

Tommy Kaplan, PhD

Contact Address

Prof. Tommy Kaplan
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[Google Scholar](#): 6870 citations, H-index 33

Appointments

- 2022 –** **Professor**, School of Computer Science and Engineering, The Hebrew university of Jerusalem
- 2022 –** **Professor**, Developmental Biology and Cancer Research, Faculty of Medicine, The Hebrew university of Jerusalem
- 2019 – 2022** **Associate Professor**, Faculty of Medicine, The Hebrew university of Jerusalem
- 2017 – 2022** **Associate Professor**, School of Computer Science and Engineering, The Hebrew university of Jerusalem
- 2015 –** **Head, Computational Biology Program**, The Hebrew University of Jerusalem
- 2012 – 2017** **Assistant Professor**, School of Computer Science and Engineering, The Hebrew university of Jerusalem
- 2008 – 2012** **Post-doctoral Fellow in Computational Biology**, UC Berkeley

Education

- 10/02 – 08/08** **Ph.D. in Computer Science and Computational Biology**, The Hebrew University, Jerusalem, Israel.
- 10/00 – 10/02** **M.Sc. in Computer Science**, The Hebrew University, Jerusalem, Israel.
- 10/98 – 10/00** **B.Sc. in Computer Science and Cognitive Studies**, The Hebrew University, Jerusalem, Israel

Honors and Awards

- 06/23** **Blavatnik Award** in Computer Science to PhD student **Netanel Loyfer**
- 06/19** **Kaye Innovation Award** awarded to PhD student **Josh Moss**
- 10/16** **Bergmann Memorial Research Award**
- 12/09** **GE & Science Prize for Young Life Scientists**
- 09/08 – 09/10** **EMBO long-term post-doctoral fellowship**
- 10/08** Candidate, 2008 **ACM Doctoral Dissertation** award in Computer Science
- 10/07** Distinguished Graduate Student prize, The Hebrew University
- 06/06** **Barenholz Prize for Applied Research**
- 10/05 – 10/08** **Leibniz Center for Research in Computer Science student fellowship**
- 04/04** **Keystone Symposia Scholarship Winner**
- 10/02 – 10/05** **Horwitz Fellowship for Excellent Interdisciplinary Ph.D. students**
- 10/02 – 10/05** **Eshkol Foundation scholarship for Ph.D. students (waived)**
- 07/02** **Rector's Award** for graduate students

Teaching

- 2022 –** **Artificial Intelligence in Medicine**
- 2015 –** **Algorithms in Computational Biology**
- 2015 – 2021** **Advanced seminar in Computational Biology**
- 2015 –** **Computational Genomics**
- 2014 – 2020** **Systems Biology of Transcription**
- 2013 – 2017** **Advanced Practical Course in Machine Learning**
- 2013 –** **Undergraduate seminar in Computational Biology**
- 2012 –** **Guided research in Computational Biology**
- 2012 – 2015** **High-throughput Methods in Genomics**

2004 – 2008	Research Projects in Computational Biology (Organizer)
2006 – 2007	Undergraduate seminar in Computational Biology
2001 – 2004	Computational Bioskills Workshop
2000 – 2001	Computer Architecture (TA)

Current Funding

2023 – 2028	ISF (PI): A human atlas of imprinting and allele-specific methylation
2023 – 2027	EU Horizon (Co-PI): PANCAID - Machine learning analysis of multi-omics data for early detection and diagnosis of pancreatic cancer
2023 – 2027	Ministry of Innovation (Co-PI): A knowledge center for forensic DNA
2023 – 2024	ISF Precision Medicine IPMP (Co-PI): Monitoring response to cancer treatment using Point-of-care multi-modal cfDNA profiling
2022 – 2025	Israel Innovation Auth. (Co-PI): LiquidBx - multi-omics diagnosis of human diseases from blood
2020 – 2024	CIDR (Head PI): A computational view of cell-free DNA
2020 – 2024	CIDR (Co-PI): A university-wide multi-disciplinary data science education program

Organization of Scientific Meetings

2023	Co-organizer , 21st Israeli Bioinformatics Symposium
2015 – 2019	Organizer , “Towards a Postdoc” open days at Hebrew University
2015	Co-organizer , Genome Regulation in 3D, Weizmann Inst.
2015	Co-organizer , The regulatory conformation of the genome, Israel
2013	Organizer , Analysis of Genome-Wide sequencing data, UC Berkeley

Institutional Services

2015 –	Head , Computational Biology program
2012 –	Student Counselor , Computational Biology program
2021 –	Member , Ethics committee (CS)
2019 – 2021	Member, University Senate
2018 – 2021	Counselor , Arab students in CS
2018 – 2021	Counselor , Orthodox Jew students in CS
2014 – 2021	Member, University Committee for Gender Equality
2012 – 2016	Organizer , Computational Biology Seminar
2012 – 2015	Organizer , Computer Science Colloquium

Service in other academic and research Institutions

2021 – 2022	Sabbatical , Cancer Research Inst., Cambridge University, UK
Summer 2018	Visiting Scholar , UC San Francisco
Summer 2017	Visiting Scholar , UC San Francisco
Summer 2015	Visiting Scholar , UC San Francisco
Summer 2013	Visiting Scholar , UC Berkeley
2022 –	PhD committee member, University of Cambridge
2015 –	PhD committee member / examiner, Weizmann Institute
2015 –	PhD committee member / examiner, Technion
2015 –	MSc/PhD committee / examiner, Ben Gurion University
2014 –	MSc/PhD committee / examiner, Tel Aviv University

Outreach and Volunteering

2014 –	High school lessons (through Mad'an Ba'reshet and others)
2014 – 2017	President's program for gifted children, Jerusalem
2014 –	Popular Science Talks (Madua, Shaare Zedek, Hadassah Ein Kerem, Microsoft IL)
2014, 2017	High school mentoring of matriculation projects (Leyada, IASA)
2015 – 2020	High school seminars on Gender Equality and Manhood (Mechane Meshutaf)

Reviewing Activities

Journals: Nature, Nature Communications, Nature Cell Biology, Nature MSB, Genome Biology, Developmental Cell, Genome Research, PNAS, PLoS Genetics (guest editor), PLoS Computational Biology, eLife, NAR, Genetics, Advanced Science, Bioinformatics, Journal of Computational Biology, BMC Bioinformatics, Molecular Oncology, ISMB, ECCB
Others: MALAG (committee), ISF (panel), BSF (panel), GIF, ERC, Ministry of Science and Technology, Israeli Cancer Assoc., Dutch Cancer Society, Cancer Research NZ, Swiss NSF

Selected Publications

- Netanel Loyfer*, Judith Magenheimer*, Ayelet Peretz*, ... Yuval Dor*, Ben Glaser*, Tommy Kaplan*
A human DNA methylation atlas reveals principles of cell type-specific methylation and identifies thousands of cell type-specific regulatory elements
Nature, 2023
- Miri Varshavsky, Gil Harari, Ben Glaser, Yuval Dor, Ruth Shemer, Tommy Kaplan
Accurate age prediction from blood using a small set of DNA methylation sites and a cohort-based machine learning algorithm
Cell Reports Methods, 2023
- Megan E McNamara*, Netanel Loyfer*, ..., Keith Unger*, Tommy Kaplan*, Anton Wellstein*
Circulating cell-free methylated DNA reveals tissue-specific, cellular damage from radiation treatment
JCI insight, 2023
- Ayelet Peretz*, Netanel Loyfer*, ..., Ben Glaser, Ruth Shemer, Tommy Kaplan, Yuval Dor
The DNA methylome of human vascular endothelium and its use in liquid biopsies
MED, 2023
- Jonathan Rosenski, Sagiv Shifman, Tommy Kaplan
Predicting gene knockout effects from expression data
BMC Medical Genomics, 2023
- Jaber M*, Radwan A*, Loyfer N*, ..., Tommy Kaplan*, Yossi Buganim*
Comparative parallel multi-omics analysis during induction of pluripotent and trophectoderm states
Nature Communications, 2022
- Asael Lubotzky, ... Tommy Kaplan, ... Ben Glaser, Ruth Shemer, Yuval Dor
Liquid biopsy reveals collateral tissue damage in cancer
JCI insight, 2022
- Ronen Sadeh, ... , Tommy Kaplan, ... Nir Friedman
ChIP-seq of plasma cell-free nucleosomes identifies gene expression programs of cells of origin
Nature Biotechnology, 2021
- Magen E Barefoot, Netanel Loyfer, ..., Tommy Kaplan, Anton Wellstein
Detection of Cell Types Contributing to Cancer From Circulating, Cell-Free Methylated DNA
Frontiers in genetics, 2021
- Naomi Habib, ..., Tommy Kaplan, Aviv Regev, Michal Schwartz
Disease-associated astrocytes in Alzheimer's disease and aging
Nature Neuroscience, 2020
- Hana Benchetrit, ... Oren Ram, Tommy Kaplan, Yossi Buganim
Direct induction of the three pre-implantation blastocyst cell types from fibroblasts
Cell stem cell, 2019
- Joshua Moss, ... Benjamin Glaser, Ruth Shemer*, Tommy Kaplan*, Yuval Dor*
Comprehensive human cell-type methylation atlas reveals origins of circulating cell-free DNA in health and disease
Nature Communications, 2018
- Malka Y, ... Hanah Margalit, Tommy Kaplan*, Michael Berger*
Post-transcriptional 3'-UTR cleavage of mRNA transcripts generates thousands of stable uncapped autonomous RNA fragments
Nature Communications, 2017
- Dikla Cohn, Or Zuk*, Tommy Kaplan*
Enhancer identification using transfer and adversarial deep learning of DNA sequences
BioRxiv, 2018
- Gil Ron, Yuval Globerson, Dror Moran, Tommy Kaplan
Promoter-Enhancer Interactions Identified from Hi-C Data using Probabilistic Models and

Hierarchical Topological Domains

Nature Communications, 2017

- Michael Klutstein, Josh Moss, Tommy Kaplan, Howard Cedar
Contribution of epigenetic mechanisms to variation in cancer risk among tissues
PNAS, 2017
- Xiao-Yong Li, ... Tommy Kaplan*, Michael Eisen*
Establishment of regions of genomic activity during the Drosophila maternal to zygotic transition
eLife, 2014
- Axel Visel, ... Tommy Kaplan, Eddy Rubin, Len Pennacchio, John Rubenstein
A High-Resolution Enhancer Atlas of the Developing Telencephalon
Cell, 2013
- Dalit May, ... Tommy Kaplan, Eddy Rubin, Len Pennacchio, Axel Visel
Large-scale discovery of Enhancers from Human Heart Tissue
Nature Genetics, 2012
- Melissa Harrison*, Xiao-Yong Li*, Tommy Kaplan*, Michael Botchan, Michael Eisen
Zelda Binding in the Early Drosophila melanogaster Embryo Marks Regions Subsequently Activated at the Maternal-to-Zygotic Transition
PLoS genetics, 2011
- Tommy Kaplan, ..., Mark D Biggin*, Michael B Eisen*
Quantitative Models of the Mechanisms That Control Genome-Wide Patterns of Transcription Factor Binding during Early Drosophila Development
PLoS genetics, 2010
- Moran Yassour*, Tommy Kaplan*, ..., Nir Friedman, Aviv Regev
Ab initio construction of a eukaryotic transcriptome by massively parallel mRNA sequencing
PNAS, 2009
- Tommy Kaplan*, Chih Long Liu*, ..., Nir Friedman, Oliver J Rando
Cell cycle—and chaperone-mediated regulation of H3K56ac incorporation in yeast
PLoS genetics, 2008
- Andrew Capaldi, Tommy Kaplan, ... Aviv Regev, Nir Friedman, Erin O'Shea
Structure and Function of a Transcriptional Network Activated by the MAPK Hog1
Nature Genetics, 2008
- Michael Dion*, Tommy Kaplan*, ... Nir Friedman, Oliver J Rando
Dynamics of replication-independent histone turnover in budding yeast
Science, 2007
- Chih-Long Liu*, Tommy Kaplan*, ... Nir Friedman, Oliver J Rando
Single-nucleosome mapping of histone modifications in *S. cerevisiae*
PLoS biology, 2005
- Tommy Kaplan, Nir Friedman, Hanah Margalit
Ab initio prediction of transcription factor targets using structural knowledge
PLoS computational biology, 2005
- Yoseph Barash*, Gal Elidan*, Nir Friedman, Tommy Kaplan*
Modeling dependencies in protein-DNA binding sites
RECOMB, 2003