

CV  
Livnat Afriat-Jurnou

Date: 15/12/21

A. Personal Details

- Full name: Livnat Afriat Jurnou
- Date of birth: 22/05/1980
- Country of birth: Israel
- Citizenship: Israeli
- ID (or passport) number: 040257271
- Family status : Married + 2
- Full home address: Kfar Szold Po box 132, ZIP code 12230
- Home: 0556669613
- Work: MIGAL-research institute and Tel-Hai College
- E-mail address: [livnatj@migal.org.il](mailto:livnatj@migal.org.il), [livnatafriat@yahoo.com](mailto:livnatafriat@yahoo.com)

B. Higher Education

**2001-2004** Tel Aviv University, Tel Aviv, Israel, Combined degree in Chemistry and Biology, the Faculty of Exact Sciences and the Faculty of Life Science.

B.Sc. degree, 2004, with honors (final degree score 93).

**2004-2006** Feinberg Graduate School of the Weizmann Institute of Science, Department of Biological Chemistry, Rehovot, Israel.

Master thesis topic: "The latent promiscuity of newly identified microbial lactonases is linked to a recently diverged phosphotriesterase."

Thesis advisor: Prof. Dan Tawfik.

MSc. degree, December 2006, (final degree score 93).

**2006-2012** Feinberg Graduate School of the Weizmann Institute of Science,  
Department of Biological Chemistry, Rehovot, Israel.

PhD thesis topic: "The divergence of new enzymes functions via active site loop remodeling"

Thesis advisor: Prof. Dan Tawfik.

PhD degree, May 2012.

**2012-2013** Research School of Chemistry, The Australian National University,  
Canberra, Australia. Postdoctoral Research Fellow in The laboratory of  
Dr. Colin Jackson.

C. Academic Appointments and Academic Administrative Positions in Institutions of Higher Education with an asterisk marking new appointments since last promotion

November 2013- July 2017- Research Associate, Migal – Galilee Research institute.

October 2016- Lecturer, Tel-Hai College, Israel

\*July 2017- Principal Investigator, Migal – Galilee Research institute, Israel.

\*October 2019- Academic Senior staff, Faculty of Science and Technology, Tel-Hai College, Israel

D. Teaching

Describe teaching experience thoroughly, in chronological order (from old to new):  
with an asterisk marking new courses since last promotion.

2016-2017 Organic Chemistry laboratory, undergraduate, Exact Sciences faculty,  
Tel Hai College.

2017-General Chemistry Laboratory course, undergraduate, Exact Sciences faculty,  
Tel-Hai College.

\*2017- Scientific writing Seminar, undergraduate, Biotechnology, Exact Sciences  
faculty, Tel-Hai College.

\*2018- General Chemistry course, undergraduate, Exact Sciences faculty, Tel-Hai  
College.

\*2019- Organic Chemistry course, undergraduate, Exact Sciences faculty, Tel-Hai  
College.

E. Supervision of Graduate Students with an asterisk marking new graduated students  
since last promotion

\*2018-2020 Tel-Hai College, Biotechnology program, MSc, Sapir Yaar-Bar, co-supervisor Prof. Martin Goldway, in Honors, score 93.

F. Research Grants with an asterisk marking indicated new grants since last promotion

1. 2016-"Structure determination of levansucrase from *Zymomonas mobilis* (PID: 1663)", Instruct, support by the proteomics unit at the Weizmann institute of Science.
2. \*2017- Kamin grant from the Israel Innovation Authority, "The Development of superior Inulosucrases for industrial production of dietary fibers", 400,000 ILS for 2 years, in collaboration with Dr. Itamar Yadid from Migal. *Corosponding publication number 7.*
3. \*2017- Jewish Charitable Association (JCA), "Evolving a stable and efficient N-acyl homoserine lactonase as antimicrobial agents against *Erwinia amylovora* for the treatment of fire blight disease in apples and pears", 100,000 ILS for 1 year, *Corosponding publication number 11.*
4. \*2017- Ministry of Agriculture, " Establishing a platform for the encapsulating of stable Quorum Quenching lactonases as antibacterial agents agianst plant pathogens", 750,000 ILS for 3 years, project leader in collaboration with Dr. Lihi Adler-Abramovich from Tel Aviv University and Dr. Mery Dafny Yelin from Migal. *Corosponding publication number 10.*
5. 2019-Ministry of Science Technology and Space, " Enzymes Encapsulation in Peptide-based Nanoparticles for the Degradation of Organophosphate Pesticides in Agriculture Soil and Aquatic Environment", 800,000 ILS for 3 years, in collaboration with Dr. Lihi Adler-Abramovich from Tel Aviv University.
6. \*2020- Jewish Charitable Association (JCA) in Migal accelerator, "Designing enzymes that degrade bacterial signaling molecules secreted by food spoilage bacteria", 100,000 ILS for 1 year. . *Corosponding publication number 14.*
7. \*2021- MIGAL Internal grant, "Understanding the mechanism of Quorum Quenching lactonase inhibition of necrotrophic decay caused by *P. expansum* in apple", 80,000 ILS for 1 year. *Corosponding publication number 13.*
8. \*2021- MIGAL Internal grant, "Automated identification of enzymes with desirable traits for agriculture use in extreme climate learning", 250,000 ILS for 2 years. In collaboration with Prof. Ofer Shir and Dr. Itai Sharon from Migal.

9. \*2022- Ministry of Agriculture, " Using enzymes degrading *E. amylovora* signaling molecules as a new antibacterial treatment, and studying their effect on genes expression and the microbiome", 830,000 ILS for 3 years, project leader, with in collaboration with Dr. Itai Sharon and Dr. Mery Dafny Yelin from Migal.

#### Awards and Fellowships

1. Tel Aviv University, the Faculty of Life Science, Dean's award for excellence, 2003.
2. Weizmann Institute of Science, Ph.D. scholarship granted by Feinberg Graduate School, 2006.

#### G. Active Participation in Conferences. Asterisk marking conferences since the last promotion

1. 2008- ESF, Protein Design and Evolution for Biocatalysis, ESF-EMBO Symposium, "The gradual evolution of new enzymes via multi step loop replacements", 1st prize in poster competition, Hotel Eden Roc, Sant Feliu de Guixols (Costa Brava), Spain
2. 2011- FISEB, the 6th Congress of the Federation of the Israel Societies for Experimental Biology - FISEB (ILANIT), "The gradual evolution of a recently diverged phosphotriesterase via surface loops rearrangement", poster session, Eilat, Israel.
3. \*2017- ISBE, the Israel Society of Biotechnology Engineering, "Using directed enzyme evolution for the degradation of organophosphate pesticide heavily used in Agriculture", poster session, Tel Aviv, Israel.
4. \*2019-ISBE, the Israel Society of Biotechnology Engineering, "Harnessing quorum quenching lactonases to fight plant bacterial pathogens", invited oral presentation, Tel Aviv, Israel.
5. \*2020-FISEB, the Federation of the Israel Societies for Experimental Biology - FISEB (ILANIT), "Using directed enzyme evolution towards stable and active quorum quenching lactonases", invited oral presentation, Eilat, Israel.
6. \*2021- Agricon2021, "Directed Enzyme Evolution and Encapsulation of Quorum Quenching Lactonase in Peptide Nano Spheres as an Antibacterial Treatment against Plant Pathogen", Oral presentation, Bar Ilan university Ramat-Gan, Israel.

7. \*2021- The annual conference of the Israel Society for Molecular Biology, "Identifying and designing new Quorum Quenching enzymes for studying and attenuating virulence of microbial plant pathogen", invited oral presentation at the Weizmann Institute of Science, Israel.

Invited talks at departmental seminars:

1. \*2019- Agriculture Research Organization in Neve-Ya'ar, Israel, "Harnessing quorum quenching lactonases to fight bacterial pathogens"
2. \*2019- Plant Protection department in the Agriculture Research Organization in Bet Dagan, Israel, "Towards the harnessing quorum quenching lactonases to fight bacterial pathogens".
3. \*2021-Department of Plant Pathology and Microbiology, Robert H. Smith Faculty of Agriculture, Food and Environment Hebrew University, Israel, "Identifying and designing new enzymes for microbial signal disruptions".
4. \*2021-The Azrieli Faculty of Medicine, Bar-Ilan University, Israel, "Identifying and designing new enzymes for microbial signal disruptions".

H. Non-Academic Activity & Positions

2008-2011-Research instructor

International Summer Science Institute , Weizmann Institute of Science, Israel

2015-2016 Chemistry and Biotechnology laboratory for excellent high school student, Sidney Warren Science Education Center for Youth Center in Tel-Hai College

I. Attached Documents

Photocopies of the following certificates (for first appointment only):

- Doctorate, Master's, Bachelor's-attached
- Other certification and letters of recommendation

A. Publications. Asterisk marking publications since the last promotion

1. M.Sc. thesis: Master thesis topic: "The latent promiscuity of newly identified microbial lactonases is linked to a recently diverged phosphotriesterase", The Weizmann Institute of Science, Department of Biological Chemistry, Thesis advisor: Prof. Dan Tawfik. December 2006.

2. PhD thesis topic: “The divergence of new enzymes functions via active site loop remodelling.” The Weizmann Institute of Science, Department of Biological Chemistry, Thesis advisor: Prof. Dan Tawfik., PhD. degree, May 2012.
3. Books
4. Edited books
5. Articles in refereed journals, with an asterisk marking publications since the last promotion:
  1. Afriat L, Roodveldt C, Manco G, Tawfik DS. “The latent promiscuity of newly identified microbial lactonases is linked to recently diverged phosphotriesterase.” *Biochemistry*. 2006. 21;45(46):13677-86. JCR 5 year Impact Factor: 3.16, Q1, SJR 2020: 1.43, Q1. Cited by 256.
  2. Jackson CJ, Foo JL, Tokuriki N, Afriat L, Carr PD, Kim HK, Schenk G, Tawfik DS, Ollis DL. “Conformational sampling, catalysis, and evolution of the bacterial phosphotriesterase.” *Proc Natl Acad Sci U S A*. 2009, 106(51):21631-6, 5 year Impact Factor: 10.620, Q1, Rank 4/63, SJR 2020: 5.01, Q1. Cited by 115.
  3. Afriat-Jurnou L, Jackson CJ, Tawfik DS. “Reconstructing a Missing Link in the Evolution of a Recently Diverged Phosphotriesterase by Active-Site Loop Remodeling.” *Biochemistry*. 2012, 7;51(31):6047-55, JCR 5 year Impact Factor: 3.16, Q1, SJR 2020: 1.43, Q1. Cited by 123.
  4. Tokuriki N, Jackson CJ, Afriat-Jurnou L, Tawfik DS, “Diminishing returns and tradeoffs constrain the laboratory optimization of an enzyme.” *Nature communication*, 2012. 4;3:1257, JCR 5 year Impact Factor: 14.9, Q1, Rank 3/63, SJR 2020: 5.56, Q1. Cited by 178.
  5. Ahmed FH, Carr PD, Lee BM, Afriat-Jurnou L, Mohamed AE, Hong NS, Flanagan J, Taylor MC, Greening C, Jackson CJ. "Sequence-Structure-Function Classification of a Catalytically Diverse Oxidoreductase Superfamily in Mycobacteria". *Journal of Molecular Biology*, 2015. 427(22):3554-71, JCR 5 year Impact Factor: 4.393, Q1, Rank 62/289, SJR 2020: 3.19, Q1. Cited by 62.
  6. Campbell E, Kaltenbach M, Correy GJ, Carr PD, Porebski BT, Livingstone EK, Afriat-Jurnou L, Buckle AM, Weik M, Hollfelder F, Tokuriki N, Jackson CJ. "The role of protein dynamics in the evolution of new enzyme function". *Nature Chemical Biology* 2016. 12(11):944-950, JCR 5 year Impact Factor: 13.942, Q1, Rank 9/289, SJR 2020: 6.41, Q1. Cited by 162.

7. \*Afriat-Jurnou L, Cohen R, Paluy I, Ben-ativa R, Yadid I. "Directed evolution of an endoinulinase from *Talaromyces purpureogenus* toward efficient production of inulooligosaccharides", *Biotechnology Progress*, 2018. JCR 5 years IF 2.6, Q2 Rank 79/161, SJR 2020: 0.57, Q2. Cited by 8.
8. \*Prabahar V, Afriat-Jurnou L, Paluy I, Peleg Y, Noy D. "New homologues of Brassicaceae water-soluble chlorophyll proteins shed light on chlorophyll binding, spectral tuning, and molecular evolution". *FEBS J.*, 2019. JCR 5 years Impact Factor: 5.5, Q1, Rank 72/298, SJR 2020: 1.98, Q1. Cited by 5.
9. \* Lee BM, Almeida DV, Afriat-Jurnou L, Aung HL, Forde BM, Hards K, Pidot SJ, Ahmed HF, Mohamed E, Taylor MC, West NP, Stinear TP, Greening C, Beatson SA, Cook GM, Nuermberger EL, Jackson CJ. "Predicting nitroimidazole antibiotic resistance mutations in *Mycobacterium tuberculosis* with protein engineering". *PLOS pathogen*, 2020. JCR 5 years Impact Factor: 6.8, Q1, Rank 20/137, SJR 2020: 3.72, Q1. Cited by 15.
10. \*Gurevich D, Dor S, Erova M, Dan Y, Moy JC, Mairesse O, Dafny-Yelin M, Adler-Abramovich L, Afriat-Jurnou L. "Directed Enzyme Evolution and Encapsulation of Quorum Quenching Lactonase in Peptide Nano Spheres as an Antibacterial Treatment against Plant Pathogens". *American Chemical Society- Applied Materials and Interfaces*, 2020. JCR 5 years Impact Factor 9.57, Q1, Rank 17/127, Cited by 2.
11. \*Ya'ar-Bar S, Dor S, Mayan E, Afriat-Jurnou L. " The identification of putative N-acyl homoserine lactonases in Plant pathogenic *Erwinia* species, and the characterization of a quorum quenching lactonase from *E. amylovora* the causal of fire blight disease". *American Chemical Society- Journal of Agriculture and Food Chemistry*, 2021. JCR 5 years Impact Factor: 5.26, Q1, Rank 5/58, Cited by 1.
12. \* Tohar R , Ansbacher T, Sher I , Afriat-Jurnou L, Weinbergand E, Gal M. "Screening Collagenase Activity in Bacterial Lysate for Directed Enzyme Applications". *Journal of Molecular Sciences*. 2021. Impact Factor 5.923, Q1 Rank 74/297.
13. \* Dor S, Prusky D , Afriat-Jurnou L. " Bacterial Quorum Quenching lactonase Hydrolyses Fungal Mycotoxin and Reduces Pathogenicity of *P. expansum*- Suggesting a Mechanism of Bacterial Antagonism". *Journal of Fungi*, 2021. Impact Factor 5.816, Q1 Rank 94/629.

14. \*Haramati R, Dor S, Gurevich D, Levy D, Freund D, Rytwo G, Sharon I, Afriat-Jurnou L. "Mining marine metagenomes reveals a Quorum Quenching lactonase with unique biochemical properties that inhibits milk spoilage caused by *Pseudomonas fluorescens*". Accepted to *Applied and Environmental Microbiology* 2021, Impact Factor 4.792, Q1.

6. Articles or chapters in refereed books

7. Refereed conference proceedings

8. Other articles (in collections or non-refereed journals)

9. Articles in review:

#### J. Miscellaneous

- 1998-2000 Israel Defense Forces, compulsory service.

Rank upon discharge: Lieutenant.

- Patents. Asterisk marking publications since the last promotion

1. \*Yadid I, Cohen R, Afriat-Jurnou L, "Improved endoinulinase", MIGAL APPLIED RESEARCH, LTD, PCT/IL2018/050872, 07 Aug 2018.
2. \*Afriat-Jurnou L, Erova M, Gurevich D, and Mery Dafny-Yalin. "Stabilized mutants of quorum quenching lactonase as antibacterial treatment for plant pathogens". MIGAL APPLIED RESEARCH, LTD, PCT/IL2020/050673, 17-Jun-2020.
3. \*Adler-Abramovich L., Afriat-Jurnou L. "Peptide nanospheres and nanotubes encapsulating quorum quenching lactonase and uses". MIGAL APPLIED RESEARCH US Patent Application No. 63/040,299.
4. \*Afriat-Jurnou L., Dov Prusky, "USE OF STABILIZED MUTANTS OF LACTONASE IN TREATMENT OF FUNGI". MIGAL APPLIED RESEARCH. U.S. Patent Application Number 63/126,277, filed December 16, 2020.