

Yuval ESHDAT Ph.D.



Emeritus Principal Research Director & Consultant
Agricultural Research & Development, Biotechnology & Innovative Bio-Economy

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Education

Ph.D. in Biological Chemistry (from the Department of Biophysics, the Weizmann Institute of Science, Israel, 1973). **M.Sc.** in Chemistry, The Hebrew University of Jerusalem.

Former Main Positions and Experience

- **Governmental Key Position in R&D:**
The Chief Scientist of the Ministry of Agriculture and Rural Development, Israel (2007-12).
- **Science & Research Management:** at the Agricultural Research Organization
 - **Director**, Institute of Horticulture and Floriculture (1998-2002).
 - **Head**, Center of Biotechnology (1991-95).
 - **Head**, Dept. of Fruit-Tree Breeding and Molecular Genetics (1990-98).
 - **Director**, Division of Research Projects and Budgets (1981-90).
- **Scientific Research:**
 - **Principal Research Director** ("Research Professor"), an established senior scientist in Horticulture Molecular Genetics and Agricultural Biotechnology in the ARO (1981-2013).
 - **Senior Scientist**, Department of Biophysics, the Weizmann Institute of Science, Israel (1973-81).
 - **Research Associate**, Yale University School of Medicine, New Haven, USA (1974-6).
 - **Visiting Scientist/Professor** at top research centers worldwide [such as: Max-Planck-Institut (4m), Institut Pasteur (1y), Tel-Aviv University (1y), Institut Cochin & Université Paris VII (2y)].
- **International & local R&D mediation and policy:**
 - **Co-Chairperson of BARD** (USA-Israel Bi-national Agricultural R & D Fund, 2007-12).
 - **General Secretary and Treasurer** of **5** international scientific conferences (GlycoX Sym. '89, IUB Congress '92, IAPTC Congress '98, IUBMB Sym. '98, FEBS Congress 2002).
 - **Co-Chairperson** of the Egypt-Israel bi-lateral committee for agriculture (2007-11).
 - **Member**, the Governing Boards of **8** European Research Area Networks (ERA-Nets) dealing with: plant genomics and science, agricultural ICT, veterinary diseases, Mediterranean agriculture, rural agriculture, industrial biotechnology (2007-17).
 - **Member**, the Governing Board of the European joint initiative on Food Crisis and Climate Change (JPI-FACCE) (2007-13).
 - **Scientific Expert** of the European Program Committee of the Seventh Framework Program (FP7) on Food, Agriculture, Fishery and Biotechnology (2007-13).
 - **National Delegate and Member of SCAR** (the EU Standing Committee for Agricultural Research) (2007-13).
 - **Expert**, Euro-Mediterranean Expert Group (EMEG), EU project MEDSPRING (Mediterranean Science, Policy, Research and Innovation Gateway) & PRIMA (2015-17)
 - **Team Member**, Shirat Enterprises Ltd project with Tianjin Academy of Agriculture Science (2013).
 - **Member, Board of Directors**, Israel Oceanographic and Limnological Research Institution (IOLR, a non-profit governmental corporation). (2012-2015).
 - **Chief Scientific Advisor**, Israel Wine Grape Board (2012-2015).

Current Professional Activity

- **Emeritus Principal Scientist** ("Research Professor"), the Agricultural Research Organization, Volcani Center.
- **Consultant**, BioHarvest Ltd., Rehovot, Israel.
- **Consultant**, Chief Scientist Office, the Ministry of Agriculture and Rural Development, Israel.
- **Expert**, the European Framework **Program Committee for Horizon 2020** Societal Challenge 2 Bioeconomy [Food Security, Sustainable Agriculture and Forestry, Marine and Maritime and Inland Water Research and the Bioeconomy, *European Commission - DG Research & Innovation*] (2014-20); on behalf of Israel Government & ISERD.
- **Chairman**, Scientific Advisory and Policy Board, New Reality Solution (NRS), Israel (<https://www.nr-s.net/about-us/management/dr-yuval-eshdat-ph-d/>)

Scientific Research Areas & Interest

Structure and Function of Proteins - Especially: receptors; biomembranes; protein engineering; signal transduction; anti-oxidants, anti-inflammatory agents. Plant Functional Genomics and Proteomics; molecular breeding; environmental-abiotic stress tolerance; secondary metabolites. Biofood.

Agricultural Biotechnology focused on the above areas. Climate Change; Food & Nutrition Security.

General Current Activity:

Expert, Entrepreneur & Consultant in Agricultural Innovative Knowledge-based Bio-Economy; R&D Strategy; Projects' Planning, Mediating & Directing.

LIST OF SELECTED PUBLICATIONS

PEER-REVIEWED ARTICLES

1. Mayer, I., and Eshdat, Y. (1968). MSi_xGe_{2-x} ternary phases of rare earth metals. *Inorganic Chem.* 7, 1904-1908.
2. Mayer, I., and Fromerman-Eshdat, Y. (1968). The $YbSi_xGe_{2-x}$ system. *J. Less-Common Metals* 15, 355-356.
3. Eshdat, Y., and Mirelman, D. (1972). An improved method for the recovery of compounds from paper chromatograms. *J. Chromat.* 65, 458-459.
4. Maron, E., Eshdat, Y., and Sharon, N. (1972). Immunological studies of affinity labelled hen egg-white lysozyme and of the active site region of related lysozymes. *Biochim. Biophys. Acta* 278, 243-249.
5. Moulton, J., Eshdat, Y., and Sharon, N. (1973). The identification by X-ray crystallography of the site of attachment of an affinity label to hen egg-white lysozyme. *J. Mol. Biol.* 75, 1-4.
6. Eshdat, Y., McKelvy, J.F., and Sharon, N. (1973). Identification of Asp 52 as a point of attachment of an affinity label in hen egg-white lysozyme. *J. Biol. Chem.* 248, 5892-5898.
7. Eshdat, Y., and Sharon, N. (1973). Lysozyme, an enzyme which dissolves bacteria. *Mada*, 18, 76-84 (in Hebrew).
8. Sharon, N., and Eshdat, Y. (1974). Affinity labeling of lysozymes. In E.F. Osseman, R.E. Canfield and S. Beychok (Eds.), *Lysozyme* (pp. 195-218). New York: Academic Press.
9. Sharon, N., Eshdat, Y., Maoz, I., Bernstein, Y., Prager, E.M., and Wilson, A.C. (1974). Comparative studies of the active site region of lysozymes from eleven different sources. *Israel J. Chem.* 12, 591-603.
10. Eshdat, Y., Dunn, A., and Sharon, N. (1974). Chemical conversion of aspartic acid 52, a catalytic residue in hen egg-white lysozyme, to homoserine. *Proc. Natl. Acad. Sci. U.S.A.* 71, 1658-1662.
11. Eshdat, Y., and Sharon, N. (1977). Affinity labeling of lysozyme. *Methods Enzymol.* 46, 403-414.
12. Leung, J.P., Plow, E.P., Eshdat, Y., Marchesi, V.T., and Edgington, T.S. (1977). Delineation of three classes of CEA antigenic determinants: Identification of membrane-associated CEA as an independent species of CEA. *J. Immunol.* 119, 271-276.
13. Leung, J.P., Eshdat, Y., and Marchesi, V.T. (1977). Colonic tumor membrane-associated glycoprotein: Isolation of antigenically-active peptides after chemical cleavage. *J. Immunol.* 119, 664-670.
14. Fukuda, M., Eshdat, Y., Tarone, G., and Marchesi, V.T. (1978). Isolation and characterization of peptides derived from the cytoplasmic segment of Band 3, the predominant intrinsic membrane protein of the human erythrocyte. *J. Biol. Chem.* 253, 2419-2428.
15. Eshdat, Y., Ofek, I., Yashouy-Gan, Y., Sharon, N., and Mirelman, D. (1978). Isolation of a mannose-specific lectin from *Escherichia coli* and its role in the adherence of the bacteria to epithelial cells. *Biochem. Biophys. Res. Commun.* 85, 1551-1559.
16. Eshdat, Y., and Lemay, A. (1979). Specific fragmentation of human erythrocyte spectrin by chemical cleavage at cysteine residues. *Biochim. Biophys. Acta* 577, 360-370.
17. Eshdat, Y., and Prujansky-Jakobovits, A. (1979). Isolation of human erythrocyte membranes and their outer surface proteins by covalent fractionation on solid support. *FEBS Lett.* 101, 43-46.
18. Hsu, C.J., Lemay, A., Eshdat, Y., and Marchesi, V.T. (1979). Substructure of human erythrocyte spectrin. *J. Supramol. Struct.* 10, 227-239.
19. Mirelman, D., Altman, G., and Eshdat, Y. (1980). Screening of bacterial isolates for mannose-specific activity by agglutination of yeasts. *J. Clin. Microbiol.* 11, 328-331.
20. Eshdat, Y., Silverblatt, F.J., and Sharon, N. (1981). Dissociation and reassembly of *Escherichia coli* type 1 pili. *J. Bacteriol.* 148, 308-314.
21. Jakobovits, A., Eshdat, Y., and Sharon, N. (1981). Receptor isolation without the use of detergents by plucking from cell surfaces. *Proceedings of the 9th Aharon Katzir-Katchalsky Conference on "Carbohydrate-Protein Interactions", Israel.*
22. Sharon, N., Eshdat, Y., and Ofek, I. (1981). Bacterial adherence to cell surface sugars. *Proceedings of the 9th Aharon Katzir-Katchalsky Conference on "Carbohydrate-Protein Interactions", Israel.*
23. Eshdat, Y., Speth, V., and Jann, K. (1981). Participation of pili and cell wall adhesin in the yeast cell agglutination activity of *Escherichia coli*. *Infect. Immun.* 34, 980-986.
24. Sharon, N., Silverblatt, F.J., Ofek, I., Goldhar, J., and Eshdat, Y. (1981). Studies on the structure and phenotypic expression of mannose-specific lectins that mediate bacterial adherence to surface sugars of mammalian cells. *Proceedings of the 6th International Symposium on Glycoconjugates*, pp. 389-390.
25. Sharon, N., Eshdat, Y., Silverblatt, F.J., and Ofek, I. (1981). Bacterial adherence to cell surface sugars. In K. Elliot, M. O'Connor and J. Whelan (Eds.), *Adhesion and Micro-Organism Pathogenicity* (pp. 119-135). London: Pitman Medical Ltd.
26. Jakobovits, A., Eshdat, Y., and Sharon, N. (1981). Plucking of lectin receptors from erythrocytes: isolation of cell surface compounds without the use of detergents. *Biochem. Biophys. Res. Commun.* 100, 1484-1490.

27. Ofek, I., Goldhar, J., Eshdat, Y., and Sharon, N. (1982). The importance of mannose specific adhesins (lectins) in infections caused by *Escherichia coli*. *Scand. J. Infect. Dis.* 33, S61-67.
28. Eshdat, Y., and Sharon, N. (1982). *Escherichia coli* surface lectins. *Methods Enzymol.* 83, 386-391.
29. Mirelman, D., Izhar, M., and Eshdat, Y. (1982). Carbohydrate recognition mechanisms which mediate microbial adherence to mammalian mucosal surfaces. *Tokai J. Exp. Clin. Med.* 7, 177-183.
30. Eshdat, Y., and Sharon, N. (1983). The molecular basis of bacterial adherence to epithelial cells. In: T.C. Bog-Hansen and G.A. Spengler (Eds.), *Lectins Vol. 3* (pp. 667-675). Berlin & New York: Walter de Gruyter & Co.
31. Eshdat, Y., and Sharon, N. (1984). Recognitory bacterial surface lectins which mediate its mannose-specific adherence to eukaryotic cells. *Biol. Cell* 51, 259-266.
32. Marullo, S., Delavier-Klutchko, C., Eshdat, Y., Strosberg, A.D., and Emorine, L. (1988). Human β_2 -adrenergic receptors expressed in *Escherichia coli* membranes retain their pharmacological properties. *Proc. Nat. Acad. Sci. U.S.A.* 85, 7551-7555.
33. Emorine, L.J., Marullo, S., Briend-Sutren, M., Delavier, C., Eshdat, Y., Guillet, J.-G., Patey, G., and Strosberg, A.D. (1989). Molecular physiology of adrenergic receptors. In P. Vermeire, M. Demedts and J.-C. Yernault (Eds.), *Progress in Astma and COPD* (pp. 113-121). Amsterdam: Elsevier Science Publishers BV.
34. Eshdat, Y., Chapot, M.-P., and Strosberg, A.D. (1989). Chemical characterization of ligand binding site fragments from turkey β -adrenergic receptor. *FEBS Letters* 246, 166-170.
35. Emorine, L.J., Marullo, S., Sutren, M., Delavier, C., Eshdat, Y., Raposo, G., and Strosberg, A.D. (1989). Common properties of receptors coupled to GTP binding regulatory proteins. In A. Maelicke (Ed.), *NATO ASI Series, Vol. H32. Molecular biology of neuroreceptors and ion channels* (pp. 245-257). Berlin-Heidelberg: Springer-Verlag.
36. Chapot, M.-P., Eshdat, Y., Marullo, S., Guillet, J.-G., Charbit, A., Strosberg, A.D., and Delavier-Klutchko, C. (1990). Localization and characterization of three different β -adrenergic receptors expressed in *Escherichia coli*. *Eur. J. Biochem.* 187, 137-144.
37. Holland, D., Ben-Hayyim, G., Faltin, Z., Camoin, L., Strosberg, A.D., and Eshdat, Y. (1993). Gene (*csa*) for salt stress protein (*Cit-SAP*) from *Citrus sinensis* homologous to mammalian glutathione peroxidase; sequence of two clones: R10-, xC7 and R10-C16 (Sequence announcement). *Plant Mol. Biol.* 21, 738.
38. Holland, D., Eshdat, Y., Faltin, Z., and Ben-Hayyim, G. (1993). Molecular cloning of *csa*, a gene from citrus encoding a protein potentially involved in the defence against oxidative stress. *Acta Hort.* 329, 228-230.
39. Ben-Hayyim, G., Faltin, Z., Gepstein, S., Camoin, L., Strosberg, A.D., and Eshdat, Y. (1993). Isolation and characterization of salt-associated protein in Citrus. *Plant Sci.* 88, 129-140.
40. Holland, D., Ben-Hayyim, G., Faltin, Z., Camoin, L., Strosberg, A.D., and Eshdat, Y. (1993). Molecular characterization of salt-stress associated protein in citrus: protein and cDNA sequence homology to mammalian glutathione peroxidases. *Plant Mol. Biol.* 21, 923-927.
41. Holland, D., Faltin, Z., Perl, A., Ben-Hayyim, G., and Eshdat, Y. (1994). A novel plant glutathione peroxidase like protein provides tolerance to oxygen radicals generated by paraquat in *E. coli*. *FEBS Letters* 337, 52-55.
42. Guillaume, J.-L., Petitjean, F., Haasemann, M., Bianchi, C., Eshdat, Y., and Strosberg, A.D. (1994). Antibodies for the immunochemistry of the human β_3 -adrenergic receptor. *Eur. J. Biochem.* 224, 761-770.
43. Naot, D., Ben-Hayyim, G., Eshdat, Y., and Holland, D. (1995). Drought, heat and salt stress induce the expression of a citrus homologue of an atypical late-embryogenesis *Lea5* gene. *Plant Mol. Biol.* 27, 619-622.
44. Beeor-Tzahar, T., Ben-Hayyim, G., Holland, D., Faltin, Z., and Eshdat, Y. (1995). A stress-associated citrus protein is a distinct plant phospholipid hydroperoxide glutathione peroxidase. *FEBS Letters* 366, 151-155.
45. Naot, D., Holland, D., Avsian-Krechmer, O., Eshdat, Y., and Ben-Hayyim, G. (1995). Induction of a gene encoding an oleosin homologue in cultured citrus cells exposed to salt-stress. *Gene* 161, 171-173.
46. Eshdat, Y., Holland, D., Faltin, Z., and Ben-Hayyim, G. (1997). Plant glutathione peroxidases. *Physiol. Plant.* 100, 234-240.
47. Perl, A., and Eshdat, Y. (1998). DNA transfer and gene expression in transgenic grapes. *Biotechnology and Genetic Engineering Reviews* 15, 365-386.
48. Faltin, Z., Camoin L., Ben-Hayyim G., Perl A., Beeor-Tzahar T., Strosberg A.D., Holland D., and Eshdat Y. (1998). Cysteine is the presumed catalytic residue of *Citrus sinensis* phospholipid hydroperoxide glutathione peroxidase over-expressed under salt stress. *Physiol. Plant.* 104, 741-746.
49. Avsian-Kretchmer, O., Gueta-Dahan, Y., Eshdat, Y., and Ben-Hayyim, G. (1999). Salt tolerance and oxidative stress as studied by the regulation of phospholipid hydroperoxide glutathione peroxidase in salt-sensitive and salt-tolerant citrus cells. In A. Altman, M. Ziv and S. Izhar (Eds.), *Proceedings of the IX International IAPTC Congress on Plant Tissue and Cell Culture - Plant Biotechnology and In Vitro Biology in the 21st Century* (pp. 457-460). Dordrecht/Boston/London: Kluwer Academic Publishers.
50. Federici, C., Eshdat, Y., Richard, I., Bertin, B., Guillaume, J.-L., Hattab, M., Beckmann J.S., Strosberg, A.D., and Camoin, L. (1999). Purification and identification of two putative autolytic sites in human calpain 3 expressed in heterologous systems. *Arch. Biochem. Biophys.* 363, 237-245.
51. Ben-Hayyim, G., Holland, D., and Eshdat, Y. (1999). Salt induced proteins related to oxidative stress: PHGPX and other proteins of the Asada-Halliwel cycle. In C. Calvert, M. Smallwood and D. Bowles (Eds.) *Plant Responses to Environmental Stress* (pp. 173-177). Oxford, UK: BIOS Scientific Publishers Ltd.
52. Avsian-Kretchmer, O., Eshdat, Y., Gueta-Dahan, Y., and Ben-Hayyim, G. (1999). Regulation of stress-induced phospholipid hydroperoxide glutathione peroxidase expression in citrus. *Planta* 209, 469-477.
53. Ye, B., Faltin, Z., Ben-Hayyim, G., Eshdat, Y., and Gressel, J. (2000). Correlation of glutathione peroxidase to paraquat/oxidative stress resistance in *Conyza* determined by direct fluorometric assay. *Pestic. Biochem. Phys.* 66, 182-194.
54. Horev, G., Einat, P., Aharoni, T., Eshdat, Y., and Friedman-Einat, M. (2000). Molecular cloning and properties of the chicken leptin-receptor (CLEPR) gene. *Mol. Cell. Endo.* 163, 95-106.
55. Gollop, R., Eshdat, Y., Perl, A., and Tsoolova, V. (2000). Proanthocyanidins production in tissue culture: regulation of dihydroflavonol reductase promoter-GUS-intron fusions in grapes. *Acta Hort.* 528, 395-400.
56. Dunn, I.C., Boswell, T., Friedman-Einat, M., Eshdat, Y., Burt, D.W., and Paton, I.R. (2000). Mapping of the leptin receptor gene to chicken chromosome 8. *Anim. Genet.* 31, 290.

57. Hazebrouck, S., Camoin, L., Faltin, Z., Strosberg, A.D., and Eshdat, Y. (2000). Substituting selenocysteine for catalytic cysteine 41 enhances enzymatic activity of plant phospholipid hydroperoxide glutathione peroxidase expressed in *E. coli*. *J. Biol. Chem.* 275, 28715-28721.
58. Friedman-Einat, M., Camoin, L., Faltin, Z., Rosenblum, C.I., Kaliouta, V., Eshdat, Y., and Strosberg, A.D. (2002). Serum leptin activity in obese and lean patients. *Regul. Peptides* 11, 77-82.
59. Perl, A., Colova-Tsolova, V., and Eshdat, Y. (2004). *Agrobacterium*-mediated transformation of grape embryogenic calli. In: I.S. Curtis (Ed.) *Transgenic Crops of the World* (pp. 229-242). Dordrecht, The Netherlands: Kluwer Academic Publishers.
60. Velcheva, M., Faltin, Z., Flaishman, M., Eshdat, Y. and Perl, A. (2005). A liquid culture system for *Agrobacterium*-mediated transformation of tomato (*Lycopersicon esculentum*, L. Mill). *Plant Sci.* 168, 121-130.
61. Herbette, S., Le Menn, A., Patrick Rousselle, P., Ameglio, T., Faltin, Z., Branlard, G., Eshdat, Y., Julien, J-L., Drevet JR. and Roeckel-Drevet P. (2005). Modification of photosynthetic regulation in tomato overexpressing glutathione peroxidase. *Bioch. Biophys. Acta* 1724:108-18.
62. Velcheva, M., Faltin, Z., Vardi A., Eshdat, Y. and Perl, A. (2005). Regeneration of *Aloe arborescens* via somatic organogenesis from young inflorescences. *Plant Cell Tiss. Org.* 83:293-301.
63. Perl, A., and Eshdat, Y. (2007). Grapes. In: *Biotechnology in Agriculture and Forestry - Transgenic Crops V. Vol. 60*. (E.C. Pua and M.R. Davey, eds.) Springer-Verlag, Berlin Heidelberg, pp. 189-208.
64. Faltin Z., Holland D., Margarita Velcheva, Marina Tsapovetsky M., Roeckel-Drevet P., Handa A.K., Abu-Abied M., Friedman-Einat M., Yuval Eshdat Y. and Avihai Perl A. (2010). Glutathione Peroxidase Regulation of Reactive Oxygen Species Level is Crucial for In Vitro Plant Differentiation. *Plant Cell Physiol.* 51:1151-1162.
65. Velcheva, M., Faltin, Z., Vardi, A., Hanania, U., Eshdat Y. and Perl, A. (2010). Amberite XAD-4 beads and antioxidants enhance transformation and regeneration of *Aloe Vera* in suspension cultures. *In Vitro Plant Cell Dev. Biol. – Plant.* 46: 477-484.
66. Leibowitz, A., Faltin, Z., Perl, A., Eshdat, Y., Hagay, Y., Peleg, E. and Grossman, E. (2014). Red grape berry-cultured cells reduce blood pressure in rats with metabolic-like syndrome. *Euro. J. Nutr.* 53:973-980.

Patents

- 1999 Polynucleotides and Polypeptides of Avian Leptin Receptor - M. Einat-Friedman, G. Horev and Y. Eshdat.
- 1999 Plant Enzymes with Phospholipid Hydroperoxide Glutathione Peroxidase Activity, their Analogues and their Use - Y. Eshdat and A.D. Strosberg.
- 2005 Polyphenols Derived from Red-Wine Cell Lines for Prevention of Atherosclerotic Inflammation - Y. Eshdat and A. Perl. A company (BioHarvest Ltd.) is currently (2015) produces and commercializes of the patented product - Vinia.

IN ADDITION:

OVER 60 ABSTRACTS OF LECTURES AND POSTERS PRESENTED IN SCIENTIFIC AND PROFESSIONAL MEETINGS (NOT LISTED)