

Curriculum Vitae

Hani AL-AHMAD, Ph.D.

Assistant Professor
Department of Biology & Biotechnology
An-Najah National University
Nablus, Palestine
Phones: +972-9-234-4261 internal 2342office;
+972-9-234-3235 home, Fax: +972-9-234-5982
hani.alahmad@gmail.com
alahmad@najah.edu

Education:

- 1999-2004** **Ph.D.** Feinberg Graduate School of The Weizmann Institute of Science, Rehovot, Israel. Department of Plant Sciences. Thesis: *Tandem constructs mitigate transgene introgression and establishment in volunteers and in related wild or weedy species: a molecular ecology study.*
Supervisor: Prof. Jonathan Gressel.
Issued Date: February, 1st 2005.
Study language: English.
Courses average (14.5 credits): 93.2%
- 1993-1996** **MSc.** An-Najah National University, Nablus, West Bank, Department of Biological Sciences. Degree, July 1996, with highest honors (88.1%). Thesis topic: *The epidemiology of Pseudomonas aeruginosa nosocomial infections in Rafedia Hospital, Nablus, West Bank.*
- 1993** **B.Sc.** An-Najah National University, Department of Biological Sciences. Degree, June 1993, with honors (86.8%).

Scientific Interests:

Plant Biotechnology: including genetic engineering, molecular genetics, tissue culture, and bioenergy.

Research & Teaching Experience:

2005-Present **Assistant Professor**, Department of Biology & Biotechnology, An-Najah National University, Nablus, Palestine.

Lecturer of the following courses:

- Recombinant DNA: principles & applications;
- Plant cell & tissue culture;
- Ecology;
- General biology.

- Summer 2009** **Visiting Scientist**, Plant Biotechnology, Department of Plant Sciences University of Tennessee, Tennessee, Knoxville, USA- Plant Molecular Genetics Lab of Prof. C. Neal Stewart Jr.
- Project:** **Protoplast isolation from embryogenic cell suspension of switchgrass, *Panicum virgatum* L.**
- Summer 2008** **Visiting Scientist**, Plant Biotechnology, Department of Plant Sciences University of Tennessee, Tennessee, Knoxville, USA- Plant Molecular Genetics Lab of Prof. C. Neal Stewart Jr.
- Project:** **Differential gene expression in soybean infected with soybean cyst nematode. A microarray and real-time qPCR genomic approach.**
- Summer 2007** **Visiting Scientist**, Plant Biotechnology, Department of Plant Sciences University of Tennessee, Tennessee, Knoxville, USA- Plant Molecular Genetics Lab of Prof. C. Neal Stewart Jr.
- Project:** **Protoplast isolation and transient gene expression in switchgrass *Panicum virgatum* L.**
- Feb.-Aug.2006** **Post Doctoral Research Associate**, Plant Biotechnology, Department of Plant Sciences – University of Tennessee, Tennessee, Knoxville, USA – Plant Molecular Genetics Lab of Prof. C. Neal Stewart Jr.
- Project:** **Plant Biotechnology & Bioenergy: Bioethanol & biodiesel production from plant biomass.**
- Cytometric analysis for determining the genome sizes of several plant species including *Copaifera officinalis* L., and switchgrass (*Panicum virgatum* L. Alamo).
 - Searching for novel traits/genes to improve feedstock characteristics in switchgrass for better bioethanol production.
- 1st Nov. 2004-17th Aug. 2005** **Post Doctoral Fellowship**, The Weizmann Institute of Science, Rehovot, Israel. Department of Plant Sciences, Plant Biotechnology lab of Prof. Jonathan Gressel.
- Project:** **Biocontrol agents for weeds:** Development of safe, highly virulent, weed-specific fungal biocontrol agents (mycoherbicides) for control of noxious and invasive weeds.
- Identification of hypervirulence genes for enhancement of mycoherbicides;
 - Construction of universal DNA cassettes for cloning and overexpression of hypervirulence genes;
- 1996-1998** An-Najah National University, Faculty of Agriculture, and The Community College. Part-time instructor of microbiology and genetics.

- 1995-1999** Ministry of Education, Directorate of Education, Nablus, Palestinian Authority. Middle and high school teacher of biology and science.
- 1993-1995** An-Najah National University, Department of Biological Sciences. Teaching assistant in several biology laboratory courses.

Awards and Fellowships:

- 2002** Schwarz Memorial Graduate Scholarship Fund. Feinberg Graduate School, Weizmann Institute of Science. Special award to outstanding graduate students.
- 2002** Travel fellowship. The 10th International Congress of Plant Tissue Culture & Biotechnology. Orlando, Florida-USA.
- 2001-2002** Israel and Sophie Safer Fund Scholarship for the PhD project.

Expertise

- Isolation, identification, and characterization of various gram +ve and gram –ve bacterial spp. Qualitative analyses by pyocin and antibiogram typing, and characterization of bacterial virulence factors.
- Design, assembly and verification of genetically engineered DNA constructs.
- Transformation of genetically engineered constructs into *Nicotiana tabacum*, *Brassica napus*, and *Arabidopsis thaliana* species via *Agrobacterium*.
- Tissue culture techniques for regeneration of transgenic plants, and various related assays.
- Standard molecular tools & techniques:
 - Extraction of genomic DNA, total RNA, mRNA, total soluble proteins.
 - PCR, RT-PCR, TAIL-PCR, Southern hybridization analysis.
 - Bioinformatics: using genomic and proteomic programs (e.g., GCG's) and online available databases for: DNA sequencing, database similarity searches, pairwise comparison, multiple sequence alignment, protein Analysis, etc.
- Agronomic and breeding techniques, artificial cross pollination of *Brassica napus/B. campestris*, and *Nicotiana tabacum/N. sylvestris* species, identification and genetic assay of crop/weed hybrids and backcross progeny.
- Studying plant physiological responses to various chemical growth regulators (PGRs) e.g., GA and paclobutrazol.
- Herbicide enzymatic-resistance assays (acetohydroxy acid synthase; AHAS) for field screening of herbicide-resistant plants.
- Gene flow risk assessments: Ecological competition experiments under greenhouse and bio-containment screen-house environments.
- Statistical analysis of data using software programs e.g., JMP[®] program (SAS Institute 2000).
- Estimation of the genome size of many plant species with Flow Cytometric analysis.
- Protoplast isolation from plant shoot and root tissues, and from cell suspension cultures as well.
- Transient gene expression in switchgrass protoplasts.
- Microarray analysis of differential gene expression.

Selected advanced courses

MSc courses: An-Najah National University, Department of Biological Sciences

- Microbial ecology.
- Advanced biochemistry.
- Advanced mycology.
- Advanced biostatistics.

Ph.D. courses: Weizmann Institute of Science, Department of Plant Sciences

- Developmental genetics.
- Computing for the life sciences.
- Molecular biology of membrane transport proteins.
- Molecular biology of glycoproteins and glycolipids.
- Molecular cell biology.
- Genetics of apoptosis.

Professional Service

Manuscript reviewer: (journals reviewed, and the year):

- Planta, 2006
- Plant Science, 2007

Graduate thesis reviewer:

- Master thesis, 2005. Faculty of graduate studies, An-Najah National University, Nablus, Palestine.

List of publications

Patents

US 7,612,255 B2: Gressel, J. and Al-Ahmad H. Transgenic plants for mitigating introgression of genetically engineered genetic traits. United States Patent. Issued **Nov. 3, 2009** (<http://www.uspto.gov/>).

Peer-Reviewed Publications

Rose, C.W., R.J. Millwood, H.S. Moon, M.R. Rao, M.D. Halfhill, P.L. Raymer, S.I. Warwick, H. Al-Ahmad, J. Gressel, and C.N. Stewart, Jr. **2009**. Genetic load and transgenic mitigating genes in transgenic *Brassica rapa* (field mustard) × *Brassica napus* (oilseed rape) hybrid populations. *BMC Biotechnology* 9:93. (14 pages). <http://www.biomedcentral.com/1472-6750/9/93/>

Feng Chen F*, Al-Ahmad H.*, Joyce B., Zhao n., Köllner T.G, Degenhardt J., and Stewart C N Jr. **2009**. Within-plant distribution and emission of sesquiterpenes from *Copaifera officinalis*. *Plant Physiology and Biochemistry*. 47, 1017-1023. (***These authors contributed equally to this work**).

- Meir S., Larroche C., Al-Ahmad H., and Gressel, J. **2009**. Fungal transformation of *Colletotrichum coccodes* with bacterial *oahA* gene to suppress defences of *Abutilon theophrasti*. ***Crop Protection*** 28, 749-755.
- Meir S., Amsellem Z., Al-Ahmad H., Einat Safran E., and Gressel, J. **2009**. Transforming a *NEP1* toxin gene into two *Fusarium* spp. to enhance mycoherbicide activity on *Orobanche* – failure and success. ***Pest Management Science***. 65, 588-595.
- Yuan, J.S., K.H. Tiller, H. Al-Ahmad, N.R. Stewart, C.N. Stewart, Jr. **2008**. Plants to power: bioenergy to fuel the future. ***Trends in Plant Science*** 13, 421-429.
- Mazarei M., Al-Ahmad H., Rudis M R., and Stewart, C N Jr., **2008**. Protoplast isolation and transient gene expression in switchgrass, *Panicum virgatum* L. ***Biotechnology Journal*** 3, 354-359.
- Al-Ahmad H., Dwyer J., Moloney M., and Gressel J. **2006**. Mitigation of establishment of *Brassica napus* transgenes in volunteers using a tandem construct containing a selectively unfit gene. ***Plant Biotechnology Journal*** 4, 7-21.
- Al-Ahmad H., and Gressel J. **2006**. Mitigation using a tandem construct containing a selectively unfit gene precludes establishment of *Brassica napus* transgenes in hybrids and backcrosses with weedy *Brassica rapa*. ***Plant Biotechnology Journal*** 4, 23-33.
- Al-Ahmad H., Galili S., and Gressel J. **2006**. Infertile interspecific sexual hybrids between transgenically mitigated *Nicotiana tabacum* and wild type *Nicotiana sylvestris* did not backcross to *N. sylvestris*. ***Plant Science*** 170 (5), 953-961.
- Al-Ahmad H., Galili S., and Gressel J. **2005**. Poor competitive fitness of transgenically mitigated tobacco in competition with the wild type in a replacement series. ***Planta*** 222, 372-385.
- Al-Ahmad H., and Gressel J. **2005**. Transgene containment using cytokinin-reversible male sterility in constitutive, gibberellic acid-insensitive (Δgai) transgenic tobacco. ***Journal of Plant Growth Regulation*** 24, 19-27. (With accompanying journal cover).
- Al-Ahmad H., Galili S., and Gressel J. **2004**. Tandem constructs to mitigate transgene persistence: tobacco as a model. ***Molecular Ecology*** 13 (3), 697-710.
- Gressel J., and Al-Ahmad H. **2005**. Assessing and managing biological risks of plants used for bioremediation, including risks of transgene flow. ***Zeitschrift für Naturforschung*** 60c, 154-165.
- Gressel J., and Al-Ahmad H. **2004**. Molecular solutions for increasing biosafety of transgenic plants. GMOs in Integrated Production. ***IOBC/wprs Bulletin*** 27 (3), 7-13.

Book Chapters/Proceedings Contributions/International Scientific News Reports

- Joyce, B., H. Al-Ahmad, F. Chen., C. Basu., and C. N. Stewart, Jr., **2009**. Diesel tree: Copaifera. In: Chittaranjan Kole, Chandrasekhar P. Joshi and David R. Shonnard (Eds). Bioenergy Crops: Volume 3, Emerging Bioenergy Crops. Springer Verlag, Heidelberg. (In revision).
- Meir S., Herschkovitz Y., Larroche C., Al-Ahmad H., Amsellem Z., and Gressel J. **2008**. Unholy trinity of crop, attached parasitic weed, and transgenic biocontrol agents. In: Biology of Plant-Microbe Interactions CD, Volume 6: XIII International Congress on Molecular Plant-Microbe Interactions, 2007. *International Society for Molecular Plant-Microbe Interactions*. Lorito M., Woo S., and Scala F. eds. (Available on CD: PC and Mac Compatible; ISBN 978-0-9654625-5-6; Item No. 62556; <http://www.ismpminet.org/bookstore/VOL6.ASP>).
- Gressel J., Meir S., Herschkovitz Y., Al-Ahmad H., Babalola O. O., and Amsellem Z. **2007**. Transgenic biocontrol agents to overcome evolutionary barriers. Pages 313-323 in: *Integrating new technologies for Striga control - towards ending the witch-hunt*. Ejeta G., and Gressel J. eds. World Scientific, Singapore.
- Gressel J., Meir S., Herschkovitz Y., Al-Ahmad H., Greenspoon I., Olubukola B., and Amsellem Z. **2007**. Approaches to and successes in developing transgenically enhanced mycoherbicides. *Novel Biotechnologies for Biocontrol Agent Enhancement and Management*. Springer, pp. 297-305.
- Rotteveel T., Al-Ahmad H. and Gressel J. **2006**. Assessing and containing or mitigating biosafety risks of transgenic and non-transgenic phytoremediating plants. In M. Macková, D.N. Dowling and T. Macek, eds. *Phytoremediation and Rhizoremediation, Focus on Biotechnology*, Vol. 6, Springer, Dordrecht, pp. 259-284.
- Gressel J., and Al-Ahmad H. **2006**. Transgene flow control discussed. *CropBiotech update*. February 10th. Global Knowledge Center on Crop Biotechnology, International Service for the Acquisition of Agri-biotech Applications SEAsiaCenter (ISAAA), USA.
- Gressel J., and Al-Ahmad H. **2006**. Mitigating transgene flow from crops. Risk assessment news. *Information Systems for Biotechnology (ISB) news report*. Virginia Tech USA, February, pp. 8-11.
- Gressel J., and Al-Ahmad H. **2005**. Molecular containment and mitigation of genes within crops, prevention of gene establishment in volunteer offspring and feral strains. In Gressel J., ed. *Crop Fertility and Volunteerism*. CRC Press, Boca-Raton, pp. 371-388.
- Gressel J., and Al-Ahmad H. **2004**. Mitigating transgene flow – successes. Proceedings 8th *International Symposium on the Biosafety of Genetically Modified Organisms*. Montpellier: International Society for Biosafety Research. pp. 162-166 (available online at: http://www.isbr.info/document/proceedings_montpellier2004.pdf).
- Gressel J., and Al-Ahmad H. **2003**. Containment and mitigation of transgene flow from crops. BCPC *International Congress-Crop Science and Technology*. pp 1175-1180.

Abstracts of Invited Lectures ^L and Posters ^P

Abstracts

- ^PJoyce, B.L, Feng C., Al-Ahmad H., Zhao N., Köllner T., Degenhardt J., and Stewart, Jr., C.N. **2009**. Introducing the ‘diesel trees’ (*Copaifera spp.*) as an alternative source of novel chemicals for biofuel. UT-China conference, Knoxville, TN, USA, November -
- ^PMazarei, M., Al-Ahmad, H., Rudis, M.R., Joyce, B.L., and Stewart, Jr., C.N. Switchgrass cell suspension cultures: establishment, characterization, and application. **2009**. UT-China conference, Knoxville, TN, USA, November -
- ^PMazarei, M., H. Al-Ahmad, W. Liu, P.R. Arelli, V.R. Pantalone, C. N. Stewart, Jr. **2009**. Gene expression profiling of a resistant and a susceptible soybean challenged with soybean cyst nematode, World Soybean Research Conference VIII, Beijing, China, August 10th-15th.
- ^P Stewart, Jr., C.N., Rose C. W., R. J. Millwood, H. S. Moon, M. R. Rao, M. D. Halfhill, P. L. Raymer, S. I. Warwick, H. Al-Ahmad, J. Gressel. **2009**. Genetic load and competition effects resulting from transgene flow from canola to field mustard: event specific introgression and transgenic mitigation. Weed Science Society of America Annual Meeting Orlando, Florida, USA, February 2009.
- ^PMazarei, M., Al-Ahmad, H., Rudis, M.R., Stewart, Jr., C.N. **2008**. Protoplast isolation and transient gene expression in switchgrass, *Panicum virgatum* L. Bioenergy Science Center Retreat, Chattanooga, TN, USA, December 1st-3rd.
- ^LStewart, C.N., Jr., M. Mazarei, D.A. Mann, M.R. Rudis, J. Burris, L.L.G. Abercrombie, H. Al-Ahmad. **2008**. Switchgrass biotechnology: tools for switchgrass improvement. China-US Workshop: Bioenergy Consequences for Global Environmental Change. Beijing, China, October 15th-18th. Program book p. 28.
- ^PMazarei, M., Al-Ahmad, H., Rudis, M.R., Stewart, Jr., C.N. **2008**. Switchgrass protoplasts: isolation and transient gene expression. Bioenergy Science Center Annual Review, ORNL. USA. October 14th.
- ^PMazarei, M, H Al-Ahmad, MR Rudis, CN Stewart, Jr. **2008**. Protoplast isolation and transient gene expression in switchgrass, *Panicum virgatum* L. Abstract Book, Plants and People--Mutual Dependence in the 21st Century: PhD Symposium of the Zürich-Basel Plant Science Center-- ETH Zurich June 6th ; pp. 33-34.
- ^PAl-Ahmad H., Kania S A., Trent D J., and Stewart C N Jr. **2008**. Determination of bioenergy plant nuclear DNA content by flow cytometry. Plant and Animal Genomes XVI Abstracts P902, Town & Country Convention Center, San Diego, California, USA. January 12th-16th.
- ^PAl-Ahmad, H, Kania, S.A., Trent, D.J. , Stewart Jr., C. N. **2007**. Determination of plant nuclear DNA content by flow cytometry. Abstract 2723. Plant Biology and Botany Joint Congress 2007, Chicago. USA, Julye 7th -11th.

- ^LAl-Ahmad H. **2007**. Genetically modified crops: engineering and commercialization. Dept. of Biology & Biotechnology. An-Najah National University, Nablus, Palestine. April 15th.
- ^LGressel J., Meir S., Herschkovitz Y., Al-Ahmad H., Olubukola B., and Amsellem Z. **2006**. Transgenic biocontrol agents to overcome evolutionary barriers. Integrating new technologies for *Striga* control: towards ending the witch-hunt, Addis Ababa, Ethiopia. November 5th-11th.
- ^PAl-Ahmad H., and Gressel J. **2006**. Transgenic mitigation technology for reducing risks of transgene flow. In Vitro Biology Meeting, Minneapolis, Minnesota, USA. June 3rd-7th.
- ^LAl-Ahmad H. **2006**. Mitigating risks of gene flow from transgenic crops into related weeds. Plant Sciences Department, University of Tennessee, Knoxville, TN, USA. March 27th.
- ^LMeir S., Amsellem Z., Al-Ahmad H., Babalola O., Herschkovitz Y., and Gressel J. **2005**. Biotechnology and the Management of Weedy *Orobanchace*. COST Action 849, Parasitic Plant Management in Sustainable Agriculture. WG1+4 Workshop on Means for Limiting *Orobanche* Propagation and Dispersal in Agricultural Fields. Neve-Yaar Research center, Israel. December 4th-6th.
- ^LGressel J., Al-Ahmad H., and Weissmann S. **2005**. Containing and mitigating transgene flow. BioThailand, Challenges in the 21st Century. Queen Sirikit National Convention Center, Bangkok, Thailand. November 2nd-5th.
- ^LAmsellem Z., Meir S., Babalola O., Al-Ahmad H., Safran E., and Gressel J. **2005**. Transforming *NEP1* toxin gene and other genes into two *Fusarium* spp. to enhance mycoherbicidal activity against *Orobanche* – failure, success and progress. Joint Working Groups and MC meeting of COST Action 849, Biology, Control and Management. Reading University, UK. September 15th –17th.
- ^LGressel J., Al-Ahmad H., Meir S., Babalola O., Safran E., Amsellem Z., Cohen B. **2005**. Transgenic enhancement of biocontrol agents. American Phytopathology Society Meeting, Austin, USA. 31th July-2nd August.
- ^LAl-Ahmad H., and Gressel J. **2005**. Transgenic mitigation precludes the establishment of *Brassica napus* transgenes in volunteer and weedy *B. rapa*. Meeting of the Weed Science Society of America. Honolulu, Hawaii, U.S.A.
- ^LAl-Ahmad H. **2005**. Hypervirulence genes for efficient Fungal Biocontrol of noxious and parasitic weeds. 2EBCAs Annual Meeting: “Enhancement and Exploitation of Soil Biocontrol Agents for Bio-Constraint Management in Crops”. 6th EU Framework Programme. Priority 5 - Food Quality and Safety. January 11 - 15. Magic Nirvana Club - Dead Sea – Israel.
- ^LGressel J., and Al-Ahmad H. **2004**. Mitigating transgene flow – successes. 8th International Symposium on the Biosafety of Genetically Modified Organisms. September 26 - 30 Montpellier, France.

- ^LGressel J., and Al-Ahmad H. **2004**. Assessing and managing biological risks of plants used for bioremediation, including risks of transgene flow. OECD-Workshop: Phytoremediation: Environmental and Molecular Biological Aspects. September 11. Matrahaza, Hungary.
- ^LGressel J., and Al-Ahmad H. **2004**. Molecular solutions for increasing biosafety of transgenic plants. GMOs in Integrated Production. IOBC/wprs, Prague, Czech.
- ^LGressel J., Al-Ahmad H., and Amsellem Z. **2003**. Mitigating transgene flow from crops to weeds; from biocontrol agents to crop pathogens. ESF-Workshop: New Science for Increasing Biosafety of GM Plants. March 8-12. Braunschweig, Germany.
- ^LGressel J., and Al-Ahmad H. **2003**. Containment and mitigation of transgene flow from crops. BCPC International Congress-Crop Science and Technology. Glasgow, UK.
- ^LAl-Ahmad H., and Gressel J. **2003**. Mitigation of transgene flow from crops to related weeds; tobacco as a model. Meeting of the Weed Science Society of America, volume 43. Jacksonville, Florida-U.S.A.
- ^{L+P}Al-Ahmad H., and Gressel J. **2002**. Mitigation of transgene flow from crops to related weeds; tobacco as a model. The 7th International Symposium on the Biosafety of Genetically Modified Organisms. October 10-15. Beijing, China.
- ^PAl-Ahmad H., and Gressel J. **2002**. Mitigation of transgene flow from crops to related weeds. The 10th International Congress of Plant Tissue Culture & Biotechnology. June 23-28. Orlando, Florida-U.S.A.
- ^PAdwan K., Abu-Hasan N., and Al-Ahmad H. **1998**. The epidemiology of *Pseudomonas aeruginosa* infections in a neonatal unit. The second scientific day, March 15. Al-Quds University, Jerusalem, Faculty of Medicine.

Referees:

C. Neal Stewart, Jr. Professor and Racheff Chair of Excellence in Plant Molecular Genetics.

Department of Plant Sciences, University of Tennessee, Knoxville, TN 37996-4561 USA. Tel: 865 974 7324, Fax: (865) 946-1989. E-mail: nealstewart@utk.edu

Jonathan Gressel (Prof.), Plant Sciences, Weizmann Institute of Science, Rehovot, Israel 76100. Tel. +972-8-934-3481 (office); +972-8-934-2447 (lab), Fax: +972-8-934-4181. E-mail: Jonathan.Gressel@weizmann.ac.il

Maurice Moloney (Prof.) Chief Scientific Officer and scientific founder, SemBioSys Genetics INC. Calgary, AB T1Y7L3, Canada. Tel: (403) 250-5424, Fax (403) 250-3886. E-mail: moloneym@sembiosys.ca. Chief of Harpenden's Rothamsted Research Centre. UK. E-mail: maurice.moloney@bbsrc.ac.uk.

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