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29/1/2023

Curriculum Vitae

Personal details

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Higher Education

2006-2009: B.Sc. Agr. Animal Science, The Hebrew University of Jerusalem, Israel.

2010-2012: M.Sc. Plant Science, Breeding and Genetic resources, Wageningen University, the Netherlands.

Advisor: Prof. Dr. Edith T. Lammerts van Bueren

2013-2018: Ph.D. Plant Genomics and Genetics, the Hebrew University of Jerusalem, Israel. Advisors: Dr. Moshe A. Flaishman and Dr. Yonatan Elkind.

2018-Present: Postdoctoral researcher at Plant science department, University of California-Davis, Host: Prof. Jorge Dubcovsky.

Service in Academic and Research Institutions

2010-2011: Pre-breeder in apple breeding program. The Louis Bolk institute & Wageningen University, the Netherlands.

2011: Assistant breeder and researcher in organic plant breeding programs of Cucurbits (Zucchini, Pumpkin etc.), Tomato and Broccoli for the organic sector. De Bolster & Wageningen University, the Netherlands

2012: Consultant for statistics and genetics, the Dutch gene bank, Centre for Genetic Resources (CGN) & Wageningen University, the Netherlands.

2013-2014: Teacher and instructor in 'Agrostudies' - International Students' program. Courses: Plant breeding and genetics

2013-2018: Ph.D. Research program in Plant Genomics and Genetics, ARO, Volcani center and the Hebrew University of Jerusalem. Plant Genetics, Breeding and Physiology Laboratory.

Development of genetic and genomic tools in Pear, construction of genetic maps and QTL detection. Molecular markers identification and implementation in breeding programs.

Mentor and supervisor of M.Sc. and PhD students in Dr. Flaishman Lab, ARO, Volcani center. Specifically, in genetics, plant breeding experimental design, bioinformatics, Statistical analysis, molecular biology and molecular markers.

Supervision of Master's and doctoral degree students at ARO, Volcani center, Israel

Master students

2015-2018: Idan Barshan, co-supervisor – Dr. Moshe A. Flaishman

2016-2018: (completed 2020) Gilad Haim Gottlieb, co supervisor – Dr. Moshe A. Flaishman

Doctoral degree student

2015-2018: (Completed 2020) Kumar Lama, co supervisor – Dr. Moshe A. Flaishman

Post-doctoral Fellows and Visitors (6 months or longer):

2014-2016: Sharawan Yadav, co supervisor – Dr. Moshe A. Flaishman

2018- Present: Postdoctoral researcher (BARD-Vaadia Postdoctoral Fellow) at the University of California-Davis. Wheat Developmental Genetics Laboratory

Research and development of genetic resources, genomics and bioinformatics tools in wheat.

Genetics and Functional genomics of root development, response to temperature and circadian clock in wheat and other cereal species.

Mentor and supervisor of undergraduate and PhD students. Specifically, in wheat genetics and genomics, generation of transgenic lines (CRISPR-Cas9, UBI::Over Expression, amiRNA), quantitative genetics, epistatic interactions, molecular biology, molecular genetics, experimental design, bioinformatics, statistical analysis, and molecular markers.

Supervision of undergraduate and doctoral degree students at UC Davis, USA:

Undergraduate degree student:

2019-2020: Jin Huang, co supervisor Prof. Jorge Dubcovsky

Doctoral degree student

2020-Present: Hanchao Wang, co supervisor: Prof. Tzion Fahima

List of Publications

Articles

Gabay G, Dahan Y, Izhaki Y, Isaacson T, Elkind Y, Ben-Ari G, Flaishman M.A. Identification of QTLs associated with spring vegetative budbreak time after dormancy release in pear (*Pyrus communis* L.). 2017. *Plant Breeding*. <https://doi.org/10.1111/pbr.12499>. 2.536; 32/90(AGRONOMY – SCIE)

Gabay G, Dahan Y, Izhaki Y, Faigenboim A, Ben-Ari G, Elkind Y, Flaishman M.A. High-resolution genetic linkage map of European pear (*Pyrus communis* L.) and QTL fine-mapping of vegetative budbreak time. 2018. *BMC plant biology*. <https://doi.org/10.1186/s12870-018-1386-2>. 5.26; 30/238 (PLANT SCIENCES – SCIE)

Gabay G, Faigenboim A, Dahan Y, Izhaki Y, Itkin M, Malitsky S, Elkind Y, Flaishman M.A. Transcriptome analysis and metabolic profiling reveal the key role of α -linolenic acid in dormancy regulation of European pear. 2018. *Journal of Experimental Botany*. <https://doi.org/10.1093/jxb/ery405>. 7.298; 15/238 (PLANT SCIENCES – SCIE)

Gabay G*, Zhang J*, Burguener G.F, Howell T, Wang H, Fahima T, Lukaszewski, A^C, Moriconi, J.I^C, Santa Maria G.E^C, Dubcovsky J^{PI}. Structural rearrangements in wheat (1BS)–rye (1RS) recombinant chromosomes affect gene dosage and root length. 2021. *The Plant Genome*. <https://doi.org/10.1002/tpg2.20079>. 4.219; 48/238 (PLANT SCIENCES – SCIE)

Gabay G, Dahan Y, Cohen O, Barshan I, Itzhaki Y, Flaishman M. A. Detection of QTLs in a Mediterranean climate associated with fire blight necrosis length in *Pyrus communis* L. using a high-resolution genetic linkage map. 2021. *Plant Breeding*. <https://doi.org/10.1111/pbr.12903>. 2.536; 32/90(AGRONOMY – SCIE)

Gabay G., Wang H., Zhang J, Moriconi J, Burguener, G.F, Howell, TR, Lukaszewski, A., Staskawicz, B., Cho, MJ, Tanaka J, Fahima T, Ke H, Dehesh K, Zhang GL, Gou JY, Hamberg M, Santa Maria G, Dubcovsky J. Dosage differences in *12-OXOPHYTODIENOATE REDUCTASE* genes modulate wheat primary root growth. *Nature Communication (In Press)*. 17.694; 6/74 (MULTIDISCIPLINARY SCIENCES). bioRxiv version: <https://biorxiv.org/cgi/content/short/2022.08.25.505338v1>

Barshan I, **Gabay G***, Dahan Y, Cohen O, , Itzhaki Y, Flaishman MA. (*In preparation*) QTL identification of fruit quality in *Pyrus communis* using a high-resolution genetic linkage map.

Glenn P, Woods D, **Gabay G**, Odle N, Zhang J, Dubcovsky J. (*In preparation*) Identification of *bZIPC1* as a protein interactor of FT2 that affects spikelet number per spike in wheat

Wang HC*, **Gabay G***, Zhang JL, Burguener GF, Howell T, Fahima T, Lukaszewski A, Moriconi JI, Maria GES, Dubcovsky J (*In preparation*) QTL epistatic interaction in 1BS.1RS chromosomes associated with root development in wheat

*Equal contribution

Chapters in Books

Gabay G, Flaishman M.A. Genetic and Genomic Analyses of Vegetative Budbreak in Response to Chilling Units in European Pear (*Pyrus Communis* L.). 2019. In: Korban S. (eds) *The Pear Genome. Compendium of Plant Genomes*. https://doi.org/10.1007/978-3-030-11048-2_12

Gabay G. Allele mining in *Pyrus Communis* L. (*In press*). In: Kole C. *Allele mining for crop genomic designing*.

Participation in Scientific Conferences, Lectures, and Other Activity

Oral presentations

Gabay, G., Dahan, Y., Izhaki, Y., Isaacson, T., Elkind, Y., Ben-Ari, G., Flaishman, M.A. Identification of a new pear (*Pyrus Communis*) QTL associated with spring vegetative budbreak- 8th International Rosaceae Genomics Conference, Angers, France, 21-23 June 2016.

Gabay, G., Dahan, Y., Izhaki, Faigenboim, A., Ben-Ari, G., Elkind, Y., Flaishman, M.A. 2016. Genetic and genomic analysis of Pear's chilling requirements. The annual meeting of fruit tree department, plant science institute, ARO, Volcani center, Israel, December 25, 2016.

Gabay, G., Zhang, Z., Burguener F, G., Howell, T., Fahima, T., Lukaszewski, A., Santa Maria, G., Moriconi, I, J., Dubcovsky, J. Characterization of a 1RS Chromosome with a 1BS Introgression Associated

with Seminal Root Length and Root Development in Wheat. Plant and Animal Genome XXVIII, San Diego, January 14, 2020.

Gabay, G., Zhang, Z., Burguener F, G., Howell, T., Wang, H., Fahima, T., Lukaszewski, A., Santa Maria, G., Moriconi, I, J., Dubcovsky, J. The effect of gene dosage in chromosome 1B (wheat) on root length in wheat. Plant Breeding Annual Retreat, Virtual Meeting Hosted by UC Davis December 15, 2020.

Gabay, G., Wang, H., Zhang, J., Moriconi, J., Burguener, G.F., Howell, T.R., Lukaszewski, A., Staskawicz, B., Cho, M.-J., Tanaka, J., Fahima, T., Ke, H., Dehesh, K., Zhang, G.-L., Gou, J.-Y., Hamberg, M., Santa Maria, G., Dubcovsky, J. Regulatory genes and biosynthetic pathways associated with root development in wheat. Plant and Animal Genome 30, San Diego, January 13-18, 2023.

Invited presentation

Gabay, G. GBS as a tool for identification of genomic regions associated with quantitative traits – bioinformatics research units' seminar. Israel Plant Gene Bank, Israel. March 27, 2017.

Gabay, G., Elkind, Y., Flaishman, M.A. Genetic and genomic analysis of vegetative budbreak in response to chilling units in European pear (*Pyrus Communis* L.). Plant genetic and breeding seminar, Faculty of Agriculture, Food and Environment, the Hebrew University of Jerusalem, Rehovot, Israel, January 25, 2018.

Gabay, G., Elkind, Y., Flaishman, M.A. Genetic and genomic analysis of vegetative budbreak in response to chilling units in European pear (*Pyrus Communis* L.). Plant science institute seminar, ARO, Volcani center- Israel, May 30, 2018.

Gabay, G., Zhang, Z., Burguener F, G., Howell, T., Wang, H., Fahima, T., Lukaszewski, A., Santa Maria, G., Moriconi, I, J., Dubcovsky, J. 2021.Changes in gene dosage affect seminal root length in wheat. The Robert H. Smith Institute of Plant Sciences and Genetics in Agriculture, Israel. June 14, 2021.

Gabay, G., Zhang, Z., Burguener F, G., Howell, T., Wang, H., Fahima, T., Lukaszewski, A., Santa Maria, G., Moriconi, I, J., Dubcovsky, J. Gene dosage effect in seminal root development in wheat. Institute of Evolution, Haifa university, Israel June 22, 2021.

Selected Poster presentation

Gabay, G., Dahan, Y., Izhaki, Faigenboim, A., Ben-Ari, G., Elkind, Y., Flaishman, M.A. Detection of QTLs associated with main genotypic effect and genotype by environment interaction of chilling requirements in European pear. At The Forefront of Plant Research. Ghent, Belgium. 16 June, 2017.

Gabay, G., Zhang, Z., Burguener F, G., Howell, T., Wang, H., Fahima, T., Lukaszewski, A., Santa Maria, G., Moriconi, I, J., Dubcovsky, J. Changes in gene dosage affect seminal root length in wheat. 11th International Symposium of the International Society of Root Research, Virtual Meeting Hosted by the University of Missouri Columbia, Missouri, US, May 24 - 28, 2021.

Gabay, G., Zhang, Z., Burguener F, G., Howell, T., Wang, H., Fahima, T., Lukaszewski, A., Santa Maria, G., Moriconi, I, J., Dubcovsky, J. Structural chromosome rearrangements affects gene dosage and root development in wheat. American Seed Trade Association Vegetable & Flower Conference. San Diego, California, USA. January 28 - Feb. 1, 2022.

Gabay, G., Zhang, Z., Burguener F, G., Howell, T., Wang, H., Fahima, T., Lukaszewski, A., Santa Maria, G., Moriconi, I, J., Dubcovsky, J. Changes in gene dosage affect seminal root length in wheat. American Seed Trade Association Vegetable & Flower Conference. San Diego, California, USA. January 28 - Feb. 1, 2022.

Media

Change Gene Dosage, Change Wheat Root Development:

<https://access.onlinelibrary.wiley.com/doi/10.1002/csan.20507>

Membership in Professional Societies

- Horizon 2020, Framework Program for Research and Innovation Group
- Alumni @Wageningen University & Research
- American Society of Plant Biologists – ASPB
- Plant Breeding and Genetics Network

Prizes awarded

2010-2011: Research fellowship, Apple plant breeding. The Louis Bolk institute, the Netherlands.

2013-2018: Ph.D. scholarship, The Hebrew university of Jerusalem and the Volcani Research Center, Israel.

2016: Travel Grant, participation of Ph.D. students in scientific conferences. The Hebrew university of Jerusalem, Israel.

2019-2021- BARD-Vaadia Postdoctoral Fellowship

Ad hoc reviewing of manuscripts for scientific journals

2019-Present: Scientific manuscript reviewer for Journal of experimental botany (4 papers), Journal of American Society for Horticultural Science (1 paper), Genes (1 paper) and Agronomy (2 papers)

Reviewing of research proposals for granting agencies

2018: Austrian Science Fund (ASF)- Comprehensive dissection of the superficial scald in apple

Research Grants

2019-2022: Preparation of BARD research grant (US-5191-19C): “Validation of candidate genes for a QTL responsible for water stress tolerance and their diversity in wheat”. PI: Dubcovsky, J. The University of California, Davis. CO PI: Fahima, T. University of Haifa

2022-2025: Preparation of BARD research grant (US-5515-22C): Natural variation molecular characterization of genes responsible for root length and drought tolerance in wheat. PI: Dubcovsky, J. The University of California, Davis. CO PI: Fahima, T. University of Haifa