

UNC Nutrition Research Institute
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Steven H. Zeisel, MD, PhD

Experience, Professional

2006–present University of North Carolina at Chapel Hill
Director, Nutrition Research Institute

2005–present University of North Carolina at Chapel Hill
Kenan Distinguished University Professor of Nutrition and Pediatrics

1999– 2007 University of North Carolina at Chapel Hill
Associate Dean for Research, School of Public Health

1990–2005 University of North Carolina at Chapel Hill
Chairman, Department of Nutrition, School of Public Health and School of Medicine

1990–present University of North Carolina at Chapel Hill
Professor of Nutrition and Pediatrics

2004–2005 University of North Carolina at Chapel Hill
AICR/WCRF Professor in Food, Nutrition and Prevention of Cancer

1982–1990 Boston University School of Medicine
Assistant, Associate and Full Professor, Department of Pathology

1982–1990 Boston City Hospital Department of Pediatrics
Assistant, Associate Visiting Physician

Education

1980–1981 Postdoctoral Fellow in Neurochemistry
Massachusetts Institute of Technology

1978–1981 Fellow in Human Nutrition
Children's Hospital Medical Center, Boston

1977–1980 Doctor of Philosophy, Nutrition
Massachusetts Institute of Technology

1975–1977 Pediatric Resident
Yale-New Haven Hospital

1971–1977 Doctor of Medicine
Harvard Medical School

1967–1971 Bachelor of Science
Massachusetts Institute of Technology

National and
International Service

National Panel Service

- 2001-2005 Scientific Advisory Panel, Dietary Supplements, Food and Drug Administration USA.
- 1997-1999 National Academy of Sciences, U.S.A., Committee on Dietary Required Intakes, Panel on Folate, B-vitamins and Choline.
- 2004-present Scientific panel, second version of "Food, Nutrition and the Prevention of Cancer: a global perspective", World Cancer Research Fund.

National Institutes of Health Study sections

- 2011 Chair, Molecular Mechanisms for Actions of Botanicals Study Section, NIH.
- 2010 Nutrition Obesity Research Centers study section, NIH
- 2004-2006 Chair, Integrative Nutrition and Metabolic Processes study section, NIH
- 2003 Chair, Special Emphasis Panel, NIH
- 2000-2006 Integrative Nutrition and Metabolic Processes study section, NIH
- 1994-1999 Clinical Nutrition Research Centers study section
- 1996 NIH, Office of Dietary Supplements
- 1995 Nutrition T32 Grant study section, NIH
- 1991 NIMH special study section, NIH

Editorial Board Service

- Editor, ***Present Knowledge in Nutrition*** Volume 10, 2010-present.
- Chief Editor, ***Frontiers in Nutrigenomics***, 2010-present.
- Editorial Board, ***Functional Food Reviews***, 2009-present.
- Advisory Board ***Encyclopedia of Dietary Supplements***, 2009.
- Associate Editor, ***Functional Food Reviews***, 2008-present.
- Editorial Board, ***FASEB Journal***, 2005-present.
- Editorial Board, ***Annual Review of Nutrition***, 2003-2008.
- Consultant editor, ***Nutrition Research***, 1996-present.
- Editor-in-Chief, ***Journal of Nutritional Biochemistry***, 1989-2001.
- Editorial Board, ***Encyclopedia of Food Sciences and Nutrition***, 2000.
- Associate Editor, ***Encyclopedia of Human Biology***, Third Edition, Elsevier Press 1999.

Professional Society and Industry Service

- Member, Hershey Health & Wellness Advisory Board, 2005-present.
- Member, Board of Trustees of the North American branch of the International Life Sciences Institute (ILSI N.A.), 2004-present.
- President, American Society for Nutrition 2002-2003; (this is the premier nutrition research society and a component of FASEB). Strategic Oversight Committee, 2004-present; Chair, Long-Range Planning Committee, 2000-2001; Chair, Graduate Nutrition Education Committee, 1997-1999; Chair, Standing Committee on Medical/Dental School Residency Nutrition Education and Subspecialty Training, 1995-1997; Councilor, 1991-1994; Chair, Membership Committee, 1990-1994.
- Member, Board of Scientific and Policy Advisors, American Council on Science and Health, 2000-present.
- Member, NCI/FDA Biomarker and Cancer Risk Workshop, 2006.
- Member, Dupont Health Advisory Board, 2005-present.
- Member, Advisory Board to the Commission on Secretion and Absorption, International Union of Physiological Sciences, 2003-2005.
- Member, Grant Review Panel, American Institute for Cancer Research; 1998-2000.
- External Advisory Board, South Carolina's Center for Cancer Research Excellence, 2009

External Advisory Board, Harvard University, Clinical Nutrition Research Unit, 2000-present.
External Advisory Board, University of California, Los Angeles and University of California at Davis, Clinical Nutrition Research Unit, 2006.
External Advisory Board, University of Utah, Pediatric Research Unit, 2000-2005.
Galileo Laboratories Scientific Advisory Board, 2001-2003.
Central Soya/Solae; Scientific Advisory Board; 1999-present.
Member, Public Policy Committee, American Society for Parenteral and Enteral Nutrition, 1999-2000.
Member, Physician Nutrition Specialist Awards Task Force, American Society for Clinical Nutrition, 1998.
Monsanto Corporation; Scientific Advisory Board 1998-2000.
Chair, American Society for Parenteral and Enteral Nutrition, Frontiers in Antioxidants Research Workshop, 1998.
Dannon Institute Foundation; Scientific Council 1997-2001.
Bristol-Myers Squibb/Mead Johnson Corporation; Chairman, External Award Selection Committee 1997-1999.
Board of Directors, Association of Departments and Programs of Nutrition 1993-1999.
Delegate, Association of American Medical Colleges Council of Academic Societies, 1991-1997.

Academic Service

University of North Carolina

Dean's Cabinet, School of Public Health, 1990-2005.
Advisory Committee of the Medical Faculty, School of Medicine, 1990-2005.
Distance Education Advisory Committee, School of Public Health 1999-2004.
Mass Spectrometry Facility Advisory Board, School of Public Health, 1995-2000.
School of Public Health Alumni Association Board (ex officio), 1993-2005.
Committee to develop metrics for school evaluation School of Public Health; 2001-2005.
Scientific Panel, Center for Women's Health Research, University of North Carolina, 2004-present.
Internal Advisory Board Member, R24 Mind-Body Infrastructure Grant, University of North Carolina, 2004-2009.
Advisory Board Member, UNC Center for Functional GI & Motility Disorders 2004-present.
Educational Policy Committee, School of Medicine, 1992-2005.
Chairman, General Clinical Research Center Advisory Board, University of North Carolina at Chapel Hill, 1990-2000.
Chair, Excellence Committee, School of Public Health, 1998.
Chair, Search Committee, Associate Dean for Students, School of Public Health, 1997-1998.
Course Director, Nutrition, Medical School, 1995-1998.
Director, Nutrition Curriculum Committee School of Medicine, School of Medicine, 1993-1998.
Advisory Committee of the Research Education Support (RES) Program, School of Education, 1997.
Alumni Planning Committee, School of Public Health, 1994-1997.
Search Committee, Associate Dean for Development, School of Public Health, 1996 and 2006.
Digestive Diseases and Nutrition Task Force, School of Medicine, 1992-

1996.
Maternal Child Health Department, Chair Search Committee, 1994-1995.
Five Year Performance Review Committee for Chair of Department of Social Medicine (L. Churchill), School of Medicine, 1994.
Search Committee, Director of Office of Information Services, School of Medicine, 1994.
Vascular Disease and Arteriosclerosis Task Force, School of Medicine, 1991-1993.
Doctoral Committee, Nutrition Department, University of North Carolina at Chapel Hill 1990-1992, 2009-present.
Bachelor of Science in Public Health Committee, Nutrition Department, University of North Carolina at Chapel Hill, 2006-2009.

Boston University

Clinical Research Center Advisory Board, Boston University School of Medicine 1987-1990.
Institutional Review Board for Human Research, Boston University School of Medicine 1984-1990.

Massachusetts Institute of Technology

Clinical Research Center Medical Advisory Board, Massachusetts Institute of Technology, 1988-1990.

Honors

Mildred A. Reeves Distinguished Visiting Professor in Nutrition, University of Tennessee, 2011
Hans Falk Memorial Lecturer, National Institute of Environmental Health Sciences, 2010
W.O. Atwater Lecturer, U.S. Department of Agriculture's Agricultural Research Service, 2009
The American Society for Nutrition Osborne and Mendel Award, 2008.
The American College of Nutrition Award for Outstanding Achievements in Nutrition, 2007.
Bristol-Meyers Squibb/Mead Johnson Award for Distinguished Achievement in Nutrition Research, 2006.
Who's Who in the World, 2004-present.
Who's Who in America, 1996-present.
Who's Who in Science and Technology, 1994-present.
IFN/CERH Distinguished Lectureship, Texas A&M, 2005.
O'Dell Lecture, University of Missouri-Columbia, 2003
Delta Omega Public Health Honor Society, 1991- present.
Sigma Xi, Science Honor Society, 1981 - present.
American Society for Clinical Nutrition - Dannon Institute Award for Excellence in Medical/Dental Nutrition Education 2001.
Dorothy Baugh Harmon Lectureship, Oklahoma Research Foundation, 2001.
Axiem Award for Outstanding Multimedia Education Tool, 2001.
National Tibbetts Award, US Small Business Administration, Award for Outstanding Multimedia Education Tool, 2001.
Lucille Hurley Distinguished Professor, Univ. California at Davis, 1996.
Grace Goldsmith Award for Teaching & Research in Nutrition, American College of Nutrition, 1991.
Lecithin Industry Award, 1987.
Future Leader Award, International Life Sciences Institute-Nutrition Foundation, 1986.
John A. and George L. Hartford Fellow of the John A. Hartford Foundation, 1980-1983.
Postdoctoral Fellowship, National Institutes of Health, 1977-1980.

Membership in Professional Societies

Society for Neuroscience; 2000- present.
International Society for Research for Human Milk and Lactation, 1998-present.
American Society for Parenteral and Enteral Nutrition, 1993-present.
Association of Departments and Programs of Nutrition, 1993-present.
American Public Health Association, 1990-present.
Society for Pediatric Research, 1987-present.
American Society for Nutrition (formerly American Institute of Nutrition and American Society for Clinical Nutrition), 1987-present.

Grant Support - Current

NIDDK, R01 DK55865, Human Requirements for the Nutrient Choline, (S. Zeisel, P. I.) 09/01/00-01/31/12, \$410,000 annual direct (\$3,649,993 total award).
NIH, R25 CA134285, Nutrition Education for Practicing Physicians (S. Zeisel, P.I.) 07/01/08-06/30/13, \$298,830 annual direct (\$1,494,150 total award).
NIDDK, P30 DK56350, University of North Carolina Nutrition Obesity Research Center (S. Zeisel, P.I.) 09/30/99-03/31/11, \$725,756 annual direct (\$7,257,560 total award).
NIDDK, P30 DK56350-00005S2 (S. Zeisel, P.I.) 09/30/05-03/31/11 \$150,000 annual direct (\$219,000 total award).
Obesity in Asians-Supplement to UNC Nutrition Obesity Research Center (This is a supplement to the NORC for obesity research of which Steven Zeisel is the P.I.).
NCI, R01 CA109753, Dietary methyl content, epigenetics, and etiology of breast cancer, (Chen, P.I.; Gammon, P.I. of subcontract at UNC; S. Zeisel Co-P.I. of subcontract at UNC), 06/26/06-04/30/11, \$308,986 annual direct (\$2,000,000 total award).
NIDDK, T32 DK07686, Ruth L. Kirschstein National Research Service Award (NRSA) Institutional Research Nutrition Training Grant (J. Stevens, P.I. ; S. Zeisel, Program Faculty), 08/01/08-07/30/13, \$225,000 annual direct (\$1,125,000 total award).
NIEHS, ES007127, Pre- and Postdoctoral Training in Toxicology, (J. Swenberg, P.I.; S.Zeisel, Program Faculty), 07/01/08-06/30/13, \$487,516 annual direct (\$2,437,580 total award).
Mead Johnson Nutritionals, N/A, Mead Johnson Center for Excellence in Children's Nutrition, (S. Zeisel, P.I.) 01/01/07-2/28/2011, \$375,000 annual direct (\$750,000 total award).

Grant Support - History

NIH, P01 AG09525, Parent program – Brain Aging: Effects of Perinatal Nutrition (J. Blusztajn, Program Director), Daughter project - Biochemistry of Supplemental Choline in Neonatal Rats (S. Zeisel, P.I.), 04/01/05-03/31/10, \$185,000 annual award (\$1,300,000 total award).
NIEHS, P30 ES10126, UNC-CH Center for Environmental Health and Susceptibility, (J. Swenberg, P.I.; S. Zeisel, Core Director), 04/01/01-3/31/10, \$62,533 annual direct (\$1,045,357 total award).
Egg Nutrition Center, N/A, Impact of Single Nucleotide Polymorphisms in Genes Related to Choline Metabolism on Choline Status in Lactating Women and Relation to Dietary Intake (S. Zeisel, P.I.), 08/31/07-09/01/09, \$152,535 annual direct (\$152,535 total award).
NCI, R03 CA125763, Metabolic and Epidemiologic Evaluation of Choline and Betaine Intake (Cho, P.I.; S.Zeisel, Co-P.I.) 08/01/07-07/31/09 \$50,000 annual direct (\$87,500 total award).
NIH, R43 DK078509, Clearing Intrahepatic Lipids to Aid in Toxicity Testing (Ruiz, P.I.; S. Zeisel, Consultant) 07/01/08-06/31/09 \$15,000 annual direct (\$15,000 total award).

UNC Center for Environmental Health and Susceptibility, N/A, Dietary Choline During Adult Life Influences the Proliferation of Progenitor Cells in Brain (S. Zeisel, Co-P.I.) 04/01/08-03/31/09, \$40,000 annual direct (\$40,000 total award).

NIH, R25 CA65474, Nutrition in Medicine, (S. Zeisel, P.I.), 2/24/95-3/31/09, \$253,818 annual direct (\$3,005,000 total award).

NCI, T32-CA72319-01 A1, Nutritional Biochemistry and the Epidemiology Carcinogenesis (S. Zeisel, P.I.), 09/30/97-6/30/07, \$308,986 annual direct (\$2,000,000 total award).

American Chemistry Council, N/A, Accumulation of Diethanolamine from Cosmetic Products (S. Zeisel, P.I.) 06/01/06-05/31/08, \$100,000 annual direct (\$100,000 total award).

Gerber Foundation, Supplemental choline and neurodevelopment in humans, (S. Zeisel, P.I.) 06/01/01-12/31/07, \$327,517 annual direct (\$1,022,827 total award).

NIDDK, T32-DK07686, Nutrition Training Grant (S. Zeisel, P.I.), 9/30/92-9/29/07, \$265,301 annual direct (\$3,050,000 total award).

NCI, R25-CA57726-11, Cancer Prevention Training Program, (S. Zeisel, Trainer), 09/05/92--08/31/07, \$499,164 annual direct (\$3,500,000 total award).

NIEHS, R21 ES012997, Diethanolamine Alters Brain Development (S. Zeisel, P.I.) 04/01/04-03/31/07, \$100,000 annual direct (\$438,000 total award).

USDA, 2005-3520015247, Dietary Choline and Folic Acid and Optimal Brain Development (S. Zeisel, P.I.) 12/1/04-11/30/06, \$212,500 annual direct (\$425,000 total award).

USDA, 58-1235-5-126, Choline Content of Commonly Eaten Foods, 09/25/00-08/15/06, \$113,636 annual direct (\$356,026 total award).

Mead Johnson Nutritional Group, N/A, Endogenous Synthesis of Choline During Pregnancy (S. Zeisel, P.I.), 09/01/04 - 12/01/05.

Egg Nutrition Center, N/A, Choline, Pregnancy and Brain Development (S. Zeisel, P.I.), 10/01/01 - 09/30/05.

NCI, N01-CN-75035-70, Phase I Single and Multiple Dose Safety, Pharmacokinetic, and Efficacy Clinical Study in Women of Two formulations of Isoflavone Mixtures (S. Zeisel, P.I.), 06/01/98-07/31/05, \$258,412 annual direct (\$1,744,281 total award).

NIH, P30-HD05798, Carolina Population Center, (S. Zeisel, Co-P.I.) 07/01/00-06/30/05, \$1,545,000 annual direct (\$7,727,045 total award).

NIDDK, T32 DK07634, Digestive Disease Epidemiology Training Program. (R. Sandler, P.I.; S. Zeisel, Trainer) 07/01/99-06/30/04, \$729,872 total award.

BASF, Bioavailability Study with Choline Ascorbate in a Rat Model (S. Zeisel, P.I.) 06/01/02-03/01/03, \$66,111 total award.

NIH, P20-CA93823, Nutrients, Oxidation and New Genetic Pathways for Cancer, (S. Zeisel, P.I.), 09/28/01-07/12/02, \$100,000 total award.

USDA, 9601699, Computer Assisted Modules for Teaching Human Nutrition to Undergraduates, (S. Zeisel, P.I.) 7/01/96-9/30/01, \$160,000 total award.

NIH, R01-HD28604 Epidemiology of Preterm Premature Rupture of Membrane. (David Savitz, P.I., S. Zeisel Co-Investigator) 01/01/95-12/31/00, \$1,582,292 total award.

NIH, R01-CA59746, Black Churches United for Health, (J. Simmons and S. Zeisel, Co-P.I. ; M. Campbell replaced Dr. Zeisel as Co-P.I. in 1995); 07/1/93- 06/30/97, \$856,539 total award.

National Dairy Council, Development of a National Nutrition Curriculum for Medical Schools, (S. Zeisel, P.I.) 09/92-08/95, \$15,000 total award.

American Institute for Cancer Research, Early Events Leading to Hepatocarcinogenesis; 07/01/920-6/30/96, \$220,000 total award.

NIH, R01-CA55760, Race, Fatty Acid Exposure and Risk of Prostate Cancer (P. Godley, P.I.; S. Zeisel Co-P.I.). 12/01/91-11/30/96, \$725,000 total award.

NIH, R01-HD26553, Choline and the Formation and Excretion of Milk, (S. Zeisel, P.I.); 04/90-04/93, \$374,000 total award.

American Institute for Cancer Research, Diacylglycerol, Methyl-Groups and Hepatocarcinoma (S. Zeisel, P.I.) 07/01/88-06/30/90, \$110,000 total award.

American Institute for Cancer Research, Lipotrope Nutrition and Cancer Chemotherapy (A. Rogers, P.I.) 07/01/88-06/30/90, \$110,000 total award.

NIMH, R01-MH41234, Assessment of Lithium Treatment/Toxicity, 8/87-8/89, \$527,000 total award.

USDA, Choline Deficiency in Humans - Effects on Muscle Function (S. Zeisel, P.I.) 8/87- 8/89, \$75,000 total award.

US Army, Heat Illness in Rats (S. Zeisel, P.I.) 01/87-06/89, \$183,000 total award.

NIH, R01-HD16727, Choline as a Nutrient for Humans (S. Zeisel, P.I.) 07/86-06/89, \$620,000 total award.

USDA, Use of Stable Isotopes Analyses to Assess Choline Status (S. Zeisel, P.I.) 08/85- 08/87, \$50,000 total award.

NIH, P01-CA26731, Endogenous Nitrite Carcinogenesis (Parent Project - S. Tannenbaum, Program Director); Endogenous Formation of Methylamines (Subproject; S. Zeisel, P.I.), 03/82-02/91, \$970,000 total award.

Publications
Peer Reviewed

1. **Zeisel, S.H.** and Millington, W.R. (1978) Free and choline assay. *American Journal of Clinical Nutrition* 31:1979-1981.
2. Blusztajn, J.K., **Zeisel, S.H.**, and Wurtman, R.J. (1979) Synthesis of lecithin (phosphatidylcholine) from phosphatidylethanolamine in bovine brain. *Brain Research* 179:319-327.
3. Milunsky, A., Blusztajn, J.B., and **Zeisel, S.H.** (1979) Amniotic-fluid total cholinesterase and neural-tube defects. *Lancet*, ii: 36.
4. **Zeisel, S.H.**, Milunsky, A., and Blusztajn, J.B. (1980) Prenatal diagnosis of neural tube defects. V. The value of amniotic fluid cholinesterase studies. *American Journal of Obstetrics and Gynecology* 137:481-485.
5. **Zeisel, S.H.**, Epstein, M.F., and Wurtman, R.J. (1980) Elevated choline concentration in neonatal plasma. *Life Sciences* 26:1827-1831.
6. **Zeisel, S.H.**, Growdon, J.H., Wurtman, R.J., Magil, S.G., and Logue, M. (1980) Normal plasma choline responses to ingested lecithin. *Neurology* 30:1226-1229.
7. **Zeisel, S.H.**, Story, D.L., Wurtman, R.J., and Brunengraber, H. (1980) Uptake of free choline by isolated perfused rat liver. *Proceedings of the National Academy of Sciences, U.S.A.* 77:4417-4419.
8. **Zeisel, S.H.** and Growdon, J.H. (1980) Diet and brain neurotransmitters. *Nutrition and the M.D.* 6:1-3.
9. Magil, S.G., **Zeisel, S.H.**, and Wurtman, R.J. (1981) Effects of ingesting soy or egg lecithins on serum choline, brain choline and brain acetylcholine. *Journal of Nutrition* 111:166-170.
10. **Zeisel, S.H.** (1981) Dietary choline: Biochemistry, physiology and pharmacology. *Annual Reviews of Nutrition* 1:95-121.
11. **Zeisel, S.H.**, Mauron, C., Watkins, C.J., and Wurtman, R.J. (1981) Developmental changes in brain indoles, serum

- tryptophan and other serum neutral amino acids in the rat. *Developmental Brain Research* 1:551-564.
12. **Zeisel, S.H.**, and Wurtman, R.J. (1981) Developmental changes in rat blood choline concentration. *Biochemical Journal* 198:565-570.
 13. Wurtman, J.J., Wurtman, R.J., Growdon, J.H., Henry, P., Lipscomb, M.A., and **Zeisel, S.H.** (1981) Carbohydrate craving in obese people: Suppression by treatments affecting serotonergic transmission. *International Journal of Eating Disorders* 1:2-15.
 14. **Zeisel, S.H.**, Reinstein, D.K., Wurtman, R.J., Corkin, S., and Growdon, J.H. (1981) Memory disorders associated with aging. *Trends in Neuroscience* 24:8-9.
 15. **Zeisel, S.H.**, Reinstein, D., Corkin, S., Growdon J., and Wurtman, R.J. (1981) Cholinergic neurones and memory (letter). *Nature* 293:187-188.
 16. Conlay, L.A., and **Zeisel, S.H.** (1982) Neurotransmitter precursors and brain function. *Neurosurgery* 10:524-529.
 17. **Zeisel, S.H.**, Stanbury, J.B., Wurtman, R.J., Brigida, M., and Fierro-Benitez, R. (1982) Choline content of mother's milk in Ecuador and Boston. *New England Journal of Medicine* 306:175.
 18. **Zeisel, S.H.**, Wishnok, J.S., and Blusztajn, J.K. (1983) Formation of methylamines from ingested choline and lecithin. *Journal of Pharmacology and Experimental Therapeutics* 225:320-324.
 19. Yogman, M.W. and **Zeisel, S.H.** (1983) Diet and sleep patterns in newborn infants. *New England Journal of Medicine* 309:1147-1149.
 20. Sheard, N. and **Zeisel, S.H.** (1983) Are we considering brain when delivering enteral/ parenteral nutrition? *Nutrition Support Services* 3:25-30.
 21. Yogman, M.W., **Zeisel, S.H.**, and Roberts, C. (1983) Assessing effects of serotonin precursors on newborn behavior. *Journal of Psychiatric Research* 17:123-133.
 22. **Zeisel, S.H.** (1985) Formation of unesterified choline by rat brain. *Biochimica et Biophysica Acta* 835:331-343.
 23. **Zeisel, S.H.**, da Costa, K-A., and Fox, J.G. (1985) Endogenous formation of dimethylamine. *Biochemical Journal* 232:403-408.
 24. Blusztajn, J.K., **Zeisel, S.H.**, and Wurtman, R.J. (1985) Developmental changes in the activity of phosphatidylethanolamine N-methyltransferases in rat brain. *Biochemical Journal* 232:505-511.
 25. Yogman, M.W. and **Zeisel, S.H.** (1985) Nutrients, neurotransmitters, and infant behavior. *American Journal of Clinical Nutrition* 42:352-360.
 26. Sheard, N.F., Tayek, J.A., Bistran, B.R., Blackburn, G.L., and **Zeisel, S.H.** (1986) Plasma choline concentration in humans fed parenterally. *American Journal of Clinical Nutrition* 43:219-224.
 27. **Zeisel, S.H.**, Char, D., and Sheard, N.F. (1986) Choline, phosphatidylcholine and sphingomyelin in human milk, bovine milk and infant formulas. *Journal of Nutrition* 116:50-58.
 28. **Zeisel, S.H.**, da Costa, K-A., Edrize, B.M., and Fox, J.H. (1986) Transport of dimethylamine, a precursor of nitroso-dimethylamine in stomach of ferret and dog. *Carcinogenesis* 7:775-778.
 29. Sheard, N.F. and **Zeisel, S.H.** (1986) An in vitro study of choline uptake by intestine from neonatal and adult rats. *Pediatric*

- Research* 20:768-772.
30. **Zeisel, S.H.** (1986) Dietary influences on neurotransmission. *Advances in Pediatrics* 33:23-48.
 31. **Zeisel, S.H.** and da Costa, K-A. (1986) Increase in man's exposure to methylamine precursors of N-nitrosamines after eating fish. *Cancer Research* 46:6136-6138.
 32. Sun, X.F., Ting, B.T.G., **Zeisel, S.H.**, and Janghorbani, M. (1987) Accurate measurement of stable isotopes of lithium with inductively coupled plasma mass spectrometry. *Analyst* 112:1223-1228.
 33. **Zeisel, S.H.**, Ellis, A.L., Sun, X.F., Pomfret, E.A., Ting, B.T.G., and Janghorbani, M. (1987) Dose-response relations in urinary excretion of trimethylselenonium in the rat. *Journal of Nutrition* 117:1609-1614.
 34. Palombo, J.D., Bistran, B.R., Lopes, S.M., **Zeisel, S.H.**, Jenkins, R.L., Albers, J.J., and Blackburn, G.L. (1987) Effectiveness of orthotopic liver transplantation on the restoration of cholesterol metabolism in end-stage liver disease patients. *Gastroenterology* 93: 1170-1177.
 35. **Zeisel, S.H.**, da Costa, K-A., and Lamont, J.T. (1988) Mono-, di- and trimethylamine in human gastric fluid: Potential substrates for nitrosodimethylamine formation. *Carcinogenesis* 9:179-181.
 36. Pomfret, E.A., O'Connor S.C., Zola, T.H., and **Zeisel, S.H.** (1988) Fewer metabolites of dietary choline reach the blood of rats after treatment with lithium. *Life Sciences* 42:821-828.
 37. Oh, S.K., Ross, S., Walker, J., and **Zeisel, S.H.** (1988) Role of a SER immune suppressor in immune surveillance. *Immunology* 64:73-79.
 38. Chao, C-K., Pomfret, E.A., and **Zeisel, S.H.** (1988) Uptake of choline by rat mammary gland epithelial cells. *Biochemical Journal* 254:33-38.
 39. Yang, E.K., Blusztajn, J.K., Pomfret, E.A., and **Zeisel, S.H.** (1988) Rat and human mammary tissue can synthesize choline moiety via the methylation of phosphatidylethanolamine. *Biochemical Journal* 256: 821-828.
 40. Palombo, J.D., Hirschberg, Y., Pompeselli, J.J., Blackburn, G.L., **Zeisel, S.H.**, and Bistran, B.R. (1988) Decreased loss of liver adenosine triphosphate during hypothermic preservation in rats pretreated with glucose: Implications for organ donor management. *Gastroenterology* 95:1043-1049.
 41. Frank, D.A. and **Zeisel, S.H.** (1988) Failure to thrive. *Pediatric Clinics of North America* 35:1187-1206.
 42. Blusztajn, J.K. and **Zeisel, S.H.** (1989) 1,2-sn-Diacylglycerol accumulates in choline deficient liver: A possible mechanism of hepatic carcinogenesis via alteration of protein kinase C activity? *FEBS Letters* 243:267-270.
 43. Sheard, N.F. and **Zeisel, S.H.** (1989) Choline: An essential dietary nutrient? *Nutrition* 5:1-5.
 44. **Zeisel, S.H.**, Gettner, S., and Youssef, M. (1989) Formation of aliphatic amine precursors of dimethylnitrosamine after oral administration of choline and choline analogs in the rat. *Food and Chemical Toxicology*, 27:31-34.
 45. **Zeisel, S.H.**, da Costa, K-A., Youssef, M., and Hensey, S. (1989) Conversion of dietary choline to trimethylamine and dimethylamine in rats: Dose-response relationship. *Journal of Nutrition* 119:800-804.
 46. **Zeisel, S.H.**, Zola, T., da Costa, K-A., and Pomfret, E.A. (1989) Effect of choline deficiency on S-adenosylmethionine and

- methionine concentrations in rat liver. *Biochemical Journal* 259:725-729.
47. Pomfret, E.A., da Costa, K-A., Schurman, L.L., and **Zeisel, S.H.** (1989) Measurement of choline and choline metabolite concentrations using high pressure liquid chromatography and gas chromatography-mass spectrometry. *Analytical Biochemistry* 180:85-90.
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71. **Zeisel, S.H.** & Niculescu, M.D. (2008) Choline and Neural Development. In *Nutrition in the Prevention and Treatment of Disease, 2nd Edition*, edited by Ann M. Coulston and Carol J. Boushey, pp. 237-247.
72. Kohlemeier, M. and **Zeisel, S.H.** (2008) Dietary Supplements and Nutraceuticals. In *Nutrition in Pediatrics, 4th Edition*, edited by Christopher Duggan, John B. Watkins, and W. Allan Walker, pp. 795-800.
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81. **Zeisel, S.H.** (2011) Choline and Phosphatidylcholine. (2011) In *Modern Nutrition in Health and Disease, 11th Edition*. edited by C. Ross, B. Caballero, R. Cousins, K. Tucker, T. Ziegler, Lippincott Williams & Wilkins, Monkton, VT [IN PRESS].
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Courses Taught 1990-2010

- NUTR 98 Undergraduate Research Experience in Nutrition, 3 credit hours, Zeisel - laboratory director. 1990-1995.
- NUTR 99 Honors Research in Nutrition, 3 credit hours, Zeisel - laboratory director. 1991-1995.
- NUTR 100 Introduction to Nutrition in Medicine, 3 credit hours, Zeisel guest lecture on membranes. 1991-1996.
- NUTR 110 Nutritional Biochemistry Of Normal Cell Function, 3 credit hours, Zeisel guest lecture on intracellular signaling. 1991-1998.
- NUTR 111 Nutrition Of Women, Infants, Children, & The Elderly, 3 credit hours, Zeisel guest lecture on nutrients and brain development. 1992, 1993.
- NUTR 120 Nutritional Biochemistry Of Disease Processes, 3 credit hours, Zeisel guest lecture on nutrients and carcinogenesis. 1991-2005.
- NUTR 170 Nutrition in Medicine CD (independent study) course, 3 credit hours, 2005.
- NUTR 305 Nutritional Metabolism, 3 credit hours, Zeisel guest lecture 1997-2006.
- NUTR 320 Advanced Nutritional Biochemistry: Special Topics, 3 credit hours, Zeisel guest lecture on mass spectrometry, high pressure liquid chromatography. 1993, 1995.
- NUTR 880 (formerly NUTR 371 and NUTR 389) Elements of Being a Scientist, 3 credit hours, Zeisel course director. 1991, 1993, 1995-2009.
- NUTR 390 Nutrition Research, 9 credit hours, Zeisel - laboratory director. 1991-1996.
- NUTR 868 (formerly NUTR 323) Nutrients and Brain Function, 2 credit hours, Zeisel course director, 1997, 1999, 2001, 2002, 2004, 2008, 2009.
- NUTR 885 Doctoral Seminar, 2010
- Medical School Nutrition Course - Zeisel course director, 1996-1998; instructor 2005.
- MCH 302 Doctoral Research Skills Colloquium, 1 credit hour, Zeisel guest lecture on Effective Proposal Writing. 2005.

Major Advisor Graduate and Postdoctoral Students

- Karen Corbin PhD, RD. Postdoctoral Fellow 2009-present. Studies relationship between fatty liver and obesity, focusing on single nucleotide polymorphisms in genes of 1-carbon metabolism.
- Melanie Spencer, PhD. Postdoctoral Fellow 2011-present. Studies microbiome and choline metabolism, developing new metabolomic methodology for assessing the microbiome.
- Harlyn Skinner, Department of Nutrition, UNC-CH, 2009 – present. Currently enrolled. PhD degree expected 2014. Epigenetic effects of aberration of choline metabolism.
- Ya-Wen Teng, Department of Nutrition, UNC-CH, 2006-present.

Currently enrolled. Ph.D. degree expected 2011. The effects of nitrous oxide on the enzymes methionine synthase and betaine homocysteine methyltransferase in mice livers.

Amy Johnson, Department of Nutrition, UNC-CH, 2007-present. Currently enrolled. Ph.D. degree expected 2011. The effects of choline dehydrogenase knockout on fetal brain development; phenotypic analysis of choline dehydrogenase knockout mouse.

Mary Resseguie, Department of Nutrition, UNC-CH, 2005-2009. (Ph.D., UNC-Chapel Hill 2009). Studied genetic variation in the gene encoding hepatic biosynthesis of the nutrient choline, Phosphatidylethanolamine N-methyltransferase (PEMT), is associated with increased susceptibility to choline deficiency thus leading to the development of hepatosteatosis and/or liver cancer. Currently, Principal Scientist, Pepsico.

Lisa Sanders, Department of Nutrition, UNC-CH, 2005-2007. Postdoctoral Fellow. (PhD, Texas A&M University). The ability of the PEMT enzyme to alter DHA content in brain phospholipids and how these alterations influence fetal brain development. Currently, Nutrition Scientist, R&D Tate & Lyle Americas, Decatur, IL

Aurelian Bidulescu, Departments of Epidemiology and Nutrition, UNC-CH, 2002-2005. Ph.D. (previous: M.D. Carol Davila University of Medicine and Pharmacy, Bucharest, Romania). Dietary intake of choline and incident coronary heart disease: the Atherosclerosis Risk in Communities (ARIC) study.

Mihai Mehedint, MD. Department of Nutrition, UNC-CH, 2007-2011. Postdoctoral Fellow. Studied choline and angiogenesis as well as effects of maternal dietary choline on histone methylation and acetylation in fetal brain. Currently Research Assistant Professor of Nutrition, UNC Chapel Hill.

Michael Webb, Department of Nutrition, UNC-CH, 2004-2005. Histone methylation and cell proliferation.

Mihai Niculescu, Department of Nutrition, UNC-CH, 2001-2005. Ph.D. (previous: M.D. Carol Davila University of Medicine and Pharmacy, Bucharest, Romania). Effects of prenatal choline availability on DNA methylation in hippocampus. Currently Assistant Professor of Nutrition, UNC Chapel Hill.

Jiannan Song, Department of Nutrition, UNC-CH, 1999–2005. Ph.D. 2005. ApoE knockout mice, reactive oxygen species, and brain development. Currently, Pathology Resident, New York University School of Medicine.

Xiannon Zhu, Department of Nutrition, UNC-CH, 2000–2004. Ph.D. 2004. Brain development in PeMT knockout mice. Currently, Nutrition Scientist, Mead Johnson.

Elliott Brown, Department of Nutrition, UNC-CH, 1997-2002.M.S. 2006. Maternal folate availability and fetal brain development.

Yutaka Yamamuro, Department of Nutrition, UNC-CH, 2001-2002. Postdoctoral Fellow. Choline and DNA methylation.

Wlodzimierz Lopaczynski, Department of Nutrition, UNC-CH, 1999–2000. Currently Senior Scientist, BBI-Biotech Research Laboratories, Inc.

Chi-Liang (Eric) Yen, Department of Nutrition, UNC-CH, 1995-2000. Currently Assistant Professor of Nutrition, University of Wisconsin.

Angelica Vrablic, Department of Nutrition, UNC-CH, 1995-1999. Ph.D., 1999. Manager, Sales and Marketing, Goodwin Biotechnology Incorporated.

Amy Tsai, Department of Nutrition, UNC-CH, 1995-1997. MS. degree December 1997. Apoptosis in fetal hippocampus is modulated by dietary choline. Currently Research Assistant in neurosciences at

UNC-CH.

- Minnie McNary-Holmes, Department of Nutrition, UNC-CH, 1994-1997. Postdoctoral Fellow. (Ph.D. University of Illinois Urbana). Choline deficiency and PC12 cell apoptosis. Currently Associate Professor, Department of Food Science, North Carolina A&T University.
- Ok-Ho Shin, Department of Nutrition, UNC-CH, 1993-1996. Ph.D., 1996. Methyl deficiency versus choline deficiency induced apoptosis. Currently Assistant Instructor at the University of Texas Southwestern Medical Center, Dallas.
- Zi Whei Zhou, Post doctoral fellow 1994-1995, previous: (M.D. Shanghai Medical School China, 1991), Hepatic steatosis in choline deficiency. Currently Assistant Professor, Shanghai Medical School, China.
- Elizabeth Rohlf, Department of Pathology, Boston University, 1989-1993, Ph.D., 1993. Effect of choline upon lipid excretion by mammary epithelial cells. Currently Clinical Assistant Professor, Department of Pathology and Laboratory Medicine, University of North Carolina at Chapel Hill.
- Kerry-Ann da Costa, Department of Pathology, Boston University, 1988-1992, Ph.D., 1992. Diacylglycerol, protein kinase C and carcinogenesis in choline deficient liver. Currently Research Assistant Professor, Department of Nutrition, University of North Carolina at Chapel Hill.
- Anu Adeyami, Department of Nutrition, UNC-CH, 1990-1992, MS. 1992. Modification of phosphorus assay. Currently scientist, industry.
- Jing Zhang, Department of Pathology, Boston University, 1988-1991, Ph.D., 1991. Betaine synthesis in the rat liver. Employment status unknown.
- Eun Yang, Department of Pathology, Boston University, 1987-1991, Ph.D., 1991. PEMT in mammary epithelial cells. Currently Investment banker, Biotech Equity Research.
- Elizabeth Cochary, Department of Pathology, Boston University, 1989-1990, postdoctoral fellow (PhD 1988). Changes in hepatic protein kinase C during choline deficiency. Currently Associate Professor, Department of Nutrition, Tufts University.
- James Pompeselli, Department of Pathology, Boston University, 1986-1990, M.D., Ph.D., 1990. N-3 fatty acids ameliorate lactic acidosis induced by endotoxin. Currently Senior Staff Surgeon, Transplant Surgery, Lahey Clinic, Burlington, Massachusetts.
- Elizabeth Pomfret, Department of Pathology, Boston University, 1985-1990, M.D., Ph.D., 1990. Choline deficiency and methotrexate treatment alter hepatic function. Currently Director, Adult Live Donor Liver Transplantation, Lahey Clinic, Burlington, Massachusetts.
- Chiao-Kang (Eric) Chao, Department of Nutrition, Boston University, 1986-1989, D.Sc., 1989. Methylamine synthesis from choline by oral microflora. Currently Director of the Dental Department of the Kaohsiung Military General Hospital, Taiwan.
- Mervat Youssef, Department of Nutrition, Boston University, 1985-1989, D.Sc, 1989. The synthesis of trimethylamine in the rat. Last known position Assistant Professor, Kuwait Medical School.
- Douglas Char, Department of Pathology, Boston University, 1985-1986, M.S., 1986. Choline content of milk. Currently Assistant Professor of Medicine, Washington University, St. Louis, Missouri.
- Nancy Sheard, Department of Nutrition, Boston University, 1980-1984, D.Sc., 1984. Choline transport by rat small intestine. Currently Associate Professor of Nutrition, University of Vermont.

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