Zeev Wiesman – CV

Born: 1957, Israel

Position: Professor, Department of Biotechnology Engineering/Energy Engineering Unit, Ben Gurion University of the Negev, Beer Sheva, Israel

Academic Qualifications:
Expert in ^{1}H NMR relaxation; Industrial MRI; biomass, plant lipids, bio-food and biofuels biotechnology

EDUCATION:

B.A. Hebrew University of Jerusalem, Faculty of Agriculture. (1982)

M.Sc., Hebrew University of Jerusalem, Faculty of Agriculture. (1985)

Ph.D., Hebrew University of Jerusalem, Faculty of Agriculture. (1989)

Personal Research Interests

My current research focus in the development of artificial intelligent industrial applications of NMR relaxation sensor.

The main biotechnology engineering areas of my research include: plant lipids, poly-sugars and complex biomass materials as sources for industry production of added value products, with emphasis of bio-food and bio-fuels quality and safety:

- Chemo-physical properties of complex plant lipids and antioxidants.
- Superamolecular chemistry of solid and liquid natural organic materials – molecular packing and weak interactions in between complex components.
- Development and novel quality control applications of Time Domain (TD) ^{1}H NMR relaxation technologies including T_1-T_2 components fingerprinting, self-diffusion (D), and droplet size distribution based on chemical composition and morphological structure, to evaluate quality and safety.
- Development a specific TD NMR application to monitor PUFA and oil in water emulsion oxidation.
- Design, engineer and monitor emulsified functional bio-food products.
- Automation of NMR sensor application base on Machine Learning (ML) and Pattern Recognition of chemical and morphological fingerprints of Oils and foods.

Educational activities:

Founder and former Head of Energy Engineering Program for research student,

Faculty of Engineering Sciences, BGU

<u>Courses taught</u>

Energy Resources A – Graduate Students - Energy Engineering Program, Ben-Gurion University of the Negev.

Plant Systems in Biotechnology – Graduate students – Department of Biotechnology Engineering, Ben-Gurion University of the Negev.

Industrial Energy Workshop– Graduate Students -Energy Engineering Program, and under graduate students – Department of Biotechnology Engineering, Ben-Gurion University of the Negev.

Supramolecular chemistry of biofuels and energy conversion systems students – Department of Biotechnology Engineering, Ben-Gurion University of the Negev.

Applications of NMR relaxation and MRI – Graduate Students - Department of Biotechnology Engineering, Ben-Gurion University of the Negev.

Research students

M.Sc. thesis – 35 students

Ph.D. thesis – 10 students

Post-Doc fellows – 12 fellows

Research engineering projects – 45 students

Scientific Publications

Authored Books and Chapters

1. **Wiesman, Z**. (2009). Desert Olive Oil Cultivation: Advanced BioTechnologies. Elsevier Publication, 424 pp. ISBN978-0-12-374257-5.
   Chapters in collective volumes
2. **Wiesman, Z.** and Lavee, S. (1994). The rooting ability of olive cuttings from cv. Manzanillo F1 progeny plants in relation to their mother cultivar. ISHS, Eds., S. Lavee and I. Klein. Acta Hort. 356: 28-30.
3. Lavee, S., Avidan, N. and **Wiesman, Z.** (1997). Genetic variation within the Nabali Baladi cultivar of the West Bank. ISHS, Eds. I.T. Metzidakis, D.G. Voyiatzis. Acta Hort. 474: 129-132.
4. **Wiesman, Z.**, Ronen, A., Ankorion Y., Novikov, V., Maranz, S. and Abramovich, Z. (2002). Effect of Olive-Nutri-Vant on Yield and quality of olives and oil. ISHS, ed. M. Tagliavini, M. Toselli, L. Bertschinger, P. Brown, D. Neilsen, M. Thalheimer. Acta. Hort. 594: 557-562.
5. **Wiesman, Z.**, Luber, M., Ronen, A. and Markus, A. (2002). Ferti-Vant - A new nondestructive and long-lasting *in vivo* delivery system for foliar nutrients. ISHS, ed. M. Tagliavini, M. Toselli, L. Bertschinger, P. Brown, D. Neilsen, M. Thalheimer. Acta. Hort. 594: 585-590.
6. **Wiesman, Z**., Kaufman, M., David, I., Wiessbein, S., Ram, A., Golan, R., Kogan, L., Berman, S. and Eshet I. (2007). Negev pomegranate selection project with emphasis on oil. ISHS, Eds., D. Havkin-Frenkel, C. Frenkel, N. Dudai. Acta Hort. 778: 45-52.

7. Ram, T., **Wiesman, Z.**, Parmet, I., Laykin, S. and Edan**,** Y. (2008). Digital Chemo-Optic System for Optimizing Predictions of Best Harvesting Date and of Olive Oil Content. European Conference for Agricultural Engineering, Crete, Greece.
8. **Wiesman, Z** and Chapagain, B.P. (2008). *Balanites aegyptiaca* –"Desert Date" as a Phyto-Diesel Production Model in Arid Lands. European Biomass Conference, Valencia, Spain.
9. **Wiesman, Z**. and Chapagain, B.P. (2009). *Balanites aegyptiaca* bioactive saponins. In the book: Natural Products: Chemistry, Biochemistry and Pharmacology. ALPHASCIENCE INTERNATIONAL, OXFORD, UK, ed., G. Brahmachari. Narosa Publishing House. (invited chapter, pp, 194-219) ISBN 978-81-7319-886-1.
10. **Wiesman, Z.** and Chapagain, B.P. (2009). Determination of fatty acid profile, phytosterol and TAG in vegetable oils by MALDI-TOF/MS fingerprinting. In Lipidomics book, a volume of Proteomics and Metabolonics, Methods in Molecular Biology – Protocols series, Donald Armstrong, Ed. Humana Press (invited chapter pp, 315-336). ISBN 978-160761-321-3.
11. Nizri, S., Berman, P., Parmet, Y. and **Wiesman, Z.** (2010). Large Scale Screening of Intact Castor Seeds by Viscosity Using Time Domain NMR and Chemometrics European Conference for Agricultural Engineering, Clermont, France.
12. **Wiesman, Z.** (2011). Shea butter chemo-physical properties and delivery of bioactives in chocolate and related products. In Cocoa Butter and Related Fats, Garti, N. and Widlak, N, Ed. AOCA Press (invited chapter).
13. **Wiesman, Z.** and Yambrolski L. (2012). Biofuel industry lipid by-products utilization for livestock feed. In Opportunities and Challenges in Utilizing By-products of the Biofuel Industry as Livestock Feed, Harinder P.S. Makkar, H.P.S, Ed. FAO press (invited chapter).
14. **Wiesman, Z.** and Linder C. (2019). Facile NMR relaxation Sensor for Monitoring of Biomass Degradation Products During Conversion to Biogas. Intech Open Access book, "Nuclear Magnetic Resonance", edited by Prof. Navin Khaneja. DOI: 10.5772/intechopen.90257. In book: Nuclear Magnetic Resonance. Pages: 1-20

Refereed articles in scientific journals

1. **Wiesman, Z.** and Epstein, E. (1987). Metabolism and transport of ^{3}H-indole-3-butyric acid in cuttings of olive. Olea 18: 29-33.
2. Epstein, E. and **Wiesman, Z.** (1987). Improved vegetative propagation of olive cultivars with IBA-alanine. Olea 18: 35-38.
3. **Wiesman, Z**., Riov, J. and Epstein, E. (1988). Comparison of movement and rate of metabolism of indole-3-acetic acid and indole-3-butyric acid in cuttings. Physiol. Plant. 74: 556-560.
4. **Wiesman, Z.**, Riov, J. and Epstein, E. (1989). Effect of paclobutrazol and urea phosphate on rooting and survival of peach 'Maravilha' softwood cuttings. HortScience 24: 908-909.
5. **Wiesman, Z**., Riov, J. and Epstein, E. (1989). Characterization and rooting ability of indole-3-butyric acid conjugates formed during rooting of mung bean cuttings. Plant Physiol. 91: 1080-1084.

6. Oldentlich, A., **Wiesman, Z**., Gotlieb, U., Cojicaro, M. and Chet, I. (1992). Inhibitory furanone produced by the biocontrol agent *Trichoderma harzianum*. Phytochemistry 31: 485-486.

7. Li, N., **Wiesman, Z**., Liu, D. and Mattoo, A. K. (1992). A functional tomato ACC synthase expressed in *Escherichia coli* demonstrates suicidal inactivation by its substrate S-adenosylmethionine. FEBS Letters 306: 1-5.

8. **Wiesman, Z**. and Lavee, S. (1994). Vegetative growth retardation, improved rooting and viability of olive cuttings. Plant Growth Reg. 14: 83-90.

9. **Wiesman, Z**., Grafi, G., Atzmon, N., Somer-Ilan, A. and Visel, Y. (1994). Indole-3-acetic acid (IAA) and cytokinin-like activity in municipal excess activated sewage sludge: effect on rooting of mung bean [*Vigna radiata* (L) Wilcz.] cuttings. Soil Sci Plant Nut 40: 117-124.

10. **Wiesman, Z**. and Riov, J. (1994). Interaction of paclobutrazol and indole-3-butyric acid in relation to rooting of mung bean (*Vigna radiata* L.) cuttings. Physiol Plant 40: 608-612.

11. **Wiesman, Z.** (1995). Rootstock and nitrate involvement in 'Ettinger' avocado response to chloride stress. Scientia Hort 62: 33-43.

12. **Wiesman, Z**. and Lavee, S. (1995). Enhancement of IBA stimulatory effect on rooting of olive cuttings. Scientia Hort 63: 189-198.

13. **Wiesman, Z.** and Lavee, S. (1995). Relationship of carbohydrate sources and IBA in olive cuttings. Aust J Plant Physiol 22: 811-816.

14. Atzmon, N., **Wiesman, Z.** and Van Staden, J. (1996). The effect of zeatin and iso-pentenyladenine on IAA transport from the shoot to the root of *Pinus pinea* seedlings. Plant Growth Reg 19: 13-18.

15. Zilka, S., **Wiesman, Z**., Klein, I. and David, I. (1996). Foliar applied urea confers freezing protection to avocado and peach. Scientia Hort 66: 85-92.

16. Atzmon, N., **Wiesman, Z**. and Fiene, P. (1997). Utilization of sewage sludge for stimulation of rooting of Bougainvillea cuttings. J Environ Hort 15: 1-5.

17. **Wiesman, Z**., Avidan, N., Lavee, S. and Quebedeaux, B. (1998). Molecular characterization of common olive cultivars in Israel and the West Bank. J Am Soc Hor Sci123: 837-841.

18. Lavee, S., Harshemesh, H., Haskal, A., Meni, Y., Wonder, M., Ogrodovich, A., Avidan, B., **Wiesman, Z**. Avidan, N. and Trapero Casas, A. (1999). 'Maalot' a new orchard resistant cultivar to Peacock eye leaf spot (*Spilocaea oleagina* cast.) Olivae 78: 51:59.

19. Schwartz, L., Wolf, D., Markus, A., **Wiesman, Z**. and Wybraniec, S. (2001). Controlled-release system for the insect growth regulator cyromazin. Clean Products and Processes 3: 49-54.

20. Wybraniec, S., Schwartz, L., **Wiesman, Z**., Markus, A. and Wolf, D. (2002). Release characteristics of encapsulated formulations incorporating plant growth factors. J. Environ. Health – Part B. Pesticides, Food Contaminants and Agricultural Wastes. B37: 235-245.

21. **Wiesman, Z**., De Malach, Y. and David, Y. (2002). Olives and saline water – story of success. International Water & Irrigation 22: 18-21.
22. Chapagain, P. B., **Wiesman, Z.,** M. Zaccai, M. Haims, P. and Magen, H. (2002). KCl enhances fruit appearance and improves quality of fertigated greenhouse tomato as compared to KNO_3. J Plant Nutr 26: 643-658.
23. Pelach, D., Markus, A. Abramovich, Z. and **Wiesman, Z.** (2002). The use of *Quillaja saponaria* extracts as potential mosquito larvicide. J Ethnopharmacology 81: 405-407.
24. **Wiesman, Z**., Markus, A., Wybraniec, S., Schwartz, L., Wolf, D. (2002). Promotion of rooting and development of cuttings by plant growth factors formulated into controlled-release system. Biology and Fertility of Soils 36: 330-334.
25. **Wiesman, Z**. and Chapagain, B. P. (2003). Natural saponin system for efficient, safe and cheap mosquito control. Dengue Bull 27: 168-173.
26. Maranz, S. and **Wiesman, Z**. (2003). Evidence for indigenous selection and distribution of the shea tree, *Vitellaria paradoxa*, and its potential significance to prevailing parkland savanna tree patterns in sub-Saharan Africa north of the equator. J Biogeography 30: 1505-1516.
27. **Wiesman, Z**., David, I. and Ben Dom, N. (2003). Optimization of saline water level for sustainable Barnea olives and oil production in desert conditions. Scientia Hort 100: 257-266.
28. Schwartz, L., Wolf, D., Markus, Wybraniec, S. and **Wiesman, Z**. (2003). Controlled-release systems for delivery of the insect growth regulator pyriproxifan. J Agric Food Chem 51: 5985-5989.
29. Schwartz, L., Wolf, D., Markus, Wybraniec, S. and **Wiesman, Z**. (2003). Controlled release systems for delivery of cyromazine. J Agric Food Chem 51: 5972-5976.
30. Maranz, S., **Wiesman, Z**. and Garti, N. (2003). Phenolic constituents of shea (Vitellaria paradoxa) kernels. J Agric Food Chem 51: 6268-6273.
31. Chapagain, P.B. and **Wiesman, Z.** (2004). Effect of potassium magnesium chloride in the fertigation solution as partial source of potassium on growth, yield and quality of greenhouse tomato. Scientia Hort 99: 279-288.
32. Maranz, S., **Wiesman, Z.,** Bisgaard, J. and Bianchi, G. (2004). Germplasm resources of *Vitellaria paradoxa* based on shea butter characteristics of regional and village populations across the species distribution range. Agroforestry Systems 60: 71-76.
33. Chapagain, P.B., **Wiesman, Z**. (2004). Effect of foliar spray of NutriVant Peak on plant development, yield and fruit quality of greenhouse grown tomatoes. Scientia Hort 102: 177-188.
34. Maranz, S., Kpikpi, W., **Wiesman, Z**. and De Saint Sauveur, A. (2004). Use and nutritional value of shea fruits, *Vitellaria paradoxa* (Sapotaceae), in the traditional African parkland-ecosystem of the Sudanian savanna belt. Econ Bot 58:588-600.

35. Maranz, S. and **Wiesman, Z**. (2004). Influence of climate on the tocopherol content of shea butter. J Agric Food Chem 52: 2934-2937.
36. Di Vincenzo, D., Maranz, M., Serraiocco, A., Vito, R., **Wiesman, Z**. and Bianchi, G. (2005). Regional variation in shea butter lipid and triterpene composition in four African countries. J Agric Food Chem. 53: 7473-7479.
37. Chapagain, B. and **Wiesman, Z.** (2005). Variation in diosgenin level in seed kernel among different provenances of *Balanites aegyptiaca* Del (Zygophyllaceae) and its correlation with oil content. African Journal Biotechnology. 4: 1209-1213.
38. Grinberg, S., Linder, C., Kolot, V., Waner, T., **Wiesman, Z**., Shaubi, E and Heldman, E. (2005). Novel Cationic Amphiphilic Derivaties from Vernonia oil: Synthesis and self-aggregation into Bilayer Vesicles, Nanoparticles, and DNA Complexants. Langmuir 21: 7638-7645.
39. Chapagain, B. and **Wiesman, Z**. (2005). Larvicidal effects of aqueous extracts of *Balanites aegyptiaca* (desert date) against the larvae of *Culex pipiens* mosquitoes. African Journal Biotechnology. 4: 1351-1354.
40. Chapagain, B. and **Wiesman, Z.** (2005). Larvicidal Activity of the Fruit Mesocarp Extract of *Balanites aegyptiaca* and its Saponin Fractions against *Aedes aegypti.* Dengue Bulletin 29: 203-207.
41. Cahapagain, B.P., Vinod, S., Pelah, D. and Yadav, R.C. and **Wiesman, Z** (2006). Bioproduction of Diosgenin in Callus Cultures of *Balanites aegyptiaca*: Effect of Growth Regulators, Explants, and Somatic Embryogenesis. Natural Products Communications 1: 215-221.
42. **Wiesman, Z**. and Chapagain, B.P. (2006). Larvicidal activity of extracts and fractions of Balanites aegyptiaca Del. Fruit mesocarp against Aedes aegypti mosquito larvae. Fitoterapaia 77: 420-424.
43. Stærk, D., Chapagain, B.P, Lindin, T., **Wiesman, Z**. and Jaroszewski,Z. (2006). Structural Analysis of Complex Saponins of *Balanites aegyptiaca* by ESI-MS^n and 800 MHz ^1H NMR. Magnetic Resonance Chem 44: 923-928. (
44. Chapagain, B.P. and **Wiesman, Z.** (2006). Saponins as a natural bio-adjuvant for delivery of agro-materials through plant cuticular membranes. J Agric Food Chem 54: 6277-6285.
45. Chapagain, B.P., **Wiesman, Z**. and Tzror, L. (2007). *In-vitro* study of antifungal activity of saponin-rich extracts from fruit mesocarp *of Balanites aegyptiaca,* bark extract of *Quillaja saponaria* and plant extract of *Yucca schidigera* against the common phytopathogenic fungi. Indus. Crops and Products 26:109-115.
46. Chapagain, B.P. and **Wiesman, Z**. (2007). Larvicidal properties of the 3 major furostanol saponins of Balanites aegyptiaca fruit mesocarp against Aedes aegypti mosquito larvae. Natural Product Communications 2: 807-810.
47. **Wiesman, Z**., Ben Dom, N., Sharvit, E., Grinberg, S., Linder, C., Heldman, E. and Zaccai, M. (2007). Novel cationic vesicle platform derived from Vernonia oil for efficient delivery of DNA through plant cuticle membranes. J. Biotechnology 130: 85-94.
48. Chapagain, B.P. and **Wiesman, Z**. (2007). Determination of saponins in *Balanites aegyptiaca* kernel cake of Israeli origin by HPLC-ESI/MS. Phytochemical Analysis 18: 354-362.

49. Kaufman, M. and **Wiesman, Z.** (2007). Pomegranate Oil Analysis with Emphasis on MALDI-TOF/MS Triacylglycerol Finger Printing. J. Agric Food Chem. 55: 10405-10413.
50. Chapagain, B., Saharan, V. and **Wiesman, Z.** (2008). Larvicidal activity of saponins from *Balanites aegyptiaca* callus against *Aedes aegypti* mosquito. Bioresources Technology 99:1165-1168.
51. **Wiesman, Z**., Wiessbein, S., Ephrath, J. and Zilberbush, M. (2008) Vegetative and Reproductive Response of Olive Varieties to Moderate Saline Water Irrigation. HortScience 43: 320-327.
52. Harel, M., Ben Dov, E., Rasoulouniriana, D., Siboni, N., Kramarsky-Winter, E., Barak, Z., **Wiesman, Z**. and Kushmaro, A. (2008). A new Thraustochytrid, strain *Fng1*, isolated from the surface-mucus of the hermatypic coral *Fungia granulosa*. FEMS Microbiology Ecology 64: 378-387.
53. Chapagain, B.P. and **Wiesman, Z**. (2009). Characterization of desert cultivated olive oils with emphasis on intact TAG profiles using MALDI-TOF/MS. J Agric Food Chem 57: 1135-1142.
54. Chapagain, B.P., Yeoushoa, Y. and **Wiesman, Z**. (2009). Desert date (*Balanites aegyptiaca*) as an arid lands sustainable bioresource for biodiesel. Bioresource Technology 100: 1221-1226.
55. Chapagain, B.P. and **Wiesman, Z**. (2009). Metabolomic profiling of saponins in *Balanites aegyptiaca* plant tissues using LC-ESI/MS and MALDI-TOF/MS. J Metabolomics 4: 357-366.
56. Ram, T., **Wiesman, Z**., and Edan, Y. (2009). Olive Oil Content Prediction Models Based on Image Processing. BioSystems Engineering. 105: 221-232.
57. Shwartz, E., Zulker, R., Glazer, I., Bar-Ya'akov, I., **Wiesman, Z**, Tripler, E., Bar-Ilan, I., Fromm, H., Borochov-Neori, H., Holland, D. and Amir, R. (2009). Geographical regions affect the color, taste and antioxidant capacity of 11 pomegranate accessions fruits. J Agric Food Chem. 57: 9197–9209.
58. Willson, R., **Wiesman, Z**. and Brenner, A. (2010). Analysing Alternative Bio-waste Feedstocks for Biodiesel Production Using TD-NMR. Waste Management . 30: 1881-1888.
59. Berman, P., Nizri, S., Parmet, I. and **Wiesman, Z**. (2010). Large scale screening of intact castor seeds by viscosity using LR-NMR and chemometrics. JAOCS 87: 1247-1254.
60. Rewald, B., Leuschner, Z., **Wiesman, Z**. and Ephrath, Y. (2010). Do root hydraulic properties influence the salt tolerance of olive trees? Plant Biosystems. 145: 12-22.
61. Beit-Yannai, E. Ben-Shabat, S., Gold, N., Chapagain, B.P., and **Wiesman, Z**. (2010). Antiproliferative Activity of Steroidal Saponins from *Balanites aegyptiaca* – an *in vitro* study. Phytochemistry Letters 4: 43-47.
62. Berman, P., Nizri, S., and **Wiesman, Z.** (2011).Castor oil biodiesel and its blends as alternative fuel. Biomass and Bioenergy 35: 2861-2866.
63. Berman, P. Leshem, A., Etziony, O., Levi, O, Parmat, Y, Saunders, M and **Wiesman, Z.** (2013). Novel ^{1}H Low Resolution (LR)-NMR Applications for the Biodiesel Industry. Biotechnology for Biofuels 6: 55-75.
64. Berman, P., Levi, O., Parmat, Y., Saunders, M. and **Wiesman, Z.** (2013). Laplace Inversion of LR-NMR Relaxometry Data using Sparse Representation Methods. Concepts in Magnetic Resonance A. 42:72-88.

65 Berman, P., Meiri, N, Colnago, L.A, Moraes, T.B., Linder, C., Levi, O., Parmet, Y., Saunders, M. and **Wiesman, Z.** (2014). Study of liquid phase molecular packing interactions and morphology of fatty acid methyl esters (biodiesel) by 1H LF-NMR relaxometry. Biotechnology for Biofuels 8: 12-28.

66. Meiri, N, Berman, P., Colnago, L.A, Moraes, T.B., Linder, C. and **Wiesman, Z.** (2015). Liquid phase characterization of molecular interactions in polyunsaturated and n-fatty acid methyl esters by 1H Low field nuclear magnetic resonance. Biotechnology for Biofuels 8: 96-108.

67. Yoshi, A., Rabinowitz, G., **Wiesman, Z.,** and Oron, G. (2015). Decision Support System Prototype for Evaluating Waste-to-Energy Technologies. Waste Management.

68. Berman, P., Meiri, N., Linder, C., **Wiesman Z.** (2016). 1H Low field nuclear magnetic resonance relaxometry for probing biodiesel autoxidation. Fuel 177: 315–325.

69. Ioannou-Ttofa, L., Michael-Kordatou, I., Fattas, S.C., Eusebio, A., Ribeiro, B., Rusan, M., Amer, A.R.B., Zuraiqi, S., Waismand, M., Linder, C., **Wiesman, Z.**, Gilron, J. And Fatta-Kassinos, J.D. (2017). Treatment efficiency and economic feasibility of biological oxidation, membrane filtration and separation processes, and advanced oxidation for the purification and valorization of olive mill wastewater**.** Water Res. 114: 1-13.

70. **Wiesman, Z.,** Linder, C, Ayalon, N, Resende, T.M, Levi, O, Colnago, L.A, Bernardinelli, O.D, Nascimento Mitre, C.I. (2018). 2D and 3D Spectrum graphics of the Chemical-Morphological Domains of Complex Biomass by Low Field Proton NMR Energy Relaxation Signal Analysis. Energy & Fuels *32*: 5090–5102.

71. Campisi-Pinto, S., Levi, L., Benson, D., Cohen, M., Resende, M.T., Saunders, M., Linder, L., **Wiesman, Z.** (2018). Analysis of the Regularization Parameters of Primal–Dual Interior Method for Convex Objectives Applied to 1H Low Field Nuclear Magnetic Resonance Data Processing. Applied NMR 49:1129-1150.

72. Tartakovsky, L., Veinblat, M., Baibikov, V., Katoshevski, D., **Wiesman, Z.** (2018). Impact of various blends of linseed oil-derived biodiesel on combustion and particle emissions of a CI engine - a comparison with diesel and soybean fuels. Energy Conversion and Management 178:178-189.

73. Resende, M.T., Campisi, S., Linder, C., **Wiesman, Z.** (2019). Multidimensional proton nuclear magnetic resonance relaxation morphological and chemical spectrum graphics for monitoring and characterization of polyunsaturated fatty-acid oxidation. JAOCS 96:125-135.

74. Resende, T., Linder, C., **Wiesman, Z.** (2019). ^{1}H LF-NMR energy relaxation time characterization of the chemical and morphological structure of PUFA-rich linseed oil during oxidation with and without antioxidants. Eur. J. Lipid Sci. and Tech. 121:1800339-1800347.

75. Campisi-Pinto, Resende, M.T., S., Levi, L., Benson, D., Cohen, M., Saunders, M., Linder, L., **Wiesman, Z.** (2019). Simulation-Based Sensitivity Analysis of Regularization Parameters for Robust Reconstruction of Complex Material's T1

− T21H LF-NMR Energy Relaxation Signals. Applied NMR. Applied NMR 51:41-58.

76. **Wiesman, Z.** and Linde, C. (2020). Facile NMR Relaxation Sensor for Monitoring of Biomass Degradation Products during Conversion to Biogas. In Nuclear Magnetic resonance, 1-20 published by IntechOpen. DOI:10.5772/intechopen.90257
77. Resende, M.T., Linder, C., **Wiesman, Z.** (2020). Alkyl Tail Segments Mobility as a Marker for Omega-3 PUFA-rich Linseed Oil Oxidative Aging. JAOCS 97:1283-1297.
78. Colnago, A.L., **Wiesman Z.**, Pages, G., Musse, M., Monaretto, T., Windt, C.W., Rondeau, C., (2020). Low field, time domain NMR in the agriculture and agrifood sectors: An overview of applications in plants, foods and biofuels. JMR 323: 106899- 106905.
79. Resende, M.T., Linder, C., **Wiesman, Z.** (2021). Low-Field Nuclear Magnetic Resonance Time Domain Characterization of Polyunsaturated Fatty Acid–Rich Linseed and Fish Oil Emulsions during Thermal Air Oxidation. JAOCS 98:495-508.
80. Resende , M.T., Osheter, T., Linder, C., **Wiesman, Z.** (2021). Proton Low Field NMR Relaxation Time Domain Sensor for Monitoring of Oxidation Stability of PUFA-Rich Oils and Emulsion Products. Foods 10:1395-1410.
81. Osheter, T., Linder C., **Wiesman, Z.** (2022). Time Domain (TD) Proton NMR Analysis of the Oxidative Safety and Quality of Lipid-Rich Foods Biosensors 2022, 12, 230-246. https://doi.org/10.3390/bios12040230.
82. Osheter, T., Casmpisi-Pinto, S., Resende, M.T., Linder, C., **Wiesman, Z.** (2022). ^{1}H LF-NMR Self-Diffusion Measurements for Rapid Monitoring of an Edible Oil's Quality with respect to its Oxidation Status. Molecules, 27, 6064. https://doi.org/10.3390/ molecules27186064.

83. Osheter, T, Campisi Pinto, S., Randieri , C., Perrotta, A., Linder, C. and Weisman, Z. (2023). Semi-Autonomic AI LF-NMR Sensor for Industrial Prediction of Edible Oil Oxidation Status. Sensors (accepted).

Published scientific reports and technical papers

1. **Wiesman, Z**. (2000). Development of novel foliar adjuvant. Report submitted to Chief Scientist of Ministry of Commerce and industry (150 pages).
2. **Wiesman, Z**. (2002). Development of new fire retardation formulations. Report submitted to Chief Scientist of Ministry of Commerce and industry (100 pages).
3. Maranz, S. and **Wiesman, Z**. (2003). Shea butter chemical analysis. Report submitted to the EU, FP4 (100 pages).
4. **Wiesman, Z**. (2006). *Balanites aegyptiaca* new concept for bio-energy. Report submitted to Ormat Industries (250 pages).
5. **Wiesman, Z**. and Edan, Y. (2007). Middle East Regional Workshop of Olive Oil Technology Upgrading Booklet, editing (softcover, 100 pages).
6. **Wiesman, Z.** (2008). Developing of new Israel branded pomegranate line. Report submitted to Chief Scientist of Ministry of Agriculture (200 pages).
7. **Wiesman, Z**. (2009). Characterization of industrial waste potential for Biodiesel in Israel. Report submitted to Chief Scientist of Ministry of Infrastructure (100 pages).
8. **Wiesman, Z**. (2010). Optimization of industrial waste for Biodiesel in Israel. Report submitted to Chief Scientist of Ministry of Infrastructure (80 pages).

9. **Wiesman, Z**., Gilron, J and Abramivich, J. (2015). Valorization of OMW polyphenols. Final report of Medolico project, submitted to ENPI (150 pages).

Recent Presentations in Conferences and Meetings

- Z. Wiesman, LF-NMR for monitoring of PUFA oxidation. Conference of Food and Nutrition 2018, Amsterdam (Invited lecture)
- Z. Wiesman, M.T Resende, C. Linder, 2D and 3D spectrums of ^{1}H LF NMR energy relaxation times of lipids to characterize the effect of their morphological and chemical domains on oxidation and antioxidant efficacy. Euro Fed Lipid Oxidation 2018, Graz.
- Z. Wiesman, Facile NMR relaxation sensor technology for food quality control. Hachva College, 2019 (Invited Lecture).
- Z. Wiesman, Smart NMR relaxation facile sensor for at-line monitoring of biomass degradation products during conversion of energy carriers materials in biorefinery plant, The 4th International Conference on new Energy and Future Energy Systems NEFES, 2019, Macau.
- Z. Wiesman, Magnetic Resonance Relaxation Sensor Application for Quality Control of Food Lipids Oxidation. Euro Fed Lipid 2019, Seville.
- Z. Wiesman, H LF NMR energy relaxation technology in the study of emulsions and monitoring of oxidation. Conference of Food and Nutrition Science 2019, Rome (Key Note Lecture).
- Z. Wiesman, Facile TD NMR Relexometry Sensor for Food Quality Control. 2019, CNR, Rome (Invited Lecture).
- Z. Wiesman, Intelligent TD NMR Relaxation Sensor for Monitoring of PUFA-rich Functional Food Quality. 18th Auremn NMR Users Virtual Meeting. 2021 (Plenary Lecture)
- Z. Wiesman, Multidimensional 1H NMR Relaxation Morphological and Chemical and Morphological Sensor for Monitoring PUFA Oxidation. 2022 AOCS Annual Meeting & Expo Atlanta May 1-4, 2022 (Invited Lecture).
- Z. Wiesman, T. Osheter, S. Camisi-Pinto, A. Osheter, C. Linder. Intelligent TD NMR Sensor to Assess Oil-rich Food Products Safety and Quality WSU, Pulman May 16, 2022 (Invited Lecture).
- TD NMR Sensor to Assess Oil-rich Food Products Safety and Quality UC Davis May 23, 2022 (Invited Lecture).
- Z. Wiesman. Intelligent TD NMR Sensor for Safety & Health Value of Plant based Food Products (Dairy & Meat Analogues). BGU Food Community special Lecture, November 21, 2022, Beer Sheva (invited Lecture).
- Z. Wiesman, T. Osheter, S. Camisi-Pinto, A. Osheter, C. Linder. Intelligent TD NMR Sensor to Assess Oil-rich Food Products Safety and Quality. BGU-Tai Workshop, Beer Sheva, December 15, 2002**.**
- Osheter,T., Campisi-Pinto, S., Linder., C and Wiesman, Z. Semi-Autonomic AI LF-NMR Sensor Diagnostic Application for Food Safety and Quality. ISBE, December 25, 2022, Tel Aviv, Israel.

Patents

- **Wiesman Z**, Linder C, Campisi-Pinto S, Osheter T, Semi-Autonomic AI LF-NMR Sensor for Industrial Prediction of Edible Oil Oxidation Status, US provisional patent Application No. 63/443,454*, filed February 6 2023*

- **Wiesman Z**, Linder C, Campisi-Pinto S, Osheter T, Osheter A, Semi-Autonomic Time Domain (TD) NMR Sensor for Food Safety Nutritional value and Quality, US provisional patent Application No. 63/319,334*, filed March 23 2022*
- **Wiesman Z,** Linder C, Novel food Formulations with oil body compositions of polyunsaturated fatty acids and antioxidants and other components whose preparation may be guided by low field (LF) proton (H1) nuclear magnetic resonance (NMR) energy relaxation technology to achieve chemical and morphological arrangements of the components needed for optimal nutritional health enhancement and oxidant stability, US provisional patent Application No. 63/283,573*, filed June 06 2021*
- Linder, C, **Wiesman, Z,** Chemical morphological arrangement needed for the PUFA-rich product's health enhancement, good shelf life and taste, guided by LF H1 NMR relaxation for quality control, US provisional patent Application No. 62/916,242*, filed August 17 2019*
- **Wiesman, Z,** Linder, C, Levi, O, Generation of nuclear magnetic resonance multidimensional T1 (spin-matrix)-T2 (spin-spin) energy relaxation maps and uses thereof, U.S. Patent Application No. 16/562,847, registered by the inventors August 2019
- **Wiesman, Z,** Linder, C, Levi, O Saunders, M, Morphological spectrum mapping using highly cost effective low resolution-proton nuclear magnetic resonance (LF H1 NMR) with novel signal processing of spin-spin relaxation time, US provisional patent Application No. 62/371,774 registered by BGU August 2016
- Linder, C, **Wiesman, Z,** Polyunsaturated fatty acids (PUFA)/antioxidant nano/ micron particles applied as a reactive surface layer against oxidation/peroxidation in pulmonary/lung/respiratory tissue due to smoke-gas, smog, air pollution, domestic, urban, rural and forest fires and cigarette smoke and tar, US provisional patent Application No. 62/342,954 filed May 2016
- Gilron, J, Linder, C, **Wiesman, Z,** Selective phenol removal membranes and valorization of olive oil waste streams, *PCT registered By BGU, WO 11-115,* 2015
- Shenhar S, Berman P, Linder C**, Wiesman Z,** Lipase-membrane transesterification bioreactor and LF-NMR monitoring, *BGU-026 US provisional patent, filed August 2014*
- **Wiesman, Z.,** Balanites aegyptiaca saponins for use as nanovesicles for encapsulating biol-active agents., *PCT Int. Appl. WO 2006137069.,* 2006
- **Wiesman, Z.,** Herskowitz, M., and Grinberg, S. **,** Production of biodiesel from Balanites aegyptiaca., *PCT Int. Appl. WO 2006126206.,* 2006
- **Wiesman, Z.** Markus, A., Multi-layer adjuvants for controlled delivery of agro-materials into plant tissues., *US patent registered by BGU. 10/488,388.,* 2004
- Grinberg, S., Heldman, E., Kolot, V., Linder, C. and **Wiesman, Z. ,** Amphiphilic derivatives for the production of vesicles, micelles and complexants, and precursors thereof. , *PCT registered by BGU, WO 02055011.,* 2002
- Riov, J., **Wiesman, Z**., Wilzeck, M. and Epstein, E. Composition for improving of rooting. Registered by Yissum. Israeli patent no. 094321., 1990.

Total publications ~ 150

Research Grants (last decade)

- 2008-2010. Two years study from Ministry of Infrastructure. "Evaluation of waste resources from biodiesel production in Israel". Z. Wiesman (P.I) and A. Brenner (375,000 NIS).
- 2011. One year extension study from Ministry of Infrastructure. "Evaluation of waste resources for biodiesel production in Israel". Z. Wiesman (P.I) (348,000 NIS).
- 2010-2014. Three years EU ENPI-CBCMED project. "Mediterranean cooperation in the treatment and valorization of olive oil mill wastewater (OMW) – MEDOLICO". Z. Wiesman (P.I) and J. Gilron (€458,000).
- 2011-2012. Two years study from Ministry of Infrastructure. "Maximization of Energy Extraction Capacity of Pomace for Biofuels". Z. Wiesman (P.I) and E. Bayer, Weizmann Institute (660,000 NIS).
- 2011-2012. One-year study from Shemen Industries "Edible oils and fats analyses". Z. Wiesman (P.I) (154,000 NIS)
- 2011-2015. Two years study from Israel Energy Initiative (IEI) "Analytics of Shale Rocks pyrolysis fuel and gas products". Z. Wiesman (P.I) (432,000 NIS).
- 2011-2013. Two years fellowships from Ministry of National Infrastructure for seven thesis students in Energy Engineering. Z. Wiesman (P.I) (700,000 NIS).
- 2012-2013. Two years study from Ministry of Energy and Water Resources. "Decision Supportive System for waste conversion to biofuels". G. Rabinovich (P.I), G. Oron(P.I) and Z. Wiesman(P.I) (280,000 NIS).
- 2013-2014. Two years study from Ministry of Environment Protection. "Study of Biofuels for Combustion Engine and Emissions". D. Katoshevsky (P.I), E. Sher (P.I) and Z. Wiesman (P.I) (200,000 NIS).
- 2015-2017. Three years study from Ministry of Energy and Water Resources. "Optimization of biofuels combustion and emission". D. Katoshevski (P.I), and Z. Wiesman (P.I) (900,000 NIS).
- 2017-2019. Three years study from Ministry of Science and Technology. "Facile Multi-Dimensional Proton LF-NMR Relaxation Biosensor System for Monitoring of Bio-Waste Conversion Process to Biofuels and By-Products". Z. Wiesman (P.I), C. Linder, O. Levi, D. Benson Karhi (1,500,000 NIS).
- 2021-2023. Two years study from The Israeli Innovation Authority – Kamin. "Optimization of LF-NMR relaxation sensor for healthy food products". Z. Wiesman (P.I), C. Linder, N. Shapira (1,150,000 NIS).
- 2022. Six months' study from Good Food Institute. Designed Natural Nano-Emulsion Systems of Omega-3 Nutritive Lipids with Other Nutrients Dispersed within Edible Vegetable Meat like Products for Enhanced Nutritional Value Z. Wiesman (P.I), C. Linder, S. Campisi-Pinto, N. Shapira (40,000 USD).