

**SHAI CARMİ****PERSONAL**

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Born: December 1981, Ramat-Gan, Israel  
Family status: married + 3  
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**CURRENT OCCUPATION**

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2021- Associate professor  
Braun School of Public Health and Community Medicine  
The Faculty of Medicine  
The Hebrew University of Jerusalem, Israel (HUJI)

**EDUCATION**

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2005 B.Sc., Bar-Ilan University, Israel, Physics and Computer Science, summa cum laude  
2006 M.Sc., Bar-Ilan University, Israel, Physics, accelerated track, magna cum laude  
Advisor: Prof. Shlomo Havlin.  
Thesis title: Statistical physics of complex networks  
2010 Ph.D., Bar-Ilan University, Israel, Physics, with distinction  
Advisor: Prof. Shlomo Havlin  
Thesis title: Complex systems from communication networks to proteins:  
statistical analysis and modeling

**PAST ACADEMIC POSITIONS**

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2010-2011 Post-doctoral fellow, The Faculty of Life Sciences, Bar-Ilan University  
Mentor: Dr. Erez Levanon  
Topic: RNA and DNA editing in mammalian genomes  
2011-2015 Post-doctoral scientist, Department of Computer Science, Columbia University  
Mentor: Prof. Itsik Pe'er  
Topics: Ashkenazi genetics; genetic sharing in founder populations  
2015-2021 Senior lecturer (assistant professor)  
Braun School of Public Health and Community Medicine,  
The Faculty of Medicine  
The Hebrew University of Jerusalem, Israel (HUJI)

**TEACHING EXPERIENCE**

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2005-2010 Teaching assistant, Department of Physics, Bar-Ilan University  
Courses: Introductory physics laboratory, Introductory physics for the life sciences, Thermodynamics and statistical mechanics  
2016- Lecturer, School of Public Health, The Hebrew University of Jerusalem  
○ Courses coordinated and taught alone: Statistical methods for biomedical sciences, Advanced topics in data analysis for public health and medicine, Personal genomics  
○ Courses coordinated alone and taught with others: Statistical methods for medicine and dental medicine

- Courses taught with others: Statistical methods for public health, Academic and research skills
  - Courses only coordinated: Introduction to R for biostatistics
- 2020,2021,2022 University-wide excellence (top 10% in student evaluation)
- 2022 Faculty of Medicine teaching excellence award

## FELLOWSHIPS, HONORS, AND AWARDS

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### Undergraduate

- 2001, 2002 The Open University president's list (as a non-degree student)
- 2003, 2004, 2005 Bar-Ilan University dean's list
- 2005 Wolf Foundation award (national)

### Graduate

- 2005 Bar-Ilan University rector's award
- 2007 Bar-Ilan University president's fellowship
- 2007 Adams fellowship of The Israel Academy of Sciences and Humanities
- 2007 'Interdisciplinary Technologies' fellowship of The Council for Higher Education of Israel (declined)
- 2008 Bar-Ilan University dean's award
- 2009 Wolf Foundation award (national)

### Post-doctoral

- 2011 Human Frontier Science Program Cross Disciplinary Fellowship (international)
- 2015 Alon fellowship of The Council for Higher Education of Israel (national; declined)

### Principal investigator

- 2018 Work covered in Science magazine's 10 breakthroughs of 2018
- 2019 Hebrew University Faculty of Medicine young researcher award
- 2019 Hebrew University presidential Ben-Porath award to an excellent young investigator
- 2022- Harry and Helen L. Brenner Chair in Molecular Biology
- 2023 Blavatnik Award for Young Scientists, Life Sciences (national)

## PUBLICATIONS

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Overall citations: 6485; *h-index*: 35; *i10-index*: 60 (Google Scholar)

### Key publications as a principal investigator

1. J. Xue, T. Lencz, A. Darvasi, I. Pe'er, and **S. Carmi**. The Time and Place of European Admixture in Ashkenazi Jewish History. *PLoS Genet.* 13, e1006644 (2017).
2. L. King, J. Wakeley, and **S. Carmi**. A non-zero variance of Tajima's estimator for two sequences even for infinitely many unlinked loci. *Theor. Popul. Biol.* 122, 22 (2018).
3. Y. Erlich, T. Shor, I. Pe'er, and **S. Carmi**. Identity inference of genomic data using long-range familial searches. *Science* 362, 690 (2018). [Covered by Science Magazine's 10 breakthroughs of 2018.](#)
4. E. Granot-HersHKovitz, D. Karasik, ..., I. Peter, **S. Carmi\***, and H. Hochner\*. A study of Kibbutzim in Israel reveals risk factors for cardiometabolic traits and subtle population structure. *Eur. J. Hum. Genet.* 26, 1848 (2018).
5. R. Schweiger, Y. Erlich, and **S. Carmi**. FactorialHMM: Fast and exact inference in factorial hidden Markov models. *Bioinformatics* 35, 2162 (2019).
6. D. Backenroth, F. Zahdeh, ..., G. Altarescu\*, **S. Carmi\***, and D. A. Zeevi\*. Haploseek: A 24-hour all-in-one method for preimplantation genetic diagnosis (PGD) of monogenic disease and aneuploidy. *Genet. Med.* 21, 1390 (2019).

7. D. Backenroth and **S. Carmi**. A test for deviations from expected genotype frequencies on the X chromosome for sex-biased admixed populations. *Heredity* 123, 470 (2019).
8. H. Fridman, D. Behar, **S. Carmi**, and E. Levy-Lahad. Preconception carrier screening yield: effect of variants of unknown significance in partners of carriers with clinically significant variants. *Genet. Med.*, 22, 646 (2020).
9. E. Karavani\*, O. Zuk\*, ..., T. Lencz\*, and **S. Carmi\***. Screening human embryos for polygenic traits has limited utility. *Cell*, 179, 1424 (2019).
10. L. Agranat-Tamir, S. Waldman, ..., B. Yakir, R. Pinhasi\*, **S. Carmi\***, I. Finkelstein\*, L. Carmel\*, and D. Reich\*. The Genomic History of the Bronze Age Southern Levant. *Cell* 181, 1146 (2020).
11. D. A. Zeevi\*, D. Backenroth\*, ..., **S. Carmi\***, G. Altarescu\*. Expanded clinical validation of *Haploseek* for comprehensive preimplantation genetic testing. *Genet. Med.* 23, 1334 (2021).
12. T. Lencz\*, D. Backenroth\*, ..., O. Zuk, and **S. Carmi**. Utility of polygenic embryo screening for disease depends on the selection strategy. *eLife* 10, e64716 (2021).
13. S. Waldman, ..., **S. Carmi\***, and D. Reich\*. Genome-wide data from medieval German Jews show that the Ashkenazi founder event pre-dated the 14<sup>th</sup> century. *Cell* 185, 4703 (2022).

## All publications

### Peer-reviewed journal papers

1. **S. Carmi**, E. Y. Levanon, S. Havlin, and E. Eisenberg. Connectivity and expression in protein networks: Proteins in a complex are uniformly expressed. *Phys. Rev. E* 73, 031909 (2006).
2. **S. Carmi**, R. Cohen, and D. Dolev. Searching complex networks efficiently with minimal information. *Europhys. Lett.* 74, 1102 (2006).
3. **S. Carmi**, S. Havlin, S. Kirkpatrick, Y. Shavitt, and E. Shir. A Model of Internet topology using *k*-shell decomposition, *P. Natl. Acad. Sci. USA* 104, 11150 (2007).
4. E. Lopez, R. Parshani, R. Cohen, **S. Carmi**, and S. Havlin. Limited path percolation in complex networks. *Phys. Rev. Lett.* 99, 188701 (2007).
5. M. Maragakis, **S. Carmi**, D. ben-Avraham, S. Havlin, and P. Argyrakis. Priority diffusion model in lattices and complex networks. *Phys. Rev. E (Rapid Communication)* 77, 020103 (2008).
6. **S. Carmi**, Z. Wu, S. Havlin, and H. E. Stanley. Transport in networks with multiple sources and sinks. *EPL* 84, 28005 (2008).
7. A. Kittas, **S. Carmi**, S. Havlin, and P. Argyrakis. Trapping in complex networks. *EPL* 84, 40008 (2008).
8. **S. Carmi**, P. L. Krapivsky, and D. ben-Avraham, Partition of networks into basins of attraction. *Phys. Rev. E* 78, 066111 (2008).
9. **S. Carmi**, E. Y. Levanon, and E. Eisenberg. Efficiency of complex production in changing environment. *BMC Sys. Biol.* 3:3 (2009).
10. **S. Carmi**, S. Havlin, C. Song, K. Wang, and H. A. Makse. Energy-landscape network approach to the glass transition. *J. Phys. A: Math. Theor.* 42, 105101 (2009).
11. **S. Carmi**, S. Carter, J. Sun, and D. ben-Avraham. Asymptotic behavior of the Kleinberg model. *Phys. Rev. Lett.* 102, 238702 (2009).
12. L. Turgeman, **S. Carmi**, and E. Barkai. Fractional Feynman-Kac equation for non-Brownian functionals. *Phys. Rev. Lett.* 103, 190201 (2009).
13. H. Goldshmidt, D. Matas, A. Kabi, **S. Carmi**, R. Hope, and S. Michaeli. Persistent ER stress induces the Spliced Leader RNA Silencing pathway (SLS), leading to programmed cell death in *Trypanosoma brucei*. *PLoS Pathog.* 6, e1000731 (2010).

14. R. Parshani, **S. Carmi**, and S. Havlin. Epidemic threshold for the Susceptible-Infectious-Susceptible model on random networks. *Phys. Rev. Lett.* **104**, 258701 (2010).
15. N. G. Kolev, J. B. Franklin, **S. Carmi**, H. Shi, S. Michaeli, and C. Tschudi. The transcriptome of the human pathogen *Trypanosoma brucei* at single-nucleotide resolution. *PLoS Pathog.* **6**, e1001090 (2010).
16. **S. Carmi**, L. Turgeman, and E. Barkai. On distributions of functionals of anomalous diffusion paths. *J. Stat. Phys.* **141**, 1071 (2010).
17. **S. Carmi**, I. Borukhov, and E. Y. Levanon. Identification of widespread ultra-edited human RNA. *PLoS Genet.* **7**, e1002317 (2011).
18. **S. Carmi**, G. M. Church, and E. Y. Levanon. Large scale DNA editing of retrotransposons accelerates mammalian genome evolution. *Nat. Commun.* **2**, 519 (2011).
19. **S. Carmi** and E. Barkai. Fractional Feynman-Kac equation for weak ergodicity breaking. *Phys. Rev. E* **84**, 061104 (2011).
20. S. K. Gupta, **S. Carmi**, H. Waldman Ben-Asher, I. D. Tkacz, I. Naboishchikov, and S. Michaeli. Basal splicing factors regulate the stability of mature mRNAs in Trypanosomes. *J. Biol. Chem.* **7**, 4991 (2013).
21. **S. Carmi**, P. F. Palamara, V. Vacic, T. Lencz, A. Darvasi, and I. Pe'er. The variance of identity-by-descent sharing in the Wright-Fisher model. *Genetics* **193**, 911 (2013).
22. S. K. Gupta, I. Kostı, G. Plaut, A. Pivko, I. D. Tkacz, S. Cohen-Chalamish, D. K. Biswas, C. Wachtel, H. Waldman Ben-Asher, **S. Carmi**, F. Glaser, Y. Mandel-Gutfreund, and S. Michaeli. The hnRNP F/H homologue of *Trypanosoma brucei* is differentially expressed in the two life cycle stages of the parasite and regulates splicing and mRNA stability. *Nucleic Acids Res.* **41**, 6577 (2013).
23. N. Bastas, M. Maragakis, P. Argyrakis, D. ben-Avraham, S. Havlin, and **S. Carmi**. Random walk with priorities in communication-like networks. *Phys. Rev. E* **88**, 022803 (2013).
24. S. K. Gupta, V. Chikne, D. Eliaz, I. D. Tkacz, I. Naboishchikov, **S. Carmi**, H. Waldman Ben-Asher, and S. Michaeli. Two splicing factors carrying serine-arginine motifs, TSR1 and TSR1IP, regulate splicing, mRNA stability and rRNA processing in *Trypanosoma brucei*. *RNA Biol.* **11**, 715 (2014).
25. H. T. Porath, **S. Carmi**, and E. Y. Levanon. A genome-wide map of hyper-edited RNA reveals numerous new sites. *Nat. Commun.* **5**, 4726 (2014).
26. **S. Carmi**, K. Y. Hui, E. Kochav, X. Liu, J. Xue, F. Grady, S. Guha, K. Upadhyay, D. Ben-Avraham, S. Mukherjee, B. M. Bowen, T. Thomas, J. Vijai, M. Cruts, G. Froyen, D. Lambrechts, S. Plaisance, C. Van Broeckhoven, P. Van Damme, H. Van Marck, N. Barzilai, A. Darvasi, K. Offit, S. Bressman, L. J. Ozelius, I. Peter, J. H. Cho, H. Ostrer, G. Atzmon, L. N. Clark, T. Lencz, and I. Pe'er. Sequencing an Ashkenazi reference panel supports population-targeted personal genomics and illuminates Jewish and European origins. *Nat. Commun.* **5**, 4835 (2014).
27. **S. Carmi**, P. R. Wilton, J. Wakeley, and I. Pe'er. A renewal theory approach to IBD sharing. *Theor. Popul. Biol.* **97**, 35 (2014).
28. J. Zidan\*, D. Ben-Avraham\*, **S. Carmi\***, T. Maray, E. Friedman, and G. Atzmon. Genotyping of geographically diverse Druze trios reveals substructure and a recent bottleneck. *Eur. J. Hum. Genet.* **23**, 1093 (2015).
29. P. R. Wilton, **S. Carmi\***, and A. Hobolth\*. The SMC' is a highly accurate approximation to the ancestral recombination graph. *Genetics* **200**, 343 (2015).
30. B. Baskovich, S. Hiraki, K. Upadhyay, P. Meyer, **S. Carmi**, N. Barzilai, A. Darvasi, K. Offit, S. Bressman, L. Ozelius, I. Peter, J. Cho, G. Atzmon, L. Clark, T. Lencz, I. Pe'er, H. Ostrer, and C. Oddoux. Expanded genetic screening panel for the Ashkenazi Jewish Population. *Genet. Med.* **18**, 522 (2016).

31. A. Quint, M. Sagi, **S. Carmi**, H. Daum, Z. Ben Neriah, V. Meiner, O. Elpeleg, and I. Lerer. An Ashkenazi founder mutation in the PKHD1 gene. *Eur. J. Med. Genet.* **59**, 86 (2016).
32. S. Yang, **S. Carmi**, and I. Pe'er. Rapidly registering identity-by-descent across ancestral recombination graphs. *J. Comput. Biol.* **23**, 495 (2016).
33. R. Jaron, N. Rosenfeld, F. Zahdeh, **S. Carmi**, L. Beni-Adani, R. Segel, S. Zeligson, L. Carmel, P. Renbaum, and E. Levy-Lahad. Expanding the phenotype of CRB2 mutations – A new ciliopathy syndrome? *Clin. Genet.* **90**, 540 (2016).
34. R. Hope, K. Egarmina, K. Voloshin, H. Waldman Ben-Asher, **S. Carmi**, D. Eliaz, Y. Drori, and S. Michaeli. Transcriptome and proteome analyses and the role of atypical calpain protein and autophagy in the spliced leader silencing (SLS) pathway in *Trypanosoma brucei*. *Mol. Microbiol.* **102**, 1 (2016).
35. J. Vijai, S. Topka, D. Villano, V. Ravichandran, K. N. Maxwell, A. Maria, T. Thomas, P. Gaddam, A. Lincoln, S. Kazzaz, B. Wenz, **S. Carmi**, K. A. Schrader, S. N. Hart, S. M. Lipkin, S. L. Neuhausen, M. F. Walsh, L. Zhang, F. Lejbkowitz, H. Rennert, Z. K. Stadler, M. Robson, J. N. Weitzel, M. J. Daly, F. J. Couch, K. L. Nathanson, L. Norton, G. Rennert, K. Offit. A recurrent *ERCC3* truncating mutation confers moderate risk for breast cancer. *Cancer Discov.* **6**, 1267 (2016).
36. E. Gilbert, **S. Carmi**, S. Ennis, J. Wilson, and G. Cavalleri. Genomic insights into the population structure and history of the Irish Travellers. *Sci. Rep.* **7**, 42187 (2017).
37. J. Xue, T. Lencz, A. Darvasi, I. Pe'er, and **S. Carmi**. The Time and Place of European Admixture in Ashkenazi Jewish History. *PLoS Genet.* **13**, e1006644 (2017).
38. Y. Einhorn, D. Weissglas-Volkov, **S. Carmi**, H. Ostrer, E. Friedman, and N. Shomron. Differential analysis of mutations in the Jewish Population and its implications on diseases. *Genet. Res., Camb.* **99**, e3 (2017).
39. D. M. Behar, L. Saag, M. Karmin, M. G. Gover, J. D. Wexler, L. F. Sanchez, E. Greenspan, A. Kushniarevich, O. Davydenko, H. Sahakyan, L. Yepiskoposyan, A. Boattini, S. Sarno, L. Paganı, **S. Carmi**, S. Tzur, E. Metspalu, C. Bormans, K. Skorecki, M. Metspalu, S. Rootsi, and R. Villems. The genetic variation in the R1a clade among the Ashkenazi Levites' Y chromosome. *Sci. Rep.* **7**, 14969 (2017).
40. K. Y. Hui, H. Fernandez-Hernandez, J. Hu, A. Schaffner, N. Pankratz, N.-Y. Hsu, L.-S. Chuang, **S. Carmi**, N. Villaverde, X. Li, M. Rivas, A. P. Levine, X. Bao, P. R. Labrias, T. Haritunians, D. Ruane, K. Gettler, E. Chen, D. Li, E. R. Schiff, N. Pontikos, N. Barzilai, S. R. Brant, S. Bressman, A. S. Cheifetz, L. N. Clark, M. J. Daly, R. J. Desnick, R. H. Duerr, S. Katz, T. Lencz, R. H. Myers, H. Ostrer, L. Ozelius, H. Payami, Y. Peter, J. D. Rioux, A. W. Segal, W. K. Scott, M. S. Silverberg, J. M. Vance, I. Ubarretxena-Belandia, T. Foroud, G. Atzmon, I. Pe'er, Y. Ioannou, D. P. B. McGovern, Z. Yue, E. E. Schadt, J. H. Cho, and I. Peter. Functional variants in the *LRKK2* gene confer shared effects on risk for Crohn's disease and Parkinson's disease. *Sci. Transl. Med.* **10**, eaai7795 (2018).
41. D. Rothschild, O. Weissbrod, E. Barkan, A. Kurilshikov, T. Korem, D. Zeevi, P. I. Costea, S. Shilo, D. Lador, A. Godneva, I. N. Kalka, N. Bar, A. V. Vila, N. Zmora, M. Pevsner-Fischer, D. Israeli, N. Kosower, G. Malka, B. C. Wolf, T. Avnit-Sagi, M. Lotan-Pompan, A. Weinberger, Z. Halpern, **S. Carmi**, J. Fu, C. Wijmenga, A. Zhernakova, E. Elinav, and E. Segal. Environmental factors dominate over host genetics in shaping human gut microbiota composition. *Nature* **555**, 210 (2018).
42. T. Lencz, J. Yu, C. Palmer, **S. Carmi**, D. Ben-Avraham, N. Barzilai, S. Bressman, A. Darvasi, J. H. Cho, L. N. Clark, Z. H. Gümüş, V. Joseph, R. Klein, S. Lipkin, K. Offit, H. Ostrer, L. J. Ozelius, I. Peter, G. Atzmon, and I. Pe'er. High-depth whole genome sequencing of an Ashkenazi Jewish reference panel: enhancing sensitivity, accuracy, and imputation. *Hum. Genet.* **137**, 343 (2018).

43. L. King, J. Wakeley, and **S. Carmi**. A non-zero variance of Tajima's estimator for two sequences even for infinitely many unlinked loci. *Theor. Popul. Biol.* **122**, 22 (2018).
44. Y. Yehuda, B. Blumenfeld, N. Mayorek, K. Makedonski, O. Vardi, L. Cohen-Daniel, Y. Mansour, S. Baror-Sebban, H. Masika, M. Farago, M. Berger, **S. Carmi**, Y. Buganim, A. Koren, and I. Simon. Germline DNA replication timing shapes mammalian genome composition. *Nucleic Acids Res.* **46**, 8299 (2018).
45. G. Rosner, N. Gluck, **S. Carmi**, D. Bercovich, N. Fliss-Issakov, M. Ben-Yehoyada, S. Aharon-Caspi, E. Kellerman, H. Strul, O. Shibolet, and R. Kariv. POLD1 and POLE Gene Mutations in Jewish Cohorts of Early-Onset Colorectal Cancer and of Multiple Colorectal Adenomas. *Dis. Colon Rectum* **61**, 1073 (2018).
46. Y. Erlich, T. Shor, I. Pe'er, and **S. Carmi**. Identity inference of genomic data using long-range familial searches. *Science* **362**, 690 (2018).
47. E. Granot-HersHKovitz, D. Karasik, Y. Friedlander, L. Rodriguez-Murillo, R. Dorajoo, J. Liu, A. Sewda, I. Peter, **S. Carmi\***, and H. Hochner\*. A study of Kibbutzim in Israel reveals risk factors for cardiometabolic traits and subtle population structure. *Eur. J. Hum. Genet.* **26**, 1848 (2018).
48. A. L. Severson, **S. Carmi**, and N. A. Rosenberg. The effect of consanguinity on between-individual identity-by-descent sharing. *Genetics* **212**, 305 (2019).
49. D. A. Zeevi, F. Zahdeh, Y. Kling, P. Renbaum, E. Levy-Lahad, **S. Carmi**, and G. Altarescu. Off the street phasing (OTSP): No hassle haplotype phasing for molecular PGD applications. *J. Assist. Reprod. Gen.* **36**, 727 (2019).
50. R. Schweiger, Y. Erlich, and **S. Carmi**. FactorialHMM: Fast and exact inference in factorial hidden Markov models. *Bioinformatics* **35**, 2162 (2019).
51. D. Backenroth, F. Zahdeh, Y. Kling, A. Peretz, T. Rosen, D. Kort, S. Zeligson, T. Dror, S. Kirshberg, E. Burak, R. Segal, E. Levy-Lahad, D. Zangen, G. Altarescu\*, **S. Carmi\***, and D. A. Zeevi\*. Haploseek: A 24-hour all-in-one method for preimplantation genetic diagnosis (PGD) of monogenic disease and aneuploidy. *Genet. Med.* **21**, 1390 (2019).
52. D. Backenroth and **S. Carmi**. A test for deviations from expected genotype frequencies on the X chromosome for sex-biased admixed populations. *Heredity* **123**, 470 (2019).
53. M. Winther, S. Shpitzen, O. Yaacov, J. Landau, L. Oren, L. Foroozan-Rosenberg, N. Lev Cohain, D. Schurr, V. Meiner, A. Szalat, **S. Carmi**, M. R. Hayden, E. Leitersdorf, and R. Durst. In search for genetic explanation for LDLc variability in an FH family: Common SNPs and a rare mutation in microsomal triglyceride transfer protein explain only part of LDL variability in an FH family. *J. Lipid Res.* **60**, 1733 (2019).
54. The ROHGen Consortium (including A. Helavy and **S. Carmi**). Associations of autozygosity with a broad range of human phenotypes. *Nat. Commun.* **10**, 4957 (2019).
55. E. Karavani\*, O. Zuk\*, D. Zeevi, N. Barzilai, N. C. Stefanis, A. Hatzimanolis, N. Smyrnis, D. Avramopoulos, L. Kruglyak, G. Atzmon, M. Lam, T. Lencz\*, and **S. Carmi\***. Screening human embryos for polygenic traits has limited utility. *Cell* **179**, 1424 (2019).
56. M. Caballero, D. N. Seidman, Y. Qiao, J. Sannerud, T. D. Dyer, D. M. Lehman, J. E. Curran, R. Duggirala, J. Blangero, **S. Carmi**, and A. L. Williams. Crossover interference and sex-specific genetic maps shape identical by descent sharing in close relatives. *PLoS Genet.* **15**, e1007979 (2019).
57. M. Grunin, G. Beykin, E. Rahmani, R. Schweiger, G. Barel, S. Hagbi-Levi, S. Elbaz-Hayoun, B. Rinsky, M. Ganiel, **S. Carmi**, E. Halperin, I. Chowers. Association of a variant in VWA3A with response to anti-VEGF treatment in neovascular age-related macular degeneration. *Invest. Ophthalmol. Vis. Sci.* **61**, 48 (2020).
58. H. Fridman, D. M. Behar, **S. Carmi**, and E. Levy-Lahad. Preconception carrier screening yield: effect of variants of unknown significance in partners of carriers with clinically significant variants. *Genet. Med.* **22**, 646 (2020).

59. L. Agranat-Tamir, S. Waldman, M. Martin, D. Gokhman, N. Mishol, T. Eshel, O. Cheronet, N. Rohland, S. Mallick, N. Adamski, A. Marie Lawson, M. Mah, M. Michel, J. Oppenheimer, K. Stewardson, F. Candilio, D. Keating, B. Gamarra, S. Tzur, R. Kalisher, S. Bechar, V. Eshed, D. J. Kennett, M. Faerman, N. Yahalom-Mack, J. M. Monge, Y. Govrin, Y. Erel, B. Yakir, R. Pinhasi\*, **S. Carmi**\*, I. Finkelstein\*, L. Carmel\*, and D. Reich\*. The genomic history of the Bronze Age Southern Levant. *Cell* **181**, 1146 (2020).
60. H. Fridman, H. G. Yntema, R. Magi, R. Andreson, A. Metspalu, M. Mezzavila, C. Tyler-Smith, Y. Xue, **S. Carmi**, E. Levy-Lahad, C. Gilissen, and H. Brunner. The landscape of autosomal-recessive pathogenic variants in European populations reveals phenotype-specific effects. *Am. J. Hum. Genet.* **108**, 608 (2021).
61. A. L. Severson, **S. Carmi**, and N. A. Rosenberg. Variance and limiting distribution of coalescence times in a diploid model of a consanguineous population. *Theor. Popul. Biol.* **139**, 50 (2021).
62. T. Lencz, J. Yu, R. R. Khan, E. Flaherty, **S. Carmi**, M. Lam, D. Ben-Avraham, N. Barzilai, S. Bressman, A. Darvasi, J. H. Cho, L. N. Clark, Z. H. Gümüş, J. Vijai, R. J. Klein, S. Lipkin, K. Offit, H. Ostrer, L. J. Ozelius, I. Peter, A. K. Malhotra, T. Maniatis, G. Atzmon, and I. Pe'er. Novel ultra-rare exonic variants identified in a founder population implicate cadherins in schizophrenia. *Neuron* **109**, 1465 (2021)
63. D. A. Zeevi\*, D. Backenroth\*, E. Hakam-Spector, P. Renbaum, T. Mann, F. Zahdeh, R. Segel, S. Zeligson, T. Eldar-Geva, I. Ben-Ami, A. Ben Yehuda, **S. Carmi**\*, G. Altarescu\*. Expanded clinical validation of *Haploseek* for comprehensive preimplantation genetic testing. *Genet. Med.* **23**, 1334 (2021).
64. S. Ben-Shachar, N. Barda, S. Manor, S. Israeli, N. Dagan, **S. Carmi**, R. Balicer, B. Zisser, and Y. Louzoun. MHC Haplotyping of SARS-CoV-2 patients: HLA subtypes are not associated with the presence and severity of Covid-19 in the Israeli population. *J. Clin. Immunol.* **41**, 1154 (2021).
65. S. Azulai, R. Grinbaum, N. Beglaibter, S. Meron Eldar, M. Rubin, **S. Carmi**, R. Ben-Haroush Schyr, O. Romano-Zelekha, and D. Ben-Zvi. Bariatric surgery affects plasma levels of alanine aminotransferase independent of weight-loss: a registry-based study. *J. Clin. Med.* **10**, 2724 (2021).
66. T. Lencz\*, D. Backenroth\*, E. Granot-Hershkovitz, A. Green, K. Gettler, J. H. Cho, O. Weissbrod, O. Zuk, and **S. Carmi**. Utility of polygenic embryo screening for disease depends on the selection strategy. *eLife* **10**, e64716 (2021).
67. E. Arciero, M. Mezzavilla, S. Dogra, T. Tsimentzoglou, Q. Q. Huang, K. A. Hunt, D. Mason, D. A. van Heel, E. Sheridan, J. Wright, N. Small, **S. Carmi**, M. M. Iles, and H. C. Martin. Fine-scale population structure and demographic history of British Pakistanis. *Nat. Commun.* **12**, 7189 (2021).
68. L. Agranat-Tamir, S. Waldman, N. Rosen, B. Yakir\*, **S. Carmi**\*, and L. Carmel\*. LINADMIX: Evaluating the effect of ancient admixture events on modern populations. *Bioinformatics* **37**, 4744 (2021).
69. S. Hagbi-Levi, L. Tiosano, B. Rinsky, N. Levinger, S. Elbaz-Hayoun, **S. Carmi**, M. Grunin, and I. Chowers. Anti-tumor necrosis factor alpha reduces the proangiogenic effects of activated macrophages derived from patients with age-related macular degeneration. *Mol. Vis.* **27**, 622 (2021).
70. F. Privé, H. Aschard, **S. Carmi**, L. Folkersen, C. Hoggart, P. F. O'Reilly, and B. J. Vilhjálmsson. High-resolution portability of 245 polygenic scores when derived and applied in the same cohort. *Am. J. Hum. Genet.* **109**, 12 (2022).
71. I. Tessler, G. Goudot, J. Albuissou, N. Reshef, D. R. Zwas, **S. Carmi**, S. Shpitzen, G. Levin, G. Kelman, C. Cheng, J.-M. Mazzella, Y. Levin, E. Messas, D. Gilon, and R. Durst.

- Is bicuspid aortic valve morphology genetically determined? A family-based study. *Am. J. Cardiol.* **163**, 85 (2021).
72. G. Azhari, S. Waldman, N. Ofer, Y. Keller, **S. Carmi**, and G. Yaari. Decomposition of Individual SNP Patterns from Mixed DNA Samples. *Forensic Sci.* **2**, 455 (2022).
73. S. Lieberman, R. Chen-Shtoyerman, Z. Levi, S. Shkedi-Rafid, S. Zuckerman, R. Bernstein-Molho, G. Reznick Levi, S. S. Shachar, A. Flugelman, V. Libman, I. Kedar, S. Naftaly-Nathan, I. Lagovsky, T. Peretz, N. Karminsky, **S. Carmi**, E. Levy-Lahad, and Y. Goldberg. Common founder BRCA2 pathogenic variants and breast cancer characteristics in Ethiopian Jews. *Breast Cancer Res. Treat.* **193**, 217 (2022).
74. D. J. Cotter, A. L. Severson, **S. Carmi**, and N. A. Rosenberg. Limiting distribution of X-chromosomal coalescence times under first-cousin consanguineous mating. *Theor. Popul. Biol.* **147**, 1 (2022).
75. S. Waldman, D. Backenroth, É. Harney, S. Flohr, N. C. Neff, G. M. Buckley, H. Fridman, A. Akbari, N. Rohland, S. Mallick, I. Olalde, L. R. Cooper, A. Lomes, J. Lipson, J. Cano Nistal, J. Yu, N. Barzilai, I. Peter, G. Atzmon, H. Ostrer, T. Lencz, Y. E. Maruvka, M. Lämmerhirt, A. Beider, L. V. Rutgers, V. Renson, K. M. Prufer, S. Schiffels, H. Ringbauer, K. Sczech, **S. Carmi\***, and D. Reich\*. Genome-wide data from medieval German Jews show that the Ashkenazi founder event pre-dated the 14<sup>th</sup> century. *Cell* **185**, 4703 (2022).
76. N. Rappoport, G. Aviel, D. M. Shahian, A. Korach, **S. Carmi**, J. F. Keaney Jr., and O. M. Shapira. Re-Sternotomy Coronary Artery Bypass 1999-2018: Insights from the STS Adult Cardiac Surgery Database. *Ann. Thorac. Surg.* **115**, 62 (2023).
77. M. Krichevski, R. Calderon-Margalit, **S. Carmi\***, and R. Raz\*. The Heritability of Weight Gain in Infancy: A Population-Based Twin Study. *Paediatr. Perinat. Epidemiol.* **37**, 577 (2023).
78. I. Tessler\*, J. Albuissou\*, R. Piñeiro-Sabarís, A. Verstraeten, H. E. Kamber Kaya, M. Sigüero-Álvarez, G. Goudot, D. MacGrogan, I. Luyckx, S. Shpitzen, G. Levin, G. Kelman, N. Reshef, H. Mananet, J. Holdcraft, J. D. Muehlschlegel, G. M. Peloso, O. Oppenheim, C. Cheng, J.-M. Mazzella, G. Andelfinger, S. Mital, P. Eriksson, C. Billon, M. Heydarpour, H. C. Dietz, X. Jeunemaitre, E. Leitersdorf, D. Sprinzak, S. C. Blacklow, S. C. Body, **S. Carmi**, B. Loeys, J. L. de la Pompa\*, D. Gilon\*, E. Messas\*, and R. Durst\*. "Novel Association of the NOTCH Pathway Regulator *MIB1* Gene With the Development of Bicuspid Aortic Valve ". *JAMA Cardiol.* **8**, 721 (2023).
79. H. Levi, **S. Carmi**, S. Rosset, R. Yerushalmi, A. Zick, T. Yablonski-Peretz, The BCAC Consortium, Q. Wang, M. K. Bolla, J. Dennis, K. Michailidou, M. Lush, T. Ahearn, I. L. Andrulis, H. Anton-Culver, A. C. Antoniou, V. Arndt, A. Augustinsson, P. Auvinen, L. Beane Freeman, M. Beckmann, S. Behrens, M. Bermisheva, C. Bodelon, N. V. Bogdanova, S. E. Bojesen, H. Brenner, H. Byers, N. Camp, J. Castelao, J. Chang-Claude, M.-D. Chirlaque, W. Chung, C. Clarke, NBCS Collaborators, M. J. Collee, S. Colonna, CTS Consortium, F. Couch, A. Cox, S. S. Cross, K. Czene, M. Daly, P. Devilee, T. Dork, L. Dossus, D. M. Eccles, A. H. Eliassen, M. Eriksson, G. Evans, P. Fasching, O. Fletcher, H. Flyger, L. Fritschi, M. Gabrielson, M. Gago-Dominguez, M. García-Closas, J. Angel Garcia-Saenz, J. Genkinger, G. G. Giles, M. Goldberg, P. Guénel, P. Hall, U. Hamann, W. He, P. Hillemanns, A. Hollestelle, R. Hoppe, J. Hopper, ABCTB Investigators, S. Jakovchevska, A. Jakubowska, H. Jernström, E. John, N. Johnson, M. Jones, J. Vijai, R. Kaaks, E. Khusnutdinova, C. Kitahara, S. Koutros, V. Kristensen, A. W. Kurian, J. Lacey, D. Lambrechts, L. Le Marchand, F. Lejbkovicz, A. Lindblom, S. Loibl, A. Lori, J. Lubinski, A. Mannermaa, M. Manoochchri, D. Mavroudis, U. Menon, A. M. Mulligan, R. Murphy, I. Nevelsteen, W. G. Newman, N. Obi, K. O'Brien, K. Offit, A. Olshan, D. Plaseska-Karanfilska, J. Olson, S. Panico, T.-W. Park-Simon, A. Patel, P. Peterlongo, B. Rack, P. Radice, G. Rennert, V. Rhenius, A. Romero, E. Saloustros, D. Sandler, M. K.



Schmidt, L. Schwentner, M. Shah, P. Sharma, J. Simard, M. Southey, J. Stone, W. J. Tapper, J. Taylor, L. Teras, A. E. Toland, M. Troester, T. Truong, L. E. van der Kolk, C. Weinberg, C. Wendt, X. R. Yang, W. Zheng, A. Ziogas, A. M. Dunning, P. Pharoah, D. F. Easton, S. Ben-Sachar, N. Elefant, R. Shamir, and R. Elkon. Evaluation of European-based polygenic risk score for breast cancer in Ashkenazi Jewish women in Israel. *J. Med. Genet.* (2023).

### Other peer-reviewed publications

#### Reviews

1. I. Tessler, J. Albuissou, G. Goudot, **S. Carmi**, S. Shpitzen, E. Messas, D. Gilon, and R. Durst. Bicuspid Aortic Valve: Genetic and Clinical Insights. *Aorta* **9**, 139 (2021).

#### Conference papers

2. S. Yang, **S. Carmi**, and I. Pe'er. Rapidly registering identity-by-descent across ancestral recombination graphs. *Lect. Notes Comput. Sc.* **9029**, 340 (2015). [RECOMB 2015]
3. A. Jaffe, R. Weiss, **S. Carmi**, Y. Kluger, and B. Nadler. Learning binary latent variable models: a tensor eigenpair approach. ICML 2018.

#### Comments

4. G. Lázaro-Muñoz, S. Pereira, **S. Carmi**, and T. Lencz. Screening Embryos for Polygenic Conditions and Traits: Ethical Considerations for an Emerging Technology. *Genet. Med.* **23**, 432 (2021).
5. S. Pereira, **S. Carmi**, G. Altarescu, J. Austin, D. Barlevy, A. Hershlag, E. Juengst, K. Kostick-Quenet, E. Kovanci, R. B. Lathi, M. Mukherjee, I. Van den Veyver, O. Zuk, G. Lázaro-Muñoz, and T. Lencz. Polygenic embryo screening: four clinical considerations warrant further attention. *Hum. Reprod.* **37**, 1375 (2022).

#### Conference and workshop proceedings

6. E. Lopez, **S. Carmi**, S. Havlin, S. Buldyrev, and H. E. Stanley. Anomalous electrical and frictionless flow conductance in complex networks. *Physica D* **224**, 69 (2006). [Proceedings of the workshop “Dynamics on Complex Networks and Applications”, Dresden, 2006]
7. **S. Carmi**, Z. Wu, E. Lopez, S. Havlin, and H. E. Stanley. Transport between multiple users in complex networks. *Eur. Phys. J. B* **57**, 165 (2007). [Proceedings of the 5th International Conference “Applications of Physics in Financial Analysis” (APFA5), Torino, 2006]

#### Perspectives (not peer-reviewed)

1. **S. Carmi**. Genealogy: The challenges of maintaining genetic privacy. *eLife* **9**, e54467 (2020).

#### Comments (not peer-reviewed)

1. D. Barlevy, T. Lencz, **S. Carmi**, K. M. Kostick-Quenet, M. Mukherjee, S. Pereira, and G. Lázaro-Muñoz. Capacities and limitations of using polygenic risk scores for reproductive Decision Making. *Am. J. Bioeth.* **22**, 45 (2022).
2. R. Furrer, **S. Carmi**, T. Lencz, and G. Lázaro-Muñoz. Nurtured Genetics: Prenatal Testing and the Anchoring of Genetic Expectancies. *Am. J. Bioeth.* **23**, 42 (2023).

#### Preprints

1. **S. Carmi**. The distances between tree changes under SMC for any  $n$  and under SMC' for  $n=3$ . (2020). ([GitHub](#))
2. E. Petter, R. Schweiger, B. Shahino, T. Shor, M. Aker, L. Almog, D. Weissglas-Volkov, Y. Naveh, O. Navon, **S. Carmi**, J. H. Li, T. Berisa, J. K. Pickrell, and Y. Erlich. Relative matching using low coverage sequencing. (2020). ([bioRxiv](#))

3. **S. Carmi**. Cascade screening following a polygenic risk score test: what is the disease risk of a sibling conditional on a high score of a proband? (2021) ([bioRxiv](#))
4. Y. Huang, **S. Carmi**, D. E. Reich, and H. Ringbauer. Genetic estimates of the initial peopling of Polynesian islands actually reflect later inter-island contacts. (2022) ([bioRxiv](#)).

### Book chapters

1. **S. Carmi** and E. Barkai. Fractional Feynman-Kac equation for anomalous diffusion functionals. Chapter 8 in *Fractional Dynamics: Recent Advances*, Eds. J. Klafter, S. C. Lim, and R. Metzler (World Scientific, Singapore, 2011).

### Magazine articles

1. **S. Carmi** and D. Reich. Ancient DNA from the teeth of 14th-century Ashkenazi Jews in Germany already included genetic variations common in modern Jews. *The Conversation* (Nov 30, 2022).
2. T. Lencz and **S. Carmi**. Selected before birth: Embryo risk screening could lower the odds of illnesses ranging from depression to diabetes. Can it be ethically done? *Aeon* (Feb 17, 2023).

### MEDIA COVERAGE

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- 2006 *Limited path percolation in complex networks*. *Physical Review Focus*.
- 2007 *A model of Internet topology*. *MIT Technology Review*, *Science News*, *IEEE Spectrum*, *PopSci*, *Scientific American*, *Bloomberg News*, *Wired*, and over 15 others.
- 2011 *Large scale DNA editing of retrotransposons*. *Ha'aretz*.
- 2014 *Sequencing an Ashkenazi reference panel*. *LA Times*, *NBC News*, *Yahoo! News*, *The Scientist*, *National Geographic*, *Genome Web*, *Ha'aretz*, *The Jewish Daily Forward*, and over 20 others, including radio and TV shows in Israel.
- 2014 *A renewal theory approach to IBD sharing*. *Stanford Scope*.
- 2014 *Genotyping of geographically diverse Druze trios*. *Ha'aretz*, *Makor Rishon*, *NRG (Israel)*, *Gene Expression blog*.
- 2015 *Expanded genetic screening Panel*. *The Jerusalem Post*.
- 2016 40 most promising under 40. *TheMarker Magazine*, *Israel*
- 2017 *Genomic insights into the Irish Travellers*. *Genome Web*, *Daily Mail*, *The Irish Times*, *The Irish Post*, *Irish Central*, and others.
- 2018 *Functional variants in the LRRK2 gene*. *Genome Web*, *Science Daily*.
- 2018 *The human gut microbiota composition*. *The Scientist*, *Science Daily*, *MedicalXpress*, *ynet*, *Ha'aretz*, and others.
- 2018 *Identity inference of genomic data*. *The New York Times*, *The Wall Street Journal*, *The Washington Post*, *The Atlantic*, *Time*, *Los Angeles Times*, *NBC News*, *ABC News*, *CNN*, *Bloomberg*, *Yahoo News*, *Wired*, *Science*, *Nature*, *Scientific American*, *The Scientist*, *GenomeWeb*, *IEEE Spectrum*, *Ha'aretz*, *The Marker*, and others. Covered in *Science Magazine's breakthroughs of 2018*.
- 2018 *A 24-hour all-in-one method for preimplantation genetic diagnosis*. *Doctors Only*, *Mako (Israel)*.
- 2019 *A study of Kibbutzim in Israel*. *The NY Jewish Week*.
- 2019 *Screening human embryos for polygenic traits*. *Nature*, *Science*, *GenomeWeb*, *MIT Technology Review*, *Science News*, *Live Science*, *Inverse*, *Science Daily*, *Futurism*, *U.S. News*, *The Telegraph*, *Daily Mail*, *The Irish News*, *Ha'aretz*, *The Jerusalem Post*, *Yahoo News*, *KAN-Israeli Public Broadcasting Corporation (radio)*, and others.
- 2020 *The genomic history of the Bronze Age Southern Levant*. *National Geographic*, *Science Daily*, *Genome Web*, *Ha'aretz*, *The Times of Israel*, *ynet*

- 2021 *Ultra-rare exonic variants in schizophrenia*. Walla!, Yated Ne'eman (Hebrew), KAN-Israeli Public Broadcasting Corporation (radio).
- 2021 *Utility of polygenic embryo screening for disease*. Mako (Hebrew), Medical Xpress.
- 2022 *Genome-wide data from medieval German Jews*. The New York Times, Science, Live Science, GenomeWeb, yahoo!, Ha'aretz (Hebrew and English), ynet, Le Monde, Smithsonian Magazine, Fortune, The Times of Israel, JTA, The Jerusalem Post, Jewish News, The Jewish Chronicle, Jewish Press, walla!, archaeology.org, phys.org, NRC (Dutch), Galatz, 103FM (radio, Hebrew)
- 2018- Media appearances as an expert. *Newspapers and magazines*: The New York Times, Nature, Science, Businessweek, BBC, New Scientist, Ha'aretz (multiple times), Yedioth Ahronoth, Israel Hayom, ynet, Globes, Times of Israel, Galileo, Captain Kids, Today's Science, Inside Precision Medicine. *TV*: Channel 10, Reshet13, ynet (online), KAN-Israeli Public Broadcasting Corporation (online). *Radio*: Galatz, 103FM, Tel-Aviv radio. *Podcasts*: HUIJICAST, ManifoldOne.

## FUNDING

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- 2015-2023 Startup grant, The Faculty of Medicine (HUJI), \$200,000
- 2016- Private gift, The Barouh and Channah Berkovits Foundation, \$15,000
- 2017-2020 Abisch-Frenkel Foundation for the promotion of life sciences young researcher grant 17/HU6, "Evaluating the potential of personalized risk prediction for common diseases in the Ashkenazi Jewish population". \$55,000
- 2017 Israel Science Foundation (ISF) new faculty equipment grant 932/17, "A computing and storage system for statistical and population genetics research." 202,215₪.
- 2017-2022 Israel Science Foundation (ISF) personal grant 407/17, "New methods for using genetic variation and genealogical records for inferring recent demographic events." 1,000,000₪.
- 2018-2019 German-Israeli Foundation for Scientific Research and Development (GIF) Young Scientists' Program grant I-2489-407.6/2017, "Reconstructing recent population histories using multi-individual haplotype sharing and applications to Ashkenazi Jewish genetics." €18,000.
- 2019-2023 United States – Israel Binational Science Foundation (BSF) regular grant 2017024, "Theory of consanguinity and its effects on genomic sharing within and between individuals." Joint with Noah Rosenberg, Stanford University. \$216,000 (equally shared).
- 2018- Hebrew University president award for the publication of high-profile research, 10,000₪.
- 2019-2023 Sub-award of the Israel Science Foundation (ISF) program in precision medicine grant 3485/19, "Combined omics and electronic medical records-big data for prediction of phenotype sub-types, progression, and treatment outcome in age-related macular degeneration." Lead PI: Itay Chowers, Hadassah Medical Center. 4,700,000₪. Amount to SC: TBD.
- 2020-2021 Hebrew University Center for Interdisciplinary Data Science Research (CIDR) grant for collaborations between data science researchers and researchers from other fields, "Developing the next generation of preimplantation genetic testing." Joint with David Zeevi, Shaare Zedek Medical Center. 75,000₪.
- 2021-2022 Hebrew University Center for Interdisciplinary Data Science Research (CIDR). Competitive renewal of the grant "Developing the next generation of preimplantation genetic testing." Joint with David Zeevi, Shaare Zedek Medical Center. 45,000₪.

- 2020-2021-2022 Hebrew University Ben-Porath award for excellent young investigators. 15,000₪.  
The Israeli Council for Higher Education (CHE) (via the Weizmann Data Science Research Center) Collaborative Research Grants in Data Science 2020-P129437, “Mining the largest dataset on sexual mating preference and fitness inheritance.” Joint with Yitzhak Pilpel, Weizmann Institute of Science. 100,000₪. Amount to SC: 20,000₪.
- 2020-2024 Israel Science Foundation (ISF) program in precision medicine grant 1778/20, “Inherited retinal diseases: from national-scale discovery of genes and risk factors to development of novel personalized therapeutics.” Joint with: Dror Sharon and Eyal Banin, Hadassah Medical Center, and Shay Ben-Aroya, Bar-Ilan University. 4,200,000₪.
- 2020-2024 Israel Ministry of Science and Technology grant 3-17419, “Pharmacogenetic variants: from genotype frequencies to treatment response in high-burden diseases in Israel”. Joint with: Gad Rennert, Technion. 1,192,490₪.
- 2021-2025 National Human Genome Research Institute (NHGRI) of the National Institutes of Health (NIH) R01HG011711. “Polygenic embryo screening: towards informed decision-making”. Joint with: Todd Lencz, Northwell Health, and Gabriel Lazaro-Munoz, Harvard University. \$2,889,641.
- 2021-2022 The joint research fund of the Hebrew University and its affiliated hospitals. “Does surveillance improve ovarian cancer outcomes in BRCA mutation carriers?” Joint with: Rachel Michaelson-Cohen, Shaare Zedek Medical Center. \$10,000.
- 2021-2022 Gassner Fund for Medical Research. “Validation of Genome-Wide Polygenic Risk Scores for Coronary Artery Disease in the Israeli Population”. Joint with: Smadar Horowitz-Cederboim, Ronen Durst, and Naama Elefant, Hadassah Medical Center. 50,000₪.
- 2023-2027 Israel Ministry of Science and Technology knowledge center in forensic DNA grant number 1001584586. 2,999,150₪. Lead PI: Yuval Dor, The Hebrew University. Amount to SC (putative): 379,500₪.

## CONFERENCES

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- 2004 Science of Complex Networks: from Biology to the Internet and WWW, Portugal (poster)
- 2005 Katzir Conference on Molecular Perspectives on Protein-Protein Interactions, Israel (poster)
- 2007 Complex Networks: from Biology to Information Technology, Italy (talk)
- 2011 Weak Chaos, Infinite Ergodic Theory, and Anomalous Dynamics, Germany (talk)
- 2012 The annual meeting of the American Society of Human Genetics, USA (poster)
- 2012 Personal Genomes and Medical Genomics, Cold Spring Harbor Laboratory, USA (talk)
- 2013 The annual meeting of the American Society of Human Genetics, USA (talk)
- 2014 Human Evolution in the Genomic Era: Origins, Populations, and Phenotypes, UK (talk)
- 2014 The Biology of Genomes, Cold Spring Harbor Laboratory, USA (poster)
- 2014 The annual meeting of the Society for Molecular Biology and Evolution, Puerto Rico (poster)
- 2014 The annual meeting of the American Society of Human Genetics, USA (poster)
- 2015 The Biology of Genomes, Cold Spring Harbor Laboratory, USA (poster)
- 2016 Understanding the Function of Human Genome Variation, Sweden (poster)
- 2016 Founder populations: Lessons from the Jewish Genome, Israel (talk)
- 2016 Probabilistic Modeling in Genomics, UK (talk)
- 2017 Revisiting the Question of Jewish Origins, USA (invited talk)
- 2017 Human Evolution: Fossils, Ancient and Modern Genomes, UK (talk)
- 2018 The Israel Statistical Association Annual Meeting, Israel (invited talk)
- 2018 Genomics – from disease prevention to treatment, Israel (invited talk)

- 2018 Genealogy and the Sciences, Israel (invited talk)
- 2019 The annual meeting of the American Society of Human Genetics, USA (talk)
- 2020 ILANIT/FISEB (Federation of the Israel Societies for Experimental Biology), Israel (invited talk)
- 2021 Annual meeting of the European Society of Human Reproduction and Embryology (ESHRE), online (invited talk)
- 2021 Annual meeting of the Israeli Fertility Association, Israel (talk)
- 2022 EBART (Evidence Based Assisted Reproduction Technology) Congress (invited talk)
- 2022 The Israel Statistical Association Annual Meeting, Israel (invited talk)
- 2023 The British Fertility Society Annual Meeting, UK (presenting remotely; invited talk)
- 2023 ILANIT/FISEB (Federation of the Israel Societies for Experimental Biology), Israel (talk)
- 2023 Annual meeting of the European Society of Human Reproduction and Embryology (ESHRE), Denmark (talk)
- 2023 Polygenic Embryo Screening Meeting, USA (co-organizer + talk)

### **WORKSHOPS**

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- 2006 Workshop on Networks and Complexity, Israel (talk)
- 2007 Adams fellowship annual poster session, the National Academy of Sciences, Israel
- 2008 Adams fellowship annual poster session, the National Academy of Sciences, Israel
- 2009 The Science of Complexity, Israel (talk)
- 2009 Bar-Ilan's Institute for Nanotechnology and Advanced Materials meeting, Israel (talk)
- 2010 The annual meeting of the Israel Physical Society, Israel (talk)
- 2014 Columbia University annual postdoc research symposium (poster; 4<sup>th</sup> prize)
- 2015 Columbia University Foundations of Data Science poster session
- 2015 Columbia University Data Science Institute Bi-Annual symposium poster session
- 2016 Israeli Bioinformatics Symposium (poster)
- 2018 HLA and KIR population dynamics, Israel (invited talk)
- 2018 Computational Genomics Summer Institute, UCLA, USA (invited talk)
- 2018 Workshop on "Jewish genes", The Hebrew University of Jerusalem, Israel (invited chair)
- 2019 Israel human population genetics meeting (keynote lecture)
- 2019 Innovations in Forensics and the Law, Israel (invited talk)
- 2019 Computational Genomics Summer Institute, UCLA, USA (invited talk)
- 2021 Broad-Israel Science Foundation Annual Symposium, online (invited talk)
- 2021 Hadassah Eye and Vision Innovation Forum, Israel (invited talk)
- 2022 Thermo Fisher Scientific Webinar on Predictive Genomics (invited talk)
- 2023 Scientific, clinical and ethical challenges in Preimplantation & Prenatal fields, Belgium (invited talk; delivered online due to the Gaza war)

### **SEMINAR TALKS**

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- 2007 The Center for Polymer Studies, Boston University
- 2008 The Center for Complex Network Research, Northeastern University
- 2009 The Center for Complex Network Research, Northeastern University
- 2010 IBM research center, Tel Aviv
- 2011 Department of Mathematics, Bar-Ilan University
- 2011 Department of Physics, Tel Aviv University
- 2012 Faculty of Life Sciences, Bar-Ilan University
- 2012 School of Computer Science, Tel-Aviv University
- 2013 School of Computer Science, Tel-Aviv University
- 2013 Broad Institute

2013 Department of Genetics, Harvard Medical School  
 2013 Department of Computer Science, Columbia University  
 2014 Division of Psychiatric Genomics, Icahn School of Medicine at Mount Sinai  
 2014 Department of Organismic and Evolutionary Biology, Harvard University  
 2014 Computational Biology and Bioinformatics, University of Southern California  
 2014 Department of Computer Science, University of California, Los Angeles  
 2014 Faculty of Medicine, Tel-Aviv University  
 2015 Department of Biological Statistics and Computational Biology, Cornell University  
 2015 Department of Genetics, The Faculty of Medicine, The Hebrew University of Jerusalem  
 2015 Department of Human Genetics and Metabolic Diseases, Hadassah Medical Center  
 2015 School of Computer Science and Engineering, The Hebrew University of Jerusalem  
 2015 Institute of Genetics, Shaare Zedek Medical Center  
 2017 Faculty of Mathematics and Computer Science, Weizmann Institute of Science  
 2018 Cancer Research Hub, The Faculty of Medicine, The Hebrew University of Jerusalem  
 2018 Faculty of Mathematics and Computer Science, Weizmann Institute of Science  
 2018 Department of Archaeogenetics, Max Planck Institute for the Science of Human History  
 2018 Institute of Genetics, Ha'Emek Medical Center  
 2018 School of Public Health, The Hebrew University of Jerusalem  
 2019 Department of Molecular Genetics, Weizmann Institute of Science  
 2019 Max Planck Institute for the Science of Evolutionary Biology  
 2019 Faculty of Mathematics and Computer Science, Weizmann Institute of Science  
 2019 The Faculty of Medicine (2x), The Hebrew University of Jerusalem  
 2020 Hadassah Medical Center clinical presentation  
 2020 Faculty lecture, Faculty of Medicine, The Hebrew University of Jerusalem  
 2020 Cardiology, Hadassah Medical Center  
 2020 Department of Genetics, Harvard Medical School  
 2020 Program in Quantitative Genomics, Harvard T.H. Chan School of Public Health  
 2020 Computational Data Science, Technion  
 2021 Department of Biology, Stanford University  
 2021 Department of Molecular Genetics, Weizmann Institute of Science  
 2021 School of Public Health, The Hebrew University of Jerusalem  
 2021 International Genetic Epidemiology Society  
 2021 Department of Genetics, Institute of Life Sciences, The Hebrew University of Jerusalem  
 2022 Department of Human Genetics, University of Chicago  
 2022 Faculty of Humanities, The Hebrew University of Jerusalem  
 2022 Norwegian Institute of Public Health  
 2022 Department of Statistics and Operations Research, Tel-Aviv University  
 2022 Genetics Institute, UCL  
 2022 Department of Genetics, Harvard Medical School  
 2022 School of Computer Science and Engineering, The Hebrew University of Jerusalem  
 2022 Department of Biology, Stanford University  
 2023 Department of Biochemistry, The Faculty of Medicine, The Hebrew University of Jerusalem  
 2023 Institute of Life Sciences, The Hebrew University of Jerusalem  
 2023 Department of Jewish History, Faculty of Humanities, The Hebrew University of Jerusalem

#### **PUBLIC TALKS (UNPAID)**

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2016 World Federation of Tunisian Jews  
 2017 Boston Jewish Genealogical Society  
 2021,2022 Hebrew University annual city center public event (איינושטיין בעיר)  
 2022 באים אל הפרופסורים

2023 Medical data science Israel Meetup

## PEER REVIEW

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- 2008- An independent reviewer for:  
**Interdisciplinary:** Science, PNAS, Nature Communications, PLOS One, Scientific Reports  
**Biomedical sciences:** Cell, Nature Genetics, Nature Medicine, eLife, American Journal of Human Genetics, Genome Biology, Genetics, Genetics in Medicine, Molecular Biology and Evolution, PLOS Genetics, PLOS Computational Biology, Reproductive Biomedicine Online, Molecular Psychiatry, Theoretical Population Biology, RECOMB, BMC Bioinformatics, Human Genetics, Human Reproduction, Clinical and Translational Medicine, Genes, Human Biology, Frontiers in Genetics, Journal of Personalized Medicine, Israel Journal of Health Policy Research, Molecular Biotechnology  
**Physics:** Physical Review Letters, Physical Review E, Europhysics Letters, New Journal of Physics, Journal of Statistical Mechanics, Physics Letters A, Journal of Physics A, Physica A, ESAIM: Mathematical Modelling and Numerical Analysis, Canadian Journal of Physics  
**Other:** Journal of Anthropological Research
- 2008 Selected as a Europhysics Letters distinguished referee.
- 2016- Grant reviewer for:  
 The Wellcome Trust, German-Israeli Foundation for Scientific Research and Development (GIF), Israel Science Foundation (ISF), Dutch Research Council, Israel Cancer Association, The International Institute for Jewish Genealogy, The Israel National Institute for Health Policy Research
- 2023-2026 Associate editor, Theoretical Population Biology
- 2023- Reviewing editor, eLife

## OTHER PROFESSIONAL SERVICE

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### University committees:

- 2016- Research committee, The Faculty of Medicine (HUJI)  
 2017- Advanced studies committee, The Faculty of Medicine (HUJI)  
 2016- PhD committee, Braun School of Public Health (HUJI)

### Other university service:

- 2016-2017, 2018-2019 School seminar coordinator, Braun School of Public Health (HUJI)

### PhD committees:

- 2016-2021 Lily Agranat-Tamir, Life Sciences and Statistics (HUJI)  
 2019- Shoshana Revel-Vilk, Braun School of Public Health (HUJI)  
 2021- Sapir Labes, Faculty of Medicine (HUJI)  
 2021 Shany Derhy, Faculty of Medicine, the Technion (student quit)  
 2021- Batel Ziv, Life Sciences and Statistics (HUJI)

### PhD thesis reading:

- 2017 Samantha Streicher, Yale School of Public Health  
 2023 Keren Levinstein Hallak, Tel Aviv University

### MSc/MPH thesis reading:

- 2017 Reshit Beizer, Public Health (HUJI)  
 2018 Nechama Averick, Public Health (HUJI)  
 2019 Itay Nitzan, Public Health (HUJI)  
 2019 Gabriel Azhari, Engineering, Bar-Ilan University

2021 Rachel Michaelson-Cohen (HUJI)

2022 Tzach Ben-Menachem (HUJI)

2023 Maya Simchoni (HUJI)

2023 Gashaw Dagnaw (HUJI)

**PhD defense committee:**

2020 Mor Hanani, Hadassah Medical Center

2022 Ruth Harari-Kremer (HUJI)

**National committees:**

2020 Council for Higher Education data science fellowship

**Professional committees:**

2021- Leading a think tank on the regulation of genetic research and testing in Israel of behalf of the Israel Association of Public Health Physicians

**Consulting (non-profit):**

2017- Israel Ministry of Health national genomics initiative (PSIFAS)

2019 Israel Science Foundation

2019-2020 Israel Ministry of Justice

2023 Israel Ministry of National Security

2019-2021 Clalit Health Services

**Consulting (industry):**

2016- My Heritage

**Memberships in societies:**

2010-2011 Israel Physical Society

2012-2014, 2019 The American Society of Human Genetics

2014 The Society for Molecular Biology and Evolution

2022 Israel Association of Public Health Physicians

**STUDENTS SUPERVISED**

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**Post-docs**

2021- Michelle Grunin

2020-2021 Daniel Backenroth (part time)

2019 Einat Granot-Hershkovitz

2016-2018 Shay Tzur (part time)

2016 Avner Halevy (part time)

**PhD students**

2021- Liraz Klausner

2019- Idit Tessler (joint with Ronen Durst and Dan Gilon, Hadassah Medical Center)

2017-2021 Hila Fridman (joint with Ephrat Levy-Lahad, Shaare Zedek Medical Center, graduated with distinction)

2016-2022 Shamam Waldman

**Master's students**

2021- Guy Mizrachi

2020- Johanna Valensi (joint with Dror Sharon, Hadassah Medical Center)

2020-2022 Daria Triffon (joint with Itay Chowers, Hadassah Medical Center)

2017-2019 Idit Tessler (joint with Ronen Durst and Dan Gilon, Hadassah Medical Center; rector's list)

2017-2019 Ehud Karavani

2016-2018 David Raveh-Brawer (faculty's excellent thesis award, graduated magna cum laude)

**Undergraduate research projects and research interns**

2022- Ariel Lomes



|           |   |
|-----------|---|
| 2023-     | Jewish population genetics<br>Kinneret Norin  |
| 2021-2022 | Polygenic embryo screening in admixed populations<br>Hila Rotbard<br>Medicine (HUJI)  |
| 2020-2021 | Estimating the frequency of pharmacogenetic alleles in diverse Israeli populations<br>Guy Mizrachi<br>Biomedical sciences (HUJI)  |
| 2020-2021 | Developing computational methods for preimplantation genetic testing<br>Dana Golan<br>Biomedical sciences (HUJI)  |
| 2018-2019 | Clinical utility of polygenic scores<br>Roei Levy<br>Public health (HUJI)   |
| 2019-2021 | Inference of sex-specific founder events with X-linked IBD sharing<br>Saar Armon<br>Biomedical sciences (HUJI)  |
| 2016-2019 | Algorithms for variant calling from low coverage sequencing data<br>Kobi Landau<br>Medicine (HUJI), MD thesis   |
| 2018-2019 | Computational methods for studying the male germline cell lineage<br>Itamar Medved<br>Biomedical sciences (HUJI)  |
| 2016-2017 | Demographic inference based on multiway haplotype sharing<br>Or Yaacov<br>Medicine (HUJI)   |
| 2016      | Searching for genes associated with lipid levels in a large pedigree from Israel<br>Dana Baril<br>Computer Science (HUJI)   |
| 2015-2016 | Coalescence times in large-scale genealogical records<br>Noam Bar<br>Computer Science and Computational Biology (HUJI)  |
| 2015-2016 | Imputation of missing variants for ultra-low coverage sequencing in Ashkenazi Jews<br>Gavriel Fialkoff<br>Computer Science and Computational Biology (HUJI)   |
| 2016      | Detection of copy number variants for preimplantation genetic screening with low-coverage single cell embryonic sequencing<br>Adina Barchichat<br>Bioinformatics, Jerusalem College of Bioinformatics |
|           | IBD mapping on the X chromosome   |

### **STUDENT FELLOWSHIPS (FOR LAB PROJECTS)**

|            |   |
|------------|---|
| 2021-2023  | Michelle Grunin, Shamir scholarship of the Ministry of Science and Technology for returning scientists, 280,000₪                    |
| 2020, 2021 | Idit Tessler, Center for Interdisciplinary Data Science Research, fellowship in core data science, 44,000₪ (2020), 22,000₪ (2021)   |
| 2019, 2020 | Shamam Waldman, Center for Interdisciplinary Data Science Research, fellowship in core data science, 44,000₪ (2019), 22,000₪ (2020) |

**STUDENT PROJECTS SUPERVISED (BEFORE HUJI)**

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**Undergraduate computational biology research projects at Bar-Ilan University**

- 2010 Structural motifs in transcripts regulated under splicing factors depletion in *Trypanosoma brucei* (Or Garfunkel and Roy Azran)
- 2011 DNA editing in polymorphic human retrotransposons (Anastasia Shapiro)
- 2011 A comprehensive screen for DNA editing in mammalian genomes (Binyamin Knisbacher)

**Undergraduate/masters research projects at Columbia University**

- 2012 Quality control and variant statistics in the genomes of Ashkenazi Jews (Fillan Grady)
- 2012 Imputation of Ashkenazi Jewish genomes using whole genome sequencing panels (Ethan Kochav)
- 2012 Evaluating methods of local ancestry inference in closely related populations (James Xue)
- 2013 Coverage of Ashkenazi Jewish genomes by long segments shared with a reference panel (James Xue)
- 2014 Extracting IBD segments efficiently from genealogical trees (Shuo Yang)
- 2015 Refining the parameters of the bottleneck in the Ashkenazi Jewish population history (Hannah Rosenwein)