



Flemetakis

Name:

Emmanouil

Place of Birth:

Chania, Crete

Date of Birth:

30-07-1971

Education:

1996: MSc in Agricultural Biotechnology

Department of Agricultural Biotechnology, Agricultural University of Athens.

2002: PhD in Plant Molecular Biology

Department of Agricultural Biotechnology, Agricultural University of Athens.

Appointments:

2002-2004: PostDoc Researcher in the laboratory of Molecular Biology, Agricultural Biotechnology, Agricultural University of Athens

2004-Jan 2010: Lecturer in the Department of Agricultural Biotechnology, Agricultural University of Athens.

Jan 2010- April 2017: Assistant Professor in the Department of Agricultural Biotechnology, Agricultural University of Athens.

April 2017-present: Associate Professor in the Department of Agricultural Biotechnology, Agricultural University of Athens.

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Research Activities

- **Studies on carbon, nitrogen and sulphur metabolism in plants.**
 - Carbon, nitrogen and Sulphur metabolism during rhizobia-legume interaction and symbiotic nitrogen fixation
 - Identification and characterization of genes involved in legume nodule development and function
- **Biochemical characterization of plant and microbial enzymes:**
 - Biochemical characterization of plant monosaccharide transporters.
 - Biochemical characterization of plant and microbial parvulin-type PPIases
 - Biochemical characterization of plant and microbial carbonic anhydrases
- **Functional genomics and metabolomics studies in plants and green microalgae.**
 - Real-time RT-qPCR based transcriptomic studies, for genes involved in primary and secondary metabolism in higher plants and green microalgae.
 - GC-MS and LC-MS based metabolomic studies in higher plants and green microalgae.

Technical Skills

Basic cloning and hybridization techniques, PCR and RT-PCR techniques, Transcriptomic analysis, In situ RNA-RNA hybridization, In situ immunolocalization, Expression and purification of recombinant proteins, Enzymology, Protein-Protein interactions, Metabolomic analysis, Tissue culture, Plant transformation, Bioinformatics

Teaching Experience

Under-graduate Level courses:

- Biochemistry,
- Recombinant DNA
- Technology, Metabolic Engineering

Post-graduate Level courses:

- Genomics
- Plant-microbe Interactions
- Biochemistry of Natural Products

International Mobility

- Visiting scientist in the Laboratory of Gene Expression, Department of Molecular and Structural Biology, University of Aarhus, Denmark. 1995 (3 months). Επιχορήγηση από την Ε.Ε.
- Visiting scientist in the Institut des Sciences Végétales, CNRS, Gif-sur-Yvette Cedex, France. 1996 (1 month).
- Visiting scientist in the Institut des Sciences Végétales, CNRS, Gif-sur-Yvette Cedex, France. 1997 (1 month)
- Visiting scientist in the Institute of Molecular Plant Sciences, Leiden University, Clusius Laboratory, The Netherlands. 1998 (1.5 months).
- Visiting scientist in the Institute of Molecular Plant Sciences, Leiden University, Clusius Laboratory, The Netherlands. 1999. (1.5 months).
- Visiting scientist in the Max Plank Institute for Molecular Plant Physiology, Golm, Germany. 2003 (1 month ημέρες).
- Visiting scientist (EMBO fellow) in the Max Plank Institute for Molecular Plant Physiology, Golm, Germany. 2004 (3 months).
- Visiting scientist (FEBS) fellow in the Max Plank Institute for Molecular Plant Physiology, Golm, Germany. 2006 (1 month).
- Visiting scientist in the University of Copenhagen, Department of Biology, Denmark. 2008 (1 month).
- Visiting scientist in the John Innes Research Centre, Department of Metabolic Biology, Norwich, UK. 2008 (2 months).
- Visiting scientist in the Plant Biology Division, The Samuel Noble Foundation, Ardmore, Oklahoma, USA. 2009 (2 months).

Member of:

- Founding member and vice-president of the Hellenic Society of Agricultural Biotechnology (2006- present).
- Member of the Hellenic Biochemical and Molecular Biology Society (2002-present).
- Member of the American Society of Plant Biologists (2008-present)
- Member of the American Society for Microbiology (2008-present)

Editorial appointments, and reviewer in scientific journal

- Member of the Editorial Board of the Plant Biology journal
- Plant Physiology, Planta, New Phytologist, Molecular Plant-Microbe Interactions, BBA, FEBS Letters etc

International Collaborations

- **Laboratory of Gene Expression, Department of Molecular and Structural Biology, University of Aarhus, Denmark.** Characterization of genes involved in legume nodule organogenesis and function.
- **Institut des Sciences Végétales, CNRS, Gif-sur-Yvette Cedex, France.** Characterization of genes involved in legume nodule organogenesis and function.

- **Max Plank Institute for Molecular Plant Physiology, Am Mühlenberg, Golm, Germany.** Functional genomics and metabolomics for the study of symbiotic nitrogen fixation.
- **Laboratory of Transport of Polyols and Phloemology, CNRS, Poitiers, France.** Biochemical characterization of plant monosaccharide transporters
- **Albert-Ludwigs University of Freiburg, Laboratory of Tree Physiology, Freiburg i. Br., Germany.** Metabolomic and metabolite flux analysis studies.
- **The Samuel Roberts Noble Foundation, Plant Biology Division, Oklahoma, USA.** Legume functional genomics and reverse genetics
- **John Innes Research Centre, Department of Metabolic Biology, Norwich, UK.** Legume reverse genetics (TILLING) and metabolomic studies.

Honors and Awards:

- PhD fellow of the Greek National Fellowship Foundation (1996-2000)
- EMBO and FEBS short-term fellow
- First award in Business Ideas Competition ‘Green Dreams’ 2008, Athens, Greece.

II. SELECTED RESEARCH PROJECTS

1. Member of the research team in the Marie Curie RTN project “INTENSIFYING TRAINING IN EUROPE ON GENOMIC RESEARCH ACTIVITY IN LEGUMES – INTEGRAL” 2002-2006.
2. Principal investigator in the national research project “Studies on the molecular and biochemical mechanisms involved in nodule organogenesis and function”- Pythagoras II 2005 – 2007.
3. Member of the national research team «Stomatal organogenesis and development of the photosynthetic apparatus. Climatic change effects. Molecular, ecophysiological and anatomical studies”- Pythagoras II 2005 – 2007.
4. Principal investigator in Greek-France bilateral project “Molecular and biochemical characterization of monosaccharide transporters expressed in nitrogen fixing nodules” 2005-2008.
5. Principal investigator in Greek-Germany exchange research project IKY-DAAD “Studies on the carbon cycle during the symbiotic interaction of the model legume *Lotus japonicus* and the rhizobium *Mesorhizobium loti*” 2009-2011.
6. Member of the research team of the national project “Biotechnology for the exploitation of microalgae – BioExplore”- Cooperation. 2007-2013.
7. Principal investigator in FP7-PEOPLE-2010-IRSES project AQUAPHAGE—Network for the development of phage therapy in aquaculture PIAPP-GA-2010-269175. 2010-2013
8. Member of the research team national project “Research for the improvement of the efficiency of breeding programs for the production of sunflower seeds” - Cooperation. 2007-2013.
9. Principal investigator in Greek national project Excellence II – « Studying the Hypoxia-Related Regulation and the Biochemical Role of Genes Involved in Symbiotic Nitrogen Fixation in Legume Root Nodules. – NodHypSNF», 2014-2015.
10. Coordinator of the FP7-PEOPLE-2011-IAPP project “Exploitation of microalgae diversity for the development of novel high added-value cosmeceuticals-AlgaeCom” PIAPP-GA-2011-286354. 2011-2014.
11. Principal investigator in H2020-PEOPLE-2015-RISE project “Development of Microalgae-based novel high added-value products for the Cosmetic and Aquaculture industry – Algae4A-B”. 2016-2019.
12. Principal Investigator in Greek national project «Use of marine Bacteriophages for the control of bacterial pathogens in fish nurseries» 2018-2022
13. Principal Investigator in Greek national project «Optimization of Pargus color using novel nutritional approaches» 2018-2022.
14. Coordinator of the «Development of novel cosmeceuticals by Greek indigenous microalgae strains. - PhyCosmetic-GR » - GSRT - 2019-2022.

II. LIST OF SELECTED MOST SIGNIFICANT PUBLICATIONS

1. Kavroulakis, N., **Flemetakis, E.**, Aivalakis, G. and Katinakis P. (2000). Carbon metabolism in developing soybean nodules: the role of carbonic anhydrase. *Mol. Plant Microbe Interact.* 13:14-22.

2. **Flemetakis, E.**, Kavroulakis, N., Quaedvlieg, N., Spaink, H., Dimou, M., Roussis, A. and Katinakis P. (2000). *Lotus japonicus* contains two distinct ENOD40 genes which are expressed in symbiotic and non-symbiotic tissues including embryos. *Mol. Plant Microbe Interact.* 13: 987-994.
3. **Flemetakis, E.**, Agalou, A., Kavroulakis, N., Dimou, M., Martsikovskaya, A., Slater, A., Spaink, H., Roussis, A. and Katinakis P. (2002). *Lotus japonicus* gene *Ljsbp* is highly conserved among plants and animals and encodes a homologue to the mammalian selenium-binding proteins. *Mol. Plant Microbe Interact.* 15:313-22.
4. Kavroulakis, N., **Flemetakis, E.**, Aivalakis, G., Dahiya, P., Brewin, N. J., Fasseas, K., Hatzopoulos, P. And Katinakis, P. (2003). Tissue distribution and subcellular localization of carbonic anhydrase in mature soybean root nodules indicates a role in CO₂ diffusion. *Plant Physiol. Biochem.* 41:479-484.
5. **Flemetakis, E.**, Dimou, M., Cotzur, D., Efrose, R. C., Aivalakis, G., Colebatch, G., Udvardi, M. and Katinakis P. (2003). A sucrose transporter, *LjSUT4*, is up-regulated during *Lotus japonicus* nodule development. *J. Exp. Bot.* 54:1789-1791.
6. Roussis, A., **Flemetakis, E.**, Dimou, M., Kavroulakis, N., Venieraki, A., Aivalakis, G. and Katinakis, P. (2003). Nodulin PvNOD33, a putative phosphatase whose expression is induced during *Phaseolus vulgaris* nodule development. *Plant Physiol. Biochem.* 41:719-725.
7. **Flemetakis, E.**, Dimou, M., Cotzur, D., Aivalakis, G., Efrose, R. C., Kenoutis, C., Udvardi, M. and Katinakis, P. (2003). A *Lotus japonicus* β -type carbonic anhydrase gene expression pattern suggests distinct physiological roles during nodule development. *Biochim. Biophys. Acta - Gene Structure and Expression.* 1628:186-194.
8. Aivalakis, G., Dimou, M., **Flemetakis, E.**, Plati, F., Katinakis, P. and Drossopoulos, J. B. (2004). Immunolocalization of carbonic anhydrase and phosphoenolpyruvate carboxylase in developing seeds of *Medicago sativa*. *Plant Physiol. Biochem.* 42:181-186.
9. Gaude, N., Tippmann, H., **Flemetakis, E.**, Katinakis, P., Udvardi, M. and Dormann, P. (2004). The galactolipid digalactocylglycerol accumulates in the peribacteroid membrane of nitrogen-fixing nodules of soybean and *Lotus*. *J. Biol. Chem.* 279:34624-34630.
10. **Flemetakis, E.**, Efrose, R. C., Desbrosses, G., Dimou, M., Delis, C., Aivalakis, G., Udvardi, M. and Katinakis, P. (2004). Induction and spatial organization of polyamine biosynthesis during nodule development in *Lotus japonicus*. *Mol. Plant Microbe Interact.* 17:1283-1293.
11. Delis, C., Dimou, M., Efrose, R.C., **Flemetakis, E.**, Aivalakis, G. and Katinakis P. (2005). Ornithine decarboxylase and arginine decarboxylase gene transcripts are co-localized in developing tissues of *Glycine max* etiolated seedlings. *Plant Physiol. Biochem.* 43:19-25.
12. Grønlund, M., Roussis, A., **Flemetakis, E.**, Quaedvlieg, N. E. M., Schlaman, H. R. M., Umehara, Y., Katinakis, P., Stougaard, J. and Spaink, H. P. (2005). Analysis of Promoter Activity of the Early Nodulin *Enod40* in *Lotus japonicus*. *Mol. Plant Microbe Interact.* 18: 414-427.
13. Tjamos, S. E., **Flemetakis, E.**, Paplomatas, E. J. and Katinakis P. (2005). Induction of Resistance to *Verticillium dahliae* in *Arabidopsis thaliana* by the Biocontrol Agent K-165 and Pathogenesis-Related Proteins Gene Expression. *Mol. Plant Microbe Interact.* 18: 555-561.
14. Dimou, M., **Flemetakis, E.**, Delis, C., Aivalakis, G., Spyropoulos, K.G. and Katinakis, P. (2005). Co-expression of two sugar transporters in primary and lateral roots of etiolated *Glycine max* seedlings. *Plant Growth Regulation.* 45: 259-266.
15. Dimou, M., **Flemetakis, E.**, Delis, C., Aivalakis, G., Spyropoulos, K.G. and Katinakis, P. (2005). Genes coding for a putative cell-wall invertase and two putative monosaccharide/H⁺ transporters are expressed in roots of etiolated *Glycine max* seedlings. *Plant Sci.* 169: 798-804.
16. Delis, C., Dimou, M., **Flemetakis, E.**, Aivalakis, G. and Katinakis, P. (2006). A root- and hypocotyl-specific gene coding for copper-containing amine oxidase is related to cell expansion in soybean seedlings. *J. Exp. Bot.* 57:101-111.
17. **Flemetakis, E.**, Efrose, R.C., Ott, T., Stedel, S., Aivalakis, G., Udvardi, M.K. and Katinakis, P. (2006). Spatial and Temporal Organization of Sucrose Metabolism in *Lotus japonicus* Nitrogen-Fixing Nodules Suggests a Role for the Elusive Alkaline/Neutral Invertase. *Plant Mol. Biol.* 62:53-69.
18. Efrose, R.C., **Flemetakis, E.**, Sfichi, L., Stedel, C., Kouri, E.D., Udvardi, M.K., Kotzabasis, K. and Katinakis P. (2008). Characterization of spermidine and spermine synthases in *Lotus japonicus*: induction and spatial organization of polyamine biosynthesis in nitrogen fixing nodules. *Planta.* 228:37-49.

19. Rogato, A., D'Apuzzo, E., Barbulova, A., Omrane, S., Stedel, C., Simon-Rosin, U., Katinakis, P., **Flemetakis, M.**, Udvardi, M. and Chiurazzi, M. (2008). Tissue-specific down-regulation of *LjAMT1;1* compromises nodule function and enhances nodulation in *Lotus japonicus*. *Plant Mol. Biol.* 68:585-595.
20. Kalloniati, C., Tsikou, D., Lampiri, V., Fotelli, M. N., Rennenberg, H., Chatzipavlidis, I., Fasseas, C., Katinakis, P. and **Flemetakis, E.*** (2009). Characterization of a *Mesorhizobium loti* α -type carbonic anhydrase and its role in symbiotic nitrogen fixation. *J. Bacteriol.* 191:2593-600.
21. Ott, T., Sullivan J., James, E. K., **Flemetakis, E.**, Günther, C., Gibon, Y., Ronson, R. and Udvardi, M. (2009). Absence of symbiotic leghemoglobins alters bacteroid and plant cell differentiation during development of *Lotus japonicus* root nodules. *Mol. Plant Microbe Interact.* 22:800-808.
22. Andreadeli, A., **Flemetakis, E.**, Axarli, I., Dimou M., Udvardi, M.K., Katinakis, P. and Labrou, N.E. (2009). Cloning and Characterization of *Lotus japonicus* Formate Dehydrogenase: a Possible Correlation with Hypoxia. *Biochim. Biophys. Acta – Proteins and Proteomics.* 1794:976-84.
23. Tani, E., Polidoros, A.N., **Flemetakis, E.**, Stedel, C., Kalloniati, C., Demetriou, K., Katinakis, P. and Tsaftaris, A.S. (2009). Characterization and expression analysis of AGAMOUS-like, SEEDSTICK-like, and SEPALLATA-like MADS-box genes in peach (*Prunus persica*) fruit. *Plant Physiol. Biochem.* 47:690-700.
24. Tsiplakou, E., **Flemetakis, E.**, Kalloniati, C., Papadomichelakis, G., Katinakis, P. and Zervas, G. (2009). Sheep and goats differences on CLA and fatty acids milk fat content in relation with mRNA stearoyl-CoA desaturase and lipogenic genes expression in their mammary gland. *J Dairy Res.* 76:392-401.
25. Kouri, E.D., Labrou, N.E., Garbis, S.D., Kalliampakou, K.I., Stedel, C., Dimou, M., Udvardi, M.K., Katinakis, P. and **Flemetakis E.*** (2009). Molecular and Biochemical characterization of the Parvulin-type PPIases in *Lotus japonicus*. *Plant Physiol.* 150:1160-1173.
26. Welham, T., Pike, P., Horst I., **Flemetakis, E.**, Katinakis, P., Kaneko, T., Sato, S., Tabata, T., Perry, J., Parniske, M. and Wang, T.L. (2009). A cytosolic invertase is required for normal growth and cell development in the model legume, *Lotus japonicus*. *J. Exp. Bot.* 60:3353-3365.
27. Dimou, M., Paunescu, A., Aivalakis, G., **Flemetakis, E.** and Katinakis, P. (2009). Co-localization of carbonic anhydrase and phosphoenol-pyruvate carboxylase and localization of pyruvate kinase in roots and hypocotyls of etiolated *Glycine max* seedlings. *Int. J. Mol. Sci.* 10:2896-2910.
28. Sfetsas, C.C., Milios, L., Skopelitou, K., Venieraki, A., Todou, R., **Flemetakis, E.**, Katinakis, P. and Labrou, N.E. (2009). Characterization of 1,2-dibromoethane-degrading haloalkane dehalogenase from *Bradyrhizobium japonicum* USDA110. *Enzyme and Microbial Technology.* 45:397-404.
29. Fasseas, M.K., Tsikou, D., **Flemetakis, E.** and Katinakis, P. (2010). Molecular and biochemical analysis of the beta class carbonic anhydrases in *Caenorhabditis elegans*. *Mol Biol Rep.* 37:2941-2950.
30. Fasseas, M.K., Tsikou, D., **Flemetakis, E.** and Katinakis, P. (2011). Molecular and biochemical analysis of the α class carbonic anhydrases in *Caenorhabditis elegans*. *Mol Biol Rep.* 38:1777-1785.
31. Kalliampakou, K.I., Kouri, E.D., Boleti, H., Pavli, O., Maurousset, L., Udvardi, M.K., Katinakis, P., Lemoine, R. and **Flemetakis, E.*** (2011). Cloning and functional characterization of *LjPLT4*, a plasma membrane xylitol H⁺- symporter from *Lotus japonicus*. *Molecular Membrane Biology.* 28:1-13.
32. Tsikou, D., Stedel, C., Kouri, E.D., Udvardi, M.K., Wang, T.L., Katinakis, P., Labrou, N.E., and **Flemetakis, E.*** (2011). Characterization of two novel nodule-enhanced α -type carbonic anhydrases from *Lotus japonicus*. *Biochim. Biophys. Acta – Proteins and Proteomics.* 1814:496-504.
33. Tani, E., Tsaballa, A., Stedel, C., Kalloniati, C., Papaefthimiou, D., Polidoros, A., Darzentas, N., Ganopoulos, I., **Flemetakis, E.**, Katinakis, P. and Tsaftaris, A. (2011). The study of a *SPATULA*-like bHLH transcription factor expressed during peach (*Prunus persica*) fruit development. *Plant Physiol. Biochem.* 49:654-663.
34. Fotelli, M.N., Tsikou, D., Kolliopoulou, A., Aivalakis, G., Katinakis, P., Udvardi, M.K., Rennenberg, H. and **Flemetakis, E.*** (2011). Nodulation enhances dark CO₂ fixation and recycling in the model legume *Lotus japonicus*. *J. Exp. Bot.* 62: 2959–2971.
35. Skopelitou, K., Muleta, A.W., Pavli, O., Skaracis, G.N., **Flemetakis, E.**, Papageorgiou, A.C. and Labrou, N.E. (2012). Overlapping protective roles for glutathione transferase gene family members in chemical and oxidative stress response in *Agrobacterium tumefaciens*. *Funct Integr Genomics.* 12:157-172.
36. Kapazoglou, A., Engineer, C., Drosou, V., Kalloniati, C., Tani, E., Tsaballa, A., Kouri, E.D., Ganopoulos, I., **Flemetakis, E.** and Tsaftaris A.S. (2012). The study of two barley type I-like MADS-box genes as potential targets for epigenetic regulation during seed development. *BMC Plant Biol.* 12:166-188.

37. Tsikou, D., Kalloniati, C., Fotelli, M.N., Nikolopoulos, D., Katinakis, P., Udvardi, M.K., Rennenberg, H. and **Flemetakis, E.*** (2013). Cessation of photosynthesis in *Lotus japonicus* leaves leads to reprogramming of nodule metabolism. *J. Exp. Bot.* 64:1317-1332.
38. Diamantopoulos, P.D., Aivalakis, G., Flemetakis, E. and Katinakis, P. Expression of three β -type carbonic anhydrases in tomato fruits. *Mol. Bio. Rep. Mol. Bio. Rep.* 40:4189-4196.
39. Skopelitou, K., Georgakis, N., Efrose, R., **Flemetakis, E.**, Labrou, N.E. (2013) Sol-gel immobilization of haloalkane dehalogenase from *Bradyrhizobium japonicum* for the remediation 1,2-dibromoethane. *Journal of Molecular Catalysis B: Enzymatic.* 97: 5-11
40. Pavli, O.I., Vlachos, C.E., Kalloniati, C., Flemetakis, E. and Skaracis, G.N. (2013). Metabolite profiling reveals the effect of drought on sorghum (*Sorghum bicolor* L. Moench) metabolism. *Plant OMICS* 6:371-376.
41. Vullo, D., Flemetakis, E., Scozzafava, A., Capasso, C. and Supuran, C.T. (2014). Anion inhibition studies of two α -carbonic anhydrases from *Lotus japonicus*, LjCAA1 and LjCAA2. *J. Inorg. Biochem.* 136:67-72.
42. Kissoudis C., Kalloniati C., Pavli O., Flemetakis E., Madesis P., Labrou N.E., Skaracis G., Tsaftaris A., Nianiou-Obeidat I. (2015). Stress-inducible GmGSTU4 shapes transgenic tobacco plants metabolome towards increased salinity tolerance. *Acta Physiologiae Plantarum.* 37:102. (IF2014: 1.584)
43. Kissoudis, C., Kalloniati, C., Flemetakis, E., Madesis, P., Labrou, N.E., Tsaftaris, A. and Nianiou-Obeidat, I. (2015). Maintenance of metabolic homeostasis and induction of cytoprotectants and secondary metabolites inalachlor-treated GmGSTU4-overexpressing tobacco plants, as resolved by metabolomics. *Plant Biotech. Rep.* 9:287-296.
44. Kalloniati, C., Krompas, P., Karalias, G., Udvardi, M.K., Rennenberg, H., Herschbach, C. and Flemetakis, E.* (2015). Nitrogen-fixing nodules are an important source of reduced sulfur, which triggers global changes in sulfur metabolism in *Lotus japonicus*. *Plant Cell* 27:2384-2400.
45. Skliros D, Kalatzis PG, Katharios P, Flemetakis E. (2016) Comparative Functional Genomic Analysis of Two *Vibrio* Phages Reveals Complex Metabolic Interactions with the Host Cell. *Front Microbiol.* 14;7:1807.
46. Skopelitou K, Muleta AW, Papageorgiou AC, Chronopoulou EG, Pavli O, Flemetakis E, Skaracis GN, Labrou NE. (2017) Characterization and functional analysis of a recombinant tau class glutathione transferase GmGSTU2-2 from *Glycine max*. *Int J Biol Macromol.* 94:802-812
47. Chatzikonstantinou M., Kalliampakou, A.K., Gatzogia, M., Flemetakis, E., Katharios, P. and Labrou, N.E. (2017). Comparative analyses and evaluation of the cosmeceutical potential of selected *Chlorella* strains. *J Applied Phycology.* 29:179–188
48. Letsiou S., Kalliampakou K., Gardikis K., Mantecon L., Infante Carlos, Chatzikonstantinou M., Labrou N.E. and Flemetakis E. (2017). Skin protective effects of *Nannochloropsis gaditana* extract on H2O2-Stressed Human Dermal Fibroblasts. *Frontiers in Marine Science.* Volume 4, Article number 221
49. Stefan A, Van Cauwenberghe J, Rosu CM, Stedel C, Labrou NE, Flemetakis E, Efrose RC. Genetic diversity and structure of *Rhizobium leguminosarum* populations associated with clover plants are influenced by local environmental variables. *Syst Appl Microbiol.* 41(3):251-259.
50. Skliros, D., Kalloniati, C., Karalias, G., Skaracis, G.N., Rennenberg, H., Flemetakis,E. (2018). Global metabolomics analysis reveals distinctive tolerance mechanisms in different plant organs of lentil (*Lens culinaris*) upon salinity stress. *Plant and Soil* 429:451-468.