

# Tommy Kaplan, PhD

## Contact Address

Prof. Tommy Kaplan  
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## Education

- 2002 – 2008** **Ph.D. in Computer Science and Computational Biology.**  
Thesis title: "From DNA Sequence to Chromatin Dynamics: Computational Analysis of Transcriptional Regulation"  
Under the supervision of Prof. Nir Friedman and Prof. Hanah Margalit,  
**School of Computer Science and Faculty of Medicine,**  
The Hebrew university, Jerusalem, Israel.
- 2000 – 2002** **M.Sc. in Computer Science.**  
The Hebrew university, Jerusalem, Israel.  
(As part of direct studies towards a Ph.D. degree)
- 1998 – 2000** **B.Sc. in Computer Science and Cognitive Studies.**  
The Hebrew university, Jerusalem, Israel
- 1996 – 1997** **B.Sc. studies in Mathematics and Computer Science.**  
Tel-Aviv University, Israel.

## Appointments

- 2018 –** **Associate Professor**  
School of Computer Science and Engineering  
The Hebrew university of Jerusalem
- 2015 –** **Head**  
Program for Computer Science and Computational Biology  
The Hebrew University of Jerusalem
- 2013 – 2018** Core Member, I-CORE center for Chromatin and RNA in Gene Regulation  
(2nd wave center, Headed by Prof. Nir Friedman)
- 2012 – 2018** **Senior Lecturer (Assistant Professor)**  
School of Computer Science and Engineering  
The Hebrew university of Jerusalem
- 2012 – 2017** Core Member, I-CORE center for Gene Regulation in Complex Human Diseases (1st wave center, Headed by Prof. Howard Cedar)
- 2008 – 2012** **Post-doctoral Fellow** in Computational Biology.  
Hosted by Prof. Michael B. Eisen, Howard Hughes Medical Institute,  
California Institute of for Quantitative Biosciences, Dept. of Molecular and  
Cell Biology, University of California, Berkeley
- 2000 – 2008** **Teaching Assistant,**  
Joint BSc/MSc program in Computer Science and Life Sciences, The  
Hebrew university, Jerusalem, Israel
- 1999 – 2008** **Research Assistant,**  
Under the supervision of Prof. Nir Friedman and Prof. Hanah Margalit, The  
Hebrew University of Jerusalem.

## Honors and Awards

- 2016** **Bergmann Memorial Research Award**
- 2009** **GE & Science Prize for Young Life Scientists, "Rest of the World"**

	regional winner (excluding N. America, Europe and Japan).
<b>2008 – 2010</b>	<b>EMBO</b> long-term post-doctoral fellowship.
<b>2008</b>	Candidate for the 2008 <b>ACM Doctoral Dissertation</b> award, on behalf of the School of Computer Science, The Hebrew University of Jerusalem.
<b>2007</b>	Distinguished Graduate Student prize in <b>Computer Science and Computational Biology</b> . The Hebrew University.
<b>2006</b>	<b>Barenholz</b> Prize for Applied Research
<b>2005 – 2008</b>	<b>Leibniz</b> Center for Research in Computer Science student fellowship
<b>2004</b>	<b>Keystone</b> Symposia Scholarship Winner
<b>2002 – 2005</b>	<b>Horwitz</b> Fellowship for Excellent Interdisciplinary Ph.D. students
<b>2002 – 2005</b>	<b>Eshkol</b> Foundation scholarship for Ph.D. students (waived)
<b>2002</b>	<b>Rector's Award</b> for graduate students
<b>2000</b>	Selim and Rachel <b>Benin</b> Award for undergraduate students

## Teaching

<b>2015 –</b>	<b>Algorithms in Computational Biology</b>
<b>2014 –</b>	<b>Computational Genomics</b>
<b>2013 –</b>	<b>Systems Biology of Transcription</b>
<b>2013 –</b>	<b>Advanced Practical Course in Machine Learning</b>
<b>2012 –</b>	<b>Research Methods in Computational Biology.</b>
<b>2012 –</b>	<b>Lab in Computational Biology.</b>
<b>2012 – 2015</b>	<b>High-throughput Methods in Genomics.</b>
<b>2006 – 2008</b>	Advisor for <b>Final Research Projects</b> . Computer Science and Life Sciences B.Sc program.
<b>2005 – 2006</b>	<b>Research Methods in Computational Biology.</b>
<b>2004 – 2005</b>	Advisor for <b>Final Research Projects</b> . Computer Science and Life Sciences B.Sc program.
<b>2001 – 2004</b>	<b>Computational Bioskills</b> (hands-on semester-long course).
<b>2000 – 2001</b>	Computer Architecture (Teaching Assistant).

## Publications

### Journal Papers

1. Reut Bar Yaacov, Reut Eshel, Fania Shemulovich, **Tommy Kaplan**, and Ramon Birnbaum  
Functional characterization of the ZEB2 regulatory landscape  
*Human Molecular Genetics*, to appear
2. **Joshua Moss**, Judith Magenheimer, Daniel Neiman, Hai Zemmour, **Netanel Loyfer**, Amit Korach, Yaacov Samet, Myriam Maoz, Henrik Druid, Peter Arner, Keng-Yeh Fu, Endre Kiss, Kirsty L. Spalding, Giora Landesberg, Aviad Zick, Albert Grinshpun, AM James Shapiro, Markus Grompe, Avigail Dreazan Wittenberg, Benjamin Glaser, Ruth Shemer\*, **Tommy Kaplan\***, and Yuval Dor\*  
Comprehensive human cell-type methylation atlas reveals origins of circulating cell-free DNA in health and disease  
*Nature Communications*, 2018
3. Naama Hirsch, Reut Eshel, Reut Bar Yaacov, Tal Shahar, Fania Shemulovich, Idit Dahan, Noam Levaot, **Tommy Kaplan**, Dario Lupianez, and Ramon Birnbaum  
Unraveling the transcriptional regulation of TWIST1 in limb development  
*PLoS Genetics*, 2018
4. **Gil Ron**, **Yuval Globerson**, **Dror Moran**, and **Tommy Kaplan**  
Promoter-Enhancer Interactions Identified from Hi-C Data using Probabilistic Models and Hierarchical Topological Domains

***Nature Communications, 2017***

5. Yuval Malka, Avital Steiman-Shimony, **Eran Rosenthal**, Liron Argaman, Leonor Cohen-Daniel, Eliran Arbib, Hanah Margalit, **Tommy Kaplan\*** and Michael Berger\*  
Post-transcriptional 3'UTR cleavage of mRNA transcripts generates thousands of stable uncapped autonomous RNA fragments  
***Nature Communications, 2017***
6. **Sharon Schlesinger**, Binyamin Kaffe, Shai Melcer, Jose D. Aguilera, Divya M. Sivaraman, **Tommy Kaplan\*** and Eran Meshorer\*  
A hyperdynamic H3.3 nucleosome marks promoter regions in pluripotent embryonic stem cells  
***Nucleic Acids Research, 2017***
7. Avital Sarusi Portuguez, Michal Schwartz, Rasmus Siersbaek, Ronni Nielsen, Myong-Hee Sung, Susanne Mandrup, **Tommy Kaplan**, and Ofir Hakim  
Hierarchical role for transcription factors and chromatin structure in genome organization along adipogenesis  
***FEBS, 2017***
8. Michael Klutstein\*, **Joshua Moss\***, **Tommy Kaplan**, and Howard Cedar  
Contribution of epigenetic mechanisms to variation in cancer risk among tissues  
***PNAS, 2017***
9. **Moshe A**, and **Kaplan T**  
Genome-wide Search for Zelda-like Chromatin Signatures Identifies GAF as a Pioneer Factor in Early Fly Development  
***Epigenetics & Chromatin, 2017***
10. Markus Nevil, Eliana R. Bondra, Katharine N. Schulz, **Tommy Kaplan**, and Melissa M. Harrison  
Stable Binding of the Conserved Transcription Factor Grainy Head to Its Target Genes Throughout *Drosophila melanogaster* Development  
***Genetics, 2016***
11. Schulz KN, Bondra ER, Moshe A, Villalta JE, Lieb JD, **Kaplan T**, McKay DM, and Harrison MM  
Zelda is differentially required for chromatin accessibility, transcription-factor binding and gene expression in the early *Drosophila* embryo  
***Genome Research, 2015***
12. Li XY, Harrison MM, Villalta JE, **Kaplan T\***, and Eisen MB\*  
Establishment of regions of genomic activity during the *Drosophila* maternal to zygotic transition  
***eLife, 2014***
13. Zhou H, Wan B, Grubisic I, **Kaplan T**, and Tjian R  
TAF7L modulates brown adipose tissue formation  
***eLife, 2014***
14. Zhou H, Grubisic I, Zheng K, He Y, Wang PJ, **Kaplan T**, and Tjian R  
Taf7l cooperates with Trf2 to regulate spermiogenesis  
***PNAS, 2013***
15. Paris M, **Kaplan T**, Li XY, Villalta JE, Lott SE, and Eisen MB  
Extensive Divergence of Transcription Factor Binding in *Drosophila* Embryos with Highly Conserved Gene Expression  
***PLoS Genetics, 2013***
16. Visel A,... May D,... **Kaplan T**, Kriegstein AR, Rubin EM, Ovcharenko I, Pennacchio LA, and Rubenstein JLR  
A High-Resolution Enhancer Atlas of the Developing Telencephalon  
***Cell, 2013***
17. Zhou H, **Kaplan T**, Li Y, Grubisic I, Zhang Z, Wang PJ, Eisen MB and Tjian R  
Dual Functions of TAF7L in Adipocyte Differentiation  
***eLife, 2013***

18. **Kaplan T**, and Friedman N  
Gene Expression: Running to Stand Still  
*Nature*, 2012 (“News and Views” item)
19. May D, Blow MJ, **Kaplan T**, Jensen B, McCulley DJ, Akiyama JA, Holt A, Plajzer-Frick I, Shoukry M, Wright C, Afzal V, Simpson P, Rubin EM, Black BL, Bristow J, Pennacchio LA, and Visel A. (2012).  
Large-scale discovery of Enhancers from Human Heart Tissue  
*Nature Genetics*, 2012
20. Harrison MM\*, Li XY\*, **Kaplan T\***, Botchan M, and Eisen MB  
Zelda binding in the early *Drosophila melanogaster* embryo marks regions subsequently activated at the maternal-to-zygotic transition  
*PLoS Genetics*, 2011
21. **Kaplan T**, Li XY, Sabo P, Stamatoyannopoulos JA, Biggin MD, and Eisen MB  
Quantitative Models of the Mechanisms that Control Genome-Wide Patterns of Transcription Factor Binding During Early *Drosophila* Development  
*PLoS Genetics*, 2010
22. Halley JE, **Kaplan T**, Wang AY, Kobor MS, and Rine J  
Roles for H2A.Z and its Acetylation in GAL1 Transcription and Gene Induction, but Not GAL-1 Transcriptional Memory  
*PLoS Biology*, 2010
23. Yassour M\*, **Kaplan T\***, Fraser HB, Levine JZ, Pfiffner J, Adiconis X, Schroth G, Luo S, Khrebtkova I, Gnirke A, Nusbaum N, Thompson DA, Friedman N, and Regev A  
*ab initio* Construction of a Eukaryotic Transcriptome by Massively Parallel mRNA Sequencing  
*PNAS*, 2009
24. **Kaplan T\***, Liu CL\*, Erkmann JA\*, Holik J, Grunstein M, Kaufman PD, Friedman N and Rando OJ  
Cell Cycle- and Chaperone-Mediated Regulation of H3K56ac Incorporation in Yeast  
*PLoS Genetics*, 2008
25. Capaldi AP, **Kaplan T**, Liu Y, Habib N, Regev A, Friedman N, and O’Shea EK  
Structure and Function of a Transcriptional Network Activated by the MAPK Hog1  
*Nature Genetics*, 2008
26. Habib N\*, **Kaplan T\***, Margalit H, and Friedman N  
A novel Bayesian DNA motif comparison method for clustering and retrieval.  
*PLoS Comput Biology*, 2008
27. Dion MF\*, **Kaplan T\***, Kim M, Buratowski S, Friedman N, and Rando OJ  
Dynamics of replication-independent histone turnover in budding yeast  
*Science*, 2007
28. Liu CL\*, **Kaplan T\***, Kim M, Buratowski S, Schreiber SL, Friedman N, and Rando OJ  
Single-Nucleosome Mapping of Histone Modifications in *S. cerevisiae*  
*PLoS Biology*, 2005
29. **Kaplan T**, Friedman N and Margalit H  
*ab initio Prediction of Transcription Factor Targets using Structural Knowledge*  
*PLoS Computational Biology*, 2005
30. Barash Y\*, Elidan G\*, **Kaplan T\***, and Friedman N  
CIS: Compound Importance Sampling Method for Transcription Factor Site *p*-value Estimation  
*Bioinformatics*, 2005
31. Friedberg I, **Kaplan T** and Margalit H  
Evaluation of PSI-BLAST alignment Accuracy in Comparison to Structural Alignments.  
*Protein Science*, 2000

**Peer-reviewed Conference Proceedings**

32. Yassour M, **Kaplan T**, Jaimovich A, and Friedman N  
Nucleosome Positioning from Tiling Microarray Data. *Proc. Int. Sys. Comp. Biol. (ISMB)*, 2008
33. **Kaplan T**, Friedman N and Margalit H  
Predicting Transcription Factor Binding Sites Using Structural Knowledge  
*Proc. Of the 9<sup>th</sup> Ann. Int. Conf. in Comp. Mol. Bio. (RECOMB)*, 2005
34. Barash Y\*, Elidan G\*, **Kaplan T\***, and Friedman N  
CIS: Compound Importance Sampling Method for Transcription Factor  
Site p-value Estimation  
Short Paper. *Proc. Int. Sys. Comp. Biol. (ISMB)*, 2004
35. Barash Y\*, Elidan G\*, Friedman N, and **Kaplan T\***  
Modeling Dependencies in Protein-DNA Binding Sites  
*Proc. Of the 7<sup>th</sup> Ann. Int. Conf. in Comp. Mol. Bio. (RECOMB)*, 2003
36. Friedberg I, **Kaplan T** and Margalit H  
Glimmers in the Midnight Zone: Characterization of Aligned Identical Residues in  
Sequence-Dissimilar Proteins Sharing a Common Fold  
*Proc. Int. Sys. Comp. Biol. (ISMB)*, 2000: 162-170

### Book Chapters

37. **Kaplan T** and Biggin MD  
Quantitative Models of the Mechanisms that Control Genome-Wide Patterns of Animal  
Transcription Factor Binding  
*Methods in Cell Biology* (110), 2012

### Dissertations

38. **Kaplan T.**  
"From DNA Sequence to Chromatin Dynamics: Computational Analysis of  
Transcriptional Regulation." Ph.D. Thesis in Computer Science and Computation  
Biology, under the supervision of Prof. Nir Friedman and Prof. Hanah Margalit.  
Approved on July 15th, 2008. School of Computer Science and Faculty of Medicine.  
The Hebrew University of Jerusalem

### Conference Program Committee Member or Referee:

- **ECCB**: 2004, 2006, 2008, 2009, 2013, 2015, 2017
- **RECOMB**: 2002, 2005, 2007, 2008, 2012, 2013
- **PSB**: 2004
- **ISMB**: 2006, 2008, 2009, 2010, 2013, 2014, 2015, 2016, 2017
- **NIPS**: 2009

### Journal Referee or Editor:

- **PLoS Genetics (Guest Editor)**
- **PLoS Computational Biology**
- **Nature Communications**
- **PNAS**
- **Genome Research**
- **eLife**
- **Nature MSB**
- **Bioinformatics**
- **Journal of Computational Biology**
- **BMC Bioinformatics**

**Selected Posters:**

1. 19<sup>th</sup> Israeli Bioinformatics Symposium 2017. **Best Poster Award to Guy Kelman.**  
Comparative analysis in Bat and Mouse identifies wing-specific genes and regulatory regions
2. Hebrew University Open Day 2017. **Best Poster Award to Guy Kelman.**  
Comparative analysis in Bat and Mouse identifies wing-specific genes and regulatory regions
3. 11<sup>th</sup> Israeli Bioinformatics Symposium 2008. **Best Poster Runner-up.**  
Dynamics of Replication-Independent Histone Turnover in Budding Yeast
4. Hebrew University Open Day 2007. **Best Poster Award.**  
Dynamics of Replication-Independent Histone Turnover in Budding Yeast
5. Hebrew University Open Day 2005. **Best Poster Award.**  
Analyzing DNA sequence motifs in a SNAP
6. Keystone symposium on Biological Discovery Using High-Throughput Data, 2004. **The Keystone Symposia Scholarship Winner.**  
Using Structural Knowledge for *ab initio* Prediction of Transcription Factor Targets.
7. *Proc. Int. Sys. Comp. Biol. (ISMB)*, 2002. **Best Poster Award.**  
Using Structure and Sequence Information for Predicting Transcription Factor Binding Sites
8. *Israel Bioinformatics Symposium*, 2001. **Best Poster Award**  
Determination of Key Positions in Distantly Related Proteins

The Kaplans have also funded the Lillian Jean Kaplan Renal Transplantation Center at the University of Miami as well as a variety of prizes and grants for medical science research. In March 2014, Dr. Kaplan was awarded the rank of Chevalier in the Ordre national de la Légion d'honneur of France "the country's highest civilian distinction" by the French Ambassador to the United States, François Delattre. i love how billy and tommy are rebellious teens and still care sm about their fam also they look SO GOOD IN THIS STYLE HHHH. herolance. Follow. meet billy kaplan. he's jewish, and very very gay. known as: wiccan, asgardian, demiurge, sorcerer supreme. relationships with people: his biological family is amazing and accepting and very much alive, his other family from magical mojo is a mess. has a very supportive boyfriend. abilities: magic, being a gay icon. meet tommy shepherd.