

SUDHIR THAKURELA

Address · 7 Divinity Avenue, Cambridge, MA: 02138 (US)

sudhir_thakurela@harvard.edu · Tel: +1-617-955-4923 · ORCID: 0000-0003-1285-8680

<https://scholar.google.com/citations?user=4sX2y04AAAAJ&hl=en>

RESEARCH INTERESTS

Understanding the effects of mutations and signaling perturbations on 3D-genome organization.

My main area of research involves understanding how the genomic and epigenomic landscapes modulate the gene regulatory network. I am particularly interested in exploring how somatic mutations and signaling regulate transcription factor binding and 3D-genome organization to precisely control the cell-fate decisions. Using single-cell genomics, I further aim to understand how these principles are misregulated in a disease state.

EXPERIENCE

02/2016

POST DOCTORAL RESEARCH FELLOW, HARVARD UNIVERSITY (CAMBRIDGE, US)

(LABORATORY OF **PROF. ALEXANDER MEISSNER**)

Research Highlight: *Investigating the role of pioneer transcription factors in development and reprogramming using endogenous and ectopic systems.*

01/2012 - 12/2015

PH.D. EPIGENOMICS, INSTITUTE OF MOLECULAR BIOLOGY (MAINZ, GERMANY)

(LABORATORY OF **DR. VIJAY TIWARI**)

Research Highlight: *Investigating the dynamics of transcription factors and epigenetic modifications during neurodevelopment and neuronal signaling.*

02/2007 – 01/2012

DOMAIN TEAM LEAD, PERSISTENT SYSTEMS LIMITED (PUNE, INDIA)

Highlight: *Involved in the development and support of microarray analysis software's such as Agilent GeneSpring GX, Agilent eARRAY, Agilent CGH-Analytics, and Agilent SureSelect.*

08/2004 – 10/2006

PROJECT ASSISTANT, INDIAN INSTITUTE OF SCIENCE (BANGALORE, INDIA)

Research Highlight: *Involved in comprehensive analysis of naturally occurring disulfide bonds in proteins.*

EDUCATION

06/2002 - 05/2004

M.Sc. in BIOINFORMATICS, PUNE UNIVERSITY (PUNE, INDIA)

Graduated with A+ grade.

06/1999 - 05/2002

B.Sc. in BIOTECHNOLOGY, PUNE UNIVERSITY (PUNE, INDIA)

Graduated with A+ grade.

PUBLICATIONS

FIRST AUTHOR: (* or \$ = Equal contributions)

18) Differential regulation of OCT4 targets facilitates reacquisition of pluripotency.

Thakurela S*, Sindhu C*, Yurkovsky E*, Riemenschneider C*, Smith ZD, Nachman I^{\$}, Meissner A^{\$}.

Nature Communications, 2019

17) Genetic determinants and epigenetic effects of pioneer-factor occupancy.

Donaghey J*, **Thakurela S***, Charlton J, Chen JS, Smith ZD, Gu H, Pop R, Clement K, Stamenova EK, Karnik R, Kelley DR, Gifford CA, Cacchiarelli D, Rinn JL, Gnirke A, Ziller MJ, Meissner A.

Nature Genetics, 2018

News & Views: *Pioneering the chromatin landscape.* By **Kenneth S. Zaret**

16) Mapping gene regulatory circuitry of Pax6 during neurogenesis.

Thakurela S*, Tiwari N*, Schick S, Garding A, Ivanek R, Berninger B, Tiwari VK.

Cell Discovery, 2016

15) The transcriptome of mouse central nervous system myelin.

Thakurela S*, Garding A*, Jung RB, Müller C, Goebels S, White R, Werner HB, Tiwari VK.

Scientific Reports, 2016

F1000 Recommendations: <https://f1000.com/prime/726351923>

14) Dynamics and function of distal regulatory elements during neurogenesis and neuroplasticity.

Thakurela S*, Sanjeeb Sahu*, Angela Garding, Vijay K. Tiwari.

Genome Research, 2015

13) Gene regulation and priming by topoisomerase II α in embryonic stem cells.

Thakurela S*, Garding A*, Jung J, Schübeler D, Burger L, Tiwari VK.

Nature Communications, 2013

SIGNIFICANT CONTRIBUTIONS:

12) Stage-Specific transcription factors drive astrogliogenesis by remodeling gene regulatory landscapes.

Tiwari N^{\$}, Pataskar A^{\$}, Péron S*, **Thakurela S***, Sahu SK, Figueres-Oñate M, Marichal N, López-Mascaraque L, Tiwari VK, Berninger B.

Cell Stem Cell, 2018

11) Identifying novel transcriptional regulators with circadian expression.

Schick S*, Becker K*, **Thakurela S**, Fournier D, Hampel MH, Legewie S, Tiwari VK.

Molecular Cell Biology, 2015

10) Dynamics of chromatin accessibility and epigenetic state in response to UV damage.

Schick S*, Fournier D*, **Thakurela S**, Sahu SK, Garding A, Tiwari VK.

Journal Cell Science, 2015

9) Protein stabilization by introduction of cross-strand disulfides.

Chakraborty K, **Thakurela S**, Prajapati RS, Indu S, Ali PS, Ramakrishnan C, Varadarajan R.

Biochemistry, 2005

OTHER:

8) Fatty changes associated with N-Nitrosodiethylamine (DEN) induced hepatocellular carcinoma: a role of sonic hedgehog signaling pathway.

Tripathy A, **Thakurela S**, Sahu MK, Uthansingh K, Singh A, Narayan J, Ajay AK, Singh V, Kumari R.

Genes Cancer, 2020

7) The molecular connection of histopathological heterogeneity in hepatocellular carcinoma: A role of Wnt and Hedgehog signaling pathways.

Tripathy A, **Thakurela S**, Sahu MK, Uthanasingh K, Behera M, Ajay AK, Kumari R.

***PLoS One*, 2019**

6) Genetic labeling of nuclei-specific thalamocortical neurons reveals putative sensory-modality specific genes.

Gezelius H, Moreno-Juan V, Mezzera C, **Thakurela S**,, Tiwari VK, López-Bendito G.

***Cerebral Cortex*, 2017**

5) JNK-dependent gene regulatory circuitry governs mesenchymal fate.

Sanjeeb Sahu, Angela Garding, Neha Tiwari, **Thakurela S**, Joern Toedling, Susanne Gebhard, Felipe Ortega, Nikolai Schmarowski, Benedikt Berninger, Robert Nitsch, Marcus Schmidt, Vijay K. Tiwari.

***EMBO Journal*, 2015**

4) Epigenetic upregulation of lncRNAs at 13q14.3 in leukemia is linked to the In Cis downregulation of a gene cluster that targets NF- κ B.

Garding A, Bhattacharya N,**Thakurela S**, Tiwari V, Stilgenbauer S, Mertens D.

***PLoS Genetics*, 2013**

3) Target genes of Topoisomerase II β regulate neuronal survival and are defined by their chromatin state.

Tiwari VK, Burger*, Nikolettou V*, Deogracias R, **Thakurela S**, Wirbelauer C, Kaut J, Terranova R, Hoerner L, Mielke C, Boege F, Murr R, Peters AH, Barde YA, Schübeler D.

***Proc Natl Acad Sci U.S.A.*, 2012**

2) Conformational analysis and design of cross-strand disulfides in antiparallel β -sheets.

Indu S, Kochat V, **Thakurela S**, Ramakrishnan C, Varadarajan R.

***Proteins*, 2011**

1) Disulfide conformation and design at helix N-termini.

Indu S*, Kumar ST*, **Thakurela S**, Gupta M, Bhaskara RM, Ramakrishnan C, Varadarajan R.

***Proteins*, 2010**

SUBMITTED / IN PREPARATION:

1) Genome-wide screen of genes and distal regulatory regions critical for senescence via CRISPRi.

Sahu S*, **Thakurela S***, Meissner A, Belmonte, J.C.I.

2) Epigenetic modulation of stress-induced transcriptional reprograms in cortical neurons.

Dick A*, **Thakurela S***, Roeh S, Meissner A, Chen A.

3) Identification of novel metabolites and molecular regulators of Type1 Diabetes associated with kidney complications.

Gupta M*, **Thakurela S***, Satake E, Bansal K, Caramori L, Krolewaski A, Meissner A, Kulkarni RN.

4) STAT3 depletion from stromal cells protects mice from kidney fibrosis by inhibiting differentiation, activation, proliferation and migration of pericytes.

Ajay AK, Li-Zhao, **Thakurela S**, Manoj K. Gupta, Venkata S. Sabbiseti, Murugaiyan Gopal, Ana Maria Waaga-Gasser, David A. Frank, Meissner A, Joseph V. Bonventre, Li-Li Hsiao.

5) The KRAB-zinc finger protein Zfp354c is essential to repress retrotransposons during embryonic neurogenesis.

Johannes Jung*, Angela Garding*, Abhijeet Pataskar*, Florian Noack, Vilma Rraklli, **Thakurela S**, Johan Holmberg, Federico Calegari^S, Vijay K. Tiwari^S.

INVITED TALKS

- 2020: Institute for the Biology of Stem Cells, University of California, Santa Cruz, CA, USA.
- 2020: Department of Cardiology, Boston Children's Hospital, Boston, MA, USA.
- 2020: Program in Cancer Epigenetics, Fox Chase Cancer Center, Philadelphia, PA, USA.
- 2019: Englander Institute for Precision Medicine, Weill Cornell Medicine, New York, NY, USA.

PROFESSIONAL MENTORING / TEACHING

- **Co-mentoring** a computational student in Dr. Jungsun Kim laboratory at OHSU Knight Cancer Institute. Supervising analysis of single-cell RNA-seq data.
- **Analysis Supervision** (2013-2015): Supervised 2 computational students during Ph.D.
- **Project Lead** (2010 – 2012): Led a group of domain experts to support software a developmental team for microarray analysis software such as Agilent GeneSpring GX, Agilent CGH-Analytics, Agilent SureSelect, eARRAY etc.
- **Master Thesis** (2011): Mentored 2 projects student for their master's thesis at Bioinformatics Center, Pune University.
- **Short Project** (2009): Supervised a group of 3 students for a short project on implementation of phylogenic algorithm using Microsoft parallel programming library (**Winner of Microsoft Imagine Cup's Parallelism Challenge - 2009**).
- **Teaching** (2009 – 2011): Designed and taught computational biology course at College of Engineering, Pune (COEP).
- **Teaching** (2008 – 2011): Designed and taught course on microarray and NGS analysis at Bioinformatics Center, Pune University.

CONFERENCE TALKS/POSTERS

- 2019: CSHL Conference (**Poster**): Stem Cell Biology, Cold Spring Harbor, New York, USA
- 2019: Bioinformatics Conference (**Invited Speaker**): Recent Trends in Bioinformatics; Pune, India
- 2018: Keystone Conference (**Selected Talk**): Gene control in development and disease, Whistler, BC, Canada
- 2017: Gordon Conference (**Poster**): GRC Epigenetics, Holderness, NH, US
- 2013: IMB Conference (**Poster**): "Chromatin Dynamics and Stem Cells", Mainz, Germany
- 2012: ECCB – "European Conference on Computational Biology", Basel, Switzerland
- 2012: IMB Conference: "DNA Demethylation, Repair and Beyond", Mainz, Germany

AWARDS / GRANTS

- **2004: DBT Junior Research Fellowship**, Dept. of Biotechnology, (Government of India), Research fellowship.
- **2002-2004: DBT Research Fellowship**, Dept. of Biotechnology, (Government of India), Student fellowship for academic excellence.

REFEREES

Prof. Alexander Meissner

(Postdoc Advisor)
MPI Molecular Genetics (Germany)
Harvard Stem Cell & Regenerative Biology
(+49)-030-8413-1880
meissner@molgen.mpg.de

Prof. Leonard Zon

(Collaborator, Postdoc)
Harvard Stem Cell & Regenerative Biology
Boston Children's Hospital
(+1)- 617-919-2069
hdiccco@enders.tch.harvard.edu
leonard.zon@enders.tch.harvard.edu

Prof. Vijay Tiwari

(Ph.D. Advisor)
Institute of Experimental Medicine
Queen's University (Northern Ireland)
(+44)-28-9097-6474
v.tiwari@qub.ac.uk

Prof. Iftach Nachman

(Collaborator, Postdoc)
Tel Aviv University (Israel)
(+972)-3-640-5900
iftachn@tauex.tau.ac.il