

HEATHER ZWICKEY, Ph.D.

National College of Natural Medicine

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EDUCATION

- Ph.D.** Immunology and Microbiology Sept. 93-Oct. 98
University of Colorado Health Sciences Center (UCHSC), Denver, CO
Dissertation: Processing of Antigens Secreted by Non-cytoplasmic
L. monocytogenes and Presentation by MHC Class I molecules
- B.A. cum laude** Mathematics Sept. 87-June 91
St. Olaf College, Northfield, MN

RESEARCH AND PROFESSIONAL EXPERIENCE

- National College of Natural Medicine** Portland, OR
Dean of Research June 2007-present
Director of Research Jan. 2002-present
Professor of Immunology
Projects: Evidence Based Medicine Curriculum Development Aug. 2007-present
Anti-Inflammatory Diet for Type II Diabetes Sept. 2006- present
Immune Activation with Constitutional Hydrotherapy Sept. 2005-present
Herbal Effects on Immune Parameters Sept. 2003-present
Comparison of Two Anti-inflammatory Diets for Psoriasis Aug. 2008-present
Organ Cotton vs Semi-Synthetic Rayon Blend Tampons Jan 2010-present
Hibiscus to Reduce Cholesterol in Metabolic Syndrome Oct. 2010-present
Fertility Supplement June 2010-present
Relaxation and Visualization for Breast Cancer Sept. 2005-2010
- Oregon Health and Sciences University** Portland, OR
Adjunct Associate Professor, Department of Neurology May 2005-present
Projects: Negative Cognition and Inflammation June 2006-present
OHSU Investigator: Beth Darnall, PhD
CAMEO: Conditioned treatment of EAE May 2005-2009
VA Investigator: Richard Jones, PhD
- University of Michigan** Ann Arbor, MI
Co-Investigator Sept 2010- present
Project: Acupressure for Women with Long-term Fatigue Post
Breast Cancer Treatment
UM Investigator: Suzanna Zick, ND
- Africa Bridge** Tukuyu, Tanzania and
Co-Investigator Lake Oswego, OR
Project: Childhood Stunting in Children in the Isongole Ward January 2008-present
- Pontificia Universidade Catolica Do Rio Grange Do Sol** Porto Alegre, RS, Brazil
Collaborator July 2002-present

Yale University School of Medicine New Haven, CT
 Postdoctoral Fellow with Dr. Ira Mellman May 1999-January 2002
 Collaborator: Ralph Steinman, Rockefeller University
 Project: Analyzing the cell biology of antigen processing of self and foreign antigens by dendritic cells.

National Jewish Medical and Research Center Denver, CO
 Postdoctoral Fellow with Dr. Terry Potter Oct. 1998-Apr. 1999
 Project: Determining whether a single MHC-peptide complex could mediate skin graft rejection
 Defining attenuator peptides that are generated during a human immune response to Mycobacterium tuberculosis to be used as vaccine candidates

National Jewish Medical and Research Center Denver, CO
 Graduate Student at UCHSC with Dr. Terry Potter Sept. 1993-Oct. 1998
 Thesis Research: Using LLO- Listeria monocytogenes to model class I antigen presentation of bacteria that are confined to an intracytoplasmic vesicle (model for Tuberculosis)

Brookhaven National Laboratory Upton, NY
 Summer Research Intern with Dr. Brenda Laster June 1988-Aug. 1988
 Project: Using a mouse model to test toxicity of a new laser activated drug directed toward glial blastoma tumors

Lawrence Berkeley National Laboratory Berkeley, CA
 Summer Research Intern with Dr. Mina Bissell June 1987-Aug. 1987
 Project: Designing an in vitro culture system for primary breast tumor cells

TEACHING AND LECTURING

National College of Natural Medicine Portland, OR
 Special Project: Development of the Master's of Science of Integrative Medicine Degree Program August 2010-present
 Professor of Immunology October 2011-present
 Associate Immunology Professor April 2001-2011

Courses

Immunology	April 2001-present
Integrative Immunology	Sept 2007-present
Cellular Systems	April 2002-present
Microbiology	April 2005-2007
Research and Biostatistics	April 2002- 2010
Introduction to Cancer (Genetics)	April 2002-present
Vaccine Balancing Act (CE Course)	Nov. 2005-present
Gut Immunology (CE Course and Elective)	March 2004-present
Naturopathic Research (CE Course)	June 2002
Technology for Naturopathic Physicians (CE Course)	June 2002
Immunology Update (CE Course)	December 2001
Oregon Mini-Med School Organizer	2009-present
Resident Education Seminars	2007-present

Seminars, Lectures and Workshops

Cancer Treatment Centers of America Integrative Medicine Conference

Invited Keynote Speaker
Cancer and Immunity

Tulsa, OK
November 2011

Restorative Medicine Conference

Invited Speaker: Vaccines and the Immune System

Portland, OR
October 2011

7th Annual Pacific NW Excellence in Breast and Gynecologic Care Conference

Invited Speaker: Evidence for Mushrooms in Cancer

Portland, OR
October 2011

International Association of Medical Science Educators

Competency in Research Literacy

St. Petersburg, FL
June 2011

Symposium for Portland Area Research in Complementary and Alternative Medicine (SPARC) Conference

Pre-conference workshop: Active Teaching Strategies
Workshop: A Comparison of 6 Student Research Programs

Portland, OR
April 2011

Association of Chiropractic Colleges Educational Conference and Research Agenda Conference

Workshop: How to Teach and Apply Evidence Based Practice

Las Vegas, NV
March 2011

Integrative Medicine Grand Rounds – Legacy

Invited Speaker: Evidence for Mushrooms in Cancer Treatment

Portland, OR
February 2011

Women's Health and Autoimmunity Conference

Invited Speaker: Autoimmunity: what goes wrong?

Portland, OR
October 2010

California Association of Naturopathic Doctors Conference

Invited Speaker: Cytokines and Autoimmunity

Los Angeles, CA
October 2010

Northwest Naturopathic Physicians Conference

Invited Speaker: Pediatric Development and Vaccination

Portland, OR
May 2010

Arizona Association of Naturopathic Doctors Conference

Invited Speaker: Immune Response to Vaccination

Phoenix, AZ
May 2010

Symposium for Portland Area Research in Complementary and Alternative Medicine (SPARC) Conference

Invited Speaker: Evidence Based Natural Medicine

Portland, OR
April 2010

North American Research in Complementary and Integrative Medicine Conference

Changing the Culture of CAM Institutions Toward and Evidence-Based Approach-One R25 at a Time
Collaborating Across Disciplines to Develop Joint Degree Programs in CAM and Integrative Medicine
Practice Based Research Networks: Meeting the Challenge of Reflecting CAM Clinical Practice
How Can CAM Research Better Reflect CAM Practice?

Minneapolis, MN
May 2009

Vaccine Balancing Act

Continuing Education Course for Naturopathic Physicians

Portland, OR
2005-2011

St. Olaf College The Relationships between International Traditional Medicine and Complementary and Alternative Medicine Current Research in Complementary and Alternative Medicine	Northfield, MN May 2009, 2010 May 2009, 2010
United Nations Meeting the Global Challenge of Cancer	New York, NY April 2007
American Association of Naturopathic Physicians Conference Research: Past, Present, and Future Five Measures of Personality and Relationship to Health Effects of Echinacea, Glycycerrhiza, and Astragalus on CD69 and CD25 Expression in Human Subjects: Pilot Study	August 2008 August 2006 August 2006
Symposium for Portland Area Research in Complementary And Alternative Medicine Conference Organizer Methodological Challenges in Reiki Research Workshop: Models for teaching Evidence Based Natural Medicine	Portland, OR 2006-2010 April 2006 April 2009
Transforming the Mind: Consciousness in Medicine Conference Organizer	Portland, OR March 2008
Portland State University Natural Medicine Research, MPH Program Mind Body Medicine, Parapsychology course (Guest Lecture)	Portland, OR May 2006 2006-2009
Oregon Health and Sciences University Psychoneuroimmunology (Biological Basis of Disease) Biological Basis of Disease (Case Study Group Leader) Naturopathic Research (CAM Lecture Series)	Portland, OR May 2004-2008 May 2004 May 2003
Evergreen State College Invited Speaker: Psychoneuroimmunology Invited Speaker: Immunology and Virology	Olympia, WA April 2003-2008 October 2002, May 2005
Oregon College of Oriental Medicine Immunology of Vaccines Research Methodology in Natural Medicine	Portland, OR June 2004 February 2007
Keystone Symposium Workshop on Dendritic Cells	Keystone, CO March 2003 February 2007, 2008
Pontificia Universidade Catolica Do Rio Grange Do Sol Immunotherapy with Dendritic Cells (Course) Presentation of Self Antigens by Dendritic Cells (Lecture)	Porto Alegre, RS, Brazil July 2002 July 2002
Instituto Nacional de Cancer Immunology of Dendritic Cell Antigen Presentation (Lecture)	Rio de Janeiro, RJ, Brazil July 2002
Yale University Multiple Sclerosis Short Course Histology Course Co-Instructor	New Haven, CT February 2002 Sept. 2000-Apr. 2001

Keystone Symposium
Cell Biology of Self Antigen Presentation

Taos, NM
March 2001

University of Colorado Health Sciences Center
Immunology Graduate Program Enrichment Course
Curriculum Planning Committee for Molecular
and Cellular Graduate Course
High School Outreach Immunology Program

Denver, CO
Sept. 1996-June 1998
Nov. 1997-June 1998
Dec. 1995-Dec. 1998

AWARDS and RECOGNITION

Leadership Award, National College of Natural Medicine	2003
Leadership Award, National College of Natural Medicine	2004
Inspiration Award, National College of Natural Medicine	2007
Lifetime Achievement Award, National College of Natural Medicine	2009
Excellence in Research Award, National College of Natural Medicine	2009
Metamorphosis Award, National College of Natural Medicine	2010

PROFESSIONAL AFFILIATIONS

American Association of Immunology
American Association for the Advancement of Science
National Vaccine Safety Committee Writing Group
New York Academy of Science
Institutional Review Board of Oregon College of Oriental Medicine
Institutional Review Board of National College of Natural Medicine
Editorial Board, International Journal of Naturopathic Medicine
Editorial Board, Journal of Alternative and Complementary Medicine
International Society for Complementary Medicine Research
Academic Consortium for Complementary and Alternative Health Care (ACCAHC)
Research Working Group (RWG) Co-Chair
Natural Doctors International Board of Directors
Peer Reviewer, National Institutes of Health; Center for Complementary and Alternative Medicine

PEER REVIEWED PUBLICATIONS

1. Allen, Elizabeth S., Erin N. Connelly, Cynthia D. Morris, Patricia J. Elmer, Heather Zwickey. A Train the Trainer Model for Integrating Evidence-Based Medicine into a Complementary and Alternative Medicine Training Program. *Explore (NY)*. 2011 Mar-Apr;7(2):88-93.
2. Wahbeh H, Zwickey H, Oken B. One method for objective adherence measurement in mind-body medicine. *J Altern Complement Med*. 2011 Feb;17(2):175-7. Epub 2011 Jan 31.
3. Darnall B., Zwickey H., M.Aickin. A pilot study of inflammatory responses following a negative imaginal focus: Analysis by gender. *Gender Med*. 2010 Jun;7(3):247-60.
4. Connelly, E. N., Elmer, P. J., Morris, C. D., H. Zwickey. The Vanguard Faculty Program: Research Training for Complementary and Alternative Medicine Faculty. *Journal of Alternative and Complementary Medicine*. 2010 Oct;16(10):1117-23.
5. Hodsdon, W., H. Zwickey. Reproducibility and Reliability of Two Food Allergy Testing Methods. *Natural Medicine Journal*. March 2010; 2(3): 8-13.

6. Wahbeh, H., Haywood, A., Kaufman, K., Harling, N., and Zwickey, H. Mind Body Medicine and Immune System Outcomes: A Systematic Review. *The Open Complementary Medicine Journal*, 2009, 1, 25-34.
7. Swanick S., Windstar-Hamlin K, and H. Zwickey. An alternative treatment for cervical intraepithelial neoplasia II, III. *Integrative cancer therapies* 2009;8(2):164-7.
8. Mikolai, J., Erlandsen, A., Murison, A., Brown, K., Gregory, W., Raman-Caplan, P., and Zwickey, H. In vivo Effects of Ashwagandha (*Withania somnifera*) Extract on the Activation of Lymphocytes. *J Altern Complement Med.* 2009 Apr;15(4):423-30.
9. Tippens, K., Marsman, K., and Zwickey, H. Is Prayer CAM? *J Altern Complement Med.* 2009 Apr;15(4):435-8.
10. Tippens, K., B. Pine, E. Connelly, W. Gregory, and H. Zwickey. 2006. Effects of Soy Infant Formula on the Development of Adult Soy Allergies. *International Journal of Naturopathic Medicine.* 2009. 4(1): 12-17.
11. Chinnock, J.A., Zwickey, H., Connelly, E. and W. Gregory. Cortisol Patterns and DHEA Levels of Patients with Obesity, Prediabetes, and Type 2 Diabetes: A Chart Review in a Naturopathic Primary Care Clinic. *International Journal of Naturopathic Medicine.* 2009 4(1): 05-11.
12. Buenafe, AC, Zwickey, H, Moses, N, Oken, B, and Jones, RE. A Telemetric Study of Physiologic Changes in Mice Induced with Autoimmune Encephalomyelitis. *Lab Animal.* 2008 Aug;37(8):361-8.
13. Jones RE, Moes N, Zwickey H, Cunningham CL, Gregory WL, Oken B. Treatment of experimental autoimmune encephalomyelitis with alpha lipoic acid and associative conditioning. *Brain Behav Immun.* 2008 May;22(4):538-43.
14. Zwickey H, Brush J, Iacullo CM, Connelly E, Gregory WL, Soumyanath A, Buresh R The effect of *Echinacea purpurea*, *Astragalus membranaceus*, and *Glycyrrhiza glabra* on CD25 expression in humans: a pilot study *Phytotherapy Research.* 27 Jul 2007.
15. Wahbeh H, Calabrese C, Zwickey H, Zajdel D. Binaural beat technology in humans: a pilot study to assess neuropsychologic, physiologic, and electroencephalographic effects. *J Altern Complement Med.* 2007 Mar;13(2):199-206.
16. Motta A, Schmitz C, Rodrigues L, Ribeiro F, Teixeira C, Detanico T, Bonan C, Zwickey H, Bonorino C. Mycobacterium tuberculosis heat-shock protein 70 impairs maturation of dendritic cells from bone marrow precursors, induces interleukin-10 production and inhibits T-cell proliferation in vitro. *Immunology.* 2007 Mar 7.
17. Elder C, Ritenbaugh C, Mist S, Aickin M, Schneider J, Zwickey H, Elmer P. Randomized trial of two mind-body interventions for weight-loss maintenance. *J Altern Complement Med.* 2007 Jan-Feb;13(1):67-78.
18. Wahbeh H, Calabrese C, Zwickey H. Binaural beat technology in humans: a pilot study to assess psychologic and physiologic effects. *J Altern Complement Med.* 2007 Jan-Feb;13(1):25-32.
19. Brush, J., E. Mendenhall, A. Guggenheim, T. Chan, E. Connelly, A. Soumyanath, R. Buresh, R. Barrett, and H. Zwickey. The effect of *Echinacea purpurea*, *Astragalus membranaceus*, and *Glycyrrhiza glabra* on CD69 expression and immune cell activation in humans. *Phytotherapy Research.* 2006 Aug;20(8):687-95
20. Zwickey, H.L., J. Unternaehrer, and I. Mellman. 2006. Presentation of self antigens on MHC class II molecules during dendritic cell maturation. *International Immunology.* 2006 Jan;18(1):199-209.

21. Shannon, A., K. Weizer, S.G. Chandler, and H. Zwickey. 2005. Reversal of end stage renal disease in multiple myeloma: a case report. *International Journal of Naturopathic Medicine*. 02/05.
22. Detanico, T., L. Rodrigues, A. C. Sabritto, M. Keisermann, M. Evandro Bauer, H. Zwickey, and C. Bonorino. 2004. Mycobacterial Heat Shock Protein 70 induces IL-10 production: immunomodulation of synovial cell cytokine profile and dendritic cell maturation. *Clinical Experimental Immunology*. 135, 336-342.
23. Zwickey, H.L., and T.A. Potter. 1999. Antigen from Noncytosolic *Listeria monocytogenes* is Processed in the Classical MHC Class I Processing Pathway. *Journal of Immunology* 162:6341-50.
24. Zwickey, H.L., and T. A. Potter. 1996. Peptide Epitopes from Noncytosolic *Listeria monocytogenes* Can Be Presented by Major Histocompatibility Complex Class I Molecules. *Infection and Immunity*. 64:1870-1872.

BOOK CHAPTERS, REVIEWS and ARTICLES

1. Assessment of the Immune System. Chapter in the Textbook of Natural Medicine. Editor: Pizzorno. Submitted Jan 2011.
2. Zwickey H, Schifke HC. Genetic correlates of Chinese medicine: in search of a common language. *J Altern Complement Med*. 2007 Mar;13(2):183-4.
3. Hammerschlag, R, and H. Zwickey. Evidence Based Medicine in CAM: Back to Basics. *Journal of Alternative and Complementary Medicine*. November 4, 2006. 12: 349-350.
4. Wahbeh, H., and H. Zwickey. 2006. Relax! Applying Mind-Body Medicine to Breast Cancer. *Naturopathic News and Reviews*. June 2006.
5. Wahbeh, H., and H. Zwickey. 2005. Naturopathic Physicians Know Best: Examining where people get their information on natural products. *NCNM News*.
6. Zwickey, H. 2005. Paradigm Shifts in Energy Medicine. *Holographic Repatterning Association Journal*. May 2005.
7. Zwickey, H.L. and I. S. Mellman. 2002. Presentation of Self Antigens by Dendritic Cells. *Brazilian Congress of Cell Biology Journal*.
8. Zwickey, H.L. and T.A. Potter. 1999. Lymphocytes; Precursor Frequency (Review). *Encyclopedia of Life Sciences*. Grove's Dictionaries Inc.
9. Zwickey, H.L. Graduate Students Reach-out to High School Students. 1997 Invited American Association of Immunology article.

FUNDED PROJECTS

Ongoing

2 R25AT002878-01A1

ZWICKEY (PI)

NCCAM

Research in Complementary and Alternative Medicine Program

To integrate principles of evidence based medicine into the curriculum of the naturopathic medicine and Chinese medicine programs at NCNM, and to further train faculty in research principles and design.

Role: Principal Investigator

Company funded projects

EMERITA 2011-present
 Organ Cotton vs Semi-Synthetic Rayon Blend Tampons
 To determine whether the material of a tampon influences cervico-vaginal inflammation.
 Role: Principal Investigator

Fairhaven 2011-present
 The Effects of Fertility-blend on Pregnancy and Hormones
 To determine whether an herbal compound increases pregnancy in women with infertility.
 Role: Principal Investigator

Michelle's Miracle 2011-present
 To provide a review of studies of tart cherries for pain, sleep, and muscle recovery. This study may lead into a clinical trial.
 Role: Principal Investigator

Terra Medica 2011-present
 To complete an observational study of darkfield microscopy in cardiovascular disease.

Mushroom Science 2011-present
 To provide a review article in the biochemistry of mushrooms.
 Role: Mentor

Gaia Herbs 2010-present
 Hibiscus Herbal Supplement for People with Metabolic Disease
 To determine if an herbal supplement can reduce blood glucose, triglycerides, and cholesterol in people with metabolic syndrome and obesity.
 Role: Principal Investigator

Completed in the last 5 years:

U19 AT002656-01, Oken (PI) 2004-present
 NCCAM
 CAMEO
Conditioning: Enhanced Treatment of EAE
 To test the placebo effect in an animal model of Experimental Autoimmune Encephalitis
 Role: Co-Project Leader; Investigator

1 R21AT002374-01A1 2005-2009
 ELMER (PI)
 NCCAM
RCT of the Naturopathic Anti-inflammatory Diet
 To determine if a dietary intervention can reduce systemic inflammation in individuals with Non-Insulin Dependent Diabetes Mellitus.
 Role: Investigator

American Pain Society Leaders Award 2006-2007
 DARNALL (PI)
Inflammatory Markers During Negative Cognition
 To determine whether catastrophizing influences cytokines involved in pain
 Role: Investigator

5R25 AT001173-02
 Keenan (PI)
 NCCAM 2005-2007

Oregon CAM Course

The Oregon Complementary and Alternative Medicine Course is a collaborative project between key educators from Oregon Health & Science University (OHSU), Oregon College of Oriental Medicine, Western States Chiropractic College and the National College of Naturopathic Medicine to launch a four year longitudinal CAM curriculum for medical students at OHSU.

Role: Principal Investigator of NCNM Subcontract

NORTHWEST NATURAL PRODUCTS 2010

Probiotics for Weight Loss

To determine whether different probiotic strains of bacteria have the ability to assist in weight loss or weight loss maintenance according to the medical literature.

Role: Principal Investigator

SPECIAL PROJECTS

Council of Academic and Administrative Affairs	February 2003- present
NCNM Admissions Faculty, Chair	September 2003-2008
Natural Doctors International, Board of Directors	October 2007-2010
Oregon College of Oriental Medicine, IRB Member	September 2004-present
National Vaccine Safety Writing Group	February 2009- present
Medicine on the Move Coordinator and Group Leader	September 2007
NCNM Student Outreach Faculty Advisor	June 2002-Present
Curriculum Committee	April 2002-February 2004
International Public Policy (HIV in Africa)	August 2001

RESEARCH STUDENT'S MENTORED (Incomplete)

Student	Years	Project	Final Degree
<u>National Jewish Medical and Research Center</u>			
Megan Roth	1994	DNA Vaccine for Chronic Fatigue Syndrome	BA2000
Kourtney Henry	1995-1996	DNA Vaccine for Hsp65 of <i>M. Tuberculosis</i>	BA2001
<u>Yale University School of Medicine</u>			
Samara Newman	1999-2001	The Effects of Oregon Grape Root on Dendritic Cell Maturation and Cytokine Secretion	BA2004

National College of Natural Medicine
Available upon request (200+ students—too many to list)

POSTDOCTORAL FELLOW'S MENTORED

Post Doc	Years	Project	Current
Julie Chinook, ND, MPH	2004-2005	Cortisol Patterns in NIDDM	Nurse, OHSU
Gene Bowman, ND	2005-2006	Achlorhydria and Memory	K23 NCCAM
Kim Tippens, ND, LAc	2004-present	Health Disparities and CAM	F32 NCCAM
Helané Wahbeh, ND	2004-2007	Biological Outcomes for PNI	K99 NCCAM
Ashley Haywood, ND, LAc	2007-2010	Gymnema sylvestra for PCOS	Faculty at NCNM
Jill Edwards, ND	2008-present	Strontium for Osteoporosis	Asst Professor, NCNM
Carolyn Iacullo, ND	2009-present	Vitamin A and T cell Regulation	Asst Professor, NCNM
Kurt Beil, ND, MPH	2010-present	Environmental Medicine	Post doctoral fellow