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Education History

- Ph.D. (A: Excellent): Horticulture and Plant Protection/Pathology, Faculty of Agriculture, University of Jordan, 2002, Jordan.
Ph.D. thesis: Occurrence and partial characterization of *Prunus necrotic ringspot ilarvirus* in Jordan.
- M.Sc. (A: Excellent): Plant Protection/Pathology, Faculty of Agriculture, University of Jordan, 1997, Jordan.
M.Sc. thesis: *Faba bean necrotic yellows virus*: virus-vector relationships and effect on plant growth.
- B.Sc. (86.4%: Excellent): Plant Protection, Faculty of Agriculture, University of Jordan, 1994, Jordan.
- Elementary, preparatory and secondary schools, 1978-1990, Jordan.

Area of Specialization

Molecular biology; plant pathology/virology; isolation and characterization of plant pathogens including fungi, bacteria, nematode, phytoplasma, viruses and viroids; study their biology and epidemiology; and developing molecular methodologies for detection of plant pathogens and elimination in their host plants. Green synthesis of nanoparticles using plant extracts and their applications in plant protection.

Work Experience and Qualifications

- Associate professor
University of Jordan, Jordan
17/04/2015 – now
- Visiting Scientist at University of California, Davis, USA
25/09/2017 - 05/09/2018
- Assistant professor
University of Jordan, Jordan
05/09/2011 - 16/04/2015
- Visiting scholar
University of California, Davis, USA
01/06/2013 – 05/09/2013
19/01/2014 - 30/01/2014
01/08/2014 - 19/09/2014

- 22/07/2015 - 05/09/2015
- Lecturer (Full time)
University of Jordan, Jordan
17/04/2011 - 04/09/2011
 - Lecturer (Part time)
German Jordanian University, Jordan
The academic year 2010/2011
 - Research Scientist
Royal Scientific Society
11/11/2007 - 14/04/2011
 - Lecturer (Part time)
University of Jordan, Jordan
The academic year 2009/2010
 - Postdoctoral researcher
University of California, Riverside, USA
01/08/2006 - 15/05/2008
 - Postdoctoral researcher
University of California, Davis, USA
01/09/2005 - 31/07/2006
 - Fulbright Postdoctoral scholar
University of California, Davis, USA
01/09/2004 - 31/08/2005
 - Lecturer (Part time)
University of Jordan, Jordan
The academic year 2003/2004
 - Research assistant
University of Jordan, Jordan
2002 - 30/08/2004
 - Research assistant
University of Jordan, Jordan
1997 - 2001
 - Research assistant
University of Jordan, Jordan
1994 - 1996

Teaching Experience:

Graduate level:

- Biotechnology in Plant Protection, Ph.D. level.
- Fungal Taxonomy, molecular part, Ph.D. level.
- Plant-Pathogen Interactions, M.Sc. level.
- Biotechnology, M.Sc. level.
- Applications in Biotechnology, M.Sc. level.

Undergraduate level:

- Plant Viral Diseases, B.Sc. level.
- Principles of Plant Protection, B.Sc. level.
- Plant Pathology, B.Sc. level.
- Field Training in Plant Protection, B.Sc. level.
- Biotechnology, B.Sc. level.

- Seminar in Plant Protection, B.Sc. level.

Graduate Studies:

Advisor of graduate students for the following projects (starting date)

- Occurrence and Distribution of Okra Leaf Curl Disease (OLCD) in Jordan The University of Jordan (2014)
- The Effect of Silver Nanoparticles on Fusarium Wilt of Tomato (*Fusarium oxysporum* f.sp. *lycopersici*) The University of Jordan (2014)

• **Co-advisor of graduate students for the following projects** (starting date)

- Effectiveness of different seed disinfection treatments on *Tomato brown rugose fruit virus* (ToBRFV) in tomato. Jordan University of Science and Technology (2017)
- Distribution of root lesion nematodes (*Pratylenchus* spp.) on wheat in Jordan. The University of Jordan (2016)
- Occurrence of *Tomato Spotted Wilt Virus* on ornamental plants in Jordan. The University of Jordan (2014)
- Detection and Studying the Genetic Diversity of *Pectobacterium carotovorum* subspecies *carotovorum* (Dye, 1969) isolates, the Causal Agent of Potato Soft Rot in Jordan. The University of Jordan (2014)
- Control of mold growth and aflatoxins formation in peanuts by using chitosin containing potassium sorbate. The University of Jordan (2012)
- Occurrence, incidence and prevalence of yellowing viral disease on cucumber in Jordan. The University of Jordan (2011)

• **Ph.D. and M.Sc. Defense Committees**

- Pathogenicity of a Jordanian isolate of the dagger nematode (*Xiphinema* sp.) on Aleppo pine *Pinus halepensis*; molecular and histological studies. The University of Jordan (August, 2017)
- Biological control of pepper root rot disease using arbuscular mycorrhizal fungi and olive cake. The University of Jordan (January, 2017)
- Mapping a novel early maturity gene in barley (*Hordeum vulgare* L.). The University of Jordan (August, 2016)
- Identification, molecular differentiation and developing of commercial cultivars from wild isolates of king oyster mushroom *Pleurotus eryngii* (DC. FR. Que'l) in Jordan. The University of Jordan (July, 2016)
- Detection of genetically modified event EH92-527-1 in potato tubers imported to Jordan. The University of Jordan (May, 2016)
- Detection of genetically modified maize in imported maize seeds in Jordan. The University of Jordan (May, 2015)
- Isolation and expression analysis of putative oxo-phytodienoic acid reductase gene from barley. Al-Balqa' Applied University (April, 2013)
- Effect of different commercial mycorrhizae products on plant growth and Fusarium root rot of different vegetable crops. The University of Jordan (December, 2012)
- Utilization of an agrodrench inoculation method for *Tomato yellow leaf curl virus*. The University of Jordan (June, 2012)

- Characterization of genetic resistance against Mediterranean cereal cyst nematode (*Heterodera latipons*) in wheat. The University of Jordan (June, 2012)
- A study of chemical components of some medical plants in Syria. Aleppo University (June, 2010)
- Mining for parasporin toxin genes in Jordanian *Bacillus thuringiensis* strains. The University of Jordan (August, 2009)

List of Publications:

1. **Salem, N.**, Odeh, S., Abu Muslem, M. and Tahzima, R. (2020) Occurrence and partial genetic characterisation of *Lettuce big-vein associated virus* and *Mirafiori lettuce big-vein virus* infecting lettuce in Jordan. **Annals of Applied Biology** 2020,1-12. <https://doi.org/10.1111/aab.12595>
2. **Salem, N. M.**, Cao, M. J., Odeh, S., Turina, M. and Tahzima, R. (2020) First Report of Tobacco Mild Green Mosaic Virus and Tomato Brown Rugose Fruit Virus Infecting *Capsicum annuum* in Jordan. **Plant Disease** 104(2), 601.
3. **Salem, N. M.**, Tahzima, R., Odeh, S., Abdeen, A. O., Massart, S., Goedefroit, T. and De Jonghe, K. (2020) First Report of 'Candidatus Phytoplasma solani' Infecting Plum (*Prunus domestica*) in Jordan. **Plant Disease** 104(2), 563.
4. Campbell, A. J., Erickson, A., Pellerin, E., **Salem, N.**, Xiaohan, M., Falk, B. W. and Ferriol, I. (2020) Phylogenetic classification of a group of self-replicating RNAs that are common in co-infections with poleroviruses. **Virus Research** 276, 197831.
5. Al Banna, L. S., **Salem, N. M.**, Jaleel, G. A. and Awwad, A. M. (2020) Green synthesis of sulfur nanoparticles using *Rosmarinus officinalis* leaves extract and nematicidal activity against *Meloidogyne javanica*. **Chemistry International** 6(3), 137-143.
6. **Salem, N. M.**, Tahzima, R., Abdeen, A. O., Bianco, P. A., Massart, S., Goedefroit, T. and De Jonghe, K. (2019) First Report of 'Candidatus Phytoplasma aurantifolia'-related Strains Infecting Potato (*Solanum tuberosum* L.) in Jordan. **Plant Disease** 103(6), 1406.
7. Almomany, A. M., **Salem, N.** and Tahat, M. M. (2019). Effect of Nano Technology in combination with soil solarization to control panama disease of banana in Jordan Valley. **YYU Journal of Agricultural Science** 29, 16-23.
8. Al Banna, L., **Salem, N.**, Ghrair, A. M. and Habash, S. S. (2018) Impact of silicon carbide nanoparticles on hatching and survival of soil nematodes *Caenorhabditis elegans* and *Meloidogyne incognita*. **Applied Ecology and Environmental Research** 16(3), 2651-2662.
9. Abu-Obeid, I., Khlaif, H. and **Salem, N.** (2018) Detection and Identification of Potato Soft Rot *Pectobacterium carotovorum* subsp. *carotovorum* (Dye1969) by PCR Using Different Sets Of Primers. **Jordan Journal of Agricultural Sciences** 14(2), 200-210.
10. Abu-Obeid, I., Khlaif, H. and **Salem, N.** (2018) Comparison of Different Sets of Primers Used in Detection and Identification of Potato Soft Rot

- Pectobacterium carotovorum* subsp. *carotovorum* (DYE1969). **Asian Journal of Research in Crop Science** 1, 1-12.
11. Abu-Obeid, I., Khlaif, H. and **Salem, N.** (2018) Detection and Identification of Potato Soft Rot *Pectobacterium carotovorum* subspecies *carotovorum* by PCR Analysis of 16S rDNA in Jordan. **Agricultural Sciences** 9, 546-556.
 12. Araj, S. E., Kasrawi, M., Alsmirat, N. G., Othman, Y. A., **Salem, N. M.** and Tabieh, M. (2018) Influence of greenhouse shading techniques on pests numbers, leaf-level physiology, fruit yield and quality of cucumber. **Fresenius Environmental Bulletin** 27(8), 5721-5726.
 13. **Salem, N. M.**, Abedalaziz, F. M. and Awwad, A. M. (2018) Nanoparticles and antifungal activity of iron sulfide synthesized by green route using *Uncaria tomentosa* leaves extract. **Global Advanced Research Journal of Agricultural Science** 7, 176-182.
 14. Abu-Obeid, I., Khlaif, H. and **Salem, N.** (2017) Detection and identification of bacterial soft rot of potato *Pectobacterium carotovorum* subsp. *carotovorum* using specific PCR primers in Jordan. **African Journal of Agricultural Research** 12, 2910-2918.
 15. Abu Irmaileh, B. E., **Salem, N. M.**, Al Aboudi, A. M. F., Abu Zarqa, M. H. and Abdeen, A. O. (2017) Antifungal Activity of the Stinkwort (*Inula graveolens*) Extracts. **Journal of Plant Pathology and Microbiology** 8, 417. doi: 10.4172/2157-7471.1000417
 16. **Salem, N. M.**, Albanna, L. S. and Awwad, A. M. (2017) Nano-structured zinc sulfide to enhance *Cucumis sativus* (Cucumber) plant growth. **ARPN Journal of Agricultural and Biological Science** 12(5), 167-172.
 17. Lafi, F. F., AlBladi, M. L., **Salem, N. M.**, AlBanna, L., Alam, I., Bajic, V. B., Hirt, H. and Saad, M. M. (2017) Draft genome sequence of the plant growth-promoting *Pseudomonas punonensis* strain D1- 6 isolated from the desert plant *Erodium hirtum* in Jordan. **Genome Announcements** 5(2), e01437-16.
 18. Ghidan, A. Y., Al-Antary, T. M., **Salem, N. M.** and Awwad, A. M. (2017) Facile Green Synthetic Route to the Zinc Oxide (ZnO NPs) Nanoparticles: Effect on Green Peach Aphid and Antibacterial Activity. **Journal of Agricultural Science** 9(2), 131-138.
 19. Nouri, S., **Salem, N.**, Nigg, J. C. and Falk, B. W. (2016) A diverse array of new viral sequences identified in worldwide populations of the Asian citrus psyllid (*Diaphorina citri*) using viral metagenomics. **Journal of Virology** 90(5), 2434-2445.
 20. Nouri, S., **Salem, N.** and Falk, B. W. (2016) Complete genome sequence of *Diaphorina citri*-associated C virus, a novel putative RNA virus of the Asian citrus psyllid, *Diaphorina citri*. **Genome Announcements** 4(4), e00639-16.
 21. **Salem, N. M.**, Mansour, A., Ciuffo, M., Falk, B. W. and Turina, M. (2016) A new tobamovirus infecting tomato crops in Jordan. **Archives of Virology** 161(2), 503-506.
 22. Velasco, L., **Salem, N.**, Willemsen, A., Lapidot, M., Mansour, A. N., Rubio, L. and Galipienso, L. (2016) Genetic variation and evolutionary

- forces shaping *Cucumber vein yellowing virus* populations: risk of emergence of virulent isolates in Europe. ***Plant Pathology*** 65, 847-856.
23. **Salem, N. M.**, Al Banna, L. S., Abdeen, A. O., Ibrahim, Q. M. and Awwad, A. M. (2016) Sulfur nanoparticles improves root and shoot growth of tomato. ***Journal of Agricultural Science*** 8(4), 179-185.
 24. **Salem, N. M.**, Al Banna, L. S., Awwad, A. M., Ibrahim, Q. M. and Abdeen, A. O. (2016) Green Synthesis of Nano-Sized Sulfur and Its Effect on Plant Growth. ***Journal of Agricultural Science*** 8(1), 188-194.
 25. **Salem, N. M.**, Albanna, L. S. and Awwad, A. M. (2016) Toxic heavy metals accumulation in tomato plant (*Solanum lycopersicum*). ***ARP Journal of Agricultural and Biological Science*** 11(10), 399-404.
 26. **Salem, N. M.**, Albanna, L. S. and Awwad, A. M. (2016) Green synthesis of sulfur nanoparticles using *Punica granatum* peels and the effects on the growth of tomato by foliar spray applications. ***Environmental Nanotechnology, Monitoring and Management*** 6(12), 83-87.
 27. **Salem, N. M.**, Albanna, L. S. and Awwad, A. M. (2016) Seed germination and growth of cucumber (*Cucumis sativus*): Effect of nano-crystalline sulfur. ***Journal of Agricultural Science*** 8(10), 219-225.
 28. Awwad, A. M., **Salem, N. M.** and Ibrahim, Q. M. (2016) Rapid and large-scale green synthesis of silver nanoparticles using *Ailanthus altissima* leaves extract. ***Arab Journal of Physical Chemistry*** 3(1), 17-21.
 29. **Salem, N. M.**, Mansour, A. N., Abdeen, A., Araj, S. and Khurfan, W. I. (2015) First report of *Tomato chlorosis virus* infecting tomato crops in Jordan. ***Plant Disease*** 99 (9), 1286.
 30. Araj, S., **Salem, N. M.**, Ghabeish, I. and Awwad, A. M. (2015) Toxicity of nanoparticles against *Drosophila melanogaster* (Diptera: Drosophilidae). ***Journal of Nanomaterials*** ID758132.
 31. Athamenh, B. M., **Salem, N. M.**, El-Zuraiqi, S. W. and Rusan, M. J. (2015) Combined land application of treated wastewater and biosolids enhances crop production and soil fertility. ***Desalination and Water Treatment*** 53(12), 3283-3294.
 32. **Salem, N. M.**, Awwad, A. M. and Abdeen, A. O. (2015) Novel approach for synthesis sulfur (S-NPs) nanoparticles using *Albizia julibrissin* fruits extract. ***Advanced Materials Letters*** 6(5), 432-435.
 33. Awwad, A. M., **Salem, N. M.**, Ibrahim, Q. M. and Abdeen, A. O. (2015) Phytochemical fabrication and characterization of silver/silver chloride nanoparticles using *Albizia julibrissin* flowers extract. ***Advanced Materials Letters*** 6(8), 726-730.
 34. Awwad, A. M., Albiss, B. A and **Salem N. M.** (2015) Antibacterial Activity of synthesized Copper Oxide Nanoparticles using *Malva sylvestris* Leaf Extract. ***SMU Medical Journal*** 2(1), 91-101.
 35. Awwad, A. M., **Salem, N. M.**, Khurfan, W. and Ibrahim, Q. (2015) FT-IR spectroscopy and X-ray diffraction characterization of biosynthesized silver/silver chloride nanoparticles. ***Arab Journal of Physical Chemistry*** 2(1), 14-19.

36. Awwad, A. M., **Salem, N. M.** and Abdeen, A. O. (2015) Phytochemical and spectral studies of synthesis sulfur nanoparticles using *Sophora japonica* pods extract. **Journal of Advances in Chemistry** 11(3), 3426-3432.
37. Jaber, L. and **Salem, N. M.** (2014) Endophytic colonisation of squash by the fungal entomopathogen *Beauveria bassiana* (Ascomycota: Hypocreales) for managing *Zucchini yellow mosaic virus* in cucurbits. **Biocontrol Science and Technology** 24, 1096-1109.
38. Mansour, A., Al-Banna, L., **Salem, N.** and Alsmairat, N. (2014) Disease management of organic tomato under greenhouse conditions in the Jordan Valley. **Crop Protection** 60, 48-55.
39. Garcia, F. A., Ordonez, N., Konkol, J., Al Qasem, M., Naser, Z., Abdelwali, M., **Salem, N. M.**, Waalwijk, C., Ploetz, R. C. and Kema, G. (2014) First Report of *Fusarium oxysporum* f. sp. *cubense* Tropical Race 4 associated with Panama Disease of banana outside Southeast Asia. **Plant Disease** 98, 694.
40. **Salem, N. M.** and Awwad, A. M. (2014) Biosorption of Ni(II) from electroplating wastewater by modified (*Eriobotrya japonica*) loquat bark. **Journal of Saudi Chemical Society** 18, 379-386.
41. Awwad, A. M. and **Salem, N. M.** (2014) Kinetics and thermodynamics of cd(II) biosorption onto loquat (*Eriobotrya japonica*) leaves. **Journal of Saudi Chemical Society** 18, 486-493.
42. **Salem, N. M.**, Quaglino, F., Abdeen, A., Casati, P., Bulgari, D., Alma, A. and Bianco, P. A. (2013) First report of '*Candidatus Phytoplasma solani*' associated with grapevine Bois noir disease in Jordan. **Plant Disease** 97(11), 1505.
43. **Salem, N. M.**, Ahmad, A. L. and Awwad, A. M. (2013) New route for synthesis magnetite nanoparticles from ferrous ions and pistachio leaf extract. **Nanoscience and Nanotechnology** 3(3), 48-51.
44. Awwad, A. M., **Salem, N. M.** and Abdeen, A.O. (2013) Biosynthesis of silver nanoparticles using Loquat leaf extract and its antibacterial activity. **Advanced Materials Letters** 4(5), 338-342.
45. **Salem, N. M.** and Awwad, A. M. (2013) A novel approach for synthesis magnetite nanoparticles at ambient temperature. **Nanoscience and Nanotechnology** 3(3), 35-39.
46. Awwad, A. M., **Salem, N. M.** and Abdeen, A. O. (2013) Green synthesis of silver nanoparticles using carob leaf extract and its antibacterial activity. **International Journal of Industrial Chemistry** 4, 29.
47. **Salem, N.**, Mansour, A. and Badwan, H. (2012) Identification and partial characterization of tomato spotted wilt virus on lettuce in Jordan. **Journal of Plant Pathology** 94(2), 431-435.
48. Abu-Romman, S., Shatnawi, M., Hasan, M., Qrunfleh, I., Omar, S. and **Salem, N.** (2012) cDNA cloning and expression analysis of a putative alternative oxidase HsAOX1 from wild barley (*Hordeum spontaneum*). **Genes and Genomics** 34, 59-66.
49. Awwad, A. and **Salem, N.** (2012) Biosorption of copper(II) and lead(II) ions from aqueous solutions by modified loquat (*Eriobotrya japonica*)

- leaves (MLL). **Journal of Chemical Engineering and Materials Science** 3(1), 7-17.
50. Farhan, A. M., **Salem N. M.**, Al-Dujaili A. H. and Awwad A. M. (2012) Biosorption studies of Cr(VI) ions from electroplating wastewater by walnut shell powder. **American Journal of Environmental Engineering** 2(6), 188-195.
 51. **Salem, N. M.**, Awwad, A. M. and Al-Dujaili A. H. (2012) Biosorption of Pb(II), Zn(II), and Cd(II) from Aqueous Solutions by (*Eriobotrya japonica*) Loquat Bark. **International Journal of Environmental Protection** 2(11), 1-7.
 52. Awwad, A. M. and **Salem, N. M.** (2012) Green synthesis of silver nanoparticles by mulberry leaves extract. **Nanoscience and Nanotechnology** 2(4), 125-128.
 53. Awwad, A. M., **Salem, N. M.** and Abdeen, A. O (2012) Biosynthesis of silver nanoparticles using *Olea europaea* leaves extract and its antibacterial activity. **Nanoscience and Nanotechnology** 2(6), 164-170.
 54. Awwad, A. M. and **Salem, N. M.** (2012) A green and facile approach for synthesis of magnetite nanoparticles. **Nanoscience and Nanotechnology** 2(6), 208-213.
 55. **Salem, N. M.**, Farhan, A. M. and Awwad, A. M. (2012) Biosorption of cadmium (II) from aqueous solutions by *Prunus avium* leaves. **American Journal of Environmental Engineering** 2(5), 123-127.
 56. Farhan, A. M., **Salem, N. M.**, Ahmad, A. L. and Awwad, A. M. (2012) Kinetic, equilibrium and thermodynamic studies of the biosorption of heavy Metals by *Ceratonia siliqua* bark. **American Journal of Chemistry** 2(6), 335-342.
 57. Al-Dujaili, A. H., Awwad, A. M. and **Salem, N. M.** (2012) Biosorption of cadmium (II) onto loquat leaves (*Eriobotrya japonica*) and their ash from aqueous solution, equilibrium, kinetics, and thermodynamic studies. **International Journal of Industrial Chemistry** 3, 22.
 58. Abo-Sherbi, A. Mansour, A., **Salem, N.** and Al-Tamimi, N. (2012) Viral diseases affecting open field tomato in Jordan. **Jordan Journal of Agricultural Sciences** 8(1), 15-21.
 59. Al-Tamimi, N., Kawas, H., Mansour, A., Arabiat, A. and **Salem, N.** (2011) Molecular characterization of two (SLCV) isolates: one from the Jordan Valley and the other from Southern Syria. **Jordan Journal of Agricultural Sciences** 7 (1), 178-187.
 60. **Salem, N.**, Sadder, M. and Abdeen, A. (2011) Application of polymerase chain reaction for detection of camels' milk adulteration by milk of cow. **Current Opinion in Biotechnology** 22S (I15), S94.
 61. Al-Degs, Y., Al-Ghouti, M. and **Salem, N.** (2011) Determination of frying quality of vegetable oils used for preparing falafel using infrared spectroscopy and multivariate calibration. **Food Analytical Methods** 4, 540-549.
 62. **Salem, N. M.**, Ehlers, J. D., Roberts, P. A. and Ng, C. K. J. (2010) Biological and molecular diagnosis of seed-borne viruses in cowpea

- germplasm of geographically diverse Sub-Saharan origins. **Plant Pathology** 59, 773-784.
63. Al-Nsour, A., Mansour, A. and **Salem, N.** (2010) Incidence of *Plum pox potyvirus* in Jordan. **Dirasat** 37(1), 24-28.
64. Al-Nsour, A., Mansour, A., Al-Banna, L. and **Salem, N.** (2010) Detection of *Tomato ringspot virus* on stone fruit trees in Jordan. **Jordan Journal of Agricultural Sciences** 6 (2), 240-247.
65. Al-Tamimi, N., Kawas, H., Mansour, A., Arabiat, A. and **Salem, N.** (2010) Biological and molecular characterization of some *Zucchini yellow mosaic virus* isolates from Southern Syria and Jordan Valley. **Jordan Journal of Agricultural Sciences** 6 (3), 479-493.
66. **Salem, N.** and Ahmad, R. (2010) Mycotoxins in food from Jordan: Preliminary survey. **Food Control** 21, 1099-1103.
67. Ahmad, R., **Salem, N. M.** and Estaitieh, H. (2010) Occurrence of organochlorine pesticide residues in eggs, chicken and meat in Jordan. **Chemosphere** 78, 667-671.
68. **Salem, N.**, Ahmad, R. and Awwad, A. (2010) Chemical modification of zeolitic tuff for removal of Hg(II) from water. **Environmental Research Journal** 4, 286-290.
69. Awwad, A. M., **Salem, N. M.** and Ahmad, R. A. (2010) Biosorption of chromium (VI) onto (*Eriobotrya japonica*) loquat bark from aqueous solution. **Environmental Science** 5 (5), 311-315.
70. **Salem, N. M.**, Chen, A. Y. S., Tzanetakis, I. E., Mongkolsiriwattana, C. and Ng, J. C. K. (2009) Further complexity of the genus *Crinivirus* revealed by the complete genome sequence of *Lettuce chlorosis virus* (LCV) and the similar temporal accumulation of LCV genomic RNAs 1 and 2. **Virology** 390, 45-55.
71. Jyot, J., **Salem, N.** and Falk, B. W. (2009) Partial sequence and survey analysis identify a multipartite, negative sense RNA virus associated with fig mosaic. **Plant Disease** 93, 4-10.
72. **Salem, N. M.**, Ahmad, R. and Estaitieh, H. (2009) Organochlorine pesticide residues in dairy products in Jordan. **Chemosphere** 77, 673-678.
73. **Salem, N. M.**, Miller, A., Rowhani, A., Golino, D. A., Moyne, A. and Falk, B. W. (2008) *Rose spring dwarf-associated virus* has RNA structural and gene-expression features like those of *Barley yellow dwarf virus*. **Virology** 375, 354-360.
74. **Salem, N. M.**, Golino, A. D., Falk, B. W. and Rowhani, A. (2008) Complete nucleotide sequences and genome characterization of a novel double-stranded RNA virus infecting *Rosa multiflora*. **Archives of Virology** 153, 455-462.
75. **Salem, N.**, Golino, A. D., Falk, B. W. and Rowhani, A. (2008) Identification and partial characterization of a new *Luteovirus* associated with rose spring dwarf disease. **Plant Disease** 92, 508-512.
76. **Salem, N.**, Rowhani, A., Moyne, A. L., Sim, S. T. and Golino, D. A. (2007) Identification of a luteovirus associated with rose spring dwarf disease in roses. The 4th International Conference for Rose Research and Cultivation. **Acta Horticulturae** 751, 213-216.

77. Golino, D. A., Sim, S. T., **Salem, N.** and Rowhani, A. (2007) Rooting success of rose cuttings reduced by infection with apple mosaic virus and prunus necrotic ringspot virus. The 4th International Conference for Rose Research and Cultivation. **Acta Horticulturae** 751, 225-228.
78. Misbeh, S., Al-Musa, A., Anfoka, G. and **Salem, N.** (2007) Molecular characterization of *Grapevine virus A* (GVA) isolates from Jordan. **Phytopathologia Mediterranea** 46 (2), 195-200.
79. **Salem, N.**, Mansour, A., Al-Musa, A. and Mesbah, S. (2007) Survey of grapevine viruses in Jordan. **Dirasat** 34 (1&2), 25-33.
80. **Salem, N.**, Mansour, A., Al-Musa, A. and Al-Nsour, A. (2006) Occurrence of *Tomato ringspot virus* on grapevines in Jordan. **Phytopathologia Mediterranea** 45, 161-162.
81. **Salem, N.** Mansour, A. and Al-Musa, A. (2005) Viruses of pome fruit trees in Jordan. **Journal of Plant Pathology** 87 (2), 115-118.
82. **Salem, N.**, Mansour, A., Al-Musa, A. and Al-Nsour, A. (2004) Effect of heat treatment on eradication of *Prunus necrotic ringspot virus* in peach. **Dirasat** 31 (3), 311-316.
83. **Salem, N.**, Mansour, A., Al-Musa, A., Al-Nsour, A. and Hammond, R. (2004) Identification and partial characterization of *Prunus necrotic ringspot virus* in Jordan. **Journal of Plant Pathology** 86 (1), 83-87.
84. **Salem, N.**, Mansour, A., Al-Antary, T. and Al-Nsour, A. (2004) *Faba bean necrotic yellows virus*: virus-vector relationships and effect of inoculation stage on yield components in faba bean. **Dirasat** 31 (1), 12-20.
85. **Salem, N.**, Mansour, A., Al-Musa, A. and Al-Nsour, A. (2003) Incidence of *Prunus necrotic ringspot virus* in Jordan. **Phytopathologia Mediterranea** 42 (3), 275-279.
86. **Salem, N.**, Mansour, A., Al-Musa, A. and Al-Nsour, A. (2003) Seasonal variation of *Prunus necrotic ringspot virus* concentration in almond, peach, and plum cultivars. **Phytopathologia Mediterranea** 42 (2), 155-160.
87. Al-Nsour, A., Mansour, A., Al-Musa, A. and **Salem, N.** (1998) Distribution and incidence of *Faba bean necrotic yellows virus* in Jordan. **Plant Pathology** 47, 510-515.

List of Books:

1. Mansour, A., **Salem, N.** and Badwan, H. (2009) Plant Pathology Laboratory Manual. Amman-Dar. Jalees Alzaman for Publishing of Distribution.
2. **Salem, N. M.**, Quaglino, F., Abdeen, A., Casati, P., Bulgari, D., Alma, A. and Bianco, P.A. (2014) *Candidatus Phytoplasma solani* associated with grapevine "bois noir" disease in Jordan. In: Phytoplasmas and phytoplasma disease management: how to reduce their economic impact (Bertaccini, A., ed.) Food and Agriculture COST Action FA0807, Integrated management of phytoplasma epidemics in different crop systems. IPWG-International Phytoplasma Working Group, Bologna (2014).

3. Awwad, A., **Salem, N.** and Abdeen, A. (2013) Biosynthesis of Metal Sulfide Nanoparticles using Plant Leaf Extract. LAP LAMBERT Academic Publishing, Saarbrucken-Germany.
4. Awwad, A. and **Salem, N.** (2013) Green synthesis of magnetite and silver nanoparticles. LAP LAMBERT Academic Publishing, Saarbrucken-Germany.
5. Awwad, A. and **Salem, N.** (2011) Biosorption of Heavy Metal Ions from Aqueous Solutions by Agrowastes. LAP LAMBERT Academic Publishing, Saarbrucken-Germany
6. Awwad, A. and **Salem, N.** (2011) Zeolitic tuff: water pollution, agriculture, and building applications: Zeolitic tuff and its Applications. LAP LAMBERT Academic Publishing, Saarbrucken-Germany

In Arabic:

منصور، عقل، أمين عامر حاج قاسم، نداء سالم، ايليا الشويبري، يوسف أبو جودة، جبر خليل ونبيل عزيز. (2008) الفيروسات التي تصيب محصول البطاطا/البطاطس. الأمراض الفيروسية للمحاصيل الزراعية المهمة في المنطقة العربية. إعداد: مكوك، خالد محيي الدين، جابر إبراهيم فجلة و صفاء غسان قمري. 308-273.

Conferences:

- **Salem, N.,** Mansour, A., Falk, B., Turina, M. and Tahzima, R. (2019) Discovery of a New Plant Virus Threatening the World Tomato Industry. The Ninth Conference on Scientific Research in Jordan, November 9, 2019, The University of Jordan, Amman, Jordan.
- **Salem, N.,** Odeh, S. and Abu Muslem, M. (2019) Occurrence and Partial Characterization of *Lettuce Big-Vein Associated Virus* and *Mirafiori Lettuce Big-Vein Virus* Infecting Lettuce in Jordan. International Advances in Plant Virology. October 29-31, 2019, CREA, Roma, Italy.
- **Salem, N. M.** and Tahzima, R. (2019) High-throughput sequencing reveals the presence of *Tobacco mild green mosaic virus* infecting *Capsicum annum* in Jordan. IX International conference "Bioresources and Viruses", September 9-11, 2019, Kyiv, Ukraine.
- Erickson, A., **Salem, N.** and Falk, B. (2019) Interactions of plant infecting Poloroviruses, Umbraviruses, and self-replicating associated RNAs. American Society for Virology ASV 2019 meeting, July 20-24, 2019, the University of Minnesota, Twin Cities Minneapolis, Minnesota, USA.
- Khnouf, R., Al Shami, F., **Salem, N.** and Al Biss, B. (2018) Using Nanomaterials Assisted Real Time PCR in the Enhancement of Bacterial Pathogen Detection. The Twenty Second International Conference on Miniaturized Systems for Chemistry and Life Sciences (μ TAS 2018), November 11-15, 2018, The Kaohsiung Exhibition Center, Kaohsiung, Taiwan.
- Abu Jaleel, G., Awwad, A., **Salem, N.** and Al Banna, L. (2018) Nematicidal activity of sulfur nanoparticles against root-knot nematode *Meloidogyne javanica*. The Eighth Scientific Agricultural Conference ESAC-2018, October 15-17, 2018, Karak, Jordan.
- Abu Zahrah, S., **Salem, N.,** Al Banna, L. and Abu Jaleel, G. (2018) Characterization of a Jordanian local isolate of the bioagent fungus

Trichoderma. The Eighth Scientific Agricultural Conference ESAC-2018, October 15-17, 2018, Karak, Jordan.

- Almomany, A., **Salem, N.** and Tahat, M. (2018) Genetic diversity and phylogeny of *Fusarium* species associated with panama disease of banana in Jordan. International Congress of Plant Pathology (ICPP) 2018: Plant Health in A Global Economy, July 29-August 3, 2018, Boston, Massachusetts, USA.
- **Salem, N.**, Falk, B. W., Vallino's, M. and Turina, M. (2018) *Tomato brown rugose fruit virus*: A New Emerging Virus Affecting Tomato Crops in Jordan. American Society for Virology ASV 2018 meeting, July 14-18, 2018, University of Maryland, College Park, Maryland, USA.
- Abu Jaleel, G., **Salem N.** and Al Banna. L. (2017) First report of *Fusarium proliferatum* isolate kills young trees of pomegranate in Jordan. The 12th Arab Congress of Plant Protection, November 4-10, 2017, Hurghada, Egypt.
- Almomany, A. M., **Salem, N.** and Tahat, M. (2017) Survey of fungal diseases of banana in the Jordan Valley. The 12th Arab Congress of Plant Protection, November 4-10, 2017, Hurghada, Egypt.
- Salhen, S., **Salem, N.** and Al Banna, L. (2017) Occurrence and Distribution of Root Lesion Nematodes (*Pratylenchus* spp.) on Wheat in Jordan. The Sixth International Cereal Nematode Symposium, September 11-15, 2017, Agadir, Morocco.
- Al Banna, L., **Salem N.**, Awwad, A., Abu Jaleel, G. and Al-Abed, A. (2017) Sulfur and Metal Sulfide Nanoparticles to Suppress Cereal Nematodes. The Sixth International Cereal Nematode Symposium, September 11-15, 2017, Agadir, Morocco.
- Al Banna, L., Al-Abed, A., **Salem, N.**, Salhen, S. (2017) Two New Records of *Pratylenchoides ritteri* and *Geocenamus* Species Associated with Wheat in Jordan, September 11-15, 2017, Agadir, Morocco.
- **Salem, M. N.**, Mansour, A., Abu-Romman, S., Abo-Sherbi, A. and Abdeen, A. (2017). Occurrence and distribution of citrus virus and viroid diseases in Jordan. The 24th International Conference on Virus and other Graft Transmissible Diseases of Fruit Crops, June 5-9, 2017, Thessaloniki, Greece.
- Nouri, S., **Salem, N.** and Falk, B. (2015) Next generation sequencing for identifying known and novel viruses in the Asian citrus psyllids, the vector of *C. Liberibacter asiaticus*. The American Phytopathological Society 2015 APS Annual Meeting, August 1-5, 2015, Pasadena, California, USA.
- **Salem, N. M.**, Mansour, A. and Obidat, A. (2014) Survey of potato viruses in Jordan. The 11th Arab Congress of Plant Protection, November 9-12, 2014, Amman, Jordan.
- Al-Banna, L., **Salem, N. M.**, Awwad, A., Khrfan, W. and Habash, S. (2014) Evaluation of silver nanoparticle applications on infestation of root-knot nematode on tomato. The 11th Arab Congress of Plant Protection, November 9-12, 2014, Amman, Jordan.
- Mansour, A., Al-Banna, L., **Salem, N.** and Alsmairat, N. (2014) Disease management of organic tomato under greenhouse conditions in the Jordan Valley. The 11th Arab Congress of Plant Protection, November 9-12, 2014, Amman, Jordan.

- **Salem, N. M.**, Quaglino, F., Abdeen, A., Casati, P., Bulgari, D., Alma, A. and Bianco, P. A. (2013) First report of '*Candidatus Phytoplasma solani*' associated with grapevine Bois noir disease in Jordan. COST Action FA0807 Integrated Management of Phytoplasma Epidemics in Different Crop Systems, September 30-October 1, 2013, Lisbon, Portugal.
- **Salem, N.**, Mansour, A. and Abdeen, A. (2013) Identification of *Cotton leaf curl Gezira virus* in okra in Jordan. The American Society for Virology 32nd Annual Meeting, July 20-24, 2013, Pennsylvania State University, University Park, Pennsylvania, USA.
- Al Banna, L., Khrfan, W. I., **Salem, N.** and AlMazraawi, D. (2012) Characterization of a fungus parasitizing Mediterranean Cereal Nematode (*Heterodera latipons*). The 3rd International Cereal Cyst Nematode Initiative (ICCVI) Workshop, September 22-23, 2012, Adana, Turkey.
- Al Banna, L., **Salem, N.**, Habash, S. and Ghrair, A. (2012) Ecotoxicity of zeolitic nanoparticles on the nematodes *Caenorhabditis elegans* and *Meloidogyne incognita*. The 31st International Symposium of the European Society of Nematologists, September 23-27, 2012, Adana, Turkey.
- **Salem, N.** (2012) Virus and virus-like diseases of stone fruits in Jordan. Biodiversity and nutrition in the Mediterranean area, University of Milan, Faculty of Agriculture, July 5, 2012, Milan, Italy.
- **Salem, N.** (2011) Virus and phytoplasma diseases of stone fruits in Jordan. Emerging phytoplasma diseases of stone fruits and other crops and their possible impact on EU countries, COST Action FA0807 Integrated Management of Phytoplasma Epidemics in Different Crop Systems, December 1-2, 2011, Istanbul, Turkey.
- **Salem, N.**, Sadler, M. and Abdeen, A. (2011) Application of polymerase chain reaction for detection of camels' milk adulteration by milk of cow. European Biotechnology Congress, September 28-October 1, 2011, Istanbul, Turkey.
- **Salem, N.**, Tzanetakis, I., Falk, B. and Ng, J. (2009) *Lettuce chlorosis virus* (LCV): Genome sequencing, molecular characterization and whitefly transmission. The 10th Arab Congress of Plant Protection, October 26-30, 2009, Beirut, Lebanon.
- Chen, A., **Salem, N.**, Mongkolsiriwattana, C. and Ng, J. (2009) Analysis of *Lettuce chlorosis virus* (LCV) subgenomic RNA expression and accumulation kinetics of LCV RNAs. The American Society for Virology 28th Annual Meeting, July 11-15, 2009, University of British Columbia, Vancouver, BC, Canada.
- **Salem, N.**, Tzanetakis, I., Falk, B. and Ng, J. (2008) Genome sequencing, molecular characterization and whitefly transmission of *Lettuce chlorosis virus* (LCV). The American Society for Virology 27th Annual Meeting, July 12-16, 2008, Cornell University-Ithaca, New York, USA.
- Jyot, J., **Salem, N.**, Aradhya, M., Stover, Ed. and Falk B. (2008) Fig mosaic associated virus: A new type of negative strand RNA virus? The American Society for Virology 27th Annual Meeting, July 12-16, 2008, Cornell University-Ithaca, New York, USA.
- Jyot, J., **Salem, N.**, Aradhya, M. and Falk, B. (2007) Metagenomic sequenced based approach reveals a complex of viruses from diverse taxa

associated with fig mosaic disease. The American Society for Virology 26th Annual Meeting, July 14-18, 2007, Oregon State University Corvallis, Oregon, USA.

- **Salem, N.**, Falk, B., Golino, D. and Rowhani, A. (2006) Genomic characterization of a novel member of the *Luteoviridae* associated with rose spring dwarf disease. The American Society for Virology 25th Annual Meeting, July 15-19, 2006, University of Wisconsin-Madison, Madison, USA.
- **Salem, N.**, Rowhani, A., Moyne, A. L., Sim, S. T. and Golino, D. A. (2005) Identification of a luteovirus associated with rose spring dwarf disease in roses. The 4th International Conference for Rose Research and Cultivation, ISHS, September 19-25, 2005, Santa Barbara, California, USA.
- Golino, D. A., Sim, S. T., **Salem, N.** and Rowhani, A. (2005) Rooting success of rose cuttings reduced by infection with apple mosaic virus and prunus necrotic ringspot virus. The 4th International Conference for Rose Research and Cultivation, ISHS, September 19-25, 2005, Santa Barbara, California, USA.
- **Salem, N.** and Mansour, A. (2000) Viral diseases of stone fruits in Jordan. The 7th Arab Congress of Plant Protection, October 22-26, 2000, Amman, Jordan.
- **Salem, N.** and Mansour, A. (1997) Yield reductions in faba bean infected with *Faba bean necrotic yellows virus* in Jordan. The 8th Arab Conference of Biological Sciences and the 4th Jordanian Conference of Biological Sciences, November 8-11, 1997, Amman, Jordan.
- **Salem, N.** and Mansour, A. (1997) Virus-vector relationships of *Faba bean necrotic yellows virus* and the lentil aphid *Aphis craccivora*. The 6th Arab Congress of Plant Protection, October 27-31, 1997, Beirut, Lebanon.

Research:

- Molecular biology: DNA, RNA, and protein isolation; gel electrophoresis; transformation (*Escherichia coli*); labeling (radioactive and nonradioactive); PCR (overlapping, degenerated, RT-PCR); Western, and Northern hybridizations; library screening; DNA sequencing; cDNA-library and cloning; primer engineering; protein purification and antisera production; ODD, ELISA, TBIA tests.
- Green synthesis of nanoparticles and their applications in plant protection.
- Scientific procedures, record keeping, documentation and photography.

Funded Projects:

- Studying the effect of using different shading techniques for plastic houses on fruit quality, production, insect and viral pests of cucumber plants, funded by Deanship of Academic of Research (DAR), University of Jordan, 2016. (Co-investigator)
- Survey and evaluation of control methods for fungal diseases of banana in Jordan Valley, funded by Scientific Research Fund/Ministry of Higher Education and Scientific Research, 2015. (Co-investigator)

- High throughput screening of nanoparticles effect on biochemical mechanisms using BioMEMS platforms for applications in therapeutics and biotechnology, funded by Scientific Research Fund/Ministry of Higher Education and Scientific Research, 2015. (Co-investigator)
- Managing some cucumber diseases using available cucurbit rootstocks, funded by Deanship of Academic of Research (DAR), University of Jordan, 2015. (Co-investigator)
- Occurrence, Distribution and Molecular Characterization of Cucurbit Aphid-borne Yellow Virus (CABYV) in Jordan, funded by Deanship of Academic of Research (DAR), University of Jordan, 2015. (Principal investigator)
- A green method for biosynthesis sulfur nanoparticles for control soil borne pathogens, funded by Scientific Research Fund/Ministry of Higher Education and Scientific Research, 2015. (Co-investigator)
- Epidemiology; Occurrence, Distribution, Molecular Characterization and Detection of Citrus Virus and Viroid Diseases in Jordan, funded by Scientific Research Fund/Ministry of Higher Education and Scientific Research, 2014. (Principal investigator)
- Novel Approach for Synthesis Sulfur Nanoparticles for Control of Fungal Diseases of Plants, funded by Abdul Hameed Shoman Foundation, Fund for Scientific Research Support, 2014. (Co-investigator)
- Establishing a Botanical Garden at Agricultural Research Station, Deanship of Academic of Research (DAR), University of Jordan, 2013. (Co-investigator)
- Preparation and characterization of magnetite (Fe_3O_4 , Fe_2O_3) nanoparticles from iron wastes: antibacterial and antimicrobial activity, funded by Abdul Hameed Shoman Foundation, Fund for Scientific Research Support, 2012. (Co-investigator)
- Occurrence, distribution and molecular characterization of potato virus diseases in Jordan, funded by Deanship of Academic of Research (DAR), University of Jordan, 2011. (Principal investigator)
- Management of banana wilt diseases in Jordan Valley, funded by National Center for Agricultural Research and Extension (NCARE), 2012. (Co-investigator)
- Development of a novel antimicrobial silver nanoparticle for control of soilborne pathogens, funded by EWE/ Clean Technologies (CT) center/USAID-SABEQ, 2011. (Principal investigator)
- Reuse of biosolids as a fertilizer for increasing forage production and enhancing soil fertility, funded by the Scientific Research Fund/Ministry of Higher Education and Scientific Research, 2011. (Co-investigator)
- An environmentally friendly biosorbents for the removal of toxic heavy metal ions from wastewater, funded by Abdul Hameed Shoman Foundation, Fund for Scientific Research Support, 2010. (Co-investigator)
- Toxicity of Jordanian zeolitic nano tuff and other engineered nanoparticles to the nematode *Caenorhabditis elegans*, funded by Hamdi Mango Center for Scientific Research (HMCSR), 2010. (Co-investigator)
- Development of a rapid, sensitive and reliable test for detection of *Salmonella* spp. in food, funded by Support to Research and Technological

Development and Innovation Initiatives and Strategies in Jordan (SRTD), 2009. (Principal investigator)

- Detection of adulterated food products in Jordan, funded by Abdul Hameed Shoman Foundation, Fund for Scientific Research Support, 2009. (Principal investigator)
- Development of salinity tolerant tomato genotypes using molecular marker assisted selection, funded by the Scientific Research Fund/Ministry of Higher Education and Scientific Research, 2009. (Co-investigator)
- Preliminary survey of food contamination by mycotoxins in Jordan, funded by The National Centre for Biotechnology (NCB), 2008. (Principal investigator)

Affiliations:

- The Association of Applied Biologists (AAB).
- The American Phytopathological Society (APS).
- The American Society for Virology (ASV).
- The Arab Society for Plant Protection.
- The Jordanian Agricultural Engineers Association.

Training Courses and Workshops:

- Online meeting "How to Publish in Scopus; Facts and Tips" workshop, May 7 2020, The University of Jordan, Amman, Jordan.
- Online meeting "How to make exams by using Microsoft Forms application" workshop, April 29, 2020, The University of Jordan, Amman, Jordan.
- Online meeting "Using Microsoft Teams" workshop, April 23, 2020, The University of Jordan, Amman, Jordan.
- Online meeting "How to make Quiz in moodle" workshop, April 4, 2020, The University of Jordan, Amman, Jordan.
- Attendance the "International Center for Biotechnology and Genetics Engenerring" workshop, October 27, 2019, The University of Jordan, Amman, Jordan.
- Participation in "Survey and evaluation of control methods of fungal diseases of banana in Jordan Valley" workshop, March 14, 2019, Agricultural Research Station, Jordan Valley, Jordan.
- Attendance the "Classroom Managements" workshop, February 28, 2019, The University of Jordan, Amman, Jordan.
- Attendance the "Web of Science Training workshop", February 27, 2019, The University of Jordan, Amman, Jordan.
- Attendance the "Management and Leadership Skills" workshop, March 28, 2019, The University of Jordan, Amman, Jordan.
- Seminar presentation "*Tomato Brown Rugose Fruit Virus: A New Emerging Virus Affecting Tomato Crops*" to the R&D team at HM Clause (Seed Company) in August 21, 2018, Davis, California, USA.
- Seminar presentation "Identification of citrus virus and virus-like diseases with next generation sequencing", Citrus Research Institute (CIRC), the Southwest University (SWU) and the Chinese Academy of Agricultural Sciences, September 7, 2017, Chongqing, China.

- Seminar presentation at Semillas Fito on "Viruses and Virus Diseases of Vegetable Crops in Jordan", January 27, 2017, Barcelona, Spain.
- Attendance of the "Proposal writing for H2020 EU funding opportunities" Higher Council for Science and Technology (HCST) for the implementation of the Support to Research, Technological Development and Innovation in Jordan-Phase II (SRTDII), January 17-19, 2017, Amman, Jordan.
- Attendance of the "Introduction to Erasmus+ funding opportunities" lecture, December 22, 2016, The University of Jordan, Amman, Jordan.
- Attendance of the "Gold Nanocrystals: Physics, Chemistry, Biology, Ecology" lecture, December 8, 2016, The University of Jordan, Amman, Jordan.
- Seminar presentation in Syngenta Middle East Field Day "Viral Diseases of Plants", August 10, 2016, Amman, Jordan.
- Seminar presentation in Monsanto Field Day Winter "Viral Diseases of Tomato Crops in Jordan", March 30, 2016, Jordan Valley, Jordan.
- Attendance of "Plagiarism Detection" workshop, March 3, 2016, The University of Jordan, Amman, Jordan.
- Attendance of "How to get published author workshop", February 29, 2016, The University of Jordan, Amman, Jordan.
- Participation in the "Growtech Eurasia, 15th International Greenhouse, Agricultural Equipment and Technologies Fair", December 2-5, 2015, Antalya, Turkey.
- Visiting scholar to the Center for Desert Agriculture at King Abdullah University of Science and Technology (KAUST), Thuwal, Saudi Arabia during the period of June 16-27, 2015. Working on "Cloning and sequencing begomovirus components and associated satellite molecules".
- Symposium "Restoring damaged ecosystems: Regional and international perspectives", March 30, 2015 organized by The Royal Botanic Garden of Jordan, Amman, Jordan.
- "Defects in cereal and legume seeds", The University of Jordan, December 2-5, 2013, Amman, Jordan.
- "Expert Mission on Detection of Phytoplasmas Disease in Jordan", AGR IND/EXP 53371, European Commission, Technical Assistance Information Exchange Instrument (TAIEX), October 27-31, 2013, Amman, Jordan.
- "E-learning Contents Design and Development", The University of Jordan, Center for Educational Development, January 16-24, 2013, Amman, Jordan.
- Regional Workshop on "Strengthening Regional Cooperation and Knowledge Sharing in Plant Protection between the Near East Countries" December 2-4, 2012, Cairo, Egypt.
- Regional Workshop on "Agricultural Biotechnology Knowledge Network for Strengthening Regional Cooperation and Knowledge Sharing" July 2-4, 2012, Cairo, Egypt.
- "Staff Development Workshops", University of Jordan, Center for Educational Development, January 15- February 6, 2012, Amman, Jordan.
- "Clean Technology Applications in Energy, Water & Environment, scientific visit in USA" organized by EWE/ Clean Technologies (CT) center/USAID-SABEQ, including University of Nevada, Desert Research Institute (DRI),

Reno, Nevada; University of Illinois at Chicago, Chicago, Illinois; The Milwaukee Water Council, Milwaukee, Wisconsin, December 12-21, 2011, USA.

- "Clean Technology Applications in Energy, Water & Environment" USAID and RSS, November 20-22, 2011, Amman, Jordan.
- "EU legislations on Import Control of Potato Seeds", AGR 43028, European Commission, Technical Assistance Information Exchange Instrument (TAIEX), DG Enlargement, October 25-26, 2010, Amman, Jordan.
- "Quality Infrastructure for Food Safety" 229MENA, February 7- March 5, 2010, Sweden.
- "Media Go to Europe" Framework Programme 7, the European Commission's main Instrument for Funding Research, October 14, 2009, the Royal Scientific Society, Amman, Jordan.
- Strategies and techniques for generating inventions and acquiring patents, September 6-10, 2009, Royal Scientific Society, Amman, Jordan.
- Practical training on GC/MS, November 11-15, 2007, Royal Scientific Society, Amman, Jordan.
- Taqman-Real time PCR, July 26, 2007, University of California, Riverside, USA.
- A field guide to genbank and National Center for Biotechnology Information (NCBI) molecular biology resources, July 12, 2005, University of California, Davis, USA.
- Principles of beekeeping and honey production, March 16-22, 1999, the Ministry of Agriculture, Amman, Jordan.
- "Introduction to modeling and model maker", June 19-23, 1999, the University of Jordan, Amman, Jordan.
- Conversation in English language / advanced level, July 11-August 12, 1998, the Center for Consultation, Technical Services and Studies, Amman, Jordan.
- Specialized training course in virus diagnosis, December 2-7, 1996, the International Center for Agriculture Research in Dry Area (ICARDA), Aleppo, Syria.
- Microsoft Word (Windows 3.1), July 2-13, 1994, the Center for Consultation, Technical Services and Studies, Amman, Jordan.

Academic Awards and Honors:

- The University of Jordan Award for the highly cited researchers 2020 in Scopus database.
- The best poster award presented at IX International conference 'Bioresources and Viruses', September 9-11, 2019, Kyiv, Ukraine
- Abdul Hameed Shoman Arab Researchers Award in the field of Technological and Agricultural Sciences/ Plant Pests and Diseases, 2016.
- ASV 2013 Undergraduate Teacher Travel Grant to attend 32nd Annual Meeting, July 20-24, 2013, Pennsylvania State University, University Park, Pennsylvania, USA.
- A 2004-05 Fulbright Post-Doctoral Scholar Award. 1st September 2004 - 31st August, 2005, University of California Davis, USA.

- A ward for the best research paper presentation in the 7th Arab Congress of Plant Protection, October 22-26, 2000, Amman, Jordan.
- University of Jordan stipendium for Ph.D. degree (1999/2000).
- Hamdi Manko fellowship for M.Sc. and Ph.D. degrees (1995, 2000).
- First rank certification for B.Sc. (1994), M.Sc. (1997) and Ph.D. degrees (2002).

Skills:

- Languages:
 1. Arabic: mother language.
 2. English: very good.
- Computer:

Good capability in dealing with several software packages: word processing (WinWord), statistics (SAS, Excel), graphics /presentation (PowerPoint, Adobe photoshop), primers design, Clustal X, Clustal W (DNA and protein sequense alignment and phylogenetic analysis), sequence analysis programs (NTIVector, NCBI, MEGAX, CLC workbench, SnapGene).