

# CURRICULUM VITAE

## **Rachel Amir**

### **1. Personal Details:**

Country of birth: Israel

Identity No.: 053570198

Nationality: Israeli

Family status: Married +3

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E-mail address: Rachel@migal.org.il

### **2. Higher Education**

1979-1982 B.Sc. The Faculty of Agriculture of the Hebrew University in Jerusalem  
(Plant Protection)

1983-1985 M.Sc. Department of Plant Science, Tel- Aviv University, Tel-Aviv.  
(Phytopathology). Thesis title: Effect of iron deficiency on siderophores production by  
*Verticillium dahliae* (KELB) under in vivo and invitro conditions. Supervisor: Prof.  
Isaac Barash.

1987-1994 Ph.D. The Faculty of Agriculture of the Hebrew University in Jerusalem  
Thesis title: Formation of sclerotia and translocation in the edible mushroom  
*Morechella esculenta*. Supervisors: Prof. Issac Hadar, Prof. Dan Levanon, Prof. Ilan  
Chet.

### **3. Additional Education, Training and professional certificates**

1994-1996 Department of Plant Genetics, Post-doctoral, Plant Genetics, Weizmann  
Institute of Science, Rehovot. Supervisor: Prof. Gad Galili.

**4. Appointments at academic institutions**

- 1996 Lecturer, Tel Hai Collage  
2002 Senior Lecturer, Tel Hai Collage.  
2007 Associated Professor, Tel Hai Collage  
2014 Adjunct Associated Professor, Technion  
2017 Full Professor, Tel Hai Collage

**5. Administrative positions in academic institutions**

- 2008-2011 Head of the Department of Environmental Science  
2016-2020 Head of the graduate program in the Department of Biotechnology

**6. Positions in non academic & research Institutions**

- 1987-1994 Lecturer, Tel Hai College

**7. Membership in professional organizations**

- 2001-2018 American Society of Plant Biologists  
2008-2018 American Chemical Society  
2008-2018 Federation of European Society of plants Biology

**8. Research Grants**

- 1997-2000 Binational Agricultural Research and Development Funds (BARD).  
Improving methionine content in transgenic forage legumes \$ 60,000  
1997-1999 The Ministry of Industry, Approaches to identify the bacteria *Clavibacter michiganensis* in tomatoes plants. \$ 200,000  
1997-2000 European FP4 (QLRT-2000-00103) Optimizing nutritional quality of crops \$ 75,000  
1998-2001 The Israel Science Foundation (ISF). The regulatory role of cystathionine gamma-synthase in carbon flows towards methionine biosynthesis in plants. \$ 111,000

- 1999-2001 The Ministry of Industry, Transgenic plants overexpressing the yeast *Met2* and *Met25* genes, new way to manipulate the level of methionine in plants. \$ 100,000
- 2000-2002 The Israeli Academy for Science together with Yad-Hanadive Foundation, Improving the nutritional quality of seeds by expressing the enzyme cystathionine gamma synthase from Arabidopsis. \$ 70,000
- 2001-2004 European FP5 (QLRT-2000-00103) Optimize the methionine content in transgenic plants. \$ 80,000
- 2002-2004 European FP5 INCO. Improving the nutritional value of Sorghum seeds. \$ 50,000.
- 2001-2004 Ministry of Agriculture, section: Biotechnology in Agriculture. Improving the nutritional value of legume plants by increasing the level of methionine. \$ 100,000.
- 2002-2003 Ministry of Agriculture. New way to elevate the tannins content in alfalfa plants. \$ 10,000.
- 2002-2006 The Israel Science Foundation (ISF). Regulation of methionine metabolism in plants by the N-terminal region of the enzyme cystathionine  $\gamma$ -synthase. \$ 162,000.
- 2005-2008 Ministry of Science. Metabolic networks in pomegranate fruit: An analytical platform for food functionality. \$ 105,000.
- 2006-2009 JCA Foundation. Screening of 30 different accessions of pomegranates grown in Israel for their bioactive phytochemicals. \$ 95,000.
- 2007-2010 JCA Foundation. Elucidate the changes in the pomegranates fruits peels during different periods of storage. \$ 60,000.
- 2007-2009 UJIA Foundation. The regulation of methionine biosynthesis pathway. \$ 40,000.
- 2008-2011 Ministry of Science (Mop Ezori). Elucidating the ability of different pomegranate fruit parts to inhibit the proliferation of prostate cancer cells and examining the nature of the bioactive compounds. \$ 95,000.
- 2009-2012 Binational Agricultural Research and Development Funds (BARD). The Role of Cysteine Partitioning into Glutathione and Methionine Synthesis During Normal and Stress Conditions. With Oliver, D.J. from Iowa State University, USA. \$150,000.

2009-2013 The Israel Science Foundation (ISF). Elucidation of regulatory metabolic networks associated with methionine metabolism during seed development. \$240,000

2010-2013 The Ministry of Industry. Production of Human Elastin in tobacco transgenic plants \$ 336,000

2012-2013 Bar-Ilan University- Migal Technology Center Collaboration. Role of glutathione and reactive oxygen species (ROS) metabolism in seeds-germination and heat-stress tolerance. \$70,000

2011-2014 Ministry of Science (Mop Ezori). New approach for the identification of bioactive compounds in pomegranates by using metabolic profiling. 360,000 NIS

2015-2016 Ministry of Agriculture Rural Development (Nitzan). Producing Broomrape resistant tomato plants. 250,000 NIS

2015-2016 The Ministry of Industry (Kamin). Pomegranates tissue culture as source of health beneficial compounds. 756,000 NIS

2015-2018 Binational Agricultural Research and Development Funds (BARD). Elucidating the genetic pathways involved in shikimate, anthocyanin and hydrolyzable tannin accumulation in pomegranate. With Dr. Doron Holand Newe Yaar, and Li Tian UCDAVIS, US. \$82,000

2015-2020 The Israel Science Foundation (ISF). Elucidation of the regulatory role of glutathione on cystathionine gamma-synthase and methionine metabolism, and the effects of altered methionine levels on the accumulation of amino acids in seeds. 1,150,000 NIS.

2015-2019 The Ministry of Industry (Tastiute). Designing new herbicides. Together with Mayyan Gal 33,000 NIS.

2017 JCA Foundation (Accelerator). New way to look on Broomrape. 75,000 NIS.

2018 JCA Foundation (Accelerator). Bioactive compounds from pomegranates. 100,000 NIS.

2019-2020 The ministry of Agriculture. Development of resistant tomato rootstock to parasitic weeds by gene editing using CRISPR/Cas9. With Radi Ali 80,000 NIS

2019-2022 The ministry of Agriculture. Broomrapes are an enemy or a friend?  
Examination of broomrape as a source of rich protein and essential amino acids for human nutrition. 1,200,000 NIS

2020-2025 The Israel Science Foundation (ISF). Elucidating the link between high methionine content, DNA methylation and the accumulation of amino acids in Arabidopsis. 290,000 NIS (per a year); total 1,450,000 NIS

2021-2024 The ministry of Agriculture. Production of essential amino acids by bacterial fermentation for the Agriculture and Food Tech industry – focused on Methionine (Together with Itamar Yadid, Itay Bloch and Maayan Gal). 1,000,000 NIS

## **9. Teaching**

### **A. Teaching at Academic Institutions**

1983-1985 Tel-Aviv University, Plant Science Department, Courses: "Plant Anatomy", "Plant Physiology" for Undergraduate students.

1994-2019 Tel Hai College, Course: "Cell Biology" to BA students

1994-2003 Tel Hai College, Course: "General Microbiology" BA students

1996-2002 Tel Hai College, Course: "Plant Tissue Culture" BA students

1998-2004 Tel Hai College, Course: "Plant Anatomy" for students of the Faculty of Agriculture and Tel Hai students. BA students

2000-2020 Tel Hai College, Course: "Plant Anatomy and Physiology" BA students

2000-2011 Tel Hai College, Course: "Laboratory in Plant Physiology" BA students

2003-2008 Tel Hai College, Course: "Plant Biotechnology and Engineering" BA students

2013 Tel Hai College, Course: "Botany for Nutrition department students" BA students

2009-2020 Tel Hai College, Course: "Plant Biotechnology" MSc students

2011-2020 Tel Hai College, Course: "Plant Engineering and Plant Tissue Culture" for students from the sub-program Agriculture in the Biotechnology program

2020- Tel Hai College, Course "Seminar II- Scientific Writing" MSc students

Excellence in Teaching 2003, 2004, 2008, 2009, 2014

**B. Teaching at non-Academic Institutions**

- 1997 Teaching in EMBO course: Functional genomics in plants, Weizmann Institute
- 1988-1994 Tel Hai College, Course: "Cell Biology" in the program for "Practical Engineering in Biotechnology"
- 1988-1994 Tel Hai College, Course: "Microbiology" in the program for "Practical Engineering in Biotechnology"
- 2016 Academy Square (Tel Hai) seven lessons in the subject of "Transgenic plants" for the public

**10. Supervision of Master's and doctoral degree students**

PhD students

1. 2002-2006 Yael Hacham, "Regulation of methionine metabolism in plants by the N-terminal region of the enzyme cystathionine  $\gamma$ -synthase" for Ph.D degree. The supervision was together with Gadi Schuster, Technion Haifa.
2. 2011-2015 Hagai Cohen "Elucidation of regulatory metabolic networks associated with methionine metabolism during seed development" for Ph.D degree. The supervision was together with Gadi Schuster, Technion Haifa.

MSc students

- 1999-2001 Yael Hacham, "The regulatory role of cystathionine gamma-synthase in carbon flows towards methionine biosynthesis in plants". The supervision was together with Gadi Schuster, Technion Haifa.
- 2000-2002 Dan Gamrasni, "Transgenic plants overexpressing the yeast *MET2* gene were more tolerated to heat stress". The supervision was together with Avia Zilbershteen, Tel-Aviv University.
- 2001-2003 Tal Avraham, "Methionine and threonine regulate the branching point of their biosynthesis pathways and thus controlling the level of each other". The supervision was together with David Weiss, Faculty of Agriculture, the Hebrew University.

- 2002-2004 Amira Golan, "Soluble methionine enhanced the accumulation of 15 kD zein, a methionine rich storage protein, in BY2 cells and in alfalfa transgenic plants but not in transgenic tobacco plants". The supervision was together with Amnon Shwartz, Faculty of Agriculture, the Hebrew University.
- 2002-2004 Lilach Kachan, "The effect of high cysteine level on methionine accumulation in transgenic plants". The supervision was together with Zach Adam, Faculty of Agriculture, the Hebrew University.
- 2004-2006 Alex Kaplan, "The expression level of cystathionine gamma-synthase, the key enzyme for methionine synthesis, reduced during a oxidative stress". The supervision was together with Avia Zilbershteen, Tel-Aviv University.
- 2005-2007 Revital Zulker, "Metabolic networks in pomegranate fruits". The supervision is together with Hillel Froum, Tel-Aviv University.
- 2006-2008 Ira Glazer, "New approaches for searching antioxidant compounds in Pomegranate fruits". The supervision is together with Zhoar Kerem, Faculty of Agriculture, The Hebrew University.
- 2007-2009 Elinor Swartz, "Elucidating the enzymes that involve in the biosynthesis of punicalagin and punicalin in the pomegranate fruits". The supervision is together with Hillel Frum, Tel-Aviv University.
- 2007-2009 Itamar Godo, "How light modulates the expression of the key enzyme of methionine biosynthesis". The supervision was together with Gadi Schuster, Technion Haifa.
- 2009-2011 Ola Gutermacher-Or Gil "Elucidating the ability of different pomegranate fruit parts to inhibit the proliferation of prostate cancer cells". Tel Hai Collage
- 2009-2011 Alon Frank "Elucidation of regulatory metabolic networks associated with methionine metabolism during seed development". Tel Hai Collage
- 2010-2012 Lior Baruch "Elucidating the factors that regulate the acidity of pomegranates fruit". Tel Hai Collage.
- 2011- 2012 Asaf Cohen "The role of glutathione in seeds germination". Tel Hai Collage
- 2011-2013 Dotan Hoffman "The role of methionine in determination the protein profiles of seeds-proteins". Tel Hai Collage.

- 2012-2014 Meital Frieback "The role of methionine gamma-lyase and SAM synthase in methionine accumulation in Arabidopsis seeds". Tel Hai Collage.
- 2012-2014 Yochai Wolpe "The role of the yeast *O*-acetyl(thiol)lyase in methionine and cysteine accumulation in Arabidopsis seeds". Tel Hai Collage.
- 2013-2015 Aner Choen, "The role of glutathione reductase in glutathione synthesis and in stress in Arabidopsis and tobacco leaves". Tel Hai College.
- 2013-2015 Asaf Shalmon, "The role of homocysteine *S*-methyltransferase (HMT) in methionine synthesis in Arabidopsis seeds". Tel Hai College.
- 2014-2016 Aviv Gay, "Metabolites that affects the development of Broomrape" Tel Hai College.
- 2014-2016 Barak Segev, "The health benefit of pomegranate's peel tissue culture" Tel Hai College
- 2015-2017 David Shotan "Arabidopsis seeds expressing methionine-rich storage proteins together with Arabidopsis cystathionine  $\gamma$ -synthase" Tel Hai College
- 2015-2017 Ortal Nisismi "Elucidation the effect of co-expression of Arabidopsis cystathionine  $\gamma$ -synthase and methionine- $\gamma$ -lyase in Arabidopsis seeds" Tel Hai College
- 2015-2017 Rida Habashi "Clarification the role of shikimate synthase in anthocyanins accumulation in pomegranate fruits". Tel Hai College
- 2015-2017 Noam Native "Elucidation the nitrogen assimilation of broomrape". Tel Hai College
- 2016-2018 Itay Noked "The development of chilling injuries in mango during storage and the effectiveness of various preventive methods". Associated supervisor together with Tali Goldberg. Tel Hai College
- 2016-2018 Sally Marzok "Editing of *CCD8* gene in tomato using CRISPR/Cas9 and its effect on *Phelipanche aegyptiaca* seed germination by hairy root system". Associated supervisor together with Radi Ali. Tel Hai College.
- 2017-2019 Ohad Hanan "The role of the SIKIMATE pathway in the parasitic plant, broomrape". Tel Hai College
- 2018-2020 Odelia Shitrit "The role methionine- $\gamma$ -lyase during stresses in Arabidopsis plants". Tel Hai College

2018-2020 Gal Nov "Elucidate the activity of repressors in the shikimate pathway in pomegranates". Tel Hai College

2018-2020 Shachar Devir "The role cystathionine  $\gamma$ -synthase in seeds during oxidative stress". Tel Hai College

2019-2021 Uri Yaritz- "The role of shikimate dehydrogenase in synthesis of hydrolysable tannins in pomegranate". Tel Hai College

2019-2021 Naserin Rabach- "Elucidation the effect of higher methionine levels on the hyper methylation in Arabidopsis". Tel Hai College

2020-2022 Yonatan Yeroshalmi- "The role of MYB transcription factors in the synthesis of hydrolysable tannins". Tel Hai College

2020-2022 Tova Ben-Mordechai- "Can the desert plant parasite *Cistanche tubulosa* be used as an edible plant?". Tel Hai College

#### Post-doctoral

2001-2002 Dr. Sigal Corem, "Expressing the key enzyme of methionine biosynthesis, cystathionine gamma-synthase in tobacco seeds" Post Doctorate.

2003-2005 Dr. Yael Katz, "Methionine metabolism in tomato fruits" Post Doctorate.  
The supervision was together with Gad Galili, Weizamnn institute, Rechovot.

2009-2010 Dr. Meri Dafni-Yalin, "GC-MS analysis for determination of bioactive compounds, in pomegranates" Post Doctorate.

2010-2012 Dr. Yaron Dekel, "The role of cysteine partitioning into glutathione and methionine synthesis during normal and stress conditions". Post Doctorate.

2010-2011 Dr. Shay Kosevitzki, "The role of methionine recycles pathways during abiotic stresses" Research Colleague.

2013-2015 Dr. Lior Rubinovitch, "Elucidation genes involved in synthesis of hydrolysable tannins in Pomegranates husks". Post Doctorate.

2017-2019 Dr. Aiswarya Gupta, "Elucidation of the regulatory role of altered methionine levels on the accumulation of amino acids in seeds". Post Doctorate.

2018-2020 Dr. Rohit Dhakarey "The role of four MYB transcription factors in the shikimate pathway in Pomegranate". Post Doctorate.

2019-2021 Dr. Krishna Kumar "Revealing the metabolism of parasitic plants". Post Doctorate.

MSc without thesis (Tel Hai Collage)

2011 Prosper Marciano "Elucidation of bioactive compounds in peels of pomegranates"

2012 Lior Gabso "The effect of glutathione on seeds germination"

2013 Raeida Renawii "Tobacco plants expressing the bacterial AroG gene"

2014 David Shotan "Arabidopsis seeds expressing methionine-rich storage proteins"

2018 Odelia Cohen "The role of MGL during Arabidopsis seeds development"

2019 Eva Kon "The effect of *Agrobacterium rhizogenes* on punicalagin synthesis in pomegranate roots"

**11. Participation in Scientific Conferences**

Lectures:

1. **Amir R**, Levanon, D, Chet, I, Hadar Y. (1993) Translocation and sclerotial formation by *Morchella esculenta*. The sixth symposium of Mycology and Microbiology. July 14-18, Prague, Czech
2. Galili G, **Amir R**, Karchi, H, Shaul O, Zhu X-Z, Miron D, Yang L, Ben-Yaacov S, Perl A. (1996) Expression of bacterial dihydrodipicolinate synthase in transgenic plants: Potentials to improve lysine content in forage, grain and tuber crops. Proceeding of the third International ISHS Symposium on *In Vitro* Culture and Horticultural Breeding. June 5-8, Jerusalem, Israel
3. Galili S, **Amir R**, Ganon D. (1998) Molecular approaches for improving quality of forage legumes. IX International congress on Plant tissue and Cell Culture. IX International congress on Plant tissue and Cell Culture. June 5-8 Jerusalem, Israel
4. **Amir R**, Karchi H, Yang L, Perl A, Galili G. (1998) T-DNA tagged, gain of function tobacco mutants with altered amino acid metabolism and plant development. IX International congress on Plant tissue and Cell Culture. June 5-8, Jerusalem, Israel

5. **Amir R.** (1999) Engineering metabolic pathways for production of methionine and secondary metabolites in transgenic plants. The second symposium of the Joan and Jaime Constantiner for Plant Genomics. May 20-21, Maagan, Israel
6. **Amir R.** (2000) Genetically engineered metabolic pathways for improve methionine content in plants. Bilateral Dutch-Israeli workshop on Food, Nutrition and Biotechnology. May 16-17, Rehovot, Israel
7. **Amir R.** (2000) Transgenic plants expressing the Met2 yeast gene are more tolerant to biotic and abiotic stress. Slovenian-Israeli symposium on animal and plant genetics in biotechnology. September 4-5, Domzale, Slovenia
8. **Amir R.** (2001) Approaches to improve the nutritional values of transgenic plants by increasing their lysine and methionine content. The first symposium in Nutrition in the new age. January 9-10, Tel-Aviv, Israel
9. **Amir R,** Hacham Y, Avraham T. (2001) Deletion of the regulatory part of cystathionine gamma-synthase increases the methionine level in transgenic plants. Biotechnology of Plants. May 3, 2001, Tel Hai College, Israel
10. **Amir R,** Hacham Y. (2001) The N-terminal region of cystathionine gamma-synthase plays important role in methionine metabolism” December 3-5, Tubitak-Marmara university, Turkey
11. **Amir R,** Hacham Y. (2002) Regulation of methionine metabolism in plants by the N-terminal region of the enzyme cystathionine gamma-synthase., FISEB. Federation of the Israeli Society of Experimental Biology, February, 4-7, Eilat, Israel
12. **Amir R,** Hacham Y. (2005) An *in vivo* internal deletion in the N-terminus of cystathionine  $\gamma$ -synthase in Arabidopsis results with decreased modulation of expression by methionine. 9<sup>th</sup> International Congress on Amino Acids and Proteins. August 8-12, Vienna, Austria
13. **Amir R,** Matityahu I. (2005) “Transgenic tobacco plants overexpressing the *Met25* gene of *Saccharomyces cerevisiae* exhibit enhanced levels of cysteine and glutathione and increased tolerance to oxidative stress”. 9<sup>th</sup> International Congress on Amino Acids and Proteins. August 8-12, Vienna, Austria
14. **Amir R.** (2006) Improved nutritional values of transgenic plants. Biotechnology in Agriculture, MARD. February 6-10, Amman, Jordan

15. **Amir R**, Holand D, Aviram M. (2006) Identification of antioxidants in Pomegranate fruits through GC-MS and LC-MS. The second Biotechnology conference. February 4, in Shde-Boker
16. Hacham Y, **Amir R**. (2006) Lysine enhances methionine content by modulating the expression of *S*-adenosylmethionine synthase. Minerva Workshop: Metabolism Meets Development. September 9-12, Rechovot, Israel
17. Hacham Y, **Amir R**. (2007) Higher lysine or threonine levels affect the methionine content in higher plants August 20-25, 2007, 10<sup>th</sup> International Congress on Amino Acids and Proteins. Kallithea, Greece. (Invited speaker)
18. Tzulker R Glazer I, Bar-Ilan I, Holland D, Aviram M, **Amir R**. (2008) Elucidation compounds that contribute to the antioxidant activity of pomegranates by screening 29 accessions using modern analytical techniques. IsraAnalitica - The 11<sup>th</sup> annual meeting of the Israel analytical chemistry society January 22-23, Tel Aviv, Israel (Invited speaker)
19. **Amir R**. (2008) Higher levels of lysine, threonine or cysteine affect the level of methionine in higher plants. 7<sup>th</sup> workshop on sulfur in plants. May 13-17, 2008, Warsaw, Poland. (invited speaker)
20. Hacham Y, Amir R. (2008) Higher levels of amino acids in aspartate family affect the methionine level in higher plants. XVI Congress of the Federation of European Society of plants Biology (FESPB). August 17-22, Tampere Finland. (selected speaker)
21. Shilo S, Dgany O, Rosental M, **Amir R**, Tal T, Yaari A, Avraham T, Stein H, Ofir K, Kredy-Farhan L, Ziv V, Amitai H, Lapidot N, Shoseyov O. (2009) Novel Recombinant human collafene for wound healing. The 19<sup>th</sup> Annual Meeting of the Wound Healing Society with SAWC. April 26-29, Dallas, Texas.
22. **Amir R**. (2009) Elucidating Compounds that Contribute to the Antioxidant Activity of Pomegranates by Screening 29 Cultivars. Preventive Nutrition Unified Forces. The 1<sup>st</sup> International Mediterranean Nutrition Metabolism congress. May 19-21, Tel Aviv. (invited speaker)
23. **Amir R**. (2009) Crop plants having higher content of methionine, an essential amino acid. The Pears Foundation, Alumni Workshop in Plant Sciences Symposium-

- Designing Crops For Functional Foods. September 10, Recovot, Faculty of Agriculture. (invited speaker)
24. Glazer I, Marciano P, Dafni-Yalin M, Holland D, Kerem Z, **Amir R.** (2009) Can metabolomics tools help elucidate bioactive compounds contributing to the health benefits of pomegranates? Research Workshop of the Israel Science Foundation Metabolism, Metabolomics and Metabolic Engineering in Plants to Increase Crop Productivity and Nutritional Value. November 1-4, Kibbutz Ein-Gedi, Israel. (invited speaker)
  25. Godo I, Matityahu I, Hacham Y, **Amir R.** (2010) Meeting the challenge of higher nutritional value in seeds: a novel way of increasing methionine content in seeds of the model plant of tobacco. Third International Conference on Plant Molecular Breeding. September 5-9, Beijing, China. (Plenary Lecture)
  26. Gutmacher O, Glazer I, Holland D, MachagnA J, **Amir R.** (2010) Elucidating the ability of different pomegranate fruit parts to inhibit the proliferation of prostate cancer cells and examining the nature of the bioactive compounds. The First conference of Galill Bio-Medicin. October 10, Tel Hai Collage, Israel (invited speaker)
  27. Glazer I, Marciano P, Dafni-Yalin M, Holland D, Kerem Z, **Amir R.** (2010) Elucidating antioxidant and bioactive compounds in pomegranates using metabolomics tools. The 26<sup>th</sup> Annual Meeting, Israel Society for oxygen and free Radical Research. December 5, Tel-Aviv University, Tel-Aviv, Israel. (selected speaker)
  28. Hacham Y, Matityahu I, Godo I, Kousseevitzky S, **Amir R.** (2011) Higher lysine or threonine levels affect the methionine level in higher plants. The 6<sup>th</sup> Congress of the Federation of the Israeli Society of Experimental Biology. February 7-10, Eilat, Israel. (selected speaker)
  29. Choen H, Schuster G, **Amir R.** (2013) Seed-specific expression of feedback-insensitive form of cystathionine- $\gamma$ -synthase in transgenic Arabidopsis, stimulates stress-associated genes and primary metabolites. Bionut ITN, Biochemical and genetic dissection of control of plant mineral nutrition (Marie Curie initial training network) June 23-26, Italy. (selected speaker)

30. Glazer I, Marciano P, Holland D, **Amir R.** (2013) Can metabolomics help to elucidate the bioactive compounds contributing to the health beneficial properties of pomegranates? The 9<sup>th</sup> International Conference of the Metabolomics Society. July 1-5, Glasgow, Scotland. (selected speaker)
31. **Amir R,** Glazer I, Tzulker R, Orgil, O, Holland D. (2013) Identification of compounds in pomegranates that contribute to the antioxidant activity and to inhibition of cancer cells & clarifying the factors that affect their levels. 246<sup>th</sup> American Chemical Society National Meeting September 8 - 12, Indianapolis, USA. (invited speaker)
32. **Amir R,** Glazer I, Tzulker R, Orgil, O, Holland D. (2013) Identification of bioactive compounds in pomegranates. The 2<sup>nd</sup> Conference of the Israel Society for Biotechnology Engineering (ISBE) December 1, Dan Hotel, Tel-Aviv, Israel. (selected speaker)
33. **Amir R,** Hacham Y, Matityahu I, Choen H. (2014) Seeds of soybean and tobacco expressing feedback-insensitive cystathionine gamma-synthase exhibit elevated content of methionine and altered metabolic and transcript profiles. The 9<sup>th</sup> International Workshop of Sulfur Metabolism in Plants: Molecular Physiology and Eco-physiology of Sulfur. April 14-17, Freiburg-Munzingen, Germany. (invited speaker)
34. Choen H, **Amir R.** (2014) Seed-specific expression of a feedback-insensitive form of cystathionine- $\gamma$ -synthase (CGS) in transgenic Arabidopsis stimulates stress-associated genes and primary metabolites. Plant Biology Europe FESPB/EPSO 2014 Congress. June 22-26, Dublin, Ireland. (selected speaker)
35. **Amir R,** Hacham Y, Matityahu I, Choen H. (2014) Plants overexpressing the cystathionine  $\gamma$ -synthase, have higher levels of methionine, have lower contents of glutathione, and they are more sensitive to oxidative stress. The 30<sup>th</sup> Annual Meeting, Israel Society for oxygen and free Radical Research. December 21, Bar-Ilan University, Israel. (selected speaker)
36. Choen H, **Amir R.** (2015) Seed-specific expression of a feedback-insensitive form of cystathionine- $\gamma$ -synthase (CGS) in Arabidopsis stimulates metabolic and

- transcriptomics responses associated with desiccation stress. The Israeli Society of Plant Sciences. February 24, Weizmann Institute, Rehovot, Israel
37. **Amir R**, Hacham Y, Matityahu I. (2015) Evidences of metabolic competition between methionine and glutathione biosynthetic pathways. Global Biotechnology Congress. July 22-25, Boston, MA USA (invited speaker)
  38. **Amir R**, Glazer I, Tzulker R, Orgil, O, Holland D. (2016) Pomegranates and human health. The 5<sup>th</sup> Translational Research Day. February 15, The faculty of Medicine, Zfazit (selected speaker)
  39. **Amir R**, Orgil, O, Holland D. (2016) Bioactive compounds from pomegranate. CEREHA meeting. January 7-10, Brisiel, Belgium.
  40. Cohen A, **Amir R**. (2017) The effect of expression levels of *AtGRI* and *AtGR2* genes on the sulfur assimilation pathway in *Arabidopsis thaliana* plants. Significance of Sulfur in High-Input Cropping Systems. Hampshire Hotel - Plaza Groningen, Groningen, The Netherlands, September 5-9. (invited speaker)
  41. Cohen H, Hacham Y, **Amir R**. (2017) The roles of cystathionine  $\gamma$ -synthase and S-methylmethionine cycle in methionine synthesis in *Arabidopsis* seeds. Plant & Human Sulfur Biology Conference. September 10-14, Balaton lake, Hungary. (invited speaker)
  42. Cohen H, Hacham Y, **Amir R**. (2018) What can we learned by increasing the amino acid methionine in seeds, on the nutritional quality of seeds? The 29<sup>th</sup> Evenari Symposium. June 12, Sede Boqer Campus. (invited speaker)
  43. Nisimi O, Hacham Y, **Amir R** (2018) Does the enzyme methionine  $\gamma$ -lase play a role in the metabolism of methionine during *Arabidopsis* seed development and germination? 11<sup>th</sup> International Plant Sulfur Workshop. September 16-20, Conegliano, Italy (selected speaker).
  44. Habashi R, **Amir R**. (2019) Elucidating the role of shikimate dehydrogenase in controlling the production of anthocyanins and hydrolysable tannins in the outer pomegranate peels. Galil Research conference, Tel Hai April 18.
  45. Hacham Y, **Amir R**. (2020) Evidence for a metabolic competition between methionine and glutathione biosynthetic pathways. Illanit/FISEB. Federation of the Israeli Society of Experimental Biology. February 17-20, Eilat, Israel

46. Hacham Y, Kumar K, **Amir R.** (2020). Does the parasite have an agenda? The metabolic profiling of broomrape. Galil Research conference, Tel Hai March 3.
- 47.
- 48.

Posters:

1. Gupta S, Karchi H, **Amir R**, Perl A, Galili G. (1998) Characterization of a tobacco gene encoding distant homologue of the SCARECROW family of transcription activators that appear to regulate metabolic and developmental processes. IX International congress on Plant tissue and Cell Culture. June 5-8, Jerusalem, Israel
2. **Amir R**, Karchi H, Gupta S, Perl A, Galili G. (1998) T-DNA and “gain of function” tobacco mutants with altered threonine metabolism. FISEB. Federation of the Israeli Society of Experimental Biology. July 15-18, Jerusalem, Israel
3. **Amir R**, Goldway M, Hadar Y, Levanon D. (1999) *Morchella conica* exhibiting a long fruiting season. Plant Science conference, Weizmann Institute, August 2-6, Rehovot, Israel
4. Moshe I, **Amir R.** (1999) Regulation of methionine biosynthesis in plants and potentials for metabolic engineering using yeast genes. The second symposium of the Joan and Jaime Constantiner for Plant Genomics. June 22-25, Magaan, Israel
5. Hacham Y, Shaul O, Galili G, **Amir R.** (1999) Lysine metabolism regulated by light in tobacco plants. The second symposium of the Joan and Jaime Constantiner for Plant Genomics. June 22-25, Magaan, Israel
6. **Amir R**, Moshe I, Gamrasni D, Weizmann Y, Galili G. (2000) Transgenic plants expressing the met2 gene. Plant Science Conference. February 4, Volcani Center, Bet Dagan, Israel
7. Hacham Y, **Amir R.** (2000) Substrate specificity of cystathionine gamma synthase, the key enzyme in methionine biosynthesis. The 6<sup>th</sup> International Congress of Plant Molecular Biology. June 26-30, Quebec, Canada
8. Hacham Y, **Amir R.** (2001) *Arabidopsis* cystathionine  $\gamma$ -synthase mRNA contains two stem-loop structures in its 5'-methionine-dependent regulatory region. Plant Science meeting, Faculty of Agriculture, February 3, Rehovot, Israel

9. Hacham Y, **Amir R.** (2002) Deletion of 30 amino acids at the N-terminal region of the cystathionine gamma-synthase enzyme causes methionine overproduction. Federation of the Israeli Society of Experimental Biology. February 4-7, Eilat, Israel
10. Hacham Y, **Amir R.** (2002) Regulation of methionine metabolism in plants by the N-terminal region of the enzyme cystathionine gamma-synthase. First international congress on Plant Metabolomics. April 7-11, Wageningen, Netherlands
11. Hacham Y, **Amir R.** (2003) Regulation of methionine metabolism in plants by the N-terminal region of the enzyme cystathionine gamma-synthase. The 7<sup>th</sup> International Congress of Plant Molecular Biology. June 23-28, Barcelona, Spain
12. Matityahu I, Kachan L, **Amir R.** (2005) Transgenic tobacco plants overexpressing the *MET25* gene of *Saccharomyces cerevisiae* exhibit enhanced levels of cysteine and glutathione and increased tolerance to oxidative stress. Federation of the Israeli Society of Experimental Biology. February 7-10, Eilat, Israel
13. Katz Y, Galili G, **Amir R.** (2005) Ethylene synthesis in tomato coincides with elevation of cystathionine gamma synthase mRNA levels, suggesting a requirement for de-novo synthesis of methionine. February 7-10, Eilat, Israel
14. Hacham Y, Schuster G, **Amir R.** (2005) A form of cystathionine gamma synthase with a 90-bp deletion within the N-terminal region causes methionine overproduction. Federation of the Israeli Society of Experimental Biology. February, 7-10. Eilat, Israel
15. **Amir R.**, Avraham T, Galili S. (2005) Enhanced levels of methionine and cysteine in transgenic alfalfa plants overexpressing the Arabidopsis cystathionine gamma synthase gene. Federation of the Israeli Society of Experimental Biology. February 7-10, Eilat, Israel
16. Katz Y, Galili G, **Amir R.** (2005) Ethylene synthesis in tomato coincides with elevation of cystathionine gamma synthase mRNA levels, suggesting a requirement for de-novo synthesis of methionine". 9<sup>th</sup> International Congress on Amino Acids and Proteins. August 8-12, Vienna, Austria
17. Holland D, **Amir R.**, Bar-Ilan I, Aviram Y. (2006) Bioactive compounds in pomegranates. Plant Science meeting. February 21, Weizmann Institute, Rehovot, Israel

18. **Amir R**, Avraham T, Golan A. (2006) Improved nutritional values of transgenic alfalfa plants. Plant Biology. August 5-9, Boston, USA
19. Hacham Y, **Amir R**. (2007) Higher lysine or threonine levels affect the methionine content in higher plants. 10<sup>th</sup> International Congress on Amino Acids and Proteins. August 20-25, Kallithea, Greece
20. Tzulker R, Glazer I, Bar-Ilan I, Holland D, Aviram M, **Amir R**. (2007) Elucidation compounds that contribute to the antioxidant activity of pomegranates by screening 29 accessions. The Israel society for oxygen and free radical research. 23<sup>rd</sup> annual meeting. December 9, Rehovot, Israel
21. Hacham Y, Matityahu I, Schester G, **Amir R**. (2008) Effect of lysine on methionine metabolism. Ilanit/FISEB. Federation of the Israeli Society of Experimental Biology. January 28-31, Eilat, Israel
22. Matityahu I, Hacham Y, Schuster G, **Amir R**. (2008) Overexpression of mutated forms of aspartate kinase and cystathionine  $\gamma$ -synthase in tobacco leaves resulted in the high accumulation of methionine. Federation of the Israeli Society of Experimental Biology. January 28-31, Eilat, Israel
23. Tzulker R, Glazer I, Bar-Ilan I, Holland D, Aviram M, **Amir R**. (2007) Elucidation compounds that contribute to the antioxidant activity of pomegranates by screening 29 accessions. Federation of the Israeli Society of Experimental Biology. January 28-31, Eilat, Israel
24. Hacham Y, **Amir R**. (2009) Higher lysine or threonine levels affect the methionine level in higher plants. International Plant Molecular Biology (IPMB). October 25-30, St. Luis, Missouri, USA
25. Godo I, Matityahu I, Song S, Hou W, Han T, **Amir R**. (2010) Producing of soybean grains and tobacco seeds having higher methionine content. XVII Congress of the Federation of European Society of plants Biology (FESPB). July 4-9, Valencia, Spain
26. Dekel Y, Matityahu I, Hacham Y, **Amir R**. (2011) The competition between glutathione and methionine for cystein: glutathione is down regulating the protein levels of cystathionine  $\gamma$  synthase. The 6<sup>th</sup> Congress of the Federation of the Israeli Society of Experimental Biology. February 7-10, Eilat, Israel

27. Guterma O, Machajna G, **Amir R.** (2011) Revealing the mechanism of prostate cancer cells inhibition by pomegranate peel. The 6<sup>th</sup> Congress of the Federation of the Israeli Society of Experimental Biology. February 7-10, 2011 Eilat, Israel
28. Frank A, **Amir R.** (2011) Elucidation of regulatory metabolic role of aspartate and SMM pathways during Arabidopsis seed development. The 6<sup>th</sup> Congress of the Federation of the Israeli Society of Experimental Biology. February 7-10, 2011 Eilat, Israel
29. Maricano P, Glazer I, Holland D, Kerem Z, **Amir R.** (2012) Can metabolomic tools help elucidate bioactive compounds contributing to the health benefits of pomegranates? Banff Conference on Plant Metabolism. June 28 – July 2, Banff, Alberta, Canada
30. Matityahu I, Godo I, Hacham Y, Avzach A, **Amir R.** (2012) Enhancing methionine accumulation in tobacco seeds reveals a physiological link between methionine and glutathione and its impact on seed germination. Conference on Plant Metabolism. June 28 – July 2, Banff, Alberta, Canada
31. Hacham Y, Matityahu I, Dekel Y, **Amir R.** (2012) The role of cysteine partitioning into glutathione and methionine under normal and stress conditions. Plant Biology Congress jointly organized by FESPB and EPSO. July 28- 3 August 3, Freiburg, Germany.
32. Hacham Y, Matityahu I, Godo I, **Amir R.** (2013) Tobacco seeds expressing a mutated form of *Arabidopsis* cystathionine  $\gamma$ -synthase exhibit higher level of methionine and altered levels of several metabolites. The 9<sup>th</sup> International Conference of the Metabolomics Society. July 1-5, Glasgow, Scotland
33. Cohen H, Schuster G, **Amir R.** (2013) Seed-specific expression of feedback-insensitive form of cystathionine- $\gamma$ -synthase in transgenic Arabidopsis stimulates stress-associated genes and primary metabolites. The 9<sup>th</sup> International Conference of the Metabolomics Society. July 1-5, Glasgow, Scotland
34. Cohen H, Schuster S, **Amir A.** (2014) The effect of seed-specific expression of a feedback-insensitive form of cystathionine- $\gamma$ -synthase on seeds metabolic profiling. The 7<sup>th</sup> Congress of the Federation of the Israeli Society of Experimental Biology (FISEB). February 10-13, Eilat, Israel

35. Hacham Y, Matityahu I, Yaron Dekel, **Amir R.** (2014) The metabolic profiles of plants expressing the O-acetylserine thiol lyase that grown under normal and stress conditions. The 7<sup>th</sup> Congress of the Federation of the Israeli Society of Experimental Biology (FISEB). February 10-13, Eilat, Israel
36. Hacham Y, Matityahu I, Cohen H, **Amir R.** (2014) The relation between methionine to abiotic stresses. The 9<sup>th</sup> International Workshop of Sulfur Metabolism in Plants: Molecular Physiology and Ecophysiology of Sulfur. April 14-17, Freiburg-Munzingen, Germany
37. Hacham Y, Matityahu I, **Amir R.** (2015) Evidences of metabolic competition between methionine and glutathione biosynthetic pathways. The Israeli Society of Plant Sciences. February 24, Weizmann Institute, Rehovot, Israel
38. Cohen H, **Amir R.** (2015) Repression of cystathionine  $\gamma$ - synthase in Arabidopsis seed recruits *S*-methylmethionine cycle in vegetative tissues to maintain methionine metabolism. 10<sup>th</sup> Jubilee Plant Sulfur Workshop “Sulfur Nutrition and Assimilation in Higher Plants: Fundamental, Environmental and Agricultural Aspects” Hotel Der Achtermann, Goslar, Germany, September 1-4, 2015
39. Rogachev I, Cohen H, Panizel I, Feldberg L, Dong Y, Aharoni A, **Amir R.** (2017) Methionine-SMM analysis using LCMS in MRM mode. IsraAnalitica, The 20<sup>th</sup> annual meeting of the Israel analytical chemistry society. January 24-25, Tel Aviv, Israel
40. Hacham Y, Matityahu I, **Amir R.** (2017) Transgenic tobacco plants having a higher level of methionine are more sensitive to oxidative stress. Plant & Human Sulfur Biology Conference. September 10-14, Balaton lake, Hungary.
41. Hacham Y, Cohen H, **Amir R.** (2018) What can we learned by increasing the amino acid methionine in seeds, on the nutritional quality of seeds? Intentional Plant Molecular Biology (IPMB). August 5-9, Montpellier, France
42. Hacham Y, Native N, **Amir R.** (2018) Primary metabolic profiling of the parasitic plant Broomrape. Intentional Plant Molecular Biology (IPMB). August 5-9, Montpellier, France
43. Hacham Y, Native N, **Amir R.** (2019) Primary metabolic profiling of Broomrape. XVI Solanaceae conference. Somber 15-99, Jerusalem, Israel

44. Habashi R, Hacham Y, Matityahu I, Dhakarey R, **Amir R.** (2020) Elucidating the role of shikimate dehydrogenase in controlling the production of anthocyanins and hydrolysable tannins in pomegranate. Illanit/FISEB. Federation of the Israeli Society of Experimental Biology. February 17-20, Eilat, Israel
45. Kumar K, Hacham Y, **Amir R.** (2020) Effects of host plants on primary metabolites profile of parasitic plant. Illanit/FISEB. Federation of the Israeli Society of Experimental Biology. February 17-20, Eilat, Israel

### **Conference organization:**

1. Israel-Turkish joint conference on "Plant Genetics & Molecular Biology". Tel Aviv (April 2000)
2. Academic Organizer of "Plant Biotechnology". Tel-Hai College (May 2001)
3. Israel- China joint conference on "Plant Genetics & Biotechnology". Volcani Center, Bet-Dagan (June 2006)
4. Plant Science conference- Member in the organizer committee of the conference of the Israeli society of plant science (since 2015)
5. Organizer the session of "Plant Biotechnology". In Galilee research conference at Tel-Hai College (April 2016)
6. Human Sulfur Biology Conference. Balaton lake, Hungary (10-14<sup>th</sup> September)
7. 11<sup>th</sup> International Plant Sulfur Workshop. September 16-20, Conegliano, Italy.
8. Organizer the session of "Plant Biotechnology". In Galilee research conference at Tel-Hai College (April 2019)

## **12. List of Publications**

### **Doctoral Dissertation**

1985- Effect of iron deficiency on siderophores production by *Verticillium dahliae* (KELB) under in vivo and invitro conditions. Supervisor: Isaac Barash.

1994 – Formation of sclerotia and translocation in the edible mushroom *Morechella esculenta* – Supervisors: Issac Hadar, Dan Levanon, Ilan Chet.

Books (Academic)

Conferences Books Edited

1. Galili, G., **Amir, R.**, Karchi, H., Shaul, O., Zhu, X-Z., Miron, D., Yang, L., Ben-Yaacov, S. and Perl A. (1996). Expression of bacterial dihydrodipicolinate synthase in transgenic plants: Potentials to improve lysine content in forage, grain and tuber crops. Proceeding of the third International ISHS Symposium on In Vitro Culture and Horticultural Breeding. (A. Altmann, M. Ziv, Eds) pp. 551-561
2. **Amir, R.**, Karchi, H., Yang, L., Perl, A., Galili, G. (1999) T-DNA and “gain of function” tobacco mutants with altered threonine metabolism. Plant Biotechnology and in vitro biology in the 21<sup>st</sup> century. Kluwer academic publishers (A. Altman, M. Ziv, S. Izhar, Eds) 273-276.
3. Galili, S. **Amir, R.** Guenoune, D. (1999) Molecular approaches for improving quality of forage legumes. Plant Biotechnology and in vitro biology in the 21<sup>st</sup> century. Kluwer academic publishers (A. Altman, M. Ziv, S. Izhar, Eds) 293-296.
4. Guenoune, D. **Amir, R.** Wolf, S. Wininger H. Badani H. Ben-Dor B. Galili, S. (1999) Expression of soybean vegetative storage proteins (VSP) in tobacco leaves. Plant Biotechnology and in vitro biology in the 21<sup>st</sup> century. Kluwer academic publishers (A. Altman, M. Ziv, S. Izhar, Eds) 296-299.
5. Rubinovich L, Holland D, **Amir R.** (2014) Characterization of pomegranate`s health beneficial bioactive compounds, taste, color and post-harvest fruit quality by studding a wide collection of diverse accessions. Instrumental Methods for the Analysis and Identification of Bioactive Molecules, ACS Symposium Series 1185 (JK. Jayprakasha, BS. Patil, F. Pellati, Eds) 201-2015.

Chapter in Collections (editing books )

1. **Amir R**, Galili G. (1999) Regulation of lysine and threonine metabolism in plants. In: Genetic Engineering, Principals and Methods, J. K. Setlow (ed) Plenum Press, 21: 57-77.
2. **Amir R**, Galili G. (2003) Approaches to improve the nutritional values of transgenic plants by increasing their methionine content. In: Advances in plant physiology V. 6 (ed. Hemantaranjan, A.) Scientific publishers, Jodhpur, India. pp. 61-77. Cited: 9
3. Hawkesford M, Hoefgen R, Galili G, **Amir R**, Angenon G, Hesse H, Rentsch D, Schaller J, Van der Meer I, Rouster J, Banfalvi Z, Zsolt P, Szabados L, Szopa J, Sirko A. (2006) Optimizing nutritional quality of crops. In Plant Genetic Engineering Vol 7: Plant Metabolic Engineering and Molecular Farming I. Editor: Dr PK Jaiwal. Studium Press LLC, Huston, Texas 77272, USA, pp. 85-116.
4. **Amir R**, Tabe L. (2006) Molecular approaches to improving plant methionine content. Plant Genetic Engineering Vol 8: Metabolic engineering and molecular farming II. Editors: Jaiwal PK and Singh, RP. Studium Press LLC, Huston, Texas 77272, USA, pp. 1-26. Cited:11
5. Shaul O<sup>#</sup>, **Amir R**<sup>#</sup>, Galili G. (2007) Improving the nutritional quality of plants through enhanced accumulation of essential amino acids by genetic engineering. *Europe BioForum* 10: 36-38. <sup>#</sup>Equal contribution.
6. Hacham Y, **Amir R**. (2008) Methionine metabolism in plants. In: Sulfur: A Missing Link Between Soils, Crops, and Nutrition. Editor: Joseph Jez. Published by: ASA-CSSA-SSSA Madison, WI, USA pp. 251-279.
7. **Amir R**, Hacham Y, Matityahu I, Schuster G. (2009) Higher levels of lysine, threonine or cysteine affect the level of methionine in higher plants. Sulfur metabolism in plants, regulatory aspects significant of sulfur in the food chain agriculture and environment. Ed. Sirko, A; De Kok LJ.; Haneklaus S.; Hawkesford MJ; Renneberg H.; Saito K.; Shnug E.; Stulen I. pp. 9-20. Backhuys Publishers, Liden.
8. **Amir R**, Hacham Y. (2013) Methionine Metabolism in Plants: Current Understanding of the Factors Regulating its Metabolism. In: Methionine: Biosynthesis, Chemical Structure and Toxicity. pp. 61-87. Nova Science Publishers, Inc. Hauppauge, NY.

9. Cohen H, Hacham Y, Matityahu I, **Amir R.** (2017) Elucidating the effects of higher expression level of cystationione  $\gamma$ -synthase on methionine contents in transgenic *Arabidopsis*, soybean and tobacco seeds. *Sulfur Metabolism in Higher Plants - Fundamental. Environmental and Agricultural Aspects.* Eds. De Kok, L.J., Haneklaus, S.H., Hawkesford, M.J. and Schnug, E. Springer, The Netherlands.
10. **Amir R**, Holland D, Tian L (2018) What can we learn about the traits of aril juice by studying wide collections of diverse pomegranate fruits? In: *Pomegranate, cultivation, composition, antioxidant properties, and health benefits.* pp. 203-231. Nova Science Publishers, Inc. Hauppauge, NY.

Articles in refereed journals

1. Barash Y, **Zion (Amir) R**, Crikon J.A Nachmias A. (1988). Effect of iron status on Verticillium wilt disease and on *in vitro* production of siderophores by *V. dahliae*. *Journal of Plant Nutrition*, 11:893-905.
2. **Amir R**, Levanon D, Hadar Y, Chet I. (1992). Formation of sclerotia by *Morchella esculenta*: relationship between media composition and turgor potential in mycelium. *Mycology Research* 96: 943-948.
3. **Amir R**, Levanon D, Hadar Y, Chet I. (1993). Morphology and physiology of *Morchella esculenta* during sclerotial formation. *Mycology Research* 97: 683-689.
4. **Amir R**, Levanon D, Hadar Y, Chet I. (1994). The role of source-sink relationship in translocation during sclerotial formation by *Morchella esculenta*. *Mycology Research* 98: 1409-1414.
5. **Amir R**, Levanon D, Hadar Y, Chet I. (1995). Factors affecting translocation and sclerotial formation in *Morchella esculenta*. *Experimental Mycology* 19: 61-70.
6. **Amir R**, Steudle E, Levanon D, Hadar Y, Chet I. (1995). Turgor changes in *Morchella esculenta* during translocation and sclerotial formation. *Experimental Mycology* 19: 129-136.
7. Tang G, Zhu X-Z, **Amir R**, Ben-Tzvi I, Galili G. (1997) Cloning and expression of an *Arabidopsis thaliana* cDNA homologous to bacterial *lysC* gene encoding a lysine-sensitive aspartate kinase. *Plant Molecular Biology* 34: 287-294.

8. Galilli G, Karchi H, Shaul O, Zhu-Shimoni X, Miron D, Yang L, Ben-Yaacov S, Perl A, **Amir R.** (1997) Expression of bacterial dihydrodipicolinate synthase in transgenic plants: potentials to improve lysine content in forage, grain and tuber crops. *Acta Horticulture* 447: 551-559.
9. Guenoune D, **Amir R**, Ben-Dor B, Wolf S, Galili S. (1999) A soybean vegetative storage protein accumulates to high levels in various organs of transgenic tobacco plants. *Plant Science* 145: 93-98.
10. **Amir R**, Goldway M, Goldberg D, Hadar Y, Levanon D. (2000) *Morchella conica* exhibiting a long fruiting season. *Mycological Research* 104: 1000-1004.
11. Galili G, Tang G, Zhu X, **Amir R**, Levanony H, Shy G, Herman E. (2000) Plant seeds: an exciting model system for dissecting molecular and cellular regulation of metabolic processes. *Israel Journal of Plant Science* 48: 181-187.
12. Hacham Y, Avraham T, **Amir R.** (2002) The N-terminal Region of *Arabidopsis* cystathionine  $\gamma$ -synthase plays an important regulatory role in methionine metabolism. *Plant Physiology* 128: 454-462.
13. **Amir R**, Hacham Y, Galili G. (2002) Cystathionine  $\gamma$ -synthase and threonine synthase operate in concert to regulate carbon flow towards methionine in plants. *Trends in Plant Science* 7: 153-156.
14. Guenoune D, Landau S, **Amir R**, Badani H, Devash L, Wolf S, Galili S. (2002) Resistance of Soybean Vegetative Storage Proteins (S-VSPs) to Proteolysis by Rumen Microorganisms. *Journal of Agriculture Food Chemistry* 50: 2256-2260.
15. Guenoune D, **Amir R**, Badani H, Wolf S, Galili S. (2002) Combined expression of S-VSP $\alpha$  in two different organelles enhanced its accumulation and total lysine production in transgenic tobacco plants. *Journal of Experimental Botany* 53: 1867-70.
16. Guenoune D, **Amir R**, Badani H, Wolf S, Galili S. (2003) Enhanced protein-bound lysine levels and improved nutritional quality of transgenic tobacco plants expressing the rumen stable soybean vegetative storage protein,  $\beta$  subunit. *Transgenic research* 12: 123-126.

17. Hacham Y, Gofna U, **Amir R.** (2003) *In vivo* analysis of various substrates utilized by cystathionine  $\gamma$ -synthase and *O*-acetylhomoserine sulfhydrylase in methionine biosynthesis. *Molecular Biology and Evolution* 20:1513-1520.
18. Avraham T, Badani H, Galili S, **Amir R.** (2005) Enhanced levels of methionine and cysteine in transgenic alfalfa (*Medicago sativa* L.) plants overexpressing the Arabidopsis cystathionine  $\gamma$ -synthase gene. *Plant Biotechnology Journal* 3: 71-80.
19. Gamrasni D, Matityahu I, **Amir R.** (2005) Aggregates formed as a result of the expression of yeast *Met2* gene in transgenic tobacco plants, stimulate the production of stress-protective metabolites and increased the plants tolerance to heat stress. *Molecular Breeding*.15: 65-74.
20. Avraham T, **Amir R.** (2005) Methionine and threonine regulate the branching point of their biosynthesis pathways and thus controlling the level of each other. *Transgenic Research* 14: 299-311.
21. Golan A, Avraham T, Matityahu I, Badani H, Galili S, **Amir R.** (2005) Soluble methionine enhanced the accumulation of 15 kD zein, a methionine rich storage protein, in BY2 cells and in alfalfa transgenic plants but not in transgenic tobacco plants. *Journal of Experimental Botany* 56: 2443-2452.
22. Galili G, **Amir R.**, Hesse H, Hoefgen R. (2005) Improving the levels of essential amino acids and sulfur metabolites in Plants. *Biological Chemistry* 386: 817-31.
23. Matityahu I, Kachan L, Bar Ilan Y, **Amir R.** (2006) Transgenic tobacco plants overexpressing the *Met25* gene of *Saccharomyces cerevisiae* exhibit enhanced levels of cysteine and glutathione and increased tolerance to oxidative stress. *Amino Acids* 30:185-194.
24. Hacham Y, Schuster G, **Amir R.** (2006) An *in vivo* internal deletion in the n-terminus of cystathionine  $\gamma$ -synthase in Arabidopsis results with decreased modulation of expression by methionine. *The Plant Journal* 45: 955-967.
25. Katz Y, Galili G, **Amir R.** (2006) Regulatory role of cystathionine  $\gamma$ -synthase and *de-novo* synthesis of methionine in ethylene production during tomato fruit ripening. *Plant Molecular Biology* 61:255-268.

26. Hacham Y, Song L, Schuster G, **Amir R.** (2007) Lysine enhances methionine content by modulating the expression of *S*-adenosylmethionine synthase. *The Plant Journal* 51: 850-861.
27. Tzulker R, Glazer I, Bar-Ilan I, Holland D, Aviram M, **Amir R.** (2007) Antioxidant activity, polyphenol content and related compounds in different fruit juices and homogenates prepared from 29 different pomegranate accessions. *Journal of Agricultural and Food Chemistry* 55: 9559-9570.
28. Hacham Y, Matityahu I, Schuster G, **Amir R.** (2008) Overexpression of mutated forms of aspartate kinase and cystathionine  $\gamma$ -synthase in tobacco leaves resulted in the high accumulation of methionine and threonine. *The Plant Journal* 54: 260-71.
29. **Amir R.** (2008) Towards improving methionine content in plants for enhanced nutritional quality. *Functional Plant Science and Biotechnology* 2: 36-46.
30. Galili S, **Amir R,** Galili G. (2008) Genetic Engineering of Amino Acid Metabolism in Plants. *Advances in Plant Biochemistry and Molecular Biology* 1: 49-80.
31. Shwartz E, Glazer I, Bar-Ya'akov I, Matityahu I, Bar-Ilan I, Holland D, **Amir R.** (2009) Changes in chemical constituents during the maturation and ripening of two commercially important pomegranate cultivars. *Food Chemistry* 115: 965-973.
32. Stein H, Wilensky M, Tsafrir Y, Rosenthal M, **Amir R,** Avraham T, Ofir K, Dgany O, Yayon A, Shoseyov O. (2009) Production of bioactive, post-translationally modified, heterotrimeric, human recombinant type-I collagen in transgenic tobacco. *Biomacromolecules* 10: 2640-2645.
33. Czuj T, Żuk M, Starzycki M, **Amir R,** Szopa J. (2009) Engineering increases in sulfur amino acid contents in flax by overexpressing the yeast *Met25* gene. *Plant Science* 177: 584-592.
34. Shwartz E, Tzulker R, Glazer I, Bar-Ya'akov I, Tripler E, Wiesman Z, Bar-Ilan I, Fromm H, Borochoy-Neori H, Holland D, **Amir R.** (2009) Environmental conditions affect the color, taste and antioxidant capacity of 11 pomegranate accessions 'fruits. *Journal of Agricultural and Food Chemistry* 57: 9197-9209.
35. **Amir R.** (2010) Current understanding of the factors regulating methionine content in vegetative tissues of higher plants. *Amino Acids* 39: 917- 931.

36. Dafni-Yalin M, Glazer I, Bar-Ilan I, Kerem Z, Holland D, **Amir R.** (2010) Color, sugars and organic acids composition in aril juices and peels homogenates prepared from different pomegranate accessions. *Journal of Agricultural and Food Chemistry* 58: 4342-4352.
37. **Amir R,** Han T, Ma F. (2012) Bioengineering approaches to improve the nutritional values of seeds by increasing their methionine content. *Molecular Breeding* 29: 915-924. Glazer, I; Masaphy, S; Marciano, P; Bar-Ilan, I; Holland, D; Kerem, Z; **Amir, R.** (2012) Partial identification of bioactive compounds having antifungal activities from *Punica granatum* peel extracts. *Journal of Agricultural and Food Chemistry* 60: 4841-8.
39. Galili G, **Amir R.** (2013) Fortifying plants with the essential amino acids lysine and methionine to improve nutritional quality. *Plant Biotechnology Journal* 11: 211-222.
40. Song S, Hou W, Godo I, Wu C, Yu Y, Matityahu I, Hacham Y, Sun S, Han T, **Amir R.** (2013) Soybean seeds expressing feedback-insensitive cystathionine  $\gamma$ -synthase exhibit a higher content of methionine. *Journal of Experimental Botany* 64: 1917-1926.
41. Hacham Y, Matityahu I, **Amir R.** (2013) Light and sucrose up-regulate the expression level of Arabidopsis cystathionine  $\gamma$ -synthase, the key enzyme of methionine biosynthesis pathway. *Amino Acids* 45:1179-90.
42. Matityahu I, Godo I, Hacham Y, **Amir R.** (2013) Tobacco seeds expressing feedback-insensitive cystathionine gamma-synthase exhibit elevated content of methionine and altered primary metabolic profile. *BMC Plant Biology* 13: 206-220.
43. Matityahu I, Glazer I, Holland D, Bar-Ya'akov I, Ben-Arie R, **Amir R.** (2014) Total antioxidative capacity and total phenolic levels in pomegranate husks correlate to several post-harvest fruit quality parameters. *Food and Bioprocess Technology* 7: 1938-1949.
44. Orgil O, Schwartz E, Baruch L, Matityahu I, Mahajna J, **Amir R.** (2014) The antioxidative and anti-proliferative potential of non-edible organs of the pomegranate fruit and tree. *LWT - Food Science and Technology* 58: 571-577.

45. Hacham Y, Koussevitzky S, Kirma M, **Amir R.** (2014) Glutathione application affects the transcript profile of genes in Arabidopsis seedling. *Journal of Plant Physiology* 171: 1444-1451.
46. Chen C, Letnik I, Hacham Y, Dobrev P, Ben Daniel B-H, Vanková R, **Amir R**, Miller G. (2014) Ascorbate peroxidase 6 protects Arabidopsis thaliana desiccating and germinating seeds from stress and mediates crosstalk between ROS, ABA and auxin. *Plant Physiology* 166: 370-383.
47. Cohen H, Israeli H, Matityahu I, **Amir R.** (2014) Seed-specific expression of a feedback-insensitive form of cystathionine  $\gamma$ -synthase in Arabidopsis stimulates metabolic and transcriptomic responses associated with desiccation stress. *Plant Physiology* 166: 1575-1592.
48. Frank A, Cohen H, Hoffman D, **Amir R.** (2015) Methionine and S-methylmethionine exhibit temporal and spatial accumulation patterns along the Arabidopsis life cycle. *Amino Acids* 47: 497-510.
49. Brychkova G, Yarmolinsky D, Batushansky A, Grishkevich V, Khozin-Goldberg I, Fait A, **Amir R**, Fluhr R, Sagi, M. (2015) Sulfite oxidase activity is essential for normal sulfur, nitrogen and carbon metabolism in tomato leaves. *Plants* 4: 573-605.
50. Stein O, Damari-Weissler H, Secchi F, Rachamilevitch S, German M, Yeselson Y, **Amir R**, Schaffer A, Holbrook M, Aloni R, Zwieniecki M, Granot D. (2015) The tomato plastidic fructokinase SIFRK3 plays a role in xylem development. *New Phytologist* 209: 1484-95.
51. Matityahu I, Marciano P, Holland D, Ben-Arie R, **Amir R** (2016) Differential effects of regular and controlled atmosphere storage on the quality of three cultivars of pomegranate (*Punica granatum* L.). *Postharvest Biology and Technology* 115: 132–141.
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77. Cohen A, Hacham Y, Welfe Y, **Amir R.** (2020) Evidence for a significant role for glutathione reductase in sulfur assimilation pathway. *The Plant Journal* 102: 246-261. <https://doi.org/10.1111/tpj.14621>
78. Giriya A, Shotan D, Hacham Y, **Amir R.** (2020) The level of methionine residues in storage proteins is the main limiting factor of protein-bound-methionine accumulation in Arabidopsis seeds. *Frontiers in Plant Science* 11:1136. doi: 10.3389/fpls.2020.01136.
79. Oliva M, Guy A, Galili G, Dor E, Schweitzer R, **Amir R\***, Hacham Y.M (2021) Enhanced production of aromatic amino acids in tobacco plants leads to increased phenylpropanoid metabolites and tolerance to stresses. *Frontiers in Plant Science* 11: 604349. doi: 10.3389/fpls.2020.604349
- 80.

Submission

1. Bloch I, Rapaport I, Cohen E, Dotan N, Haviv H, Hacham Y, Amir R, Gal M. Discovery and characterization of small molecule inhibitor of the cystathionine gamma-synthase with in-planta activity

Patents:

1. **Amir, R.** and Galili, G. (1999) Genetically modified plants having genes coding for proteins with modified amino acids composition. Israeli and USA Patent no. 1536/1 GE and 09/959,890.
2. **Amir, R.** (2001) Plants characterized by an increase content of methionine and related metabolites and methods of generating same. Patent Application US PTO no. 10/475,852.
3. **Amir, R.** (2011) ENHANCED LEVEL OF METHIONINE IN TRANSGENIC SOYBEAN SEEDS US Provisional Patent Application No. 61/379,399
4. **Amir R,** Dor E., Hershenhorn J, Hacham Y. (2015) Development of broomrape resistant crops (Provisional)
5. **Amir R,** Rubini Vish L, Amir R. (2018) *Punica granatum* L. Fruit Peel Cell Culture (Provisional)
6. Bloch I, Cohen E, **Amir R,** Gal M. (2020) New methionine metabolic pathway inhibitors (Provisional)

**13. Current research**

1. Studying the methionine metabolism in plants
2. Studying the effect of metabolites of aspartate family on the methionine level
3. Studying the interaction between cysteine and glutathione and methionine metabolism
4. Studying the metabolic networks in pomegranate fruits.
5. Studying the nature of the bioactive compounds in pomegranate fruits.
6. Studying the metabolism of Broomrape

#### **14. Miscellaneous**

##### **A. Scientific Delegation member and Visitor:**

1. Slovenian-Israeli Symposium on Plant Genetics in Biotechnology (Domezale, September 2000)
2. Turkish- Israeli Symposium on Plant Biotechnology (Istanbul, October 2001)
3. Jordan- Palestine-Israel conference organized by MARD "Biotechnology in Agriculture" (Amman, February, 2006)
4. Egypt-Israel Scientific meeting. Visiting the Nsar Shalach laboratory and the CARO institute (Cairo, June 2002)
5. Visiting in Prof Tianfu Han laboratory, Institute of Crop Sciences, The Chinese Academy of Agricultural Sciences, Beijing, China (2005).
6. Visiting in Prof Tianfu Han laboratory, Institute of Crop Sciences, The Chinese Academy of Agricultural Sciences, Beijing, China (2010).

##### **B. Reviewer in the Journals:**

###### **1998-2005:**

Plant Cell Reports, African Journal of Pure and Applied Chemistry, International Journal of Molecular Sciences, Plant Biology.

2003-2018: Plant Physiology, The Plant Journal, Planta, Journal of Experimental Botany, Amino Acids, Plant Molecular Biology, Annals Botany, Journal of Biochemistry Biology, Plant and Cell Physiology, Plant Cell Tissue and Organ Culture, Plant Biotechnology Journal, BMC Plant Biology, Plant Science, Molecular Plant, Journal of Food Biochemistry, Journal of Agriculture Food Chemistry, Journal of Cereals Science, Plant Food for Human Nutrition, Food and Nutrition Sciences, Journal of Food Science and Technology, Journal of Biotechnology, Food Chemistry, PLOS One, Nucleic Acids Research, Frontiers in Plant Science, Journal of Food Composition and Analysis, Acta Pharmaceutica Sinica B.

##### **C. Reviewer of Ph.D. and M.A. thesis in the:**

Technion, Hebrew university, (including the Faculty of Agriculture), Weizmann Institute, Ben Guiron University, Bar Ilan University, Haifa University and Tel Hai College.

D. Reviewer for Promotion in other Universities:

Ben Guiron University, University of California Davis USA, New Mexico University USA, Bar Ilan University; Volcani center- Bet Dagan.

2020- Guest Editor of special issue in Frontiers in Plant Science, entitled “Amino acids in plants: Regulation and functions in development and stress defense”

E. In Tel-Hai and in the Community

In Tel Hai:

1994-2018 Responsible for the Plant Science and Cell Biology courses in Tel-Hai Collage.

2006-2008 Take part in 'Discipline committee' at Tel-Hai College.

1998-2004 Responsible for the connections between the students of 'Faculty of Science in Tel-Hai Collage' to the '*Center for Learning Disabilities*'

2007-2012 precipitating in "Green Campus Council" Tel-Hai College

2008-2011 precipitating in "Institute for culture and art" Tel-Hai College

2008-2014 precipitating in "The center for democracy" Tel-Hai College

2008-2011 Head of the Department of Environmental Science. Tel-Hai College

2011-2020 Promoting & Nominating Committee. Tel-Hai College

1996- 2020 Supervision of short-term scientific research projects as part of the first degree (Undergraduate student). The Students spent 2-4 month in our research laboratory and did a research project that was summarize as a research report. During the years 46 BSc students and 10 Technician students of Tel-Hai College of Technology for Engineering were trained in my laboratory.

2015-2020 Head of the Department of MSc students in Biotechnology. Tel-Hai College

2017-2020 Promoting & Nominating Committee of the MALAG.

In Migal:

2003-2008 Organize the Retreat days in Migal Research Institute

F. Member on the Following Panels

Israel Science Foundation (ISF) administrated by the Israel Academy of Science and Humanities, Plant Science

United States-Israel Binational Agricultural Research and Development Fund (BARD), Cellular and Molecular Biology

Chief Scientist of the Ministry of Science, Plant and Agriculture

Chief Scientist of the Ministry of Agriculture

G. Service as *Ad Hoc* Reviewer for Proposals

Israel Science Foundation; BARD; GIF; BSF; Ministry of Science (Israel); Ministry of Agriculture (Israel); USDA (USA); Canada Science foundation; Bases del Concurso Nacional de Proyectos FONDECYT Chile.

H. In the Community:

1996-2016- Lectures in popular science in the communities in Galilee, including lectures to high school teachers, high school students, pensioners in Kiryat Shmona and in the kibitzes, and agricultures organizations in subjects of Plant science, and Plant biotechnology (about 12-15 lectures per a year)

1996-2014 Education in the Galilee- Supervision of High school students in scientific projects in the research laboratory (total of about 25)

1996-1998 Scientific director of high school educational programs in MIGAL.

2003-2008 Organizer and precipitate in the day of "Plant tissue culture" at the "The Association for Science Education in Galilee" for High-School students.

2006-2008 Responsible for the connections between students of 'Faculty of Biotechnology' and activities in the community (lectures in different subjects of biotechnology in high schools, special seminars, lectures in kibbutz, and different clubs as well as different activities for high school students).

2016 course in the subject of "who afraid from transgenic plants?" give to the public in Academia in the square (7 meetings about 60 participants, Tel Hai, Kiryat Shmona)

I. Industrial collaborations

2005-2010 Together with Prof. Oded Shoseyov established the Start-up company CollPlant that produces collagen in transgenic tobacco plants. The company started inside my laboratory in Migal under the administration of "Meitav" the Kiriati Shmona technological incubator. The Collagen producing plants were produced in my laboratory. Today the company is traded in the Israeli Stock exchange and had Greenhouses all over the country, processing plant in Yessud Hama'ala in the Upper Galilee and Laboratories and offices in Nes-Ziona.

2008-2012 Consultant scientist to "Rimon" winery. I have helped to develop a juice extraction procedure to achieve maximal extraction of health benefiting compounds into the juice from the peel and seeds. My laboratory provided chemical and biological essays to assess the juice qualities following different extraction protocols.

2010-2012 Consulted "Primor" and "Bereshit" on the production of high quality Pomegranate juice.

2015-2016 Collaborating with Kaiima Bio Agritech LTD on the subject of tolerates plants to broomrape, together with Joseph Hershnohoren (Newe Yaar)

2015-2018 Collaborating with "Adamma" Designing new herbicides. Together with Mayyan Gal.

2020 Establish the BioRootIn startup at Migal