



Dr. Hassan Rahnama

Personal Information

Surname: **Rahnama**

First name: **Hassan**

Gender: **Male**

Marital Status: **Married**

Nationality: **Iranian**

Date of birth: year: **1968** month: **08** may: **24**

Place of Birth: **Gilan**

Occupation: **Associate Professor, Ph.D**

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Academic Carrier

2004: PhD in Plant Physiology, University of Tehran, Tehran, I.R.Iran

1995: M.Sc in Plant Sciences, University of Tehran, Tehran, I.R.Iran

1990: B.Sc in Plant Sciences, Ferdowssi University, Mashad, I.R.Iran

Research experience

- Plant biotechnology and genetic engineering
 - Physiology and biochemistry of plant abiotic stresses
 - Plant cell and tissue culture
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On-going projects

- Development of transgenic herbicide and pest resistant soybean plants
- Improvement of oil quality in *Brassica carinata* using CRISPR/Cas technology
- Bio-fortification of Rapeseed with vitamin D using genome editing technology CRISPR/Cas
- Engineering of crude oil-degrading bacteria to produce super bacteria for oil pollution biodegradation
- Arbuscular mycorrhizal fungi in interactive effects of *Macrophomina phaseolina* and water stress in the soybean disease, charcoal root rot

Performed Projects

Genetic Engineering of Safflower Plant (*Carthamus tinctorius*) for Improving Oil Quality and Quantity

- Production of Very-Long Poly-Unsaturated Chain (VLC-PUF or Omega3) Fatty Acids in Safflower Plants
- Improvement of seed oil content in safflower plant (*Carthamus tinctorius* L.) by metabolite engineering
- Genome Editing for production of High Oleic Acid Safflower (CRISPR/Cas9 Technology)

Molecular Farming

- Production of edible vaccine for hepatitis B virus in potato and tomato plants

Metabolite Engineering

- Genetic transformation of *Silybum marianum* hairy roots using chalcone synthase (*chs*) gene
- Gene silencing of *chs* in hairy roots of *Silybum marianum* using RNAi

Abiotic stress

- Genetic engineering of *Brassica napus* for resistance to abiotic stress
- Genetic engineering of corn plant (*Zea mays*) using *DREB1A* gene for resistance to abiotic stresses (Drought, chilling and salinity)

Biotic stress

- Development of potato plants resistant to virus using RNAi
 - Genetic transformation of *Brassica napus* for resistance to pests
 - Genetic transformation of corn plant (*Zea mays*) for resistance to pests
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- Production of transgenic potato plants (*Solanum tuberosum*) for resistance to potato tuber moth and Colorado beetle
- Greenhouse study of transgenic RNAi potato for resistance to potato viruses
- Genetic transformation of corn plant (*Zea mays*) for resistance to pests and Herbicide

Risk Assessment

- Evaluation of the food safety of a genetically modified potato expressing Cry1Ab gene using animal model
- Detection of Cry1Ab protein and recombinant DNA fragments in digesta and tissues of rat fed genetically modified potato
- Immune response study to genetically modified potato expressing *Cry1Ab* gene using animal model.
- Study of feeding transgenic potato expressing cry1Ab gene using animal model
- Evaluation of metabolites and key nutrients in transgenic potato plants resistant to potato tuber moths

Memberships

- Member of Iranian Biology Society
- Member of Biotechnology Society of Islamic Republic of Iran
- Member of Nanotechnology Society of Iran
- Member of Genetics Society of Iran
- Member of Biosafety Academic Society of Iran
- Member of Iran's Agronomy and Breeding Sciences Society

Patents

Rahnama H, Sattarzadeh G and Kazemi F (2013) NanoMagnetic Kit for genomic DNA extraction from plant tissues. Iranian Patent Grant Number: 80762.

Rahnama H, Sattarzadeh G and Kazemi F (2013) NanoMagnetic Kit for genomic DNA extraction from human and animal tissues. Iranian Patent Grant Number: 80628.

Rahnama H, Sattarzadeh G and Kazemi F (2013) NanoMagnetic Kit for DNA extraction from Oils, Foods and Feeds. Iranian Patent Grant Number: 80761.

Rahnama H, Sattarzadeh G and Kazemi F (2013) NanoMagnetic Kit for recovery of DNA from agarose gel. Iranian Patent Grant Number: 80607.

Rahnama H, Ahmadi N and Kazemi F (2013) NanoMagnetic Kit for purification of plasmid DNA bacterial cells. Iranian Patent Grant Number: 80605.

Ahmadian N, Sharifi M, Karimi F and **Rahnama H** (2009) Hairy root induction for production of atropine and scopolamine in *Atropa belladonna*. Iranian Patent Grant Number: 62791.

Hasanloo T, **Rahnama H**, Shamas MR and Sepehri R (2007) Induction of hairy root in *Silybum marianum* as a source of silymarin. Iranian Patent Grant Number: 44195.

Publications

Books

Rahnama H and Sanjarian F (2022) The Next 500 Years; Engineering Life to Reach New World; Academic Center of Education Press; Isfahan University of Technology; PP 371. (Translated in Persian)

Rahnama H. (2021) A Guideline for Environmental Risk Assessment of Transgenic Crops. Agricultural Biotechnology Research Institute of Iran (in Persian). PP. 173

Rahnama H (2020) A Guideline for Risk Assessment of Food Derived from Transgenic Crops. Agricultural Research Education, and Extension Organization (AREEO), Publication of Agricultural Education (in Persian). PP.120

Rahnama H. (2021) Environmental Risk Assessment of Transgenic Potato plants. Department of The Environment Islamic Republic of Iran (In Persian). PP. 84

Rahnama H, Alaie E (2015) Phytoremediation: Principles and Applications. Research Institute of Petroleum Industry Press (In Persian). PP. 644.

Salehi Jouzani G and **Rahnama H** (2014) Chapter 12: Biosafety and Bioethical Issues in Modern Agricultural Biotechnology in Iran. In Bagheri A. Biomedical Ethics in Iran. Eubios Ethics Institute.

Rahnama H, Maali Amiri R and Salehi Jouzani GR (2011) Plant Genetic Engineering and Selectable Markers (in Persian). Agricultural Biotechnology Research Institute of Iran (ABRII) Press. (In Persian) PP.406.

Rahnama H, Shakib AM, Khayam Nekouii M, Salehi Jouzani GR, Parvin MR, Mahmoodzadeh H, Sadeghi A, Sohilivand S and Tohidfar M (2009) Introduction to Bioethics. Avicenna Research Institute Press. PP. 243. (Translated in Persian)

Tohidfar M, Ghareyazie B., **Rahnama H.** and Mokhtari F. (2007) Principle for the risk analysis of foods derived from modern biotechnology Andishe Zohoor Press. Iran. PP. 109.(Translated in Persian).

Scientific Journals

Rahnama H, Dastneshan S, Abolgasimi S, Shams MR (2025) Cold Plasma as an Efficient Tool for Enhancing Callus Induction, Plant Regeneration, and Genetic Transformation in Safflower Plant (*Carthamus tinctorius*). **accepted for publication in Plant Cell, Tissue and Organ Culture (PCTOC).**

Nasiri M, Niknam V, **Rahnama H**, Rezayian M, Ahmadi-Sakha S (2025) Pivotal role of fibrous roots in drought tolerance of saffron (*Crocus sativus* L.) and mitigation of oxidative stress by penconazole. Scientific Reports, 15:19324. <https://doi.org/10.1038/s41598-025-03374-0>.

Shams MR, Razvi K, **Rahnama H**, Dashchi S, Hadavand Mirzaii H (2025) Enhanced seed oil content by overexpressing LPAAT and WRI1 genes in tobacco plant. Plant Cell Reports, 44:163 <https://doi.org/10.1007/s00299-025-03554-2>.

Hajinajaf N, Fayyazbakhsh A, Kamal Shahsavar S, Sanjarian F, **Rahnama H** (2024) Boosting plant oil yields: the role of genetic engineering in industrial applications. Biofuel Research Journal, 11(2): 2105-2145. doi: 10.18331/BRJ2024.11.2.5.

Bahmankar M, **Rahnama H**, Salehi M, Sadat Noori SA (2024) Somatic embryogenesis and genetic fidelity in camelina by RAPD markers and flow

cytometry. Plant Cell, Tissue and Organ Culture (PCTOC), 156: 67. <https://doi.org/10.1007/s11240-024-02686-9>.

Bashiri H, Kahrizi D, Salmanian AH, Rahnama H, Azadi P (2024) Engineering erucic acid biosynthesis in camelina (*Camelina sativa*) via FAE1 gene cloning and antisense technology. Cellular and Molecular Biology 70 (7), 243-251.

Rahnama H, Moradi AB, Moradi F, Noormohamadi N (2023) Compositional and Morphological Analysis of Salt Stress Tolerant *Mannitol-1-phosphate Dehydrogenase (mtlD)*-Transgenic Potato Plants. Plant Foods for Human Nutrition <https://doi.org/10.1007/s11130-023-01102-5>.

Bashiri H, Kahrizi D, Salmanian AH, **Rahnama H**, Azadi P (2023) Control of erucic acid biosynthesis in Camelina (*Camelina sativa*) by antisense technology. Cellular and Molecular Biology, 69(7): 212-217.

Bashiri H, Kahrizi D, Salmanian AH, **Rahnama H**, Azadi P (2023) Bioinformatic analysis of FAE1-A and FAD2-A genes in Camelina sativa. Iranian Journal of Genetics and Plant Breeding, 12(2): 49-59.

Dekami A, Sanjarian F, Chaichi M, Hosseini B, **Rahnama H** (2023) Effect of Plant Growth Regulators and Light on Callus Induction, Antioxidant Enzyme Response and Total Phenol in *Nigella arvensis* L. Journal of Medicinal plants and Byproduct, 12 (1), 47-56

Neycee MA, Mohsenpour M, **Rahnama H** (2022) Investigating the increase of oleic acid in safflower plant by changes in Fatty Acid Desaturase-2 gene after using CRISPR-Cas9 method. Crop Biotech. 12: 69-83 DOI: 10.30473/cb.2023.66349.1895

Ghanbari Jahromi M, **Rahnama H**, Mousavi A, Safarnejad MR (2022) Comparative evaluation of resistance to potato virus Y (PVY) in three different RNAi-based transgenic potato plants. Transgenic Research, 31: 313–323.

Hosseinzadeh-Bandbafha H, Nizami AS, Kalogirou SA, Gupta VK, Park YK, Fallahi A, Sulaiman A, Ranjbari M, **Rahnama H**, Aghbashlo M, Peng W, Tabatabaei M (2022) Environmental life cycle assessment of biodiesel production from waste cooking oil: A systematic review. Renewable and Sustainable Energy Reviews 161.112411. <https://doi.org/10.1016/j.rser.2022.112411>.

Chenarani N, Emamjomeh A, **Rahnama H**, Zamani K, Solouki M (2022) Characterization of sucrose binding protein as a seed-specific promoter in transgenic tobacco *Nicotiana tabacum* L. PLoS ONE 17(6): e0268036. <https://doi.org/10.1371/journal.pone.0268036>.

Salehian H, **Rahnama H**, Dezhsetan S, Babaei S (2021) Constitutive Expression of *cry3A* Gene in Transgenic Potato Plants for Resistance to Colorado Potato Beetle (CPB). Potato Research, 64: 667-679. <https://doi.org/10.1007/s11540-021-09500-5>.

Salehian H, **Rahnama H**, Dezhsetan S, Babaei S (2021) Constitutive expression of a synthetic *cry1ab* gene confers resistance to potato tuber moth (*Phthorimaea operculella* Zeller) larva. Crop Breeding and Applied Biotechnology, 21(1): e31292119.

Rahnama H, Ghanbari M, Mousavi A, Soheilvand S, Pourrahim R (2021) Induction of Resistance to Potato Virus Y (PVY) Using Hairpin Construct including of Coat Protein. Genetic Engineering and Biosafety, 9: 1-10. (in Persian)

Bayanatia M, Ahmadinejad E, Kazemi F, **Rahnama H**, Mohamadnia Z and Razavid K (2021) Nanosilver/hydrogel: Synthesis and application in delaying senescence of cut flower. South African Journal of Botany, 138: 415-423.

Pourianezhad F, **Rahnama H**, Mousavi A, Khosrowshahli M and Mafakheri S (2019) Parthenolide production in cell suspension culture of feverfew. *Bioresources and Bioprocessing*, 6:23. <https://doi.org/10.1186/s40643-019-0258-4>

Pourianezhad F, **Rahnama H**, Mousavi A, Khosrowshahli M and Mafakheri S (2019) Effects of combined elicitors on parthenolide production and expression of parthenolide synthase (*TpPTS*) in *Tanacetum parthenium* hairy root culture. *Plant Biotechnology Reports*, 13: 211-218. <https://doi.org/10.1007/s11816-019-00526-3>

Afshar Shandiz M, **Rahnama H** and Azarnivand H (2019) Rapid assessment of seed promoters in leaves by using LEC2 transcriptional factor. *Genetic Engineering and Biosafety Journal*, 7: 115-123.(in Persian)

Afshar Shandiz M, **Rahnama H** and Azarnivand H (2019) Callusgenesis and direct regeneration optimization for root, cotyledon and hypocotyle explants of safflower. *Journal of Applied Biology*, 32: 129-140. (in Persian)

Sattarzadeh A, **Rahnama H**, Nikmard M, Ghareyazie B (2018) Detection of recombinant DNA fragments and Cry1Ab protein in digesta and tissues of rats fed with transgenic potato. *Journal of Animal and Feed Sciences*, 27: 163–172. DOI: 10.22358/jafs/86717/2018

Rahnama H, Moradi AB, Mirrokni SH, Moradi F, Shams MR, Fotokian MH (2018) Comparative compositional analysis of transgenic potato resistant to potato tuber moth (PTM) and its non-transformed counterpart. *Transgenic Research*, 27:301-313. DOI: 10.1007/s11248-018-0075-0.

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Rahnama H, Ahmadi N, Arashkia A, Safarnejad MR (2017) Assessment of Different Promoters (CaMV35s, E8, 2A11) in Transient Expression of Hepatitis B Surface Antigene (HBsAg) in Tomato Plant. *Iranian Journal of Plant Biology*, 31: 73-86. (In Persian)

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Rahnama H, Sattarzadeh A, Kazemi F, Ahmadi N, Sanjarian F, Zand Z (2016) Dataset of plasmid DNA extraction using different magnetic nanoparticles (MNPs). *Data in Brief* 9: 807–811.

Rahnama H, Sattarzadeh A, Kazemi F, Ahmadi N, Sanjarian F, Zand Z (2016) Comparative study of three magnetic nano-particles (FeSO₄, FeSO₄/SiO₂, FeSO₄/SiO₂/TiO₂) in plasmid DNA extraction. *Analytical Biochemistry*, 513: 68-76.

Moradi B, Delfan B, Hashemi P, Mousavi A, **Rahnama H** (2015) The effect of different strains of *Agrobacterium rhizogenese* and types of explants in creation of hairy roots for *Hyoscyamus reticulatus*. *International Journal of Scientific Studies*.1: 2348-3008.

Moradi B, Delfan B, Hashemi P, Mousavi A, **Rahnama H** (2015) Matrix solid phase dispersion extraction for Tropane alkaloid detection in cultured and collected *Hyoscyamus reticulatus* plants. International Journal of Advanced Research, 3: 78-82

Ghanbari Jahromi M., **Rahnama H.**, Mousavi A., Safarnejad M.R., Kalatejari S., Soheilivand S. (2015) Transient expression of coding and non-coding regions of PVY confer resistance to virus infection. Progress in Biological Sciences, 5: 19-31.

Rahnama H and Vakilian H (2014) Cloning and functional analysis of inducible promoter Rd29A in transgenic tobacco plants. Journal of Cellular and Molecular Researches (Iranian J. Biology). 26: 480-490. (In Persian)

Sattarzadeh A, **Rahnama H**, Nikmard M, Ghareyazie B, Khosroshahli M (2014) Detection of *nptII* gene and *nos* promoter in digestive system and tissues of rat fed genetically modified potato. Genetic Engineering and Biosafety Journal, 2: 37-48. (In Persian)

Shams MR, **Rahnama H**, Bihamta MR and Khodarahmi M (2013) Transformation of *Zea mays* using DREB1A gene for abiotic stresses tolerance. Iranian Journal of Agronomy and Plant Breeding, 9: 75-89. (In Persian)

Ghanbari JM, **Rahnama H** and Mousavi A (2013) Biosafety issues of transgenic plant resistant to Viruses. Biosafety Journal, 5: 9-30. (In Persian)

Sattarzadeh A, **Rahnama H**, Ghareyazie B and Sattarzadeh R (2013) The fate of recombinant DNA and proteins in gastrointestinal of mammals. Biosafety Journal, 4: 9-29. (In Persian)

Ahmadi N and **Rahnama H** (2013) The cloning of tomato 2A11 promoter and its efficiency in transient expression system. Crop. Biotechnology, 4: 77-85. (In Persian)

Razi Z and **Rahnama H** (2013) The effects of heat shock and phytohormons on Agrobacterium mediated transformation of maize (*Zea mays* L.). Modern Genetic Journal, 8: 67-78. (In Persian)

Razi Z and **Rahnama H** (2012) Factor affecting delivery *DREB1A* gene in maize B73 split-seeds via biolistic system. Iranian Journal of Genetics and Plant Breeding, 1: 36-43.

Ahmadi N, **Rahnama H** and Kazemitabar SK (2012) Cloning of the potato pat1 promoter and survey the transient expression using Agro-infiltration system. Journal of Crop Breeding. 9: 93-107. (In Persian)

Rahnama H, Razi Z, Najafi Dadgar M, and Hasanloo T (2012) Enhanced production of flavonolignans in hairy root cultures of *Silybum marianum* by over-expression of *chalcone synthase* gene. Journal of Plant Biochemistry and Biotechnology, 22: 138-143.

Rahnama H, Takavar S (2012) Plant regeneration through callus initiation from mature embryos of maize (*Zea mays* L.). Journal of Plant Biology, 13: 71- 84. (In Persian)

Rahnama H (2012) Ethics in plant edible vaccines. Iranian Journal of Medical Ethics and History of Medicine, 6: 50-63. (In Persian)

Motallebi R, Siasar B, **Rahnama H** and Shojaei TR (2012) Transfer of manitol-1-phosphate dehydrogenase (*mtlD*) gene into canola (*Brassica napus* L.) to improve salinity stress. African Journal of Biotechnology, 11: 8414-8416.

Ahmadi N, **Rahnama H** and Kazemitabar SK (2012) Cloning of tomato *E8* promoter and its analysis in transient assays using Agro-infiltration system. Journal of Agricultural Biotechnology. 3: 1-14. (In Persian)

Rahnama H, Montaser Kohsari S, Naderi H and Fahimi H (2011) High frequency plant regeneration from leaf, internode and microtuber explants of potato (*Solanum tuberosum* L.). Iranian Journal of Biology, 25: 120-129.

Rahnama H and Sanjarian F (2011) Bioethics in Genetic Engineering. Ethics in Science and Technology. 3: 68- 76. (In Persian)

Motallebi R and **Rahnama H** (2011) Investigation of seed germination in the transgenic canola (*Brassica napus*) under salt stress. International Research Journal of Applied and Basic Sciences, 2: 339-346.

Rahnama H, Vakilian H, Fahimi H and Ghreyazie B (2011) Enhanced salt stress tolerance in transgenic potato plants (*Solanum tuberosum* L.) expressing a bacterial *mtlD* gene. Acta Physiologia Plantarum. 33: 1521-1532.

Soltani Pool MM, Mohammadi A, **Rahnama H** and Abbaszadeh B (2011) Callus genesis investigation in lemon balm (*Melissa officinalis*). Journal of Agronomy and Plant Breeding. 7: 45-54. (In Persian)

Nikkhoo H, Mohammadi A, **Rahnama H** and Abbaszadeh B (2011) *In vitro* culture optimization of *Capsicum annuum* L. Journal of Agronomy and Plant Breeding. 7: 1-11. (In Persian)

Ahmadian Chashmi N, Sharifi M, Karimi F and **Rahnama H** (2010) Comparative study of tropane alkaloids production in hairy roots and plantlet cultures of *Atropa belladonna* L. by salicylic acid treatments. Iranian Journal of Plant Biology. 1: 63-76.

Irannezhad A, Vatanpour Azghandi A, **Rahnama H**, Jaliani N and Bozorgipour R (2010) Improvement of Rooting and Acclimatization of Tissue Cultured Plantlets of Olive (*Olea europaea* L. cv. Zard) by *Agrobacterium rhizogenes* and *Trichoderma harzianum*. Seed and Plant Production Journal. 26: 85-94. (In Persian)

Ahmadian Chashmi N, Sharifi M, Karimi F and **Rahnama H** (2010) Differential Production of Tropane Alkaloids in Hairy Roots and *in vitro* Cultured Two Accessions of *Atropa belladonna* L. under Nitrate Treatments. Zeitschrift für aturforschung C. 65 c, 373 – 379.

Takavar S, **Rahnama H**, Rahimian H and Kazemitabar K (2010) *Agrobacterium* mediated transformation of Maize (*Zea mays* L.). Journal of Sciences. 21: 21-29.

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Conferences and congresses

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Rahnama H, Salehian H, Babaei S (2021) Genetic engineering of potatoes for the production of transgenic plants resistant to the Colorado potato beetle. 17th National Congress and 3rd International Congress of Agricultural Sciences and Plant Breeding of Iran, 25-27 Jan 2021. Kerman, Iran.

Dashchi S, **Rahnama H**, Cheghamirza K, Zamani K (2021) Effect of TDZ, KIN and NAA hormones on callus induction and seedling regeneration for commercial safflower (*Carthamus tinctorius* L.) cultivars. 17th National Congress and 3rd International Congress of Agricultural Sciences and Plant Breeding of Iran, 25-27 Jan 2021. Kerman, Iran.

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Moradi AB, **Rahnama H**, Moradi F and Fotokian MH (2015) Evaluation of fatty acid content in transgenic potatoes resistant to potato tuber moth. 4th Iranian Conference of Plant Physiology, 2-3 Sep. Tehran, Iran.

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Helali M, **Rahnama H**, Golkari S and Ahmadi N (2015) Genetic transformation of tomato plant using 2A11 constructs for production of hepatitis B vaccine. 1st International and 9th National Biotechnology Congress of IRAN. 24-26 May, Tehran, Iran.

Mirrokn SH, **Rahnama H** and Zeynali H (2014) Qualitative and quantitative assessments of Cry1Ab protein in transgenic potato resistance to potato moth. 1st International & 13th Iranian Genetic Congress. 24-26 may. Tehran, Iran.

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