

C. Chase Bolt, Ph.D.

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Post-Doctoral Work:

École polytechnique fédérale de Lausanne - Denis Duboule Laboratory 2015 - Present
Department: Swiss Institute for Experimental Cancer Research
Research –
Hox gene cluster regulation during mouse development.

Education:

Doctorate of Philosophy – Lisa Stubbs' Laboratory 2008 - 2014
Department: University of Illinois - Cell and Developmental Biology
Research –
Regulation and function of the T-box transcription factor *Tbx18* in mouse urogenital development.
Teaching –
Teaching Assistant: MCB 410 – Developmental Biology (Discussions) Spring 2014
Teaching Assistant: MCB 250 – Molecular Genetics (Discussions and Special Tutoring).
Ranked "Excellent" on TA reviews by students Fall 2012
Teaching Assistant: CDB 495 – Genetics and Genomics (unofficial) Spring 2010

Bachelor of Science, Cum Laude – Nicholas Stover's Laboratory 2005 - 2008
Major: Bradley University - Cellular and Molecular Biology
Research –
Characterization of a novel non-receptor tyrosine kinase in the cnidarian, *Hydra vulgaris*.
Teaching –
Teaching Assistant: General Biology I and II 2007 - 2008
Teaching Assistant: General Chemistry I Fall 2007

Publications:

Tbx18 maintains a cell proliferation program in developing mouse prostate. 2015
C. Chase Bolt, Soumya Negi, Huimin Zhang, Xiaochen Lu, and Lisa Stubbs
In preparation

A distant downstream enhancer directs essential expression of *Tbx18* in urogenital tissues. 2014
C. Chase Bolt, Colleen M. Elso, Xiaochen Lu, Fuming Pan, Andreas Kispert, and Lisa Stubbs
Developmental Biology (2014) 392, pp 483-493.

Conferences & Symposia:

Institute for Genomic Biology Fellows Symposium – Urbana, IL Dissecting the Tbx18 locus regulatory structure and its role in mouse prostate development C. Chase Bolt, Xiaochen Lu, Laura Chittenden, Lisa J. Stubbs	May 2013
IGB/BGI Collaborative Workshop on Genomics –Shenzhen, CN	Jan. 2013
Cellular & Molecular Biology Training Grant Symposium – Urbana, IL Developmental dynamics of the Tbx18 locus and its downstream transcriptional targets C. Chase Bolt, Xiaochen Lu, Laura Chittenden, Nuno Camboa, Sylvia Evans, Lisa J. Stubbs	Nov. 2012
GSA Mouse Molecular Genetics Conference – Pacific Grove, CA Developmental dynamics of the Tbx18 locus and its downstream transcriptional targets C. Chase Bolt, Xiaochen Lu, Laura Chittenden, Nuno Camboa, Sylvia Evans, Lisa J. Stubbs	Oct. 2012

Scholarships & Awards:

NIH Ruth L. Kirchstein NRSA Predoctoral Training Fellowship	2010 - 2012
Bradley Biology Scholarship	2005 - 2008
Bradley University Dean's List	2005 - 2008

Professional Development & Service:

MCB Graduate Student Advisory Panel Provide advice to first year graduate students in the program	Dec. 2013
Career Professionalization Seminar Committee Nominate, invite, and host guest speakers	Aug. 2012 – Mar. 2013
Cellular & Developmental Biology Department Seminar Student Committee Invite and host guest speakers working in a field of personal or professional interest, with relevance to the department. Blanche Capel, Ph.D., Duke University (Oct. 2012) Janet Rossant, Ph.D., University of Toronto (April 2014)	2011-Present
MCB Graduate Student Advisory Panel Provide advice to first year graduate students in the program	Oct. 2011
UIUC CMBTG Symposium Chair Managed weekly meetings, organized and delegated tasks, introduced speakers during speaking sessions	May – Oct. 2011

Graduate Coursework:

RNA-Seq Data Analysis Workshop Pipeline construction for the analysis of RNA-Seq data analysis.	June 2013
MCB 529 – Genomics and Gene Networks Tools for the analysis of genomics data.	Spring 2010
MCB 571 - Bioinformatics Overview of the tools available for manipulation of bioinformatics data.	Fall 2009
MCB 529LS – Genome Annotation Using Apollo to build gene models from sequencing data.	Spring 2009
MCB 529AB – Advanced Cell Biology In depth study of cell biology and experimental techniques	Spring 2009
MCB 502 – Advanced Molecular Genetics Study of The Central Dogma and associated experimental techniques.	Fall 2008
MCB 501 – Advanced Biochemistry Advanced study of biochemical pathways and associated chemistry.	Fall 2008

Summary of Research:

My primary interest is in the long-range regulatory control and chromatin dynamics that modulate expression of genes during embryonic development. During events such as lineage specification and differentiation, gene expression is highly regulated by the changing cellular context. The genes that facilitate these important biological transitions are frequently characterized by two important properties: these genes are associated with an array of *cis*-acting regulatory elements which precisely control the expression of their target gene and the cell controls the availability of these elements using an assortment of epigenetic modifications. Particular types of mutations, such as chromosome translocations allow for a simple two-part dissection of regulatory elements. These regulatory elements can be dispersed over great genomic distances, and thus are difficult to identify. We utilize chromosome translocations in mice to identify and learn about the function of important developmental regulators and how their expression is controlled.

Specifically, my graduate work is focused on the role of a T-box transcription factor in the development of the urogenital system in mouse. The T-box gene *Tbx18* serves a vital role in the early budding and outgrowth of the prostate during late gestation. Expression of *Tbx18* in the urogenital mesenchyme directs undifferentiated mesenchymal cells to coalesce and differentiate into smooth muscle of the prostate. We have characterized a chromosome translocation mutation that disrupts the *cis*-regulatory structure of the *Tbx18* locus and reduces the expression of *Tbx18* in the developing prostate. In animals with insufficient levels of TBX18, the smooth muscle layer forms improperly, and is incapable of instructing the developing prostatic epithelium to proliferate and bud properly. We use a combination of tools ranging from next-generation sequencing to generation of transgenic mice and traditional genetics to study both the regulatory structure of the *Tbx18* locus as well as its function downstream in mediating these processes.

Skills & Techniques:

Mouse colony management, genotyping by PCR, qRT-PCR, Cloning, 5' and 3' RACE, ChIP-Chip, ChIP-Seq, RNA-Seq, Immunohistochemistry, *In situ* hybridization, Tissue culture, Tissue embedding, paraffin sectioning, cryo-sectioning, Western blot, siRNA knockdown, Tissue micro-dissection, FACS, X-Gal staining, Whole genomic amplification, histopathology.