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Full Professor of Plant Pathology

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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

- Full Professor
University of Jordan, Jordan
21/09/2020 – now
- Associate professor
University of Jordan, Jordan
17/04/2015 – 20/09/2020
- 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.
- Special topics 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)
- Occurrence and partial genetic characterization of Cucumber green mottle mosaic virus (CGMMV) infecting cucurbits in Jordan (2022)
- **Co-advisor of graduate students for the following projects** (starting date)
 - Screening for the presence of acrylamide in bread and the evaluation of dietary acrylamide exposure in adults and the study of the relationship between acrylamide exposure and glycemic control and lipid profile among a group of diabetic and healthy women in amman (2021)
 - 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**
 - Suppression mechanisms of root knot nematode by the entomopathogenic nematode *Sterinernema feltiae*. The University of Jordan (May, 2024)
 - Detection of larval residues of olive fruit fly *Bacterocera olea* in olive oil using PCR. The University of Jordan (May, 2022)
 - 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 agro-drench 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. Hussein, A., **Salem, N.**, Margaria, P., Menzel, W. and Abu Muslem, M. (2024) First report of Squash vein yellowing virus naturally infecting cucumber, squash and melon in Jordan. ***Plant Disease*** 108, 10, 3204 DOI: 10.1094/PDIS-06-24-1264-PDN
2. Abumuslem, M., Toktay, H., Sadler, M. T., Dababat, A. A., **Salem, N. M.** and AL-Banna, L. (2024) Morphological and Biochemical Changes in the Mediterranean Cereal Cyst Nematode (*Heterodera latipons*) during Diapause. ***Pathogens*** 13, 656. DOI: [10.3390/pathogens13080656](https://doi.org/10.3390/pathogens13080656)
3. Alananbeh, K. M., Alkarablieh, N., **Salem, N.**, Albanna, L. (2024). Diseases of Broad Bean. In: Elmer, W.H., McGrath, M., McGovern, R.J. (eds) Handbook of Vegetable and Herb Diseases. Handbook of Plant Disease Management. Springer, Cham. https://doi.org/10.1007/978-3-030-35512-8_17-1
4. **Salem, N. M.**, Jewehan, A., Aranda, M. A. and Fox, A. (2023) Tomato Brown Rugose Fruit Virus Pandemic. ***Annual Review of Phytopathology*** 61, 137-164. DOI: 10.1146/annurev-phyto-021622-120703

5. **Salem, N. M.**, Abumuslem, M., Katbeh-Bader, A., Bianco, P. A. and Quaglino, F. (2023) '*Candidatus* Phytoplasma trifolii' associated with faba bean phyllody in Jordan. **Phytopathogenic Mollicutes** 13, 49-50. DOI : 10.5958/2249-4677.2023.00025.7
6. Tahat, M. M., Aldakil, H. A., Alananbeh, K. M. and **Salem, N. M.** (2023) First Report of *Fusarium verticillioides* Causing Fusarium Ear Rot of Corn in Jordan. **Plant Disease** 107, 1632. DOI: <https://doi.org/10.1094/PDIS-08-22-1807-PDN>
7. Khnouf, R., Al Shami, F., Albiss, B. A., **Salem, N.**, Ababneh, H. and Mahasneh, A. (2022) Enhancement of *Salmonella* Enteritidis Detection Using Nanoparticle-Assisted Real-Time Polymerase Chain Reaction. **Journal of Biomedical Nanotechnology** 18, 2065-2075. <https://doi.org/10.1166/jbn.2022.3401>
8. **Salem, N. M.**, Abumuslem, M., Turina, M., Samarah, N., Sulaiman, A., Abu-Irmaileh, B. and Ata, Y. (2022). New Weed Hosts for Tomato Brown Rugose Fruit Virus in Wild Mediterranean Vegetation. **Plants** 11, 2287. DOI: 10.3390/plants11172287
9. Jewehan, A., Kiemo, F. W., **Salem, N.**, Tóth, Z., Salamon, P. and Szabó, Z. (2022) Isolation and molecular characterization of a tomato brown rugose fruit virus mutant breaking the tobamovirus resistance found in wild *Solanum* species. **Archives of Virology** 167, 1559-1563. <https://doi.org/10.1007/s00705-022-05438-2>
10. Jewehan, A., **Salem, N.**, Tóth, Z., Salamon, P. and Szabó, Z. (2022) Evaluation of responses to tomato brown rugose fruit virus (ToBRFV) and selection of resistant lines in *Solanum habrochaites* and *Solanum peruvianum* germplasm. **Journal of General Plant Pathology** 88, 187-196. <https://doi.org/10.1007/s10327-022-01055-8>
11. Hasan, Z. M., **Salem, N. M.**, Ismail, I. D., Akel, E. H. and Ahmad, A. Y. (2022) First report of tomato brown rugose fruit virus on greenhouse tomato in Syria. **Plant Disease** 106, 722. <https://doi.org/10.1094/PDIS-07-21-1356-PDN>
12. **Salem, N. M.**, Sulaiman, A., Samarah, N., Turina, M. and Vallino, M. (2022) Localization and transmission of tomato brown rugose fruit virus in tomato seeds. **Plant Disease** 106, 275-281. <https://doi.org/10.1094/PDIS-11-20-2413-RE>
13. Jewehan, A., **Salem, N.**, Tóth, Z., Salamon, P. and Szabó, Z. (2022) Screening of *Solanum* (sections *Lycopersicon* and *Juglandifolia*) germplasm for reactions to the tomato brown rugose fruit virus (ToBRFV). **Journal of Plant Diseases and Protection** 129, 117-123. <https://doi.org/10.1007/s41348-021-00535-x>
14. Mansour, A., **Salem, N.**, Al Banna, L., Katbeh-Bader, A., Bahdousheh, M. and Al Bess, M. (2021) Modern Approaches in Plant Protection and its Role in Sustainable Agriculture in Jordan. **Jordan Journal of Agricultural Sciences** 17(3), 291-314 (in Arabic). <https://doi.org/10.35516/jjas.v17i3.86>
15. Chiapello, M., Bosco, L., Ciuffo, M., Ottati, S., **Salem, N.**, Rosa, C., Tavella, L. and Turina, M. (2021) Complexity and local specificity of the

- virome associated with tospovirus-transmitting thrips species. **Journal of Virology** 95, e00597-21.
DOI: 10.1128/JVI.00597-21
16. **Salem, N. M.**, Shahid, M. S., Idris, A., Hattab, D. and Abdeen, A. (2021) Complete nucleotide sequence of a begomovirus associated with an alphasatellite and a betasatellite naturally infecting okra in Jordan. **Archives of Virology** 166, 2033-2036.
<https://doi.org/10.1007/s00705-021-05075-1>
 17. Jiang, J., Kuo, Y-W., **Salem, N. M.**, Erickson, A. and Falk, B. W. (2021) Carrot mottle virus ORF movement protein targets plasomdesmata by interacting with the host cell SUMOylation system. **New Phytologist** 231(1), 382-398.
<https://doi.org/10.1111/nph.17370>
 18. Samarah, N., Sulaiman, A., **Salem, N. M.** and Turina, M. (2021) Disinfection treatments eliminated tomato brown rugose fruit virus in tomato seeds. **European Journal of Plant Pathology** 159, 153-162.
<https://doi.org/10.1007/s10658-020-02151-1>
 19. **Salem, N. M.**, Almomany A. M., Tahat, M. M. and Aldakil, H. (2020) First Report of *Fusarium verticilloides* causing Banana Fruit Rot in Jordan. **Plant Disease** 104(12), 3255.
<https://doi.org/10.1094/PDIS-05-20-1116-PDN>
 20. **Salem, N. M.**, Araj, S., Shereef, T. T, Abu Muslem, M., Bess, H. and Katis, N. (2020) First report of cucurbit chlorotic yellows virus from cucumber plants affected by interveinal yellowing disease in Jordan. **Plant Disease** 104(12), 3277.
<https://doi.org/10.1094/PDIS-03-20-0674-PDN>
 21. **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** 177, 90-100.
<https://doi.org/10.1111/aab.12595>
 22. **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.
<https://doi.org/10.1094/PDIS-06-19-1189-PDN>
 23. **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.
<https://doi.org/10.1094/PDIS-01-19-0156-PDN>
 24. 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.
DOI: 10.1016/j.virusres.2019.197831
 25. 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.
DOI:10.31221/osf.io/vawz8
26. **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.
<https://doi.org/10.1094/PDIS-04-18-0705-PDN>
 27. 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.
DOI: 10.29133/yyutbd.466531
 28. 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.
DOI: http://dx.doi.org/10.15666/aeer/1603_26512662
 29. 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.
DOI: 10.4236/as.2018.95037
 30. 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.
DOI:10.9734/AJRCS/2018/40431
 31. 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.
DOI:10.4236/as.2018.95037
 32. 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.
 33. **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.
 34. 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.
DOI:10.5897/AJAR2017.12620
 35. 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
36. **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.
37. 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), e01437-6.
DOI: <https://doi.org/10.1128/genomea.01437-16>
38. 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.
39. 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.
DOI: <https://doi.org/10.1128/jvi.02793-15>
40. 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.
DOI: 10.1128/genomeA.00639-16
41. **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.
<https://doi.org/10.1007/s00705-015-2677-7>
42. 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.
<https://doi.org/10.1111/ppa.12465>
43. **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.
DOI:10.5539/jas.v8n4p179
44. **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.
DOI:10.5539/jas.v8n1p188

45. **Salem, N. M.**, Albanna, L. S. and Awwad, A. M. (2016) Toxic heavy metals accumulation in tomato plant (*Solanum lycopersicum*). **ARPN Journal of Agricultural and Biological Science** 11(10), 399-404.
46. **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. <https://doi.org/10.1016/j.enmm.2016.06.006>
47. **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.
48. 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.
49. **Salem, N. M.**, Mansour, A. N., Abdeen, A., Araj, S. and Khrfan, W. I. (2015) First report of *Tomato chlorosis virus* infecting tomato crops in Jordan. **Plant Disease** 99 (9), 1286. <https://doi.org/10.1094/PDIS-01-15-0130-PDN>
50. Araj, S., **Salem, N. M.**, Ghabeish, I. and Awwad, A. M. (2015) Toxicity of nanoparticles against *Drosophila melanogaster* (Diptera: Drosophilidae). **Journal of Nanomaterials** ID758132. <https://doi.org/10.1155/2015/758132>
51. 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. <https://doi.org/10.1080/19443994.2014.933037>
52. **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. DOI:10.5185/amlett.2015.5792
53. 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. <https://doi.org/10.5185/amlett.2015.5816>
54. 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.
55. Awwad, A. M., **Salem, N. M.**, Khrfan, 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.
56. 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.

DOI:10.24297/jac.v11i3.869

57. 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. <https://doi.org/10.1080/09583157.2014.923379>
58. 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. <https://doi.org/10.1016/j.cropro.2014.03.001>
59. 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. <https://doi.org/10.1094/PDIS-12-14-1356-PDN>
60. **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.
61. 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. <https://doi.org/10.1016/j.jscs.2011.10.007>
62. **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. DOI: 10.1094/PDIS-04-13-0428-PDN
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2. Mansour, A., **Salem, N.** and Badwan, H. (2009) Plant Pathology Laboratory Manual. 1st edition. Amman-Dar. Jalees Alzaman for Publishing of Distribution.
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منصور، عقل، أمين عامر حاج قاسم، نداء سالم، ايليا الشويري، 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. الجمعية العربية لوقاية النبات. دار النهضة العربية. 273-308.

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- **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.
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- **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:

- Developing innovative tools for detection and management of a new invasive tobamovirus threatening vegetables in the Mediterranean region, funded by Scientific Research Fund/Ministry of Higher Education and Scientific Research, 2021. (Principal investigator)
- 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 Yellows 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.
- Emerging Viruses of Cucurbits Working Group (EVCWG)/US.

Training Courses and Workshops:

- Attendance the "Advance methods in virus diagnostics: from serology to high-throughput sequencing" workshop, May 13-17, 2024, Leibniz Institute DSMZ-Plant Virus Department, Braunschweig, Germany.
- Attendance the "2023 Seed Pathology Fundamentals: Regional to Global Implications" 15 hours, December 09, 2023, the American Phytopathological Society.
- 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 sequence alignment and phylogenetic analysis), sequence analysis programs (NTIVector, NCBI, MEGAX, CLC workbench, SnapGene).