

Nutrition and Neurocognition Laboratory & Vitamin Metabolism and Aging Laboratory  
 Jean Mayer United States Department of Agriculture Human Nutrition Research Center on Aging  
 (JM USDA HNRCA) at Tufts University  
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## EDUCATION

- |                      |                                  |  |
|----------------------|----------------------------------|--|
| June 1996            | BSc                              | Biology, Hebrew University, Jerusalem, Israel  |
| Dec 2000             | DPhil                            | Physiological Sciences, Oxford University, Oxford, UK  |
| April 2001- Oct 2003 | Postdoctoral Research Associate; | Vitamin Metabolism and Aging Laboratory and Nutrition and Neurocognition Laboratory, JM USDA HNRCA at Tufts University |

## ACADEMIC APPOINTMENTS

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|--------------------|------------------------------|--|
| Oct 2003-Present   | Scientist III;               | Vitamin Metabolism and Aging Laboratory and Nutrition and Neurocognition Laboratory, JM USDA HNRCA at Tufts University |
| Sept 2006-Dec 2007 | Adjunct Assistant Professor; | Friedman School of Nutrition Science and Policy, Tufts University  |
| Jan 2008- Present  | Assistant Professor;         | Friedman School of Nutrition Science and Policy, Tufts University  |
| April 2009-Present | Scientist II;                | Vitamin Metabolism and Aging Laboratory and Nutrition and Neurocognition Laboratory, JM USDA HNRCA at Tufts University |

## AWARDS AND HONORS:

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|-----------|--|
| 1996-1999 | Oxford University Dept. of Pharmacology, Departmental Scholarship  |
| 2002      | The Alzheimer's Association Ronald and Nancy Reagan Research Institute New Investigator Research Grant Award |
| 2003      | NIH Office of Dietary Supplements, Postdoctoral Travel Award   |

## PUBLICATIONS

1. **Troen AM**, Rosenberg IH (2009). "Reply to Daval et al: How comparable are brain changes induced by dietary methyl-donor deficiency occurring before birth or after weaning?" (Letter) Proceedings of the National Academy of Sciences 106 (1)1 E2. Epub online doi:10.1073/pnas.0811541106.
2. Linhart HG, **Troen AM**, Bell GW, Cantu E, Chao WH, Moran E, Steine E, He T, Jaenisch R (2009). "Chronic Folate deficiency in Ung <sup>-/-</sup> mice induces DNA uracil misincorporation and hypomethylation without increasing mutations" Gastroenterology 136(1):227-235.e3. Epub 2008 Oct 9.
3. **Troen AM**, Shea-Budgell M, Shukitt-Hale B, Smith DE, Selhub J, Rosenberg IH (2008). "B-vitamin deficiency causes hyperhomocysteinemia and vascular cognitive impairment in mice" Proceedings of the National Academy of Sciences 105 (34): 12474-12479.

4. **Troen AM**, Chao WH, D'Anci KE, Shukitt-Hale B, Crivello NA, Albuquerque BM, Casseus S, Smith DE, Selhub J, Rosenberg IH (2008). "Folate deficiency induced cognitive impairment in rats corresponds to depleted brain phosphatidylcholine: prevention by methionine without lowering homocysteine" Journal of Nutrition 138(12):2502-2509.
5. Kalmbach RD, Choumenkovitch SF, **Troen AM**, Jacques PF, D'Agostino R, Selhub J (2008). Circulating folic acid in plasma: Relation to folic acid fortification" American Journal of Clinical Nutrition; 88: 763-768.
6. Kalmbach RD, Choumenkovitch SF, **Troen AM**, Jacques PF, D'Agostino R, Selhub J (2008). "A 19-base pair deletion polymorphism in dihydrofolate reductase is associated with increased unmetabolized folic acid in plasma and decreased red blood cell folate." Journal of Nutrition 138(12):2323-2327.
7. Johnson EJ, McDonald K, Caldarella SM, Chung H, **Troen AM**, Snodderly, DM (2008). "Cognitive findings of an exploratory trial of docosahexaenoic acid and lutein supplementation in older women" Nutritional Neuroscience;11(2): 75-83.
8. Bernardo A, McCord M, **Troen AM**, Allison JD, McDonald MP (2007). "Impaired spatial memory in APP-overexpressing mice on a homocysteinemia-inducing diet" Neurobiology of Aging; 28(8):1195-205.
9. **Troen AM**, French EE, Roberts JF, Selhub J, Ordovas JM, Parnell LD, Lai CQ (2007). "Lifespan modification by glucose and methionine in Drosophila melanogaster fed a chemically defined diet." Age; 29(1):29-39.
10. **Troen A**, Fraser, D, Abdeen, Z, Rosenberg, IH (2006). "Child Nutrition Initiative in Israel and Palestine: Status of food security, micronutrient malnutrition, and behavioral change and communication programs" Food and Nutrition Bulletin; 27(2): 180-185.
11. **Troen AM**, Mitchell B, Johnston A, Wener A, Sorensen B, Wood B, McTiernan A, Yasui Y, Selhub J, Ulrich CM (2006). "Unmetabolized Folic Acid In Plasma Is Associated With Reduced Natural Killer Cell Cytotoxicity Among Postmenopausal Women" Journal of Nutrition; 136: 1-6.
12. **Troen AM**, Shukitt-Hale B, Smith DE, Selhub J, Rosenberg IH (2006). "Cognitive Impact of Nutritional Hyperhomocysteinemia in Apolipoprotein-E Deficient Mice" Journal of Alzheimer's Disease; 9(4): 381-392.
13. Spiegelstein O, X Lu, Le XC, **Troen A**, Selhub J, Melnyk S, James SJ, Finnell RH (2005). "Effects Of Dietary Folate Intake And Folate Binding Protein-2 (Folbp2) On Urinary Speciation Of Sodium Arsenate In Mice" Environmental Toxicology and Pharmacology; 19(1): 1-7.
14. Spiegelstein O, Gould A, Wlodarczyk B, Tsie M, Lu X, Le C, **Troen A**, Selhub J, Piedrahita JA, Salbaum JM, Kappen C, Melnyk S, James J, Finnell RH (2005). "Developmental Consequences Of In Utero Sodium Arsenate Exposure In Mice With Folate Transport Deficiencies"; Toxicology Applied Pharmacology; 203(1):18-26.
15. **Troen AM**, Rosenberg IH (2005). "Homocysteine and Cognitive Function" Seminars in Vascular Medicine; 5 (2):209-14.
16. **Troen AM** (2005). "The Central Nervous System in Animal Models of Hyperhomocysteinemia" Progress in Psychopharmacology and Biological Psychiatry; 29 (7):1140-1151.
17. Kado DM, Karlamangla AS, Huang MH, Seeman TE, Selhub J, **Troen A** (2005). "Reply to: Folate, mitochondria, ROS, and the aging brain" (Letter) The American Journal of Medicine 118,(10):1174.
18. Kado DM, Karlamangla AS, Huang MH, **Troen A**, Rowe JW, Selhub J, Seeman TE (2005). "Homocysteine Versus The Vitamins Folate, B12 And B6 As Predictors Of Cognitive Function In Older High Functioning Adults: Mac Arther Studies Of Successful Aging" American Journal of Medicine; 118(2):161-167.

19. Spiegelstein O, Lu X, Le XC, **Troen A**, Selhub J, Melnyk S, James SJ, Finnell RH (2003). "Effects Of Dietary Folate Intake And Folate Binding Protein-1 (Folbp1) On Urinary Speciation Of Sodium Arsenate In Mice" Toxicology Letters; 145(2): 167-174.
20. **Troen AM**, Lutgens E, Smith DE, Rosenberg IH, Selhub J (2003). "The Atherogenic Effect of Excess Methionine Intake" Proceedings of the National Academy of Sciences; 100(25): 15089-150.

### **Doctoral Thesis**

**Troen AM** (2000) "A role for one carbon metabolism in Alzheimer's Disease". DPhil Thesis. Oxford University, Oxford, UK.

### **INVITED LECTURES AND ORAL PRESENTATIONS**

2010 FASEB Summer Research Conference on Folic Acid, Vitamin B12, and One-Carbon metabolism: Carefree, Arizona August 2010;– "*Mechanisms of hyperhomocysteinemia and cognitive impairment in experimental animals*" – Invited Lecture (Pending)

Marabou Conference on Nutrition and the Aging Brain, Marabou Foundation for the promotion of nutritional research: Stockholm, Sweden June 12-24, 2009: "*B-vitamins and the aging brain*" - Invited Discussant

Faculty of Life Sciences, Haifa University: Haifa Israel: Jan 12 2009: "*B-vitamins and Brain Aging: The Challenge of Nutritional Neuroprotection*" - Invited Seminar

Adams Super Center for Brain Studies, Tel Aviv University: Tel Aviv Israel: Jan 8 2009: "*B-vitamins and Brain Aging: The Challenge of Nutritional Neuroprotection*" - Invited Seminar

Institute of Biochemistry, Food Science and Nutrition, The Hebrew University of Jerusalem: Rehovot, Israel, Dec 30 2008: "*B-vitamins and Brain Aging: The Challenge of Nutritional Neuroprotection*" - Invited Seminar

Society for Neuroscience Meeting, Washington, DC. November 15-19, 2008: "*Dietary folate deficiency severely impairs dopamine release in rat brain*"

Nutrition Agenda 2008 and Beyond – The Friedman School Symposium; Boston MA, September 24-26, 2008: "*Hot Topic: B-vitamins and Cognition*" - Invited Lecture (<http://www.friedmansymposium.com/speakers.htm>)

Boston University Alzheimer Disease Research Center Seminar, Boston MA, May 21, 2008: "*(Mis)understanding nutritional risk for cognitive decline: the case of hyperhomocysteinemia*". - Invited Lecture

University of North Carolina, Chapel Hill NC, April 2, 2008: "*Rodent models of homocysteine-related cognitive impairment: a role for choline metabolism?*"

Jean Mayer USDA HNRCA at Tufts University – Seminar; Boston MA, March 24 2008: "*Granny's dementia is about hardening of the arteries after all*"

Friedman School of Nutrition Science and Policy Seminar Series, Tufts University, Boston MA, November 13, 2007: "*Nutritional Neuroscience: An Introduction ("What we eat = who we ARE?")*"

The Vas-Cog Congress, 2007 San Antonio TX, July 11-14, 2007: Panel on animal models of Vascular Cognitive Impairment - "*A mouse model of homocysteine-related vascular cognitive impairment*". - Invited Lecture

6th Conference on Homocysteine Metabolism, World Congress on Hyperhomocysteinemia, Saarbruecken, Germany June 5-9, 2007: *Cognitive Dysfunction and Brain Phospholipids in a Rat Model of Dietary Homocysteinemia: Relation to Folate and Methionine* - Invited Lecture

Kidney Interagency Coordinating Subcommittee Meeting, NIH, Bethesda MD. March 24, 2006: *Evaluating Cognitive Function in Renal Transplant Recipients: An Ancillary Study of the FAVORIT Trial.* - Invited Lecture

FASEB Summer Conference, Indian Wells CA, August 5-10, 2006:  
*Neurotoxicity, vascular or metabolic insult? Modeling homocysteine-related brain dysfunction*  
- Invited Lecture

Homocysteine Metabolism - 5th International Conference; Milan, Italy. June 26-30, 2005:  
*Homocysteine and Brain Dysfunction: Insight from Animal Models* - Invited Lecture

Child Nutrition in Israel & Palestine: Seeking Joint Initiatives. Beersheba, Israel.  
February 6-9, 2005. *Conference Organizer and Co-Chair, Micronutrient Deficiencies Session*

The 5<sup>th</sup> International Congress on Neuropsychiatry; Athens, Greece. October 14-19, 2004.  
Symposium on Homocysteine & MTHFR Polymorphism in Psychiatry: State of the Art: *Animal Models of Hyperhomocysteinemia* - Invited Lecture

The 32<sup>nd</sup> Annual Scientific Meeting of the American Aging Association Conference, Baltimore MD, June 6-9, 2003: *The Potential for Neuroprotection through Folate Supplementation and Homocysteine-Lowering in Alzheimer's disease.* – Invited Lecture

## RESEARCH GRANTS

### ***Current funding***

Aug 2003 – May 2009  
NIH-NIDDK/ODS  
“Renal Transplantation, Homocysteine Lowering and Cognition (R01 DK65114-01)”  
\$ 2,100,000 (Direct Costs)  
Role: Initiator, scientific coordinator and co-investigator (PI-Irwin Rosenberg)

Feb 2008 – Dec 2008  
The Ross Aging Initiative – Seed Grant  
“Nutritionally-modifiable genetic risk for age related cognitive impairment”  
Role: Principal Investigator  
\$12,000 (Direct Costs)

Mar 2007 – Dec 2008  
Subcontract with University of California at Los Angeles  
“The Study of Osteoporotic Fractures (SOF) Ancillary Study: Gene-Nutrient Interactions and Age-Related Diseases”  
Role: Co-Investigator and Principal Investigator for Tufts (Project PI – Deborah Kado)  
\$41,494 (Direct Costs)

May 2004 - Apr 2009  
USDA Cooperative Agreement 58-1950-4-0401  
“Nutritional Factors in the Prevention of Cognitive Decline and Aging”  
Role: Co-investigator (PI – Irwin Rosenberg)

July 2008-June 2011  
Unilever N.V. – Tufts JM USDA HNRCA Strategic Partnership: Cognition  
Role: Co-investigator and team leader for animal study of cerebrovascular function  
\$250,000 / year (Direct Costs)

## **Completed funding**

Aug 2002 - Dec 2004

The Alzheimer's Association, New Investigator Research Grant

"The Effect of Hyperhomocysteinemia on Cerebrovascular and Neurological Integrity in a Murine Model (NIRG-02-4119)"

Role: Principal Investigator

\$ 90,000 (Direct Costs)

Jul 2004 - Dec 2005

Jean Mayer USDA HNRCA Pilot Grant

"Life Span Extension by Dietary Methionine Restriction in *Drosophila Melanogaster* "

Role: Principal Investigator

\$15,000 (Direct Costs)

## **TEACHING**

### ***Supervision of doctoral students***

2006-2008: Co-supervision of Doctoral candidate Renee Kalmbach, MS, RD, PhD. Dr. Kalmbach was awarded her Ph.D. in May 2008 for research entitled "*The Effect of Folic Acid Fortification on Unmetabolized Folic Acid: Detection, characterization, and determinants*". The student's work arises from a hypothesis generated by article number 11 in the publication list and has resulted in three manuscripts including papers number 5 and 6.

### ***Supervision of post-doctoral fellows***

2008: Denish Moorthy, MD was recruited to carry out research on "*Nutritionally-modifiable genetic risk for age related cognitive impairment*" for which pilot funds were awarded from the Ross Aging Initiative and from collaboration with UCLA.

### ***Graduate teaching at the Friedman School of Nutrition Science and Policy***

- Nutritional Biochemistry Nutr371B (PhD level team-taught course) – lectures on:
  - "Folate and vitamin B12 - metabolic pathways and regulation"
  - "Folate for disease prevention: limits of basic science, epidemiology and clinical trials and implications for public health interventions"
- Directed Study Nutr297: Nutritional Bioinformatics (Masters level)
- Lab Practicum Nutr291MB (Masters level)
- PhD Qualifying Exam Committee (Nutritional Biochemistry 271 A&B)
- Grant Writing Seminar (Ph.D. level)

## **PROFESSIONAL ACTIVITY**

### ***Editorial and Peer Review***

- 2006 – 2007 Associate Editor, Journal of Alzheimer's Disease
- Grant review for the Alzheimer's Association and for The United States – Israel Binational Agricultural Research and Development Fund (BARD)
- Peer Review for several journals including Neuroscience, Neurobiology of Aging, Journal of Alzheimer's Disease, Molecular and Cellular Neuroscience, Experimental Gerontology, Journal of Nutrition, British Journal of Nutrition, Journal of Nutritional Biochemistry, Annals of Nutrition and Metabolism, Journal of Lipid Research.

### ***Membership in professional societies***

- The Society for Neuroscience
- The American Aging Association
- Vas-Cog (The International Society for Vascular Cognitive and Behavioral Disorders)
- The American Society of Nutrition (ASN)

### ***Advanced Training***

1<sup>st</sup> annual UC Davis Food & Health Entrepreneurship Academy; Davis, California; Feb 22-28, 2009.

2<sup>nd</sup> Annual Isotope Tracers in Metabolic Research: Principles and Practice of Kinetic Analysis; Little Rock, Arkansas; May 4-8 (pending)

### ***Conference organization***

2004 – 2005 Initiated and co-organized an international conference on nutritional deficiencies and food security in Israel, the West Bank and Gaza. The conference was held in Beer-Sheva, Israel, on February 6-9, 2005 under the joint auspices of Tufts University, Ben Gurion University and AlQuds University.

### ***Other activities***

- Friedman School of Nutrition Science and Policy Finance and Fundraising Advisory Committee and Admissions Committee
- HNRCA Seminar Committee
- HNRCA Speakers Bureau – community lectures on nutrition and cognitive function