

Vitae
Robert E. Levin

Office address: Dept. Food Science Phone no: 413-545-0187
Chenoweth Lab. Fax no: 413-545-1262
UMass, Amherst E-mail: relevin@foodsci.umass.edu

Date of birth: December 1, 1930

Education: B.S. Biology, Los Angeles State College, 1953
 M.S. Bacteriology, University of Southern California, 1954
 Ph.D. Microbiology, University of California at Davis, 1963

Positions: Assistant – full Professor of Food Science, University of Mass.
 Amherst, 1964 – present.
 Assistant Professor of Microbiology, Oregon State University,
 Corvallis Oregon, 1963 - 1964.
 Director of Research Bonnie Food Co., Sacramento, CA 1961-63.

Professional societies:

American Society for Microbiology
Society of Applied Bacteriology
Institute of food Science

Professional activities:

Past Chairman Atlantic Fisheries Technological Conference, Past President Connecticut Valley Chapter of American Society for Microbiology, past member Edit. Bd. J. Food Biochem., Ed. Bd. J. Food Safety, and present member Ed. Bd. J. Food Protection. Past member NSF Biomedical Ph.D. Fellowship Review Panel, and past member U.S.D.A NRI review Panel. Present ad hoc reviewer for Cornell University and University of Maryland Sea Grant proposals, USDA SB proposals, BARD proposals, J. Agric. & Food Chem., and J. Food Science, and J. Food Biochem.

Areas of research interest:

Mol. biol. of low temp. bacteriophage infections of fish spoilage bacteria, metabolism and taxonomy of fish spoilage bacteria, bacterial production of gums. bacterial rennet production, detection of mutagens and carcinogens in foods, mechanisms of chemical modulation of DNA repair, fish protein hydrolysates, detection of human infectious bacteria in foods by immunological and PCR methodology, industrial fermentations, toxicology, toxic marine algae, real-time PCR,

Research Funds

Professor in charge of departmental fisheries microbiology program 1966-69. Funded from Bureau of Commercial Fisheries. 1966-69. \$152,000.

Recipient of NIH grant for studies on the metabolism and taxonomy of psychrotrophic food spoilage and related human pathogenic bacteria. 1966-1975. \$135,000

Recipient of U.S. Army Natick Laboratory Research Grant for studies on spoilage volatiles in refrigerated beef. 1974-1977. \$21,000.

Recipient of industrial grant for production of bacterial gums and their characterization. Kelco Corp. 1975-1979. \$52,000.

Isolation and characterization of fungal pullulanase. 1980-1981. Dept. of Energy. \$10,000.

Shellfish depuration studies. 1985-1986. Mass. Dept. of Quality and Environmental Engineering. \$50,000.

Studies on mechanisms of antimutagenicity. 1978-1989. U.S.D.A. \$166,717.

Studies on fish hydrolysates. 1985-1986. Peoples Republic of China. Chinese scholars program. \$14,000.

Studies on fish hydrolysis. 1985. Healy public service grant. \$5,000.

Production and chemical characterization of fish hydrolysates. New England Fisheries Development Foundation. 1986-1987. \$26,000.

Development of High Value Products From Fish Processing Plant Wastes Via a Non Polluting Method. Massachusetts of Centers of Excellence Corporation. Corecipient with The Center for Applied Regional Studies and Woods Hole Oceanographic Institute. 1987 -1989. \$60,000./\$130,000.

Studies on the mutation of *Chlorella vulgaris* to salt tolerance. 1988. Egyptian postdoctoral AID funds. \$8,225.

Studies on antimutagenic components of foods. 1989. Egyptian post-doctoral AID funds. \$10,225.

Studies on monoclonal antibody production to cell wall antigens of *Listeria monocytogenes*. 1989. Egyptian AID funds. \$10,225.

Studies on the chemical composition of meat extract concentrates. 1990. Egyptian postdoctoral AID funds. \$10,225.

Studies on genetic transformation of virulence factors in *Listeria monocytogenes*. 1990. U.S.D.A. (Hatch) \$13,700.

Studies on the conversion of fish waste via fermentation to fish feed. Northeast Aquaculture Center. 1990-1992. \$32,000.

Studies on the isolation of paralytic shellfish toxins from bacteria associated with algae. National Oceanographic and Aeronautic Administration (NOAA) 1990 - 1992. \$72,720.

Detection of bacterial pathogens and spoilage yeasts in foods by coupled immunomagnetic bead-PCR methodology. U.S.D.A. 1995-1999. \$75,000.

Development of methodology for direct PCR detection of *E. coli* 0157:H7 in raw meat. U.S.D.A. 1996-1998. \$53,571.

Studies on detection of food pathogenic bacteria on seafood. Four postdoctoral fellowships of 1 year each with partial salaries furnished by Chinese government. 2001-2005. \$48,000.

Seafood Safety Program. U.S.D.A. 2000 - 2002. \$238,000.

Seafood Safety Program. U.S.D.A. 2001 - 2003. \$250,000.

Seafood Safety Program. U.S.D.A. 2002 - 2004. \$374,145.

Seafood Safety Program. U.S.D.A. 2003 - 2005. \$394,705.

Seafood Safety Program. U.S.D.A. 2004 - 2006. \$352,000.

Seafood Safety Program. U.S.D.A. 2005 - 2007. \$439,000.

Publications

Bartholomew, J. W. and R. E. Levin. 1955. The structure of *Saccharomyces carlesburgensis* and *S. cerevisiae* as determined by ultra-thin sectioning methods and electron microscopy. *J. Gen. Microbiol.* **12**: 473-477.

Levin, R. E., F. M. Sawyer and P. G. Scheurer. 1966. A limited study on the sanitation of fishing trawler holds. *J. Milk and Food Technol.* **29**: 336-337.

Levin, R. E. and Reese H. Vaughn. 1966. *Desulfovibrio aestuarii*, the causative agent of hydrogen sulfide spoilage of fermenting olive brines. *J. Food Science* **31**: 768-772.

Levin, R. E. 1968. Detection and incidence of specific spoilage bacteria on fish. I. Methodology. *Appl. Microbiol.* **16**: 1734-1737.

Chai, T. C., C. Chen, A. Rosen and R. E. Levin. 1968. Detection and incidence of specific spoilage bacteria on fish. II. Relative incidence of *P. putrefaciens* and fluorescent pseudomonads on haddock fillets. *J. Appl. Microbiol.* **16**: 1738-1741.

Levin, R. E. and vaughn, R. H. 1968. Spontaneous spheroplast formation by *Desulfovibrio aestuarii*. *Canadian J. Microbiol.* **14**: 1271-1276.

Delisle, A. L. and R. E. Levin. 1969. Bacteriophages of psychrophilic pseudomonads. I. Host range of phage pools active against fish spoilage and fish pathogenic pseudomonads. *Antonie van Leeuwenhoek J. Microbiol. and Serol.* **35**: 307-317.

- Delisle, A. L. and R. E. Levin. 1969. Bacteriophages of psychrophilic pseudomonads. II. Host range of phage active against *Pseudomonas putrefaciens*. *Antonie van Leeuwenhoek J. Microbiol. and Serol.* **35**: 318-324.
- Levin, R. E. 1969. Electrically heated cuvette chamber for deoxyribonucleic acid melting point determinations. *Appl. Microbiol.* **18**: 528-530.
- Sadovski, A. Y. and R. E. Levin. 1969. Extracellular nuclease activity of fish spoilage bacteria,; fish pathogens and related species. *Appl. Microbiol.* **17**: 787-789.
- Moore, G. S., H. A. Peters and R. E. Levin. 1970. Alterations in the electrophoretic protein patterns of refrigerated fish. *J. Fish. Res. Bd. Canada.* **27**: 31-38.
- Chen, M. K. C. and R. E. Levin. 1970. Chemical destruction of *Aspergillus niger* conidiospores. *J. Food Science.* **35**: 62-66.
- Rosen, A. and R. E. Levin. 1970. Detection and incidence of *Escherichia coli* on storage pen surfaces of fish trawlers. *Appl. Microbiol.* **20**: 107-112.
- Delisle, A. L. and R. E. Levin. 1972. Characteristics of three phages infectious for psychrophilic fishery isolates of *Pseudomonas putrefaciens*. *Antonie van Leeuwenhoek J. Microbiol. and Serol.* **38**: 1-8.
- Delisle, A. L. and R. E. Levin. 1972. Effect of temperature on an obligately psychrophilic phage-host system of *Pseudomonas putrefaciens*. *Antonie van Leeuwenhoek J. Microbiol. and Serol.* **38**: 9-15.
- Levin, R. E. 1972. Correlation of DNA base composition and metabolism of *Pseudomonas putrefaciens* isolates from food, human clinical specimens and other sources. *Antonie van Leeuwenhoek J. Microbiol. and Serol.* **38**: 121-127.
- Goodwin, K., R. E. Levin and R. G. Doggett. 1972. Autosensitivity of *Pseudomonas aeruginosa* to its own pyocin. *Inf. and Imm.* **6**: 889-892.
- Chen, T. C., W. W. Nawar and R. E. Levin. 1974. Identification of major high-boiling volatile compounds produced during refrigerated storage of haddock fillets. *Appl. Microbiol.* **28**: 679-680.
- Chen, T. C. and R. E. Levin. 1974. Taxonomic significance and phenethyl alcohol production by *Achromobacter* isolates from fishery sources. *Appl. Microbiol.* **28**: 681-687.
- Chen, T., C. and R. E. Levin. 1975. Isolation of *Aeromonas* sp. ATCC 29063, a phenol-producing organism, from fresh haddock. *Appl. Microbiol.* **30**: 120-122.
- Williams, J. L. and R. E. Levin. 1975. Bacteriocin typing of *Pseudomonas putrefaciens* from food, human clinical specimens and other sources. *Antonie van Leeuwenhoek J. Microbiol. and Serol.* **41**: 97-100.
- Levin, R. E. 1975. Characteristics of weak-H₂S-producing isolates of *Pseudomonas putrefaciens* from human infections. *Antonie van Leeuwenhoek J. Microbiol. and Serol.* **41**: 137-142.

- Chai, T. S. and R. E. Levin. 1975. Characteristics of heavily mucoid bacterial isolates from fish pen slime. *Appl. Microbiol.* **30**: 450-455.
- Levin, R. E. and C. Van Sickle. 1976. Autolysis of high-GC isolates of *Pseudomonas putrefaciens*. *Antonie van Leeuwenhoek J. Microbiol. and Serol.* **42**: 145-155.
- Stevens, R. and R. E. Levin. 1976. Viscometric assay of bacterial alginase. *Appl. Microbiol.* **31**: 896-899.
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- Lin, T. S., R. E. Levin and H. O. Hultin. 1977. Myoglobin oxidation in ground beef. *Microorganisms and Food Additives. J. Fd. Sci.* **42**: 151-154.
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- Van Sickle, C. and R. E. Levin. 1978. Relative rates of autolysis of high and low GC isolates of *Pseudomonas putrefaciens* and other gram negative bacteria. *Microbios Letters.* **6**: 85-94.
- Levin, R. E. 1978. Extractable protein as a measure of postmortem age of refrigerated haddock. *J. Fd. Biochem.* **2**: 367-378.
- Saxe, S. and R. E. Levin. 1979. Characteristics and mouse pathogenicity of a clinical isolate of *Pseudomonas putrefaciens*. *Microbios Letters.* **10**: 103-109.
- Biggs, C. B. and R. E. Levin. 1979. Inhibition of yeasts by the fluorescent culture filtrate of *Pseudomonas septica*. *Microbios Letters.* **11**: 33-35.
- Saxe, S. and R. E. Levin. 1980. Mouse lethality of *Pseudomonas putrefaciens* and *Alteromonas putrefaciens* isolates from clinical and non-clinical sources. *Microbios Letters.* **12**: 59-63.
- Levin, R. E. 1980. Antibiotic sensitivity of *Pseudomonas putrefaciens* and *Alteromonas putrefaciens* isolates. *Microbios Letters.* **13**: 109-115.
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- Levin, R. E. 1982. Influence of caffeine on mutations induced by nitrosoguanidine in *Salmonella typhimurium* tester strains. *Environ. Mut.* **4**: 689-694.
- Muche, A. A. and Levin, R. E. 1983. Repression of UV induction of prophage by caffeine. *Mutation Res.* **119**: 1-6.
- Parker, L. O. and Levin, R. E. 1983. Relative incidence of *Alteromonas putrefaciens* and *Pseudomonas putrefaciens* in ground beef. *Appl. and Environ. Microbiol.* **45**: 796-799.
- Blom, K. and Levin, R. E. 1984. Induction of SOS repair by caffeine. *Microbios Letters*. **26**: 7-11.
- Makarios-Laham, I. and Levin, R. E. 1984. Isolation from haddock tissue of psychrophilic bacteria with maximum growth temperatures below 20oC. *Appl. and Environ. Microbiol.* **48**: 439-440.
- Levin, R. E. and Witkowsky, R. 1984. Modulation of mitomycin C induction of prophage lambda by caffeine. *Microbios Letters*. **27**: 89-94.
- Makarios-Laham, I. and Levin, R. E. 1985. Autolysis of psychrophilic bacteria from marine fish. *Appl. and Environ. Microbiol.* **49**: 997-998.
- Makarios-Laham, I. and Levin, R. E. 1985. Potentiation of autolysis of obligately psychrophilic bacteria of marine fish origin. *Microbios Letters*. **29**: 131-136.
- Levin, R. E. and Witkowsky, R. 1985. Relative induction of prophage lambda by caffeine, theophylline and theobromine. *Microbios Letters*. **29**: 127-130.
- Makarios-Laham, I. and Levin, R. E. 1985. Effect of temperature on the growth of an obligately psychrophilic bacterial isolate of marine fish origin. *Microbios Letters*. **30**: 135-139.
- Kim, J. and Levin, R. E. 1986. Influence of caffeine on mitomycin C induced mutagenesis. *Microbios*. **46**: 15-20.
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- Makarios-Laham, I. and R. E. Levin. 1986. Effect of cations on the autolysis of psychrophilic vibrios of marine fish origin. *Microbios Letters*. **33**: 121-125.
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- Makarios-Laham and Levin, R. E. 1987. Thermally-induced leakage and death of a psychrophilic marine bacterium of fish origin. *Microbios.* **50**: 153-161.
- Kim, J. and Levin, R. E.. 1988. Mechanism of caffeine repression of mitomycin C induced reversion in *Salmonella typhimurium* strain TA94. *Microbios.* **53**: 181-190.
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- Witkowski, R. and Levin, R. E. 1988. Enhanced detection procedure for plasmid screening. *Microbios Letters.* **37**: 115-118.
- Hamama, A. A. and Levin, R. E. 1988. Induced mutation of *Chlorella vulgaris* to halotolerance. *Microbios.* **56**: 37-44.
- Levin, R. E., R. Witkowski, Y. Meirong, and S. Goldhor. 1989. Research note: preparation of fish silage with phosphoric acid and potassium sorbate. *J. Food Biochem.* **12**: 253-259.
- Rastogi, P. B., Witkowsky, R. D. and Levin, R. E. 1989. Effect of caffeine on mitomycin C induction of prophage lambda. *Microbios Letters.* **40**: 67-71.
- Lucas, R. D. and R. E. Levin. 1989. Genetic transformation between strains of *Listeria monocytogenes* . *Letters in Applied Microbiology.* **9**: 215-218.
- Fang, L. F. and Levin, R. E. 1990. Relative effectiveness of yeast cell wall digesting enzymes on *Yarrowia lipolytica* . *Microbios.* **63**: 109-115.
- Kim, J. and Levin, R. E. 1990. Influence of caffeine on the induction of SOS functions recA and umuC by mitomycin C in *Escherichia coli*. *Microbios.* **64**: 185-195.
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- Levin, R. E. 1991. Paralytic shellfish toxins: their origin, characteristics and methods of detection: a review. *J. Fd. Biochem.* **15**: 405-417.
- Levin, R. E. 1992. Development of a tropical fish assay for saxitoxin. *J. Food Safety.* **13**: 1-5.
- Giurca, R. and Levin, R. E. 1992. Optimization of the lactic acid fermentation of hydrolyzed cod gurry with molasses. *J. Food Biochem.* **16**: 83-97.

- Mahmoud, M. and Levin R. E. 1993. Fermentative production of propionic acid in hydrolyzed cod (*Gadus morhus*). *J. Food Biochem.* 17: 201-214.
- Giurca, R. and Levin, R. E. 1993. Optimization of the lactic acid fermentation of hydrolyzed cod (*Gadus morhua*) gurry with corn syrup as carbohydrate source. *J. Food Biochem.* 16: 277-289.
- Witkowski, R. and Levin, R. E. 1994. Differentiation of *Listeria monocytogenes* from *Listeria grayi* based on ultraviolet sensitivity. *Biomedical Letters* 49: 107-112.
- Walters, D. and Levin, R. E. 1994. Isolation and characteristics of a yeast from preserved fish hydrolysate notably resistant to propionic acid. *J. Appl. Bacteriol.* 77: 251-255.
- Broux, K. and Levin, R. E. 1994. Influence of caffeine on ultraviolet sensitivity of *Listeria monocytogenes* and *Listeria grayi*. *Biomedical Letters.* 50: 289-292.
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- Chen, L., Wang, J. and Levin, R. E. 1996. Effect of benzylpenicillin on the viability and osmotic sensitivity of *Listeria monocytogenes*. *Letters in Appl. Microbiol.* 22: 10-12.
- Chen, L., Wang, J. and Levin, R. E. 1996. Effects of benzylpenicillin on glucose utilization, macromolecule synthesis, and cell wall proteins of *Listeria monocytogenes*. *Letters in Appl. Microbiol.* 22: 13-15.
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Levin, R. E. 2003. Application of random amplified polymorphic DNA (RAPD) and pulsed-field gel electrophoresis (PGFE) analysis to *Listeria monocytogenes*: A review of methodology and results. *Food Biotechnol.* **17**: (3) 217-236 .

Levin, R. E. 2004. The application of real-time PCR to food and agricultural systems. A review. *Food Biotechnol.* **18**(1):97-133.

Wang, S. and Levin, R. E. 2004. Quantitative determination of *Vibrio parahaemolyticus* by polymerase chain reaction. *Food Biotechnol.* **18**: (3) 279-287.

Wang, S. and Levin, R. E. 2005. Quantification of *Vibrio vulnificus* using the polymerase chain reaction. *Food Biotechnol.* **19**(1):27-35.

Levin, R. E. 2005. *Vibrio vulnificus*, a notably lethal human pathogen derived from seafood: a review of its pathogenicity, subspecies characterization, and molecular methods of detection. *Food Biotechnol.* **19**(1):69-93.

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Cao, J. K., Witkowski, R. K, Lu, H., Abolmaaty, A., Lu, S., and Levin, R. E. 2005. Detection, enumeration, and RAPD analysis of *Listeria monocytogenes* isolates in fish derived from retail sources in Western Massachusetts. *Food Biotechnol.* **19**: 145-160.

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Vattem, D. A., Jang, H-D, Levin, R. and Shetty, K. Synergism of cranberry phenolics with ellagic acid and rosmarinic acid for antigenic and DNA-protection functions. *J. Fd. Biochem.* **30**:98-116.

Cao, J., Cronin, C., McLandsborough, L. and Levin, R. E. 2005. Effects of primers and *Taq* polymerase on randomly amplified polymorphic DNA analysis for typing *Listeria monocytogenes* from the environment of a shrimp processing plant. *Food Biotechnol.* **19**(3):217-226.

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Levin, R. E. 2006. *Vibrio parahaemolyticus*, a notably lethal human pathogen derived from seafood: a review of its pathogenicity, characteristics, subspecies characterization, and molecular methods of detection. *Food Biotechnol.* 20:93-128.

Wang, S. and Levin, R. E. 2006. Rapid quantification of *Vibrio vulnificus* in clams (*Protochaca staminea*) using real-time PCR. *Food Microbiol.* 23:757-761.

Gu, W., and Levin, R. E. 2006. Quantitative detection of *Plesiomonas shigelloides* in clam and oyster tissue by PCR. *Int. J. food Microbiol.* 111:81-86.

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