertension, School of Medicine, University of Colorado Health Sciences Center, Denver-Colorado, USA.

C. PUBLICATIONS

Benjamin Erickson, Ryan M. Sheridan, **Michael A. Cortazar**, and David L. Bentley. Dynamic turnover of paused Pol II complexes at human promoters. *Gene Dev* (2018).

Nova Fong, Tassa Saldi, Ryan M. Sheridan, **Michael A. Cortazar** and David L. Bentley. RNA Pol II Dynamics Modulate Co-transcriptional Chromatin Modification, CTD Phosphorylation, and Transcriptional Direction. *Mol Cell* (2017).

Tassa Saldi, **Michael A. Cortazar**, Ryan M. Sheridan and David L. Bentley. Coupling of RNA Polymerase II Transcription Elongation with Pre-mRNA Splicing. *J. Mol. Biol.* (2016)

Nova Fong, Kristopher Brannan, Benjamin Erickson, Hyunmin Kim, **Michael A. Cortazar**, Ryan M. Sheridan, Tram Nguyen, Shai Karp, and David L. Bentley. Effects of Transcription Elongation Rate and Xrn2 Exonuclease Activity on RNA Polymerase II Termination Suggest Widespread Kinetic Competition. *Molecular Cell* (2015)

Brianna J. Klein, Lianhua Piao, Yuanxin Xi, Hector Rincon-Arano, Scott B. Rothbart, Danni Peng, Hong Wen, Connie Larson, Xi Zhang, Xia Zheng, **Michael A. Cortazar**, Pedro V. Peña, Anthony Mangan, David L. Bentley, Brian D. Strahl, Mark Groudine, Wei Li, Xiaobing Shi, and Tatiana G. Kutateladze. The histone-H3K4-specific demethylase KDM5B binds to its substrate and product through distinct PHD fingers. *Cell Reports* (2014).

Yupanqui A. Caldas, Hector Giral, **Michael A. Cortázar**, Eileen Sutherland, Kayo Okamura, Judith Blaine, Victor Sorriba, and Moshe Levi. Liver X Receptor (LXR) Activating Ligands Modulate Renal and Intestinal Phosphate (Na-Pi) Transporters. *Kidney International* (July 2010).

D. PRESENTATIONS

Michael A. Cortázar. PolyA site-dependent Spt5 dephosphorylation and pol II deceleration facilitate transcription termination. The Nineteenth of Biennial meeting of Post-Initiation Activities of RNA Polymerase. Mechanisms of transcription and coupled events. (Oct 25-28, 2018), Pembroke, Virginia.

Michael A. Cortázar. Understanding the effects of camptothecin treatment on RNA polymerase II transcription. The Seventeenth Biennial meeting of Post-Initiation Activities of RNA Polymerases (October 2014), Pembroke, Virginia.

E. POSTERS

Michael A. Cortázar and David L. Bentley “The exonuclease Xrn2 induces premature termination and poly(A) site dependent termination of polymerase II transcription by targeting nascent transcripts”, Transcription and Chromatin EMBL Conference, August 2016, Heidelberg, Germany.

Yupanqui A. Caldas, Hector Giral, **Michael A. Cortázar**, Eileen Sutherland, Kayo Okamura, Judith Blaine, Victor Sorriba, and Moshe Levi. Liver X Receptor agonists modulate the expression of intestinal and renal NaPi transporters. **Kern Aspen Lipid Conference**, August 2010, Aspen, Colorado.

F. LEADERSHIP EXPERIENCE

Sep 2015 – Dec 2017 Coordinator of the “Chromatin and Gene Regulation Discussion Club”

2012 – 2018 (Aug – Sep) Leader of scientific paper discussions for first year graduate students