William KM Lai

Pennsylvania State University
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EDUCATION

2008 – 2013 **PhD in Biochemistry,** SUNY Buffalo, Buffalo, New York
Thesis: "Computational Tools for Investigating the Role of Chromatin in Regulating Genomic Functional Elements"

2005 - 2008 **BS in Neuroscience,** University of Pittsburgh, Pittsburgh, Pennsylvania
Latin Honors: Cum Laude
Minor in Chemistry 2008 from the University of Pittsburgh

RESEARCH EXPERIENCE

Postdoctoral Research Associate in the Department of Biochemistry and Molecular Biology, Pennsylvania State University in the laboratory of B. Franklin Pugh, PhD. August 2013-Present

Graduate Assistant in the Department of Biochemistry, State University of New York at Buffalo, Buffalo, New York in the laboratory of Michael Buck, PhD. March 2009 – 2013
"*Role of Chromatin in Regulating Genomic Functional Elements*"

Laboratory Research Assistant in the Department of Biological Sciences, State University of New York at Buffalo, Buffalo, New York under the guidance of Richard R. Almon, PhD. June 2003 - August 2008
"*Modeling Time-Series Gene Expression in a Model of Diabetes Development*"

JOURNAL PUBLICATIONS

Paul E; Tirosh I; **Lai W**; Buck MJ; Palumbo MJ; Morse RH. Chromatin Mediation of a Transcriptional Memory Effect in Yeast. *G3 Genes|Genomes|Genetics*. 2015, *5* (5):829-838

Puri S*; **Lai WKM***; Rizzo JM*; Edgerton M; Buck MJ. Iron- responsive chromatin remodeling and MAPK signaling enhance adhesion in Candida albicans. *Molecular Microbiology*. 2014, *93* (2):291-305 (*co-first authors)

Lai WKM; Buck MJ. An Integrative Approach to Understanding the Combinatorial Histone Code at Functional Elements. *Bioinformatics*. 2013, *29* (18):2231-7

Givens, R; **Lai, W**; Rizzo, J; Bard, J; Mieczkowski, P; Leatherwood, J; Huberman, J; Buck, M. Chromatin architectures at fission yeast transcriptional promoters and replication origins. *Nucleic Acids Research*. 2012, *40* (15):7176-7189

Lai WKM; Bard JE; Buck MJ. ArchTEx: accurate extraction and visualization of next-generation sequence data. *Bioinformatics*. 2012, *28* (7):1021-3 http://sourceforge.net/projects/archtex/

Lai WKM; Buck MJ. ArchAlign: coordinate-free chromatin alignment reveals novel architectures. *Genome Biology.* 2010, *11* (R126) Highly Accessed http://www.acsu.buffalo.edu/~mjbuck/ArchAlign.html

Escamilla-Hernandez, R; Chakrabarti, R; Romano RA; Smalley K; Zhu QQ; **Lai W**; Halfon MS; Buck MJ; Sinha S. Genome-wide search identifies *Ccnd2* as a direct transcriptional target of Elf5 in mouse mammary gland. *BMC Molecular Biology.* 2010, *11* (68)

Almon RR; DuBois DC; **Lai W**; Xue B; Nie J; Jusko WJ. Gene expression analysis of hepatic roles in cause and development of diabetes in Goto-Kakizaki rats. *Journal of Endocrinology*. 2009, 200 (3):331-46

Almon RR; Yang E; **Lai W**; Androulakis IP; Ghimbovschi S; Hoffman EP; Jusko WJ; Duboos DC. Relationships between Circadian Rhythms and Modulation of Gene Expression by Glucocorticoids in Skeletal Muscle. *American Journal of Physiology. Regulatory, Integrative, and Comparative Physiology*. 2008, *295* (4):R1031-47

Almon RR; Yang E; **Lai W**; Androulakis IP; DuBois DC; Jusko WJ. Circadian variations in rat liver gene expression: relationships to drug actions. *Journal of Pharmacology and Experimental Therapeutics*. 2008, *326* (3):700-16

Almon RR; **Lai W**; DuBois DC; Jusko WJ. Corticosteroid-regulated Genes in Rat Kidney: Mining Time Series Data. *American Journal of Physiology. Endocrinology and Metabolism.* 2005, *289* (5):E870-82

MANUSCRIPTS IN PREPARATION

Rossi, MJ; **Lai WKM**; Pugh, BF. DNA Shape is insufficient to explain binding *(Under Review at Nature Communications)*

Lai WKM; Pugh BF. Detection and characterization of mammalian pre-initiation complexes on a genomic scale.

Lai WKM; Schuster, G; Park, B; Billy, G; Mahoney, S; Pugh BF. Galaxy-exo: A galaxy platform for analysis of high-resolution genomic data.

Rossi, MJ; **Lai WKM**; Pugh, BF. In vitro genomics reveal the intrinsic DNA sequence determinants of transcription factor binding in *S. cerevisiae*.

TEACHING EXPERIENCE

Course Instructor, Spring 2014
Pennsylvania State University, State College, Pennsylvania
BMB 252 Honors – Molecular and Cellular Biology II

Graduate Teaching Assistant, Fall 2010
University at Buffalo, Buffalo, New York

Undergraduate Teaching Assistant, Fall 2006 – Spring 2008
University of Pittsburgh, Pittsburgh, Pennsylvania
General Chemistry Laboratory I and II

AWARDS

- BBA Gene Regulatory Mechanisms Best Poster - 2015
- Elizabeth Olmsted Ross Award for Outstanding Graduate Poster - 2010
- University at Buffalo Presidential Fellowship 2008-2009
- B.S. awarded Cum Laude in Neuroscience from University of Pittsburgh 2008
- University of Pittsburgh Honors Full Tuition Scholarship 2005-2008

PRESENTATIONS

Mechanism of Eukaryotic Transcription CSHL 2015 – Poster Presentation
"High-resolution assays reveal details of mammalian initiation complex organization and function"

34th Penn State Summer Symposium in Molecular Biology 2015 – Speaker and Poster Presentation
"High-resolution assays reveal details of mammalian enhanceosome organization and function"

Epigenetics and Chromatin: Interactions and Processes Conference 2013 – Poster Presentation
"*Identifying genomic features by BLASTing through chromatin*"

National Graduate Student Research Conference 2012 – Poster Presentation
"*Role of Chromatin in Regulating Genomic Functional Elements*"

NorthEast Regional Yeast Meeting (NERY) 2011 – Speaker
"*ArchAlign and ArchBLAST: Next-Generation Tools to Detect and Understand Chromatin Architecture*"

NorthEast Regional Yeast Meeting (NERY) 2010 – Poster Presentation
"ArchAlign: A Next-Generation Alignment Algorithm to Detect Chromatin Architecture"

PROFESSIONAL ACTIVITIES

April 2015, **Judge**, Penn State Undergraduate Exhibit Poster Session
2012 – 2014, **Member**, Interaction Society for Computational Biology
2010 - 2012**, Member**, American Statistical Association

OTHER RELEVANT SKILLS / COURSES

Molecular Biology Courses:
2013 Human Embryonic Stem Cell Culturing Training Course - Hands on training for the culturing and maintenance of H1 and H9 human embryonic cells lines

Statistics Courses:
2012 Statistics for Bioinformatics
2011 Applied Multivariate Statistics, Statistical Genetics, Statistical Comparison and Association, Introduction to Theoretical Statistics II
2010 Regression Analysis, Math Analysis for Biostatistics, Introduction to Theoretical Statistics I

Experimental Design Courses:
2007 Pharmacokinetic – Pharmacodynamic Modeling Concepts and Applications Summer Course – Course on experimental design with a focus on multiple dosing strategies used to analyze cellular and organismal response from a pharmacological perspective.

Programming Languages:
Java, C++, Perl, Python, R

REFERENCES

Dr. Frank Pugh
Evan Pugh University Professor
Willaman Chair in Molecular Biology and
Professor of Biochemistry and Molecular Biology
Phone: (814) 863-8252
Email: bfp2@psu.edu
Postdoctoral Advisor

Dr. Shaun Mahoney
Assistant Professor of Biochemistry & Molecular Biology
Phone: (814) 865-3008
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Collaborator

Dr. Michael J. Buck
Associate Professor of Biochemistry
Director WNYSTEM Stem Cell Sequencing/Epigenomics Facility
Phone: (716) 881-7569
Email: mjbuck@buffalo.edu
PhD Advisor

Dr. Marc S. Halfon
Associate Professor of Biochemistry
Phone: (716) 829-3126
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PhD Committee Member

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Associate Professor of Biochemistry
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