DEEPAK KUMAR TANWAR

Bioinformatics, multivariate analysis, methods development

PhD student specializing in multivariate data analysis, methods development, reproducible analyses, and epigenetics.

EDUCATION

Mar. 2018 | Mar. 2022 (expected)

ETH Zurich
PhD Candidate — Zurich, Switzerland
Supervisor: Prof. Dr. Isabelle Mansuy
Co-examiners: Prof. Mark Robinson, Prof. Tuncay Baubec, and Dr. Pierre-Luc Germain

Aug. 2016 | Jan. 2018

McGill University
Masters of Science (M.Sc.) — Montréal, Canada
Supervisors: Prof. Sarah Kimmins and Prof. Jianguo Xia
CGPA: 3.57/ 4

Aug. 2009 | Feb. 2014

Amity University Rajasthan
Bachelor of Technology (B.Tech.) in Bioinformatics — Jaipur, India
Supervisor: Prof. Dr. Rainer König
Advisor: Prof. Dr. A. N. Pathak
CGPA: 7.11/ 10 (*First Class*)

RESEARCH EXPERIENCE

Mar. 2018 | Dec. 2021

Scientific Assistant
ETH Zurich — Zurich, Switzerland
- **Supervisor:** Prof. Dr. Isabelle Mansuy
- Epigenetic inheritance research
- Methods and software development
- Multi-omics data analysis

Aug. 2016 | Jan. 2018

Graduate Research Assistant
McGill University — Montréal, Canada
- **Supervisor:** Prof. Sarah Kimmins
- **Co-supervisor:** Prof. Jianguo Xia
- Epigenetic inheritance research
- Tools and pipelines development

Oct. 2014 | Aug. 2016

Visiting Research Scientist
University of Alabama at Birmingham — Birmingham, USA
- **Supervisor:** Prof. Malay Basu
- Cancer research
- Multi-omics data analysis
- Language of protein domain architecture

Jun. 2013 | Jan. 2014

Research Associate (Intern)
University of Jena — Jena, Germany
- **Supervisors:** Prof. Dr. Rainer König
- Sepsis data analysis
- Network modeling
- Mathematical modeling

Jun.-Jul. 2012

Internsip
Rajiv Gandhi Centre for Biotechnology (RGCB) — Thiruvananthapuram, India
Supervisors: Dr. Sathish Mundayoor (Scientist G) and Mr. Siva Kumar
Project Title: Molecular Docking of NCI Drug Ligands into HIV-1, using Schrödinger.

Jun.-Jul. 2011

Industrial internship
IBI Biosolutions — Chandigarh, India
Supervisor: Dr. Rajnikant Singh
Project Title: Designing of PERL Biological Module.

CONTACT INFO

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LINKS

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d_k_tanwar
dktanwar
Deepak Tanwar
Deepak_Tanwar2
Deepak Tanwar

TECHNICAL SKILLS

Programming: R, Perl, Python, UNIX, JavaScript, HTML and CSS
Documentation: LaTeX, Markdown
Literate Programming: Sweave, Knitr
Version control: git
Cluster computing

TEACHING

2021 **Bioinformatics and genomic data analysis**
ETH Zurich — Zurich, Switzerland
Planned the computational part of the block course and delivered lectures in bioinformatics and literate programming
Study of Epigenetic Mechanisms in Mental Health (376-1346-00L)

2020 **Introduction to Bioinformatics**
ETH Zurich — Zurich, Switzerland
Introduction to bioinformatics and data analysis
Study of Epigenetic Mechanisms in Mental Health (376-1346-00L)

2019 **Introduction to Biostatistics**
ETH Zurich — Zurich, Switzerland
Introduction to variables, distributions and tests in statistics, applied towards biology
Study of Epigenetic Mechanisms in Mental Health (376-1346-00L)

2017 **BTEC501: Bioinformatics**
McGill University — Montréal, Canada
Taught R and, statistics and data visualization in R; organized weekly tutorials
Semester course

2016 **GBSC 703-01E: Computational Biology and Bioinformatics**
University of Alabama at Birmingham — Birmingham, USA
Taught R and data visualization in R and, assisted participants
Two weeks intensive course

2015 **GBSC 703: Introduction to Scientific Computing**
University of Alabama at Birmingham — Birmingham, USA
Assisted in teaching literate programming and helped participants
Two weeks intensive course

MENTORING

2021 **Julien Chabbey**
M.Sc. in Biology, ETH Zurich — Zurich, Switzerland
Title: Investigating differential exon usage and differential 3' untranslated regions usage in spermatogonial cells across development
Block course
Study of Epigenetic Mechanisms in Mental Health (376-1346-00L)

2021 **David Bugliani**
M.Sc. in Biology, ETH Zurich — Zurich, Switzerland
Title: Investigating differential exon usage and differential 3' untranslated regions usage in spermatogonial cells across development
Block course
Study of Epigenetic Mechanisms in Mental Health (376-1346-00L)

2019 **Andrew Acciardo**
M.Sc. in Computational Biology and Bioinformatics, ETH Zurich — Zurich, Switzerland
Title: Computational study of the effects of early life trauma on gene expression and exon usage in various tissues and cells in *Mus musculus*
M.Sc. Thesis

2019 **Hana Parizkova**
M.Sc. in Computational Biology and Bioinformatics, ETH Zurich — Zurich, Switzerland
Title: Detecting and simulating inheritance of differential methylation
Semester project

2019 **Daniela Schildknecht**
M.Sc. in Computational Biology and Bioinformatics, ETH Zurich — Zurich, Switzerland
Title: An extension of `IsoformSwitchAnalyzeR`
Lab Rotation

SCHOLARSHIP & AWARDS

Sep. 2018 | Aug. 2021

PhD Scholarship

Swiss Government Excellence Scholarship: Three years graduate scholarship for a PhD at ETH Zurich

2019

Summer School

Bioinformatics Summer School: Travel award by UCLouvain

2017

Travel and Workshop Awards

Graduate Research Enhancement and Travel Award (GREAT): Travel award by Animal Science Department, McGill University for the 4th Canadian Conference on Epigenetics

Galaxy Community Conference 2017: Travel and registration award by GCC

Epigenomic Data Analysis Workshop: Workshop Registration award by CRRD, McGill University

VOLUNTEERING AND LEADERSHIP

2018 | 2021

PhD student representative for SIB

Swiss Insititute of Bioinformatics PhD Training Network co-representative for Zurich area

2021

Abstract reviewing for BC2

Invited to review abstracts for workshop and tutorial session of the Basel Computational Biology Conference [BC]2 2021

2019

Symposium organization

Organizing member of the ISCB Student Council Symposium (SCS) 2019

2019

Abstract reviewing

Reviewed abstracts for GIW/ABACBS/COMBINE conference

PROFESSIONAL SERVICE

Reviewer for PLOS Genetics

Reviewed book proposals for CRC press

PRESENTATIONS AND POSTERS

Sep. 2019

shortRNA: A flexible framework for the analysis of short RNA sequencing data

Basel, Switzerland

Basel Life Conference

Short presentation & Poster

Aug. 2019

shortRNA: A flexible framework for the analysis of short RNA sequencing data applicable to studies on epigenetic inheritance

Poster

Zurich, Switzerland

Epigenetics Inheritance Conference, ETH Zurich

Jun. 2019

Understanding the molecular mechanisms of germline- dependent epigenetic inheritance: Computational analysis of multi-omics data

Zurich, Switzerland

HiFo-INI symposium, ETH Zurich

Jun. 2019

Computational analysis of multi-omics data from germ cells across development

Zurich, Switzerland

PhD Training Network Retreat, Swiss Institute of Bioinformatics

May 2019

Computational analysis of multi-omics data across biological systems

Zurich, Switzerland

ZNZ PhD Retreat, ETH Zurich
HiFo PhD Day, ETH Zurich

Nov. 2018

Computational analysis of the genetic and epigenetic impact of environmental insults across generations

Zurich, Switzerland

D-HEST 5th **Research Day**, ETH Zurich

May & Jun. 2018

The genome and epigenome from a bioinformatician's perspective

Zurich, Switzerland

Inaugural Symposium of the Institute for Neuroscience (INS), ETH Zurich
HiFo PhD Day, ETH Zurich

2017

Pipeline for H3K4me3 data analysis from sperm

Canada and France

Presentation

Science share at McGill University: A bioinformatics pipeline for sperm epigenome analysis (Montréal, Canada)

YouTube

Posters

The 4th Canadian Conference on Epigenetics (Whistler, Canada)
Animal Science Research Day (Montréal, Canada)
Galaxy Community Conference (Montpellier, France)
CRRD Research Day (Montréal, Canada)

HACKATHONS PARTICIPATION AND PROJECT

2017

Hackathons

Canada and France

DeLEG: Deep Learning for EpiGenomics data to predict phenotype; Montréal, Canada — GitHub
Hack the Galaxy: ChIP-Seq flavored Galaxy image; Montpellier, France — GitHub

2017

Project

Canada

CB2 McGill: co-founded a usergroup for ***Computational Biology and Bioinformatics*** at McGill University

PUBLICATIONS

Published papers

Anar Alshanbayeva, **Deepak K. Tanwar**, Martin Roszkowski, Francesca Manuella, Isabelle M. Mansuy. Early life stress affects the miRNA cargo of epididymal extracellular vesicles in mouse. *Biology of Reproduction*. doi: 10.1093/biolre/ioab156

Gretchen van Steenwyk, Katharina Gapp, Ali Jawaid, Pierre-Luc Germain, Francesca Manuella, **Deepak K. Tanwar**, Nicola Zamboni, Niharika Gaur, Anastasiia Efimova, Kristina M. Thumfart, Eric A. Miska, Isabelle M Mansuy. *The EMBO Journal*. doi: 10.15252/embj.2020104579

Ejimedo Madogwe, **Deepak K. Tanwar**, Milena Taibi, Yasmin Schuermann, Audrey St-Yves and Raj Duggavathi. Global analysis of FSH-regulated gene expression and histone modification in mouse granulosa cells. *Molecular Reproduction and Development*. doi: 10.1002/mrd.23419

Irina Lazar-Contes, Martin Roszkowski, **Deepak K. Tanwar**, Isabelle M. Mansuy. Symposium summary: Epigenetic inheritance-impact for biology and society 26-28 August 2019, Zurich, Switzerland. *Environmental Epigenetics*. doi: 10.1093/eep/dvaa004

Yu, L., **Tanwar, D.**, Penha, E., Wolf, Y., Koonin, E., & Basu, M. (**2019**). Grammar of protein domain architectures. *Proceedings Of The National Academy Of Sciences*. doi: 10.1073/pnas.1814684116

Tanwar, D., Parker, D., Gupta, P., Spurlock, B., Alvarez, R., Basu, M., & Mitra, K. (**2016**). Crosstalk between the mitochondrial fission protein, Drp1, and the cell cycle is identified across various cancer types and can impact survival of epithelial ovarian cancer patients. *Oncotarget*. doi: 10.18632/oncotarget.11047

Preprints

Irina Lazar-Contes†, **Deepak K. Tanwar**†, Pierre-Luc Germain, Niharika Gaur, Isabelle M. Mansuy. Transcriptome and epigenome characterization of mouse spermatogonial cells reveals distinct chromatin regulatory landscapes in postnatal and adult testis. doi: 10.1101/2020.08.20.259374

†: Equal contributions

In preparation

Martin Roszkowski, Irina Lazar-Contes, Pierre-Luc Germain, **Deepak K. Tanwar**, Anara Alshanbayeva, Niharika Obrist, Ali Jawaid, Gretchen van Steenwyk, Eloise Kremer, Dalila Korkmaz, Mark Ormiston, Francesca Manuella, Johannes vom Berg, Jorg Tost, Johannes Bohacek, Isabelle M Mansuy. OmniSperm: Multiomic analyses of sperm and offspring production from a single male

Chapter 2
doi: 10.3929/ethz-b-000489446

Irina Lazar-Contes, Gretchen van Steenwyk, **Deepak K. Tanwar**, Pierre-Luc Germain, Francesca Manuella, Martin Roszkowski, Niharika Gaur, Isabelle M Mansuy. Early life stress alters chromatin accessibility landscape and transcript usage in spermatogonial cells during postnatal testis maturation

Chapter 3
doi: 10.3929/ethz-b-000501023

Kassandra Ma, **Deepak K. Tanwar**, Nicholas Petronella, Swapan Banerjee, Jennifer Ronholm. The Bivalve Microbiome Loses Diversity in the Retail Environment and is Distinct in Bivalves Colonized with Vibrio vulnificus

Deepak K. Tanwar, Jianguo Xia, Sarah Kimmins. EpiSpermHis: A Docker container to study H3K4me3 modifications in sperm using Galaxy

THESES

Mar. 2022 (expected)

Doctor of Sciences

Deepak Tanwar, 2022. Dr.sc. Thesis. Computational analysis of multi-omics data to understand the molecular mechanisms of germline-dependent epigenetic inheritance

Jan. 2018

Master of Science

Deepak Tanwar, 2018. M.Sc. Thesis. EpiSpermHis: A Docker Container to Perform the Analysis of Sperm Histone ChIP-Seq Data in Galaxy McGill University Libraries

Jan. 2014

Bachelor of Technology (Engineering)

Deepak Tanwar, 2014. B.Tech. Thesis. Comprehensive Reanalysis of Genomic Storm (Transcriptomic) Data, Integrating Clinical Varibles and Utilizing New and Old Approaches Munich, GRIN Verlag, Available from ResearchGate