

## CURRICULUM VITAE

Melinda A. Beck, Ph.D.  
University of NC at Chapel Hill  
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### EDUCATION

- 1987 Ph.D. in Medical Microbiology and Immunology. The Ohio State University, Columbus, Ohio. Dissertation entitled "Regulation of Cell-Mediated Immunity During Reinfection with Influenza Virus". J. F. Sheridan, advisor.
- 1983 M.S. in Biological Sciences. California Polytechnic State University, San Luis Obispo. Major area of study was medical microbiology with an emphasis on host-parasite relationships. Master's thesis entitled "Development of an Indirect Immunofluorescent Test for Gardnerella vaginalis".
- 1978 B.A. in Zoology. University of California at Berkeley.

### PROFESSIONAL EXPERIENCE

- 7/09 to present Associate Chair for Academics, Department of Nutrition, Gillings School of Global Public Health, University of NC at Chapel Hill
- 6/05 to 8/11 Director, Division of Nutritional Biochemistry, Department of Nutrition
- 9/04-present Professor, Departments of Nutrition and Pediatrics, Gillings School of Global Public Health and School of Medicine, University of North Carolina at Chapel Hill
- 4/98-Present Associate Professor, Departments of Pediatrics and Nutrition, School of Medicine School of Public Health, University of North Carolina at Chapel Hill.
- 9/96-4/98 Assistant Professor, Department of Nutrition, School of Medicine and School of Public Health, University of North Carolina at Chapel Hill.
- 9/93-Present Fellow, Frank Porter Graham Child Development Center, University of North Carolina at Chapel Hill.
- 9/92 – 4/98 Assistant Professor, Department of Pediatrics, School of Medicine, University of North Carolina at Chapel Hill.
- 10/91 - 9/92 Visiting Assistant Professor, Department of Pediatrics, School of Medicine, University of North Carolina at Chapel Hill, Chapel Hill, NC

- 7/91 - 9/91 Assistant Professor, Department of Pathology and Microbiology, College of Medicine, University of Nebraska Medical Center, Omaha, NE.
- 7/89 - 6/91 Instructor, Department of Pathology and Microbiology, College of Medicine, University of Nebraska Medical Center, Omaha, NE.
- 3/87 - 6/89 Postdoctoral Research Associate, Department of Pathology and Microbiology, College of Medicine, University of Nebraska Medical Center, Omaha, NE.
- 9/84 - 3/87 Graduate Research Associate, The Ohio State University, Columbus, OH
- 9/82 - 9/84 Graduate Research Associate, University of Maryland, Baltimore, Department of Pharmacology and Experimental Therapeutics.
- 9/81 - 9/82 Research Associate, Johns Hopkins University, Baltimore, MD
- 9/80 - 9/81 Laboratory Technician II, Flow Laboratories, McLean VA.

### **HONORS AND SELECTED INVITED SPEAKER**

- American Society for Microbiology, Foundation for Microbiology Lectures Program. Speaker: July 1, 1995 - June 30, 1997.
- E.L.R. Stockstad Award, 2001. American Society for Nutritional Sciences, Federation of American Societies for Experimental Biology.
- Instituto de Medicina Tropical "Pedro Kouri", Havana, Cuba. Commemorative Centenario del Natalicio de Pedro Kouri, medal given for outstanding contribution to science, 2/2003.
- National Academy of Sciences, Conference on Human Health and Global Climate Change. Invited Participant, 9/11-9/12, 1995. National Academy of Sciences, Washington, DC.
- Invited Speaker at International Symposium "Human Viral Diseases: Selenium, Antioxidants and Other Emerging Strategies of Therapy and Prevention" 4/19-4/21, 1996, European Academy, Nonnweiler, Germany
- Invited Speaker and Participant, Institute of Medicine, Food and Nutrition Board, Workshop on "Nutrition and Immune Function: Strategies for Sustainment in the Field" May, 1996, Fort Detrick, Frederick MD.
- Invited to brief Harold Varmus M.D., Director of NIH, on antioxidant status and viral infection, 10/17/96.
- Invited Speaker, International Conference on Nutrition and Immunology, 5/5-5/7, 1997, Atlanta, GA.
- Invited Speaker, International Congress of Nutrition, 7/27-8/1, 1997, Montreal, Canada.
- Invited Speaker, Marabou Symposium, Nutrition and Viruses-From Molecular Biology to Public Health, June 11-13, 1999, Stockholm, Sweden
- Invited Speaker, Molecular Biology of Oxidative Stress, Cold Spring Harbor Laboratory, 3/5-3/8, 2000
- Member, Institute of Medicine Committee on Mineral Requirements for Cognitive and Physical Performance of Military Personnel, 2005-2006.
- Invited Speaker, Obesity Society Meeting 2009
- Co-Chair FASEB 2011 Summer Workshop, Nutrition and Immune Function
- Member, INSPIRE Committee, 2012
- Invited Speaker, British Society for Immunology Hot Topic Event, Jan 2013
- Chair, FASEB 2015 Summer Workshop: Nutrition and Immune Function

### **BIBLIOGRAPHY**

#### **Contributions to Text Books**

- Tracy, S., Chapman, N.M., Rubocki, R.J. and Beck, M.A. 1995. Host immune responses to

enterovirus infections. IN: Human Enterovirus Infections. H.A. Rotbart (ed), pp 175-190.

Beck, MA. (2000) Nutritional effects on the pathogen genome and phenotypic expression of disease. In Nutrition and Immunology. (Gershwin, M.E., German, J.B., Keen, C.L., Eds) Humana Press, Totowa, NJ, pp4 57-468.

Beck, M.A. 2001 and 2005. Selenium as an antiviral agent. IN: Selenium: Its Molecular Biology and Role in Human Health. D.L. Hatfield (ed). Pgs 235-246

### **In Refereed Journals:**

- Antoniak S, Tatsumi K, Hisada Y, Milner JJ, Neidich SD, Shaver CM, Pawlinski R, Beck MA, Bastaracher JA, Mackman N. 2016. Tissue factor deficiency increases alveolar hemorrhage and death in influenza A virus-infected mice. *J Thromb Haemost* 14:1238-48
- Sheridan PA, Paich HA, Handy J, Karlsson EA, Schultz-Cherry S, Hudgens M, Weir S, Noah T, Beck MA. 2015. The antibody response to influenza vaccination is not impaired in type 2 diabetics. *Vaccine* 33: 3306-13.
- Milner JJ, Rebeles J, Dhungana J, Stewart DA, Sumner SC, Meyers MH, Mancuso P, Beck MA. 2015. Obesity increases mortality and modulates the lung metabolome during pandemic H1N1 influenza infection in mice. *J Immunol* 10. [Epub ahead of print] PMID 25862817
- Karlsson EA, Ip HS, Hall JS, Yoon SW, Johnson J, Beck MA, Webby RJ, Schultz-Cherry S. 2014. Respiratory transmission of an avian H3N8 influenza virus isolated from a harbor seal. *Nat Commun* Sep 3;5:4791. doi: 10.1038/ncomms5791.
- Shaikh SR, Haas KM, Beck MA, Teague H. 2015. The effects of diet-induced obesity on B cell function. *Clin Exp Immunol* 179:90-99.
- Milner JJ, Wang J, Sheridan PA, Ebbels T, Beck MA, Saric J. 2014. <sup>1</sup>H NMR-based profiling reveals differential immune-metabolic networks during influenza virus infection in obese mice. *PLoS One* May 20;9(5):e97238. doi: 10.1371/journal.pone.009723
- Meliopoulos VA, Kayali G, Burnham A, Oshansky CM, Thomas PG, Gray GC, Beck MA, Schultz-Cherry S. 2014. Detection of antibodies against Turkey astrovirus in humans. *PLoS One* May 14;9(5):e96934. doi: 10.1371/journal.pone.0096934
- Milner JJ and Beck MA. 2014. Obesity and influenza infection severity. *Future Virol* (In press)
- Milner JJ, Sheridan PA, Karlsson EA, Schultz-Cherry S, Shi, Q and Beck MA. 2013 Diet-induced obese mice exhibit heightened lung inflammatory and cross-reactive CD8+ T cell responses, not enhanced mortality, during a secondary 2009 pandemic H1N1 infection. *J Immunol*:191 2474-85.
- Paich H, Sheridan PA, Handy, J, Karlsson E, Hudgens M, Weir, S, Noah T, and Beck MA. 2013. Overweight and obese adult humans have a defective cellular immune response to pandemic H1N1 influenza A virus. *Obesity* (Mar 20. doi: 10.1002/oby.20383. [Epub ahead of print]
- Antoniak S, Owens AP, Baunacke M, Williams JC, Lee RD, Weithauser A, Sheridan PA, Malz R, Luyendyk JP, Esserman, DA, Regjo J, Kirchhofer D, Blaxall B, Pawlinski R, Beck MA, Rauch U, and Mackman N. 2013. PAR-1 contributes to the innate immune response after viral infection. *J Clin Investigation* 123:1310-1322.
- Meydani, S. and Beck, M. (2012). Editorial. *Molecular Aspects of Medicine*, 33(1), 1.
- Beck, MA. 2012. Influenza and obesity: Will vaccines and antivirals protect? *J Infect* 205(2), 172-173.
- Milner, J. J. and Beck, M. A. 2012. The impact of obesity on the immune response to infection. *Proc Nutr Soc*, 4, 1-9.

- Sheridan, P., Paich, H., Handy, J., Karlsson, E., Hudgens, M., Sammon, A., Holland, L., Weir, S., Noah, T., and Beck, MA. 2011. Obesity is associated with impaired immune response to influenza vaccination in humans. *Intern J Obesity* 36:1072-7 .
- Karlsson, EA, Sheridan PA and Beck MA. 2010. Diet-induced obesity impairs the T cell memory response to influenza virus infection. *J. Immunol.* 184:3127-33.
- Karlsson EA and Beck MA. 2010. The burden of obesity on infectious disease. *Exp Biol Med* 235:1412-24.
- Schwerbrock NM, Karlsson EA, Shi Q, Sheridan PA and Beck MA. 2009. Fish oil-fed mice have impaired resistance to influenza infection. *J Nutr.* 139:1588-94.
- Karlsson EA, Wang S, Shi Q, Coleman RA and Beck MA. 2009. Glycerol-3-phosphate acyltransferase 1 is essential for the immune response to infection with coxsackievirus B3 in mice. *J. Nutr.* 139:779-783.
- Sheridan PA and Beck MA. 2009. The dendritic and T cell responses to herpes simplex virus are modulated by dietary vitamin E. *Free Radic Biol Med* 46:1581-1588
- Smith, AG, Sheridan PA, Tseng, R., Sheridan, J, Beck MA. 2008. Selective impairment in dendritic cell function and altered antigen-specific CD8+ T cell responses in diet-induced obese mice infected with influenza virus. *Immunol* 126:268-79.
- Sheridan PA and Beck MA 2008 The immune response to herpes simplex virus encephalitis in mice is modulated by dietary vitamin E. *J Nutr* 138:130-7.
- Sheridan PA, Zhong N, Carlson BA, Perella CM, Hatfield DL, Beck MA 2007. Decreased selenoprotein expression alters the immune response during influenza virus infection in mice.
- Jaspers I, Zhang W, Brighton LE, Carson JL, Styblo M, Beck MA 2007. Selenium deficiency alters epithelial cell morphology and responses to influenza. *Free Radic Biol Med.* 15;42(12):1826-1837.
- Beck, MA 2007. Selenium and vitamin E status: impact on viral pathogenicity. *J. Nutr.* 137(5):1338-40.
- Smith, AG, Sheridan PA, Harp JB, Beck MA. 2007. Increased mortality and altered immune response in obese mice infected with influenza virus. *J. Nutr.* 137(5):1236-43.
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- Styblo M, Walton FS, Harmon AW, Sheridan PA and Beck MA. 2007. Activation of superoxide dismutase in selenium-deficient mice infected with influenza virus. *J Trace Elem Med Biol* 21:52-62
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- Jaspers, I., Cienciewicki, J.M., Zhang, W., Brighton, L.E., Carson, J.L., Beck, M.A., and Madden, M.C. 2005. Diesel exhaust enhances influenza infections in human respiratory epithelial cells. *Toxicolol. Sci* 85:990-1002.
- Beck MA, Shi Q, Morris VC, Levander OA. 2005. Benign coxsackievirus damages heart muscle in iron-loaded vitamin E-deficient mice. *Free Radic Biol Med* 38:112-116.
- Beck, M.A., Shi, Q., and Harruff, R.C. 2004. Unexpected hazard of illegal immigration: Outbreak of viral myocarditis exacerbated by confinement and deprivation in a shipboard cargo container. *Am J Forensic Med Pathol.* 25:117-24.
- Beck, M.A., Handy, J. and Levander, O.A. 2004. Host nutritional status: The neglected virulence factor. *Trends Microbiol.* 12:417-23.85:990-1002.
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- Beck, M.A., Esworthy, R.S., Ho, Y.-S. and Chu, F.-F. 1998. Glutathione peroxidase protects mice from viral-induced myocarditis. *FASEB J* 12:1143-1149.
- Beck, M.A. and Levander, O.A. 1998. Dietary oxidative stress and the potentiation of viral infection. *Ann. Rev. Nutr.* 18:93-116.
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- Beck, M.A. 1997. Increased virulence of coxsackievirus B3 due to vitamin E or selenium deficiency. *J Nutr* 127:966S-970S.

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- Beck, M.A. 1996. The role of nutrition in viral disease. J. Nutr. Biochem. 7:683-690.
- Levander, O.A., Ager, A.L., and Beck, M.A. 1995. Dietary implications for parasites and viral disease. IN: Nutrition, Lipids, Health and Disease. A.S.H. Ong and L. Packer (eds), pp 280-292. AOCS Press, Champaign IL.
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- Beck, M.A., Shi, Q., Morris, V.C., and Levander, O.A. 1995. Rapid genomic evolution of a non-virulent Coxsackievirus B3 in selenium-deficient mice results in selection of identical virulent isolates. Nature Medicine 1:433-436.
- Beck, M.A., Kolbeck, P.C., Rohr, L.H., Shi, Q., Morris, V.C., and Levander, O.A. 1994. Increased virulence of a human enterovirus (coxsackievirus B3) in selenium-deficient mice. J. Infect. Dis. 170:351-357.
- Beck, M. A., Kolbeck, P.C., Rohr, L.H., Shi, Q., Morris, V. C. and Levander, O.A. 1994 Amyocarditic coxsackievirus becomes myocarditic in selenium deficient mice. J Med Virol. 43:166-170
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- Beck, M.A., Tracy, S., Collier, B.A., Chapman, N.M., Hufnagel, G., Johnson, J.W. and Lomonosoff, G. 1991. Comoviruses and enteroviruses share a T cell epitope. Virol. 186:238-246.
- Tracy, S. Chapman, N.M. and Beck, M.A. 1991. Molecular biology and pathogenesis of coxsackie B viruses. Rev. Med. Virol. 1:145-154.
- Beck, M.A. and Tracy, S. 1990. Evidence for a group-specific enterovirus antigen(s) recognized by human T cells. J. Clin. Microbiol. 28:1822-1827.
- Tracy, S., Wiegard, V., McManus, B., Gauntt, C., Pallansch, M., Beck, M. and Chapman, N. 1990. Molecular approaches to enteroviral diagnosis in idiopathic cardiomyopathy and myocarditis. JACC 15:1688-1694.
- Tracy, S., Chapman, N., McManus, B., Pallansch, M., Beck, M. and Carstens, J. 1990. A molecular and serologic evaluation of enteroviral involvement in human myocarditis. J. Mol. Cell. Cardiol. 22:403-414.
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- Beck, M.A., Chapman, N.M., McManus, B.M., Mullican, J.C., and Tracy, S. 1990. Secondary enterovirus infection in the murine model of myocarditis: pathological and immunological aspects. Am. J. Pathol. 136: 669-681.
- Beck, M.A., and Tracy, S. 1989. Murine cell-mediated immune response recognizes an enterovirus group-specific antigen(s). J. Virol. 63: 4148-4156.
- Beck, M.A., and Sheridan, J.F. 1989. Regulation of lymphokine response during reinfection by influenza virus. Production of a factor that inhibits lymphokine activity. J. Immunol. 142: 3560-3567.
- Glaser, R., Rice, J., Sheridan, J., Fertel, R., Stout, J., Speicher, C., Pinsky, D., Kohr, M., Post, A., Beck, M., and Kiecolt-Glaser, J. 1987. Stress-related immune suppression: health plications. Brain, Behavior, Immun. 1: 6-14.
- Sheridan, J. F., Beck, M., Smith, C.C., and Aurelian, L. 1987. Reactivation of herpes

simplex virus is associated with the production of a low molecular weight factor that inhibits lymphokine activity in vitro. J. Immunol. 138:1234-1239.  
Sheridan, J.F., Beck, M., Aurelian, L., and Radowsky, M. 1985. Immunity to herpes simplex virus: Virus reactivation modulates lymphokine activity. J. Infect. Dis. 152: 449-456.  
Cano, R., Beck, M.A. and Grady, D. 1983. Detection of Gardnerella vaginalis on vaginal smears by immunofluorescence. Can. J. Microbiol. 29: 27-32.

**Under Review:**

Sheridan PA, Paich HA, Handy J, Karlsson EK, Schultz-Cherry S, Hudgens M, Weir S, Noah T, Beck MA. *The antibody response to influenza vaccination is not impaired with type 2 diabetes*; Submitted.

Milner JM, Wang J, Paich HA, Sheridan PA, Ebbels T, Beck MA, Saric J. *<sup>1</sup>H NMR-based profiling reveals differential immune-metabolic networks during influenza infection in obese mice*; PLoS1.  
Under review

**In progress:**

Milner J.J., Meyers M., Sheridan P.A., Mancuso P., Beck M.A. Mortality from 2009 pandemic H1N1 influenza virus infection in obese mice is prevented by disruption of leptin signaling in T cells. In preparation.

Milner J.J., Karlsson E.A., Sheridan P.A., Bartholomew K., Shultz-Cherry S., Beck M.A. Obese individuals exhibit blunted cross-reactive T cell responses following seasonal influenza vaccination. In preparation.

Milner J.J.\*, Johnson A.R.\*, Makowski L.#, Beck M.A.# The impact of obesity on macrophage polarization during influenza virus infection. \*Co-first authors, #Co-last authors.

Milner J.J., DePetrillo, M., Drobna S., Beck M.A., Styblo M. The impact of arsenic exposure on immunity to 2009 pandemic H1N1 influenza virus infection in mice. In preparation

Karlsson E.A., Milner J.J., Schultz-Cherry S., Beck M.A.. Nutritional status as a factor in influenza virus infection. *Exp Biol Med. (Maywood)*. Invited review. In preparation.

Paulson J.\*, Paich H.A.\*, Milner J.J., Bahena M., Sheridan P.A., Noah T.A., Beck M.A. The impact of obesity on the immune response to influenza vaccination in a pediatric population. In preparation.  
\*Co-first authors.

**TEACHING:**

**Courses:**

Nutr 175: Introduction to Food Policy

Nutr 240: Introduction to Human Nutrition

Nutr 620: Human Metabolism: Micronutrients

Nutr 845: Advanced Nutritional Biochemistry: Nutrition and Immunology

Nutr 994: Doctoral Dissertation

Nutr 295: Undergraduate Research Experience in Nutrition

Nutr 861: Doctoral Seminar

**Mentoring of students:**

**Post doctoral Fellows:**

Thomas McDade, Ph.D. 1999-2001. Currently an Associate Professor at the University of Chicago  
Steven Waters, Ph.D. 2002-2004. Currently a Research Associate Professor at the University of Chicago

Patricia Sheridan, Ph.D. (2004-2008) Currently a Research Assistant Professor at UNC-Chapel Hill  
Ray Tseng, DDS, PhD (2009-2011) Currently in Dental Practice, Cary NC

**Graduate Students (Dissertation Advisor):**

Colette Matthews, 2002. Currently employed as a Research Scientists at Proctor and Gamble, Cincinnati, OH

Heather Nelson, 2003. Currently employed as a Research Scientist at PepsiCo, Quaker Oats Division., Chicago, IL

Wei Li, 2004 Currently Assistant Professor at Michigan State University

Alfred De La Torres, Currently Dean of Students at University of Argentina

Alexia Lundberg, Currently Research Scientist at Shaklee Corp, Richmond, CA

Kathryn Cole, Currently Research Associate for Tracs, UNC-Chapel Hill

Nicole Schwerbrock, 2009. Innovation and Entrepreneurship Fellow, UNC, Chapel Hill

Erik Karlsson, 2010. Currently postdoctoral research associate at St. Judes

Heather Paich, 2013 Fogarty Global Health Postdoctoral Research Fellow at Univ. of Cape Town

Justin Milner, 2014. Postdoc, University of California, San Diego

Scott Neidich, current PhD student

Jennifer Rebeles, current PhD student

Will Green, current MS student

**Graduate Students (Committee Member):**

Tracey Dawson, graduated 1999

Xiangli Li, graduated 2003

Kelly Krock graduated 2005

Karishma Fernandez (University of NC, Greensboro), graduated 2003

Raina Gay (Tufts University) graduated 2007

Ryan Gordon, graduated 2009

YuanYuan Qing graduated 2015

Anne Beal, current EPI student

Emily Rossi, current NUTR student

**Undergraduate Students: Graduated (Advisor and Honors Thesis)**

Christina Jacinto

Will Cocharan (Medical school)

Katie Savas (Medical school)

Deitra Williams (Currently at Wake Forest in an Anesthesiology Residency)

Suma Bhat (Currently enrolled in 4<sup>th</sup> year of medical school at UNC)

Caroline Um (Currently enrolled in 3rd<sup>d</sup> year of medical school at ECU)

Catherine Gang

Todd Peacock (currently medical student at Wake Forest)

Whitney Franz (currently in MPH program at UNC)

Justin Milner (currently enrolled in PhD program, UNC)

Vivian Ariel (Dental School)

Aileen Sammon (Peace Corp)

Meredith Ward (Podiatry School)



Hema Kondur (Graduate School)  
Elizabeth Golly (Vet School)  
Scott Neidich (Graduate School)  
Emily Welker (MPH/RD)  
Laura Smith (UNC-Nursing School)  
Kevin Mensah-Biney (Med School, UNC)  
Matthew Meyers (Med School, UNC)  
Erin Riley  
Nikki Patel (Med School, UNC)  
Elizabeth Rossitch (Med School, ECU)  
Mahreed Khan  
Bret Robinson (Med School, UNC)  
Cameron Robinson (Research Technician, CDC)  
Jubayer Ahmed (Medical Transcriber)  
Hussein Ahmed  
Roderick Gladney (Pharmacy Doctoral Program)  
Hieu Nguyen (Med School)  
Chris Dunlevy (Med School)  
Eloise Joubert (Med School)  
Marissa Riley (Med School ECU)  
Tatianna Blount (Laboratory Technician, UNC)  
Matthew Pressley (Med School, UNC)  
Anna Meade (Dental School)  
Emily Wheeler (Med School, UNC)  
Rachael Howard (Medical technician)

**Current Undergraduates in the laboratory:**

Amina Garba  
Katie Henning  
Usman Saquib  
Rand Khawsahneh  
Omar Resz  
Furquan Khaja  
Michael Harley  
Ryan Farrell  
Kelly Liu  
Amir Azihan  
Cyrus Adams-Mardi

**GRANTS FUNDED-Total Direct Costs Shown (PAST AND PRESENT)**

American Heart Association, Nebraska Affiliate (PI). "Coxsackievirus B3 Induced Myocarditis: Role of CMI." Postdoctoral Fellowship, \$15,500, 7/88 - 6/89.

American Heart Association, Nebraska Affiliate (PI). "Enterovirus Re-exposure as a New Model for Coxsackie B virus-induced Myocarditis." Grant-In-Aid, \$19,675, 7/90 - 6/91.

Institute of Nutrition, UNC at Chapel Hill (PI) "The Effect of Dietary Selenium on the Immunomodulation of Viral-Induced Myocarditis" \$3,000 7/1/93-6/30/94.

United States Environmental Protection Agency (Co-PI) "Estimating the Dose of Mite Allergen Inhaled During Common Indoor Activities" \$106,104 10/1/93 - 9/30/94.

Frank Porter Graham Child Development Center Small Grant Competition (PI). "A Murine Model for Protection of Neonates from Enterovirus-Induced Encephalitis and Meningitis" \$13,000 10/1/93 - 6/30/94

Institute of Nutrition, UNC at Chapel Hill (PI) "Impact of Se and/or Vitamin E Deficiency on Coxsackievirus-Induced Myocarditis" \$5,000 7/1/94 - 6/30/95.

National Institutes of Health "Enterovirus Infection and Reinfection: CMI and Myocarditis" R29 HL46195, (PI) \$336,779, 4/1/91 - 3/31/96.

United States Department of Agriculture, Co-Operative Agreement (PI) \$61,395, 4/1/95-3/31/97.

National Institutes of Health "Dietary Antioxidant Modulation of Enteroviral Pathogenesis". (PI) R01HL54123, \$641,269, 7/1/96-6/30/00.

National Institutes of Health "SCOR in Pathobiology of Lung Development, Project 4: Virus-Induced Immune Cell Response and Cytokine Production", P50-HL56395 (PI of Project 4, A. Collier PI), \$621,906, 12/1/96-11/30/01.

Nestec, Inc. (PI) "The effect of Se on virus mutations" Supported Research Agreement, 2/1/99-1/21/01, \$120,000

National Institutes of Health (PI) "The Role of Nutrition in Virus-Induced Optic Neuropathy" R01EY12410, \$1,580,000, 4/15/99-4/14/07.

National Institutes of Health (PI-S. Zeisel) "Clinical Nutrition Research Unit (Now called Nutrition and Obesity Center" 5P30 DK56350 Director of Molecular Biology and Biochemistry Core, \$430,000, 10/1/99-9/30/20.

National Institutes of Health (PI) "The Influence of Nutrition on Influenza Virus Infection" 1 RO1 HL66212-01A1, \$900,000 7/01/01-6/30/05.

National Institutes of Health (PI) "Nutrition, Viral Mutation and Host Defense" 1 RO1 AI055050-01 \$2,643,166, 10/1/03-1/31/09

National Institutes of Health (PI) "Risk of Influenza Infection in a Vaccinated Obese Population" RO1 AI78090 \$435,000 (annual direct) 12/1/08-11/30/17

Susan G. Komen Breast Cancer Foundation BCTR0600706 (05/01/2006-04/30/2009) "The role of dietary antioxidants and expression of Nm23-H1 in breast cancer skeletal metastasis" \$100,000 annual direct

National Institutes of Health (PI) "Viral Adaptation to Host Selenium Status" (04/01/2010-3/31/2014). RO1AI082298. \$250,000 (annual direct).