Maria Chikina

Contact Information

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Current Position

Assistant Professor (tenure track)
Department of Computational and Systems Biology
University of Pittsburgh School of Medicine

Previous Position

Assistant Professor (non-tenure track) 2013-2017
Department of Computational and Systems Biology
University of Pittsburgh School of Medicine

Education

Undergraduate

University of Chicago Chicago, IL USA
Mathematics B.S., Biology B.A., June 2004.

Graduate

Princeton University, Princeton, NJ USA
Ph.D., Molecular Biology, January 2011.
Advisor: Olga Troyanskaya (Dept. of Computer Science)

Postgraduate

Mount Sinai School of Medicine New York, NY
Advisor: Stuart Sealfon

Grants and Funding

Functional Annotation of Genomes via Phenotypic Convergence
- multi-PI: **Chikina**/Clark
- NIH-R01, 1R01HG009299-01A1 (scored 3%)
- own lifetime costs: $723,171
- 5/1/2017-4/30/2022

Separating Wheat from Chaff in Major Depression Blood Biomarker Studies
- mulit-PI: **Chikina**/Sealfon/Zaslavsky
- NIMH-R03, NIHM-5R03MH109008-02
- own lifetime costs: $59,641
- 7/15/2016-6/30/2018

Center for Causal Modeling and Discovery of Biomedical Knowledge from Big Data
- Co-I, PI:Bahar/Berg/Cooper
- NHGRI-U54, 1U54HG008540-04
- own lifetime costs: $109,648
- 9/29/2014-8/31/2018

Murine Memory B Cell Development and Function
- Co-I, PI:Shlomchik
- NIH-R01, 2R01 AI043603-17A1
- own lifetime costs: $76,242
- 8/22/2016-6/30/2021

PAGES: Physical Activity Genomics, Epigenomics, transcriptomics chemical analysis Site
- Co-I, PI:Sealfon/Walsh
- NIH-U24, 1U24DK112331-01
- own lifetime costs: $366,813
- 12/8/2016-11/30/2022

Transcription Elongation on Bcell Differentiation
- Co-I, PI:Milcarek
- NIH-R21, 5R21AI124241-02
- own lifetime costs: $14,366
- 3/1/2016-2/28/2018

Yap and beta-catenin interactions in liver: Implications in Pathophysiology
- Co-I, PI:Monga
- NCI-R01, 5R01CA204586-02
- own lifetime costs: $37,930
- 4/5/2016-3/31/2021

Interleukin-35 and the tumor microenvironment
- Co-I, PI:Vignali
- NCI-R01, 9R01CA203689-08
- own lifetime costs: $116,942
- 7/1/2016-6/30/2021

Awards and Honors

Icahn School of Medicine at Mount Sinai
- ISMB Travel Fellowship (competitive), 2012

Princeton University
- NSF Graduate Research Fellowship Honorable Mention, 2005

University of Chicago
- Student Marshall (highest academic honor awarded by University of Chicago), 2003
- Phi Beta Kappa, 2003
- Howard Hughes Undergraduate Research Fellowship, 2002

Teaching and Mentoring

Princeton University:
- Integrated Science, Computer Science portion – equivalent to the second semester of introductory computer science (ran recitations, wrote and graded assignments).
- Immunology (ran recitations, wrote and graded assignments, selected research papers, lead paper discussions).

Icahn School of Medicine at Mount Sinai:
- Mentored an MSTP rotation student. The project resulted in a publication in Bioinformatics.

University of Pittsburgh:
- Mentored a TecBio REU students (summer 2014, 2015, 2017). The 2014 project resulted in a publication in Molecular Evolutionary Biology.
- Co-advising Wayne Mao in The Joint CMU-Pitt Ph.D. Program in Computational Biology
- Co-Instructor Computational Genomics 2016, 2017 (cross-listed Pitt/CMU graduate class)
- Co-Instructor for The Joint CMU-Pitt Ph.D. Program in Computational Biology journal club 2017 (cross-listed Pitt/CMU graduate class)

Presentations

- April 2018. RECOMB-genetics. DataRemix: a universal data transformation for optimal inference from gene expression datasets (accepted platform presentation).
- April 2018. University of Pittsburgh Math Fest. Using mathematics to detect gerrymandering.
- March 2018. Institute of Science and Technology (IST), Austria.
- February 2018. Dartmouth College. Department of Systems Biology.
- February 2018. University of Wisconsin Madison. Department of Biostatistics and Bioinformatics.
- January 2018. Duke University. Department of Biostatistics.
- July 2017. ISMB 2017, Prague. Molecular biology of body-size variation: from evolution to human disease.
- January 2017. University of Pittsburgh Department of Human Genetics.
- July 2016. ISMB 2016 Orlando. CellCODE: a robust latent variable approach to differential expression analysis for heterogeneous cell populations.
- October 2015. University of Pittsburgh Department of Immunology.
- October 2014. University of Pittsburgh, Science 2014 event.

- January 2013. University of Illinois Urbana-Champagne, Department of Bioengineering.
- July 2012. ISMB 2012, Long Beach. Achieving better agreement among microarray disease studies through automatic correction for latent variables.
- July 2012. ISMB 2012, Long Beach. An effective statistical evaluation of ChIPseq dataset similarity.

Conference Program Committee

- Intelligent Systems for Molecular Biology (ISMB) 2017, 2016
- Machine Learning in Computational Biology workshop at Neural Information Processing Systems (NIPS) 2017

Publications

Liu C, **Chikina M**, Deshpande R, Menk AV, Wang T, ... (10 other authors) ... Vignali DAA. Regulatory T-cells promote the SREBP1-dependent metabolic fitness of M2-like intratumoral macrophages via CD8+ T cells. *In Review at Cell*

Simovski B, Kanduri C, Gundersen S, Titov D, Domanska D, ... alphabetic middle authors including **Chikina M.**, ... Sandve GK. Coloc-stats: a unified web interface to perform colocalization analysis of genomic features. *In Review Nucleic Acids Research.*

Tilstra T, Avery L, Menk A, Gordon R, Smita S, Kane L, **Chikina M**, Delgoffe G, Shlmochik M. Kidney Infiltrating T cells in Murine Lupus Nephritis are Metabolically and Functionally Exhausted. *In Review at J Clinical Investion.*

Sawant DV, Yano H, **Chikina M**, Pholek A, Workman CJ, Vignali DAA. IL10 and IL35, derived from distinct Treg subsets, drive intratumoral T cell inhibitory receptor expression *In Revision at Nature.*

Mao W, Kostka D, **Chikina M**. Modeling Enhancer-Promoter Interactions with Attention-Based Neural Networks BioRxiv: https://doi.org/10.1101/219667

Mao W, Zaslavsky E, Hartmann BM, Sealfon SC, **Chikina M**. Pathway-Level Information ExtractoR (PLIER) for gene expression data. *In Review at Nature Methods.* BioRxiv: https://doi.org/10.1101/116061

Meyer WK, Jamison J, Richter R, Woods S, Kronk C, Partha R, **Chikina M**, Bonde RK, Gaspard J, Lanyon JM, Furlong CE, and Clark NL. Ancient convergent losses of PON1 yield deleterious consequences for modern marine mammals. *In Revision at Science.*

Partha R, Chauhan BK, Ferreira Z, Robinson JD, Lathrop K, Ken K. Nischal, **Chikina M***, and Clark NL* Subterranean mammals show convergent regression in ocular genes and enhancers, along with adaptation to tunneling. To appear in *eLife*. (*co-corresponding authors)

Matte-Martone C, Liu J, Zhou M, **Chikina M**, Green DR, Harty JT, Shlomchik WD. Differential requirements for myeloid leukemia IFN- conditioning determine graft-versus-leukemia resistance and sensitivity, in *J Clin Invest* 127 (2017) 2765-2776.

Overacre-Delgoffe AE, **Chikina M**, Dadey RE, Yano H, Brunazzi EA, Shayan G, Horne W, Moskovitz JM, Kolls JK, Sander C, Shuai Y, Normolle DP, Kirkwood JM, Ferris RL, Delgoffe GM, Bruno TC, Workman CJ, Vignali DAA. Interferon- Drives Treg Fragility to Promote Anti-tumor Immunity, in *Cell* 169 (2017) 1130-1141.

Zhang Q, **Chikina M**, Szymczak-Workman AL, Horne W, Jay Kolls J, Vignali KM, Normolle D, Bettini M, Workman CJ, Vignali DAA. Lymphocyte Activation Gene-3 limits regulatory T cell proliferation and function in autoimmune diabetes, in *Science Immunol.* 2 (2017).

Chikina M., Frieze A., Pegden W. Assessing significance in a Markov chain without mixing, in *PNAS* 114 (2017) 2860-2864.

Choi SG, Wang Q, Jia J, **Chikina M**, Pincas H, Dolios G, Sasaki K, Wang R, Minamino N, Salton SR, Sealfon SC. Characterization of Gonadotrope Secretoproteome Identifies Neurosecretory Protein VGF-derived Peptide Suppression of Follicle-stimulating Hormone Gene Expression, in *J Biol Chem* 291 (2016) 21322-21334.

Tao J, Xu E, Zhao Y, Singh S, Li X, Couchy G, Chen X, Zucman-Rossi J, **Chikina M**, Monga SP. Modeling a human hepatocellular carcinoma subset in mice through coexpression of met and point-mutant -catenin, in *Hepatology* 64 (2016) 1587-1605.

Okabe H, Yang J, Sylakowski K, Yovchev M, Miyagawa Y, Nagarajan S, **Chikina M**, Thompson M, Oertel M, Baba H, Monga SP, Nejak-Bowen KN. Wnt signaling regulates hepatobiliary repair following cholestatic liver injury in mice, in *Hepatology* 64 (2016) 1652-1666.

Chikina M, Robinson JD, Clark NL. Hundreds of Genes Experienced Convergent Shifts in Selective Pressure in Marine Mammals, in *Mol Biol Evol* 33 (2016) 2182-2192.

Weisel FJ, Zuccarino-Catania GV, **Chikina M**, Shlomchik MJ. A Temporal Switch in the Germinal Center Determines Differential Output of Memory B and Plasma Cells, in *Immunity* 44 (2016) 116-130

Chikina M, Zaslavsky E, Sealfon SC. CellCODE: a robust latent variable approach to differential expression analysis for heterogeneous cell populations, in *Bioinformatics* 31 (2015) 1584-1591.

Aghaeepour N, Chattopadhyay P, **Chikina M**, Dhaene T, Van Gassen S, Kursa M, Lambrecht BN, Malek M, McLachlan GJ, Qian Y, Qiu P, Saeys Y, Stanton R, Tong D, Vens C, Walkowiak S, Wang K, Finak G, Gottardo R, Mosmann T, Nolan GP, Scheuermann RH, Brinkman RR. A benchmark for evaluation of algorithms for identification of cellular correlates of clinical outcomes, in *Cytometry A* 89 (2015) 16-21.

Hartmann BM, Thakar J, Albrecht RA, Avey S, Zaslavsky E, Marjanovic N, **Chikina M**, Fribourg M, Hayot F, Schmolke M, Meng H, Wetmur J, Garca-Sastre A, Kleinstein SH, Sealfon SC. Human Dendritic Cell Response Signatures Distinguish 1918, Pandemic, and Seasonal H1N1 Influenza Viruses, in *J Virol.* 89 (2015) 10190-205.

Chikina M, Gerald CP, Li X, Ge Y, Pincas H, Nair VD, Wong AK, Krishnan A, Troyanskaya OG, Raymond D, Saunders-Pullman R, Bressman SB, Yue Z, Sealfon SC. Low-variance RNAs identify Parkinson's disease molecular signature in blood, in *Mov Disord.* 30 (2015) 813-821.

Badgeley M, Sealfon SC, **Chikina M**. Hybrid Bayesian-Rank Integration Approach Improves the Predictive Power of Genomic Dataset Aggregation, in *Bioinformatics* 31 (2015) 209-215.

Chikina M, Seallfon SC. Increasing Consistency of Disease Biomarker Prediction Across Datasets, in *PLoS One* 9 (2014) e91272.

Wang, Q, **Chikina M**, Pincas H, Sealfon, SC. Homer1 alternative splicing is regulated by gonadotropin-releasing hormone and modulates gonadotropin gene expression, in *Mol Cell Biol* 10 (2014) 1747-56.

IMPROVER DSC Collaborators. Strengths and limitations of microarray-based phenotype prediction: lessons learned from the IMPROVER Diagnostic Signature Challenge, in *Bioinformatics* 29 (2013) 2892-2899.

FlowCap II Participants. Critical Assessment of Automated Flow Cytometry Analysis Techniques, in *Nat Methods* 10 (2013) 228-238.

Wang Q., **Chikina M**, Zaslavsky E, Pincas H., and Sealfon SC. -Catenin Regulates GnRH-Induced FSH Gene, in *Molecular Endocrinol.* 27 (2013) 224-237.

Nair V., Ge Y., Balasubramaniyan N., Kim J., Okawa Y., **Chikina M.**, Troyanskaya O., Sealfon S.C. Involvement of histone demethylase LSD1 in short-time scale gene expression changes during embryonic stem cell cycle progression, in *Mol Cell Biol.* 32 (2012) 4861-76.

Chikina M, Troyanskaya O. An effective statistical evaluation of ChIPseq dataset similarity, in *Bioinformatics* 28 (2012) 607-613.

Arslan M.A., **Chikina M**, Csermely P., Soti C. Misfolded proteins inhibit proliferation and promote stress-induced death in SV40-transformed mammalian cells, in *FASEB J.* 26 (2012) 766-777.

Chikina M, and Troyanskaya O. Accurate quantification of functional analogy among close homologs, in *PLoS Comput Biol.* 7 (2011) e1001074. *Online interface*: `http://networkhomologs.princeton.edu/`.

Chikina M, Huttenhower C, Murphy C., Troyanskaya O. Global prediction of tissue-specific gene expression and context-dependent gene networks in Caenorhabditis elegans, in *PLoS Comput Biol.* 5 (2009) e1000417. *Online interface*: `http://worm-tissue.princeton.edu`.

Huttenhower C, Schroeder M, **Chikina M**, Troyanskaya O. The Sleipnir library for computational functional genomics, in *Bioinformatics* 24 (2008) 1559-61.

Lam A, **Chikina M**, Glaaser I, Hanck D. Voltage Sensing in Ca V3.2: The Role of Domain IV S4, in *Pflugers Arch.* 451 (2005) 349-61.