

**COLLEGE OF MEDICINE CURRICULUM VITAE**

**ZUHAIR K. BALLAS, M.D.**

**8-2-11**

**I. EDUCATIONAL AND PROFESSIONAL HISTORY**

**A. Higher Education**

<b><u>Year</u></b>	<b><u>Degree</u></b>	<b><u>Institution</u></b>
1970	B.S. (With Distinction)	American University of Beirut, Lebanon
1974	M.D. (With Distinction)	American University of Beirut, Lebanon

**Postgraduate Medical Education**

<b><u>Year</u></b>	<b><u>Degree</u></b>	<b><u>Institution</u></b>
1973-74	Intern	American University of Beirut
1974-75	1 <sup>st</sup> Year Resident	Rutgers Medical School, New Jersey
1975-76	2 <sup>nd</sup> Year Resident	Thomas Jefferson University, Philadelphia
1976-78	Fellow (Allergy)	Johns Hopkins University, Baltimore
1978-80	Associate, Senior Fellow	Fred Hutchinson Cancer Research Center, Univ of Washington, Seattle

**Certification**

<b><u>Board</u></b>	<b><u>Number</u></b>	<b><u>Date</u></b>	<b><u>Recertification</u></b>
Internal Medicine	53676	6/22/77	
Board of Allergy and Clinical Immunology	2060	10/21/81	
Diagnostic Laboratory Immunology	0071	10/7/88	

**Licensure**

<b><u>State</u></b>	<b><u>Date</u></b>	<b><u>Perm./Temp.</u></b>	<b><u>Number</u></b>	<b><u>Renewal Date</u></b>
ECFMG	1974	Permanent	201-47-3	
New York	1975	Permanent	125782	Exp. 12/31/80
Maryland	1976	Permanent	D-19720	Exp 09/30/82
District of Columbia	1976	Permanent	9609	Exp. 12/31/80
Washington	1978	Permanent	16631	Exp 10/14/81
Iowa	1980	Permanent	22111	10/01/2012

**I. EDUCATIONAL AND PROFESSIONAL HISTORY**

Registration

<u>State</u>	<u>Perm./Temp.</u>	<u>Number</u>	<u>Expiration Date</u>
IA-Iowa State Controlled Substance	Permanent	Confident	7/31/11
Federal DEA	Permanent	Confident	7/31/12

**B. Professional and Academic Positions**

1. Academic

<u>Year</u>	<u>Position</u>	<u>Institution</u>
1980- present	Staff Physician, Chief Allergy Division	Veterans Administration Medical Center, Iowa City, Iowa
1980-86	Assistant Professor	Department of Internal Medicine, University of Iowa College of Medicine, Iowa City, Iowa
1986-93	Associate Professor	Department of Internal Medicine, University of Iowa College of Medicine, Iowa City, Iowa
1993- present	Professor	Department of Internal Medicine, University of Iowa College of Medicine, Iowa City, Iowa

2. Administrative

<u>Year</u>	<u>Position</u>	<u>Institution</u>
1991-present	Director, Flow cytometry Facility	University of Iowa, Iowa City, Iowa
1991-present	Director, Primary Immunodeficiency Clinic	University of Iowa Hospitals & Clinics, Iowa City, Iowa
1991-present	Director, Cellular Immunology Diagnostic Laboratory	University of Iowa & VA Medical Center, Iowa City, Iowa
1992-present	Director, Clinical Laboratory Immunology Training Program	University of Iowa Hospitals & Clinics, Iowa City, Iowa
1992-present	Member, Graduate Immunology Program	University of Iowa College of Medicine, Iowa City, Iowa
1994-present	Member-Holden Cancer Center	University of Iowa, Iowa City
1996-2004	Director, Allergy-	University of Iowa College of

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**I. EDUCATIONAL AND PROFESSIONAL HISTORY**

5/96-2/97	Immunology Training program Interim Director-Division of Allergy-Immunology	Medicine, Department of Internal Medicine, Iowa City University of Iowa College of Medicine, Department of Internal Medicine, Iowa City, Iowa
2/97-3/10	Director- Division of Allergy-Immunology	University of Iowa College of Medicine, Department of Internal Medicine, Iowa City, Iowa
10/07-present	Program Leader, Cancer Immunology & Immunotherapy Program	Holden Comprehensive Cancer Center, University of Iowa
4/2010-present	Director - Division of Immunology (Allergy / Immunology / Rheumatology)	University of Iowa College of Medicine, Department of Internal Medicine, Iowa City, Iowa

**C. Honors and Awards**

<u>Year</u>	<u>Honor</u>
1972	Alpha Omega Alpha
1981-84	Research Associate Career Award, Veterans Administration
1984-87	Clinical Investigator Career Award, Veterans Administration

**II. TEACHING**

**A. Teaching Assignments**

Classroom, Seminar, Teaching Laboratory

<u>Year</u>	<u>Course Title</u>	<u>(Wks/Year)</u>	<u>(Hrs/Wk)</u>
1982-90	Laboratory Course in Cellular Immunology	2	2
1987-99	Introduction to Clinical Medicine, Allergy/Immunology	1	3
1990	Advanced Topics in Immunology	1	3
1992-97	Clinical Pharmacology & Therapeutics, Lecture Series	1	1
1992	Advanced Cellular Immunology	1	2
1994	Advanced Immunology (61:167)	4	1.5
1994-95	Immunology I (148:201)	3	1.5
1995- present	Immunology II	3	1.5
1996-01	Immunology Case Studies, 1 <sup>st</sup> yr medical students	6	1
1997-98	Colposcopy Series, OB/Gyn	1	1
1998- present	Core Curriculum in Otolaryngology “Basics of Allergy & Immunology”	1	2
1999	Family Practice Series	1	1
2000-03	Foundations of Clinical Practice IV	1	1
2000-01	Ambulatory Block Curriculum-Int Med Residents	3	1
1/25/02 & 4/12/02	Immunology small groups: Medical Immunology course, 1 <sup>st</sup> year med students	2	1
4/16/07 & 4/18/07	Pathogenesis of Major Human Diseases 69:270	1	2
4/12/10 & 4/14/10	Pathogenesis of Major Human Diseases 69:270	1	2

Clinical Teaching (in ward, clinic, or operating room)

<u>Year</u>	<u>Where Teaching Occurred</u>	<u>Wks/Yr</u>	<u>Hrs/Wk</u>
1976-78	Housestaff Lecture Series in Allergy	20	2 hours
1980-88	Housestaff Lecture Series in Allergy	12	1 hour
1984	Physical Diagnosis Course	7	5 hours
1987-present	UIHC, Allergy Consult Service	50	5
1987-95	VA General Medicine Service	12	40 hrs
1987-present	UIHC Allergy Clinic	50	6
1989-present	UIHC, Primary Immunodef Clinic	50	6
1990-present	Intravenous Immunoglobulin Replacement Service	50	4

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**II. TEACHING (Cont.)**

1995-96	UIHC General Medicine Service, 5BT-1 GH	4	40 hrs
1997-98	UIHC General Medicine Service, 6RCE-1 GH	2	40 hrs
1999-2000	UIHC Gen Medicine Service 6RCE-1 GH	2	40 hrs

**B. Graduate student supervision and committees.**

- Member, Ph.D. Thesis Committee for Jeff Kennedy, Department of Microbiology, University of Iowa College of Medicine
- Member, Ph.D. Thesis Committee for Laura Stunz, Department of Microbiology, University of Iowa College of Medicine
- Member, Ph.D. Thesis Committee for David Ernst, Department of Microbiology, University of Iowa College of Medicine
- Member, Ph.D. Thesis Committee for Debra Burg, Department of Microbiology, University of Iowa College of Medicine
- Member, Ph.D. Thesis Committee for Henry Hunt, Department of Microbiology, University of Iowa College of Medicine
- Member, Ph.D. Thesis Committee for Thomas Jung, Department of Pathology, University of Iowa College of Medicine
- Member, Ph.D. Thesis Committee for Nynette Fandrell, Department of Microbiology, University of Iowa
- Gailen Marshall, M.D., Ph.D. (Post-doctorate), Department of Internal Medicine, University of Iowa, 1985-86
- James M. Turner, M.D. (Post-doctorate), Department of Internal Medicine, University of Iowa, 1986-88
- Robert A. Thompson, M.D. (Post-doctorate), Department of Internal Medicine, University of Iowa, 1987-90
- Julie Hutson, M.D. (Post-doctorate), Department of Internal Medicine, University of Iowa, 1991-92
- Brian Masterson, M.D. (Post-doctorate), Department of Internal Medicine, University of Iowa, 1992-93
- Member, Ph.D. Thesis Committee of Zoya Kurago, Department of Microbiology, University of Iowa, 1992-95
- Member, Master's Thesis Committee, Feng Li, Department of Pathology, 1994-1996. "Natural Killer Cell Modulation by Ethanol in vitro and in the Alcoholic Human" (Mentor: Robert Cook). **M.A. conferred 6-10-96.**
- Member, Ph.D. Thesis Committee of Shi Yan, Immunology Graduate Program, 1994-1997. "Characterization of an Epstein-Barr Virus-Specific CD8 T Cell Response", **Ph.D. conferred 12-19-97**
- Member, Master's Thesis Committee, Xiang Li, Department of Pathology, 1995-1997. "Regulation of LY-6C Expression on BNT Lymphocytes". **M.A. conferred 12-8-97.**
- Member, Ph.D. Thesis Committee, Lichao Zhao, Immunology Graduate Program, 1998-2000. "Regulation of Leukocyte Adhesion by an ADAMs Family Membrane Protease". Defense: April 17, 2000. **Ph.D. conferred 5-13-00.**
- Member, Master's Thesis Committee, Michael Shey, Department of Microbiology, 1998-2000. "Regulation of T Cell Adhesion Molecules". (Advisor: Morris Dailey, M.D., Ph.D.). Fall of 2000. **M.S. conferred 12-00.**
- Member, Master's Thesis Committee, Mikel B. Moore, Department of Pathology 1997-2001. "Receptors Regulating Natural Killer Cell Effector Functions".

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**II. TEACHING (Cont.)**

(Advisor: Charles Lutz, Ph.D). Defense: December 21, 2000. **M.S. conferred 5-01.**

Member, Master's Thesis Committee, Kristen Ness, Department of Pathology 2003-2006. "Chronic Ethanol Consumption Alters Dendritic Cell Migration". (Advisor: Annette Schleuter).

Immunology Graduate Program Comprehensive Exam Committee, 2002-2005

Member, Dissertation Committee, Claire Buchta, Department of Biosciences, (2008); Immunology (June, 2009- ), "Cellular Vaccines Against Cancer and Infectious Organisms". (Advisor: Gail Bishop)

**C. Other teaching contributions**

Institutional Conferences, Grand Rounds, Journal Clubs, Etc.

1976-present Allergy Journal Club  
1980-present Allergy Grand Rounds  
1981 Medicine Grand Rounds  
1981 Advanced Training Course, Program of Epidemiology, University of Iowa  
1982 Psychiatry Grand Rounds  
1983 Dermatology Basic Science Series  
1984 Seminars in Immunology  
1984-90 Lymphokine Journal Club  
1985 Medicine Grand Rounds  
9/9/86 UIHC: Local Chair - "Interferon Video Conference"  
2/10/87 General Medicine Conference "Recent Advances in IL2 and Cancer Therapy"  
10/6/87 UIHC: Immunology Group Seminar, "Lymphokine-Activated Killers: In Search of a Biological Role"  
12/10/87 UIHC: Internal Medicine Research Conference "LAK:A Possible Role in Thymic Maturation"  
5/21/88 UIHC: Surgery Grand Rounds, "New Modalities in Tumor Immunotherapy"  
5/28/88 UIHC: Immunopathology Conference "IL2/LAK Cell Update"  
10/6/88 UIHC: General Medicine Conference "Functional NK Deficiency"  
2/23/89 UIHC: Immunopathology Conference, Mo-1 Deficiency"  
4/15/89 Transplantation Course, "Role of Killer Cells in Graft and Tumor Rejection"  
6/29/89 UIHC: Internal Medicine Grand Rounds "Does a Positive Delayed Hypersensitivity Skin Test R/O Cellular Immune Deficiency?"  
12/5/89 UIHC: Immunology Research Seminar: "Lymphokine-Activated Killers: Effector Subsets"  
1/20/90 UIHC: Neurosurgery Grand Rounds: "Tumor Immunology"  
1991 UIHC: Core Curriculum Course in Allergy/Immunology

**II. TEACHING (Cont.)**

- 1/9/92 UIHC: Immunopathology Conference, "Workup of Cellular Immunodeficiency"
- 3/3/92 UIHC: Immunology Research Seminar, "Thymic NK Cells: An Oxymoron or a Distinct Lineage"
- 1/12/93 Immunology Research Seminar, "IL4 vs. IL2-induced LAK"
- 6/10/93 Immunopathology Conference "IgG Subclass Deficiency"
- 9/8/93 UIHC: Core Curriculum Lecture Series in Allergy/Immunology "Cellular Immunology"
- 9/22/93 UIHC: Core Curriculum Lecture Series in Allergy/Immunology "Immunodeficiency"
- 11/11/93 UIHC: Immunopathology Conference "Autoimmunity and Immunodeficiency"
- 12/17/93 UIHC: Pediatric Grand Rounds "Primary Immunodeficiency"
- 3/24/94 UIHC: Cystic Fibrosis Group, "Tentative Immunologic Steps in Cystic Fibrosis"
- 6/23/94 UIHC: Immunopathology Conference, "Natural Killer Cell Disease"
- 4/19/95 General Medicine Conference "Primary Immunodeficiency"
- 10/14/95 Department of Dermatology "Immunodeficiency Disorders"
- 10/31/95 Department of Internal Medicine Research Conference "Natural Born Killers: Ontogeny of Thymic NK Cells"
- 2/8/96 UIHC: Grand Rounds, Department of Internal Medicine "Common Variable Immunodeficiency"
- 2/27/96 UIHC: Colposcopy/Cytology Conference "Immunology of Papilloma Virus", Department of OB/Gyn
- 1997-98 Internal Medicine Board Review Course, Allergy-Immunology
- 3/6/98 UIHC: CPC Conference, Int Med Expert Consultant
- 4/21/98 UIHC: Cytology Conference, Dept of OB/Gyn, "Immunology of HPV"
- 10/98 Resident's Talk, Internal Medicine: "Drug Reactions"
- 12/12/98 UIHC: Core Conference Series, Internal Medicine "Immunodeficiency"
- 2/10/99 UIHC: Core Conference Series: Internal Medicine: "Immunodeficiency Syndromes"
- 4/14/99 Mercy Hospital, Iowa City: Family Practice Seminar, "Primary and Secondary Immunodeficiencies"
- 11/4/99 UIHC: Pediatric Genetics Conference, "Genetic Immunodeficiencies", Dept Pediatrics
- 7/5/00 UIHC: Core Curriculum Lecture Series, Allergy-Immunology, "ACGME Requirements for Fellowship Program and Teaching Structure"
- 8/2/00 UIHC: Core Curriculum Lecture Series, Allergy-Immunology, "Overview of Drug Reactions"

**II. TEACHING (Cont.)**

8/23/00	UIHC: Core Curriculum Lecture Series, Allergy-Immunology, "Immunodeficiency: Clinical Vignettes"
8/00	UIHC: Otolaryngology Basic Science Course, "Overview of Allergy and Immunology"
9/20/00	UIHC: Core Curriculum Lecture Series, Allergy-Immunology, "How to Prepare for Journal Club"
2/26/01	UIHC: Renal Research Conference, "Induction of NK Cell Activity, in vivo and in vitro, by CpG Oligodeoxynucleotides"
4/2/01	UIHC: Immunopathology Didactic lecture: "Laboratory Evaluation of Cellular Immunity"
4/18/01	UIHC: Allergy-Immunology Grand Rds, "Evaluation of Cellular Immunity"
7/6/01	UIHC: Basic Science Course-Dept Otolaryngology, "Basics of Allergy and Immunology (Rhinology)"
9/13/01	UIHC: Residents' Ambulatory Block, "Immunomodulation: Case Studies"
9/19/01	UIHC: Core Curriculum Lecture Series, Allergy-Immunology, "Evaluation of Cellular Immunology"
9/26/01	UIHC: Core Curriculum Lecture Series, Allergy-Immunology, "Immunodeficiency: Clinical Vignettes"
11/14/01	UIHC: Core Curriculum Lecture Series, Allergy-Immunology, "Overview of Drug Reactions"
3/21/02	UIHC: Applied Immunology lecture, "Diagnostic Immunology"
3/27/02	UIHC: Immunopathology Didactic lectures: "Evaluation of Cellular Immunity"
7/10/02	c "ACGME Guidelines"
7/17/02	UIHC: Allergy-Immunology Grand Rds, "ACGME Core Competencies"
7/19/02	UIHC: Basic Science Course-Dept Otolaryngology, "Basics of Allergy and Immunology (Rhinology)"
8/5/02	UIHC: Internal Medicine Grand Rounds, "Idiopathic Capillary Leak Syndrome"
2/12/03	UIHC: Immunology Group Seminar, "CpG, NK and DC"
3/28/03	UIHC: FCP IV course: "Primary Immunodeficiency"
7/23/03	UIHC: Allergy-Immunology Grand Rounds, "ACGME Guidelines"
8/27/03	UIHC: Allergy-Immunology Grand Rounds, "Immune Deficiency Workup"
4/28/04	UIHC: Immunopathology didactic lectures: "Congenital Immunodeficiency Disease"
5/3/04	UIHC: Pathogenesis of Major Human Diseases (grad student course): "Asthma Pathogenesis"



**II. TEACHING (Cont.)**

5/5/04	UIHC: Pathogenesis of Major Human Diseases (grad student course): “Asthma Pathogenesis”
5/10/04	UIHC: FCP IV course: “Primary Immunodeficiency”
7/28/04	UIHC: Allergy-Immunology Grand Rounds, “Diagnostic Immunology”
2/17/05	UIHC: Applied Immunology Conference (Fellows), “Diagnostic Immunology”
5/05	UIHC: FCP IV course: “Primary Immunodeficiency”
2/9/06	UIHC: Dermatology Grand Rounds: “Intravenous Immunoglobulin: Everything You Wanted to Know but...”
2/15/06	UIHC: CpG Club: “CpG, NK and Tumor: Soliciting Help to Make Sense of it All”
9/22/06	UIHC: Neurology Grand Rds: “Intravenous Immunoglobulins (IVIG). Everything you wanted to know but.....”
12/7/06	VA: Grand Rounds: “When Should You Suspect Immunodeficiency?”
1/10/07	UIHC: CpG Club: “CpG Activation of NK and T Cells: Mixing and Matching”
3/7/07	UIHC: Immunopathology Didactic Lecture: “Primary Immune Deficiency”
3/15/07	UIHC: Applied Immunology Conference (Fellows): “Diagnostic Immunology”
4/16/07 & 4/18/07	UIHC: Graduate Course in Asthma Pathogenesis: “Asthma Pathogenesis I & II”
9/20/07	UIHC: Dermatology Grand Rds: “Immunomodulation Beyond IVIG”
9/24/08	UIHC: Immunology Group Seminar: “CpG, NK Cells and Tumors”
11/21/08	UIHC: Rheumatology Fellows Conference: “IVIG for Dummies”
12/17/08	UIHC: Allergy-Immunology Grand Rounds: “Bugs and Immunity”
3/26/09	UIHC: Internal Medicine Fellows Interdisciplinary Conference. “Diagnostic Immunology”
4/13/09 & 4/15/09	UIHC: Graduate Course in Asthma Pathogenesis: “Asthma Pathogenesis I & II”
3/17/10	UIHC: Immunopathology lecture: “Immunodeficiency”
4/12/10 & 4/14/10	UIHC: Graduate Course in Asthma Pathogenesis: “Asthma Pathogenesis I & II”
3/9/11	UIHC: Immunopathology lecture: Primary Immunodeficiency: “A Flow-Based Approach”
4/11/11	UIHC: Graduate Course in Asthma Pathogenesis: “Asthma Pathogenesis I & II”
4/13/11	UIHC: Graduate Course in Asthma Pathogenesis: “Asthma Pathogenesis I & II”

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**II. TEACHING (Cont.)**

4/19/11 UIHC: Orthopaedic's M&M Conference: "Synovial Crystal Lab Protocol"

Teaching Committees:

Medical Student Counseling:

National Education Related Presentations:

Formal Study to Improve Teaching Abilities:

3/21/04 Hank Slotnik, Ph.D., Moderator, American Academy of Allergy, Asthma & Immunology, San Francisco

Current Research Concerning Teaching:

Local and Regional CME Talks (since 1993 only)

2/4/93 Invited Speaker: "Primary Immunodeficiency." Immune Disorder Support Group, Iowa City, Iowa, February 4, 1993

10/23/93 UIHC: "Intravenous Immunoglobulins: "Mechanisms of Action" in CME Course "Update on Polyneuropathy", Department of Neurology.

11/13/93 Invited Speaker: "The Role of the Immune System in Vestibulitis." The Vestibulitis Support Group, Iowa City, Iowa.

9/30/94 UIHC: "Immunology for Chest Physicians: Why Immunocompromised Hosts are Susceptible to Infections", Current Topics in Allergy & Clinical Immunology", Dept of Internal Medicine.

1997-2000 Director of annual CME course: Current Topics in Allergy and Clinical Immunology

10/15/99 UIHC: "Immunological Abnormalities in Chronic Sinusitis". In

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**II. TEACHING (Cont.)**

- CME Course "Current Topics in Allergy & Clinical Immunology", Department of Internal Medicine.
- 4/14/00 Iowa Medical Society annual meeting: "Workup of the Patient with Recurrent Infections", Des Moines, IA
- 10/18/01 Nebraska Allergy Society. "Immunology of Refractory Sinusitis", Omaha, NE
- 10/19/01 St. Joseph Hospital, "Evaluation of Patients with Recurring Respiratory Infection", Omaha, NE
- 10/18/02 UIHC: Program Co-Director and Moderator for CME Course "Current Topics in Allergy & Clinical Immunology", Department of Internal Medicine
- 10/24/03 UIHC: Program Co-Director and Moderator for CME Course "Current Topics in Allergy & Clinical Immunology", Department of Internal Medicine. "Allergy-Immunology: The Year-in-Review"
- 6/19/04-6/20/04 Visiting Professor: Asthma & Allergy Society of Virginia 24<sup>th</sup> annual mtg.: Breakfast Seminar: "Evaluation of the Patient with Recurrent Infections" (6/19); Morning General Session: "Common Variable Immune Deficiency and Chronic Sinusitis" (6/20); & Breakfast Seminar: "Evaluation of the Patient with Recurrent Infections" (6/20), Virginia Beach, VA
- 9/30/04 UIHC: Progress in Internal Medicine conference, "Allergy-Immunology Update: The Year in Review"
- 10/1/04 UIHC: Progress in Internal Medicine conference, "IVIG: Uses and Abuses", "Anti-IgE: Allergy Therapy for the 21<sup>st</sup> Century?"
- 10/1/04 UIHC: Progress in Internal Medicine workshop, "Evaluation & Management of Patients with Recurrent Infections"
- 10/8/04 UIHC: Program Co-Director and Moderator for CME Course, Current Topics in Allergy and Clinical Immunology, Dept Internal Medicine, "Year-in-Review".
- 5/20/05 Iowa Rheumatology Symposium, "Intravenous Immunoglobulin: An Update", Holiday Inn, Coralville
- 10/28/05 UIHC: Program Co-Director and Moderator for CME Course, Current Topics in Allergy and Clinical Immunology, Dept Internal Medicine.
- 10/17/08 UIHC: Moderator for CME Course, Current Topics in Allergy and Clinical Immunology, Dept Internal Medicine.
- 9/25/09 UIHC: Moderator for CME Course, Current Topics in Allergy and Clinical Immunology, "Skin Disorders", Dept Internal Medicine
- 10/8/10 UIHC: Moderator for CME Course, Current Topics in Allergy and Clinical Immunology, "Eosinophilic Disorders", Dept Internal Medicine

### III. SCHOLARSHIP

#### A. Publications or Creative Works

Peer-reviewed.

1. Ballas, Z.K., and Uthman, S.M.: Amebic Liver Abscess in Lebanon; A Report of 37 Cases and a Review of the Literature. *Am. J. Proctol.*, 24:228-236, 1973.
2. Salem, A.A., and Ballas, Z.K.: Inflammatory Bowel Disease: 10 Year Experience at the Hospital of the American University of Beirut. *Am. J. Proctol.*, 24:209-213, 1973.
3. Green, W.R., Ballas, Z.K., and Henney, C.S.: Studies on Lymphocyte-Mediated Cytolysis. XI. The Role of Lectin in Lectin-Dependent Cell Mediated Cytotoxicity. *J. Immunol.*, 121:1566-1572, 1978.
4. Ballas, Z.K., and Henney, C.S.: Generation of H-2 Restricted Cytotoxic T-Cells by Trinitrophenylated Proteins *In Vitro*: Specificity and Requirements. *J. Immunol.*, 123:1696-1704, 1979.
5. Ballas, Z.K., and Kuppers, R.C.: Naturally Occurring Antibodies Directed to TNBS-Modified Cell Surface But Not the Trinitrophenol Moiety. *J. Immunol.*, 125:1644-1649, 1980.
6. Ballas, Z.K., Green, W.R., and Henney, C.S.: Studies on the Mechanism of T Cell-Mediated Lysis. XIII. Lectin-Dependent Cell-Mediated Cytotoxicity is Supported by Con A-Coupled Sepharose Beads. *Cell. Immunol.*, 59:411-418, 1981.
7. Kuppers, R.C., Ballas, Z.K., Green, W.R., and Henney, C.S.: Quantitative Appraisal of H-2 Products in T Cell Mediated Lysis by Allogeneic and Syngeneic Effector Cells. *J. Immunol.*, 127:500-504, 1981.
8. Ballas, Z.K.: Limitations of Recognition of Modified-Self by Alloantigen-Activated Cytotoxic T Lymphocytes. *J. Immunol.*, 127:1589-1591, 1981.
9. Ballas, Z.K., and Donta, S.T.: Sulindac-Induced Aseptic Meningitis. *Arch. Int. Med.*, 142:165-166, 1982.
10. Weiler, J.M., Ballas, Z.K., Feldbush, T.L., and Needleman, B.W.: Inhibition of Human Lymphocytes Blastogenesis by C3: The Role of Serum in the Tissue Culture Medium. *Immunology*, 45:247-252, 1982.
11. Weiler, J.M., Ballas, Z.K., Needleman, B.W., Hobbs, M.V., and Feldbush, T.L.: Complement Fragments Suppress Lymphocyte Immune Responses. *Immunol. Today*, 3:238-243, 1982.
12. Ballas, Z.K., and Ahmann, G.B.: Generation of Cytotoxic T Lymphocytes Against Modified Self in the Absence of Antigen by Interleukin 2-Containing Preparations. *Cell. Immunol.*, 76:81-93, 1983.

**III. SCHOLARSHIP (Cont.)**

13. Ballas, Z.K., Feldbush, T.L., Needleman, B.W., and Weiler, J.M.: Complement Inhibits Immune Responses: C3 Preparations Inhibit the Generation of Human Cytotoxic T Lymphocytes. *Eur. J. Immunol.*, 13:279-284, 1983
14. Ballas, Z.K., and Schulte, W.E.: Differential Effect of Cyclosporin A on the Generation of Allogeneic vs. Syngeneic Cytotoxic T Lymphocytes. *Transpl. Proc.*, 15(Supp. 1):2323-2327, 1983.
15. Feldbush, T.L., Hobbs, M.V., Severson, C.D., Ballas, Z.K., and Weiler, J.M.: Role of Complement in the Immune Response. *Fed. Proc.*, 43:2548-2552, 1984.
16. Ballas, Z.K.: The Use of 5 Azacitidine to Establish Constitutive Interleukin 2-Producing Clones of the EL4 Thymoma. *J. Immunol.*, 133:7-10, 1984.
17. Weiler, J.M., Freiman, P., Sharath, M.D., Metzger, W.J., Smith, J.M., Richerson, H.B., Ballas, Z.K., Halverson, P.C., Shulan, D.J., Matsuo, S., and Wilson, R.L.: Serious Adverse Reactions to Protamine: Are Alternatives Needed? *J. Allergy Clin. Immunol.*, 75:297-303, 1985.
18. Feldbush, T.L., and Ballas, Z.K.: Lymphokine-Like Activity of 8-Mercaptoguanosine: Induction of T & B Cell Differentiation. *J. Immunol.*, 134:3204-3211, 1985.
19. Ballas, Z.K.: Cryopreservation of CTLL, A Murine IL2-Dependent Cell Line. *Immunol. Today* (letter), 6:145, 1985.
20. Shanley, J., and Ballas, Z.K.: Alteration of Bronchoalveolar Cells During Murine Cytomegalovirus Interstitial Pneumonitis. *Am. Rev. Respir. Dis.*, 132:77-81, 1985.
21. Goeken, N.E., Ballas, Z.K., and Staggs, T.S.: Alteration of Human Accessory Cell Function by Heat Treatment: Role of IL1 and Class II MHC Antigens. *Human Immunol.*, 16:234-246, 1986.
22. Reyes, V.E., Ballas, Z.K., Singh, H., and Klimpel, G.R.: Interleukin-2 Induces Interferon  $\alpha/\beta$  Production in Mouse Bone Marrow Cells. *Cell. Immunol.*, 102:374-385, 1986.
23. Ballas, Z.K.: Lymphokine-Activated Killer Cells (LAK). I. Differential Recovery of LAK, Natural Killer Cells and Cytotoxic T Lymphocytes after a Sublethal Dose of Cyclophosphamide. *J. Immunol.*, 137:2380-2384, 1986.
24. Ballas, Z.K., Rasmussen, W., and Van Otegham, J.K.: Lymphokine-Activated Killer Cells (LAK): II. Delineation of Distinct Murine LAK-Precursor Subpopulations. *J. Immunol.*, 138:1647, 1987.

III. SCHOLARSHIP (Cont.)

25. Kemp, J.D., Thorson, J.A., McAlmont, T.H., Horowitz, M., Cowdery, J.S., and Ballas, Z.K.: Role of the Transferrin Receptor in Lymphocyte Growth. A Rat IgG Monoclonal Antibody Against the Murine Transferrin Receptor Produces Highly Selective Inhibition of T and B Cell Activation Protocols. *J. Immunol.*, 138:2422-2426, 1987.
26. Naldini, A., Fleischmann, W.R., Jr., Ballas, Z.K., Klimpel, K.D., and Klimpel, G.R.: IL-2 Inhibits *In Vitro* Granulocyte-macrophage Colony Formation (GM-CFC). *J. Immunol.*, 139:1880-1884, 1987.
27. Ballas, Z.K., and Rasmussen, W.: Lymphokine-Activated Killer (LAK) Cells. III. Characterization of LAK Precursors and Susceptible Target Cells Within the Murine Thymus. *J. Immunology*, 139:3542-3549, 1987.
28. Cowdery, J.S., Kemp, J.D., Ballas, Z.K., and Weber, S.P.: Interleukin-1 Induces T Cell Mediated Differentiation of Murine Peyer's Patch B Cells to IgA Secretion. *J. Regional Immunol.*, 1:9-14, 1988.
29. Goeken, N.E., Staggs, T., and Ballas, Z.K.: Monocyte Suppressor Factor Plasminogen Activator Inhibitor Inhibition of Membrane Bound But Not Soluble IL-1. *J. Immunol.*, 143:603-608, 1989.
30. Kemp, J.D., Thorson, J.A., Gomez, F., Smith, K.M., Cowdery, J.S., and Ballas, Z.K.: Inhibition of Lymphocyte Activation with Anti-Transferrin Receptor Mabs: A Comparison of Three Reagents and Further Studies of Their Range of Effects and Mechanism of Action. *Cell. Immunol.*, 122:218-230, 1989.
31. Meltzer, E.O., Orgel, H.A., Bush, R.K., Haltom, J.R., Metzger, W.J., Moss, B.A., Mitchell, D.Q., Ballas, Z.K., Seltzer, J.M., Shapiro, G.G., and Van Bavel, J.H.: Evaluation of Symptom Relief, Nasal Airflow, Nasal Cytology, and Acceptability of Two Formulations of Flunisolide Nasal Spray in Patients with Perennial Allergic Rhinitis. *Ann. Allergy*, 64:536-540, 1990.
32. Ballas, Z.K., and Rasmussen, W.: Lymphokine-Activated Killer (LAK) Cells. IV. Characterization of Murine LAK Effector Subpopulations. *J. Immunol.*, 144:386-395, 1990.
33. Ballas, Z.K., and Rasmussen, W.L.: Murine Natural Killer Cells Express the Ly24 (Pgp-1) Marker on Their Surface. *Cell Immunol.*, 125:449-458, 1990.
34. Casale, T.B., Ballas, Z.K., Kaliner, M.A., and Keahey, T.M.: The Effects of Intravenous Endotoxin on Various Host-Effector Molecules. *J. Allergy Clin. Immunol.*, 85:45-51, 1990.
35. Ballas, Z.K., Turner, J.M., Turner, D.A., Goetzman, E.A., and Kemp, J.D.: A Patient with Simultaneous Absence of "Classical" Natural Killer Cells (CD3<sup>-</sup> CD16<sup>+</sup> NKH1<sup>+</sup>) and Expansion of CD3<sup>+</sup> CD4<sup>-</sup> CD8<sup>-</sup> NKH1<sup>+</sup> Subset. *J. Allergy Clin. Immunol.*, 85:453-459, 1990.

III. SCHOLARSHIP (Cont.)

36. Ballas, Z.K., and Rasmussen, W.: NK1.1<sup>+</sup> Thymocytes: Adult Murine CD4<sup>-</sup>, CD8<sup>-</sup> Thymocytes Contain an NK1.1<sup>+</sup>, CD3<sup>+</sup>, CD5<sup>hi</sup>, CD44<sup>hi</sup>, TCR-V $\beta$ 8<sup>+</sup> Subset. *J. Immunol.*, 145:1039-1045, 1990.
37. Thompson, R.A., and Ballas, Z.K.: Lymphokine-Activated Killer (LAK) Cells. V. 8-Mercaptoguanosine as an IL2-Sparing-Agent in LAK Generation. *J. Immunol.*, 145:3524-3531, 1990.
38. Ballas, Z.K., and Rasmussen, W.L.: Lymphokine-Activated Killer (LAK) Cells. VI. NK1.1<sup>+</sup>, CD3<sup>+</sup> LAK Effectors are Derived from CD4<sup>-</sup>, CD8<sup>-</sup>, NK1.1<sup>-</sup> Precursors. *Cell. Immunol.*, 134:296-313, 1991.
39. Cook, G.A., Blum, A.M., Ballas, Z.K., and Weinstock, J.V.: Substance P Does Not Stimulate Interleukin-1 Secretion or mRNA Transcription in Murine Schistosomiasis Mansoni. *J. Neuroimmunol.*, 33:217-225, 1991.
40. Ballas, Z.K., and Rasmussen, W.L.: Lymphokine-Activated Killer Cells (LAK) Lymphocytes. VII. IL4 Induces an NK1.1<sup>+</sup>CD8 $\alpha$ <sup>+</sup> $\beta$ <sup>-</sup> TCR- $\alpha$  $\beta$  B220<sup>+</sup> Lymphokine-Activated Killer Subset. *J. Immunol.*, 150:17-30, 1993.
41. Cook, R.T., Ballas, Z.K., Waldschmidt, T.J., Cook, B.L., LaBrecque, D.R., and Byers, C.: Phenotypic Alterations of Lymphocyte Fine Subsets in the Alcoholic: Implications for Function. In: Advances in the Biosciences, Pergamon Press, 86:91-102, 1993.
42. Cavanah, D.K., and Ballas, Z.K.: Pseudoephedrine Reaction Thought to be Recurrent Toxic Shock Syndrome. *Ann. Intern. Med.*, 119:302-303, 1993.
43. Ballas, Z., Blumenthal, M., Tinkelman, D.G., Kriz, R., and Rupp, G.: Clinical Evaluation of Ketorolac Tromethamine 0.5% Ophthalmic Solution for the Treatment of Seasonal Allergic Conjunctivitis. *Survey Ophthalmol.*, 38:141-148, 1993.
44. Cook, R.T., Waldschmidt, T.J., Ballas, Z.K., Cook, B.L., Booth, B.M., Stewart, B.C., and Garvey, M.J.: Fine T-Cell Subsets in Alcoholics as Determined by the Expression of L-selection, Leukocyte Common Antigen, and  $\beta$ -Integrin. *Alcoholism: Clinical and Experimental Research*, 18:71-80, 1994.
45. Bittleman, D.B., Maves, K.K., Bertolatus, J.A., Bonsib, S.M., Densen, P., Ballas, Z., and Weiler, J.M.: Recurrent Infections, Pericarditis and Renal Disease in a Patient with Total C2 Deficiency and Decreased NK Cell Function Consistent with Acute Rheumatic Fever and Systemic Lupus Erythematosus. *Ann. Rheum. Dis.*, 53:280-287, 1994.
46. Grossman, D., Lewis, D.E., Ballas, Z.K., and Duvic, M.: Idiopathic CD4<sup>+</sup> T Lymphocytopenia in a Patient with Mycosis Fungoides. *Journal of the American Academy of Dermatology*, 31(2 Pt 1):275-6, 1994.

III. SCHOLARSHIP (Cont.)

47. Cook, R.T., Ballas, Z.K., Waldschmidt, T.J., Vanderstein, D., LaBrecque, D.R., and Cook, B.L.: Modulation of T Cell Adhesion Markers, and the CD45R and CD57 Antigens in Human Alcoholics. *Alcohol Clin. Exp. Res.*, 19:555-563, 1995.
48. Masterson, B.J., Galask, R.P., and Ballas, Z.K.: Natural Killer Cell Function in Women with Vestibulitis. *J. Reproductive Med.*, 41:562-568, 1996.
49. Go, E.S. and Ballas, Z.K.: Anti-pneumococcal Antibody Response in Normal Subjects: A Meta-analysis. *J. Allergy Clin. Immunol.*, 98:205-15, 1996.
50. Ballas, Z.K., Rasmussen, W.L., and Krieg, A.M.: Induction of NK Activity in Murine and Human Cells by CpG Motifs in Oligodeoxynucleotides and Bacterial DNA. *J. Immunol.*, 157:1840-1845, 1996.
51. Persian Gulf Study Group: Self-Reported Illness and Health Status Among Gulf War Veterans: A Population-Based Study. *JAMA*, 277:238-245, 1997.
52. Wooldridge, J.E., Ballas, Z., Krieg, A.M., and Weiner, G.J.: Immunostimulatory Oligodeoxynucleotides Containing CpG Motifs Enhance the Efficacy of Monoclonal Antibody Therapy of Lymphoma. *Blood*, 89:2994-2998, 1997.
53. Cook, R.T., Stapleton, J.T., Ballas, Z.K., and Klinzman, D.: Effect of a Single Ethanol Exposure on HIV Replication in Human Lymphocytes. *J. Invest. Med.*, 45:265-271, 1997.
54. Ballas, Z.K., Rasmussen, W.L., Alber, C.A., and Sandor, M.: Ontogeny of Thymic NK1.1<sup>+</sup> Cells. *J. Immunol.*, 159:1174-1181, 1997.
55. Cook, R.T., Li, F., Vanderstein, D., Ballas, Z.K., Cook, B.L., and LaBrecque, D.R.: Ethanol and Natural Killer Cells. I. Activity and Immunophenotype in Alcoholic Humans. *Alcoholism, Clin Exp Res* 21:974-980, 1997.
56. Li, F., Cook, R.T., Alber, C., Rasmussen, W., Stapleton, J.T., and Ballas, Z.K.: Ethanol and Natural Killer Cells. II. Stimulation of Human Natural Killer Activity by Ethanol *in vitro*. *Alcoholism, Clin Exp Res* 21:981-987, 1997.
57. Graham, S.M., and Ballas, Z.K.: Preoperative Steroids Confuse the Diagnosis of Allergic Fungal Sinusitis. *J. Allergy Clin. Immunol.*, 101:139-140, 1998.
58. Gilman, A.L., Kooy, N.W., Atkins, D.L., Ballas, Z., Rumelhart, S., Holida, M., Lee, N., and Goldman, F.: Complete Heart Block in Association with Graft-Versus-Host Disease. *Bone Marrow Transplantation* 21:85-88, 1998.



III. SCHOLARSHIP (Cont.)

59. Rakasz, E., Blum, A.M., Metwali, A., Elliott, D.E., Li, J., Ballas, Z.K., Qadir, K., Lynch, R., and Weinstock, J.V.: Localization and Regulation of IFN- $\gamma$  Production Within the Granulomas of Murine Schistosomiasis in IL-4-Deficient and Control Mice. *J. Immunol.* 160:4994-4999, 1998.
60. Goldman, F.D., Ballas, Z.K., Schutte, B.C., Kemp, J., Hollenback, C., Noraz, N., and Taylor, N.: Defective Expression of p56lck in an Infant with Severe Combined Immunodeficiency. *J. Clin. Investig.* 102:421-429, 1998.
61. Peterson E.J., Clements, J.L, Ballas, Z.K., Koretzky, G.A.: NK Cytokine Secretion and Cytotoxicity Occur Independently of the SLP-76 Adaptor Protein. *Eur J Immunol* 29:2223-32, 1999.
62. Kline, J.N., Krieg, A.M., Waldschmidt, T.J., Ballas, Z.K., Jain, V, and Businga, T.R.: CpG Oligodeoxynucleotides do not Require TH1 Cytokines to Prevent Eosinophilic Airway Inflammation in a Murine Model of Asthma. *J. Allergy Clin. Immunol.* 104:1258-1264, 1999.
63. Hartmann, G., Weeratna, R.D., Ballas, Z.K., Payette, P., Blackwell, S., Suparto, I., Rasmussen, W.L., Waldschmidt, M., Sajuthi, D., Purcell, R.H., Davis, H.L. and Krieg, A.M.: Delineation of a CpG Phosphorothioate Oligodeoxynucleotide for Activating Primate Immune Responses *In Vitro* and *In Vivo*. *J. Immunol.* 164:1617-1624, 2000.
64. Ballas, Z.K., and Rasmussen, W.L.: Murine Natural Killer Cell Cloning from Fetal Thymic Organ Cultures. *Methods Mol Biol* 121:39-47, 2000.
65. Schrand, L.M., Troester, T.S., Ballas, Z.K., Mutnick, A.H., and Ross, M.B.: Preparing for Drug Shortages: One Teaching Hospital's Approach to the IVIG Shortage. *Formulary* 36: 52-59, 2001.
66. Chee, L., Graham, S.M., Carothers, D., and Ballas, Z.K. Immune Dysfunction in Refractory Sinusitis in a Tertiary Setting. *Laryngoscope* 111:233-235, 2001.
67. Krug, A., Rothenfusser, S., Hornung, V., Jahrsdörfer, B., Blackwell, S., Ballas, Z.K., Endres, S., Krieg, A.M. and Hartmann, G.: Identification of CpG Oligonucleotide Sequences with High Induction of IFN- $\alpha/\beta$  in Plasmacytoid Dendritic Cells. *Eur. J. Immunol.* 31:2154-2163, 2001.
68. Chen, Y., Zhang, J., Moore, S.A., Ballas, Z.K., Portanova, J.P., Krieg, A.M., and Berg, D.J.: CpG DNA Induces Cyclooxygenase-2 Expression and Prostaglandin Production. *Intl Immunol* 13:1013-1020, 2001.
69. Song, K., Coleman, R.A. Alber, C., Ballas, Z.K., Waldschmidt, T.J., Mortari, F., LaBrecque, D.R., and Cook, R.T.: T<sub>H</sub>1 Cytokine Response of CD57<sup>+</sup> T-Cell Subsets in Healthy Controls and Patients with Alcoholic Liver Disease. *Alcohol* 24:155-167, 2001.

**III. SCHOLARSHIP (Cont.)**

70. Ballas, Z.K., Krieg, A.M., Warren, T., Rasmussen, W., Davis, H.L., Waldschmidt, M., and Weiner, G.J.: Divergent Therapeutic and Immunologic Effects of Oligodeoxynucleotides with Distinct CpG Motifs. *J Immunol* 167: 4878-4886, 2001.
71. Orange, J.S., Brodeur, S.R., Jain, A., Bonilla, F.A., Schneider, L.C., Kretschmer, R., Nurko, S., Rasmussen, W.L., Kohler, J.R., Gellis, S.E., Ferguson, B.M., Strominger, J.L., Zonana, J., Ramesh, N., Ballas, Z.K., and Geha, R.S.: Deficient Natural Killer Cell Cytotoxicity in Patients with IKK-gamma/NEMO Mutations. *J. Clin. Invest.* 109:1501-1509, 2002.
72. Goldman, F.D., Vibhakar, R., Puck, J.M., Straus, S.E., Ballas, Z.K., Hollenback, C., Loew, T., Thompson, A., Song, K., and Cook, R.T.: Aberrant T-Cell Antigen Receptor-Mediated Responses in Autoimmune Lymphoproliferative Syndrome. *Clin Immunol.* 104:31-39, 2002.
73. Vollmer, J., Janosch, A., Laucht, M., Ballas, Z.K., Schetter, C., and Krieg, A.M.: Highly Immunostimulatory CpG-Free Oligodeoxynucleotides for Activation of Human Leukocytes. *Antisense Nucleic Acid Drug Dev.* 12:165-175, 2002.
74. Song, K., Coleman, R.A., Zhu, X., Alber, C, Ballas, Z.K., Waldschmidt, T.J., and Cook, R.T.: Chronic Ethanol Consumption by Mice Results in Activated Splenic T Cells. *J. Leukoc Biol.* 72:1109-1116, 2002.
75. Brown, H.C., and Ballas, Z.K.: Acute Thromboembolic Events Associated with Intravenous Immunoglobulin Infusion in Antibody-Deficient Patients. *J Allergy Clin Immunol* 112:797-799, 2003.
76. Lenert, P., Rasmussen, W., Ashman, R.B., and Ballas Z.K.: Structural Characterization of the Inhibitory DNA Motif for the Type A (D)-CpG-Induced Cytokine Secretion and NK-Cell Lytic Activity in Mouse Spleen Cells. *DNA and Cell Biology* 22:621-631, 2003.
77. Zhu, X., Coleman, R.A., Alber, C., Ballas, Z.K., Waldschmidt, T.J., Ray, N.B., Krieg, A.M., and Cook, R.T.: Chronic Ethanol Ingestion by Mice Increases Expression of CD80 and CD86 by Activated Macrophages. *Alcohol* 32:91-100, 2004.
78. Orange, J.S., Jain, A., Ballas, Z.K., Schneider, L.C., Geha, R.S., and Bonilla, F.A.: The Presentation and Natural History of Immunodeficiency Caused by Nuclear Factor  $\kappa$ B Essential Modulator Mutation. *J Allergy Clin Immunol* 113:725-733, 2004.
79. Cook, R.T., Zhu, X, Coleman, R.A., Ballas, Z.K., Waldschmidt, T.J., Ray, N.B., Labrecque, D.R., and Cook, B.L.: T-Cell Activation after Chronic Ethanol Ingestion in Mice. *Alcohol* 33:175,181, 2004.
80. Knudson, M., Kulkarni, S., Ballas, Z., Bessler, M., and Goldman, F.: Association of Immune Abnormalities with Telomere Shortening in Autosomal Dominant Dyskeratosis Congenita. *Blood* 105:682-688, 2005.

III. SCHOLARSHIP (Cont.)

81. Win, Ph.G., Brown, H., Zankar, A., Ballas, Z.K., and Hussain, I.: Rapid Intravenous Cephalosporin Desensitization. *J. Allergy Clin. Immunol.* 116:225-228, 2005.
82. Hatab, A.Z., McDanel, D., and Ballas, Z.K. Perilesional GM-CSF Therapy of a Chronic Leg Ulcer in a Patient with Common Variable immunodeficiency. *J. Allergy Clin. Immunol.* 116:460-462, 2005.
83. Hatab, A.Z., and Ballas, Z.K.: Caseating Granulomatous Disease in Common Variable Immunodeficiency Treated with Infliximab. *J Allergy Clin Immunol* 116:1161-1162, 2005. PMID 16275393
84. Casale, T.B., Busse, W.W., Kline, J.N., Ballas, Z.K., Moss, M.H., Townley, R.G., Mokhtarani, M., Seyfert-Margolis, V., Asare, A., Batemen, K., Deniz, Y., and the Immune Tolerance Network Group. Omalizumab Pretreatment Decreases Acute Reactions after Rush Immunotherapy for Ragweed-Induced Seasonal Allergic Rhinitis. *J Allergy Clin Immunol* 117:134-140, 2006. PMID 16387596
85. Link, B.K. Ballas, Z.K., Weisdorf, D., Wooldridge, J.E., Bossler, A.D., Shannon, M., Rasmussen, W.L., Krieg, A.M. and Weiner, G.J.: Oligodeoxynucleotide CpG 7909 Delivered as Intravenous Infusion Demonstrates Immunologic Modulation in Patients with Previously Treated Non-Hodgkin Lymphoma. *J Immunother* 29:558-568, 2006. PMID 16971811
86. Cac, N.N., and Ballas, Z.K.: Recalcitrant Warts, Associated with Natural Killer Cell Dysfunction, Treated with Systemic IFN-alpha. *J Allergy Clin Immunol* 118(2):526-529, 2006. PMID 16890785
87. Hare, N.D., and Ballas, Z.K.: Effectiveness of Delayed Epinephrine in Anaphylaxis. *J Allergy Clin. Immunol.* 120(3): 716-717, 2007. PMID 17637471
88. Cook, R.T., Schlueter, A.J., Coleman, R.A., Tygrett, L., Ballas, Z.K., Jerrell, T.R., Nashelsky, M.B., Ray, N.B., Haugen, T.H., and Waldschmidt, T.J.: Thymocytes, Pre-B Cells, and Organ Changes in a Mouse Model of Chronic Ethanol Ingestion-Absence of Subset-Specific Glucocorticoid-Induced Immune Cell Loss. *Alcoholism Clin Exp Res* 31:1-13, 2007. (Oct) PMID 17681030
89. Ballas, Z.K.: Modulation of NK Cell Activity by CpG Oligodeoxynucleotides. *Immunol Res* 39:15-21, 2007. PMID 17917052
90. Azar, A.E., and Ballas, Z.K. Reversible Panhypogammaglobulinemia Associated with the Antiepileptic Agent Levetiracetam. *Ann Allergy Asthma Immunol* 101:108-1009, 2008. (Ltr to Ed) PMID 18681095
91. Shey, M.R., and Ballas, Z.K.: Assessment of Natural Killer (NK) and NKT Cells in Murine Spleens and Livers. *Methods Mol Biol* 447:259-276, 2008. PMID 18369924

III. SCHOLARSHIP (Cont.)

92. Svensson, R.U., Shey, M.R., Ballas, Z.K., Dorkin, J.R., Goldberg, M., Akinc, A., Langer, R., Anderson, D.G., Bumcrot, D., and Henry M.D.: Assessing siRNA Pharmacodynamics in a Luciferase-Expressing Mouse. *Mol. Ther* 16:1995-2001, 2008. [EPub Sep 9, 2008]. PMID 18781145
93. Hare, N.D., Smith, B.J., and Ballas, Z.K.: Antibody Response to Pneumococcal Vaccination as a Function of Preimmunization Titer. *J Allergy Clin Immunol*, 123:195-200, 2009. PMID 18951616
94. Moore, J.C., and Ballas, Z.K.: A Novel Therapy for Lymphedema. *Arch Intern Med* 169:201-202, 2009. PMID 19171818
95. Dowden A.M., Ballas, Z.K.: Eosinophilic Fasciitis Masquerading as Angioedema. *Ann Allergy Asthma Immunol* 102:258-259, 2009. PMID 19354076
96. Dowden, A.M., Rullo, O.J., Aziz, N., Fasano, M.B., Chatila, T., and Ballas, Z.K.: Idiopathic Systemic Capillary Leak Syndrome: Novel Therapy for Acute Attacks. *J Allergy Clin Immunol* 124 (5):1111-1113, 2009. PMID: 19703708
97. Moore, J.C., and Ballas, Z.K.: Hypereosinophilia: A Case with an Elusive Etiology. *Ann Allergy, Asthma Immunol* 103:176-177, 2009 (Ltr). PMID 19739434
98. Kelso, J.M., Li, J.T., Nicklas, R.A., Blessing-Moore, J., Cox, L., Lang, D.M., Oppenheimer, J., Portnoy, J.M., Randolph, C., Schuller, D.E., Spector, S.L., Tilles, S., Wallace, D., Ballas, Z.K., Baker, J.R., Bellanti, J.A., Ein, D., Grammer, L.C.: Joint Task Force on Practice Parameters. Practice Parameter: Adverse Reactions to Vaccines. *Ann Allergy Asthma Immunol* 103(4 Suppl 2):S1-14, 2009. PMID 19886402
99. Guseva, N.V., Fullenkamp, C.A., Naumann, P.W., Shey, M.R., Ballas, Z.K., Houtman, J.C., Forbes C.A., Scalzo, A.A., and Heusel, J.W.: Glycosylation Contributes to Variability in Expression of Murine Cytomegalovirus m157 and Enhances Stability of Interaction with the NK-Cell Receptor Ly49H. *Eur J. Immunol* 40: 2618-2631, 2010. [Epub: 7-12-10] PMID 20662096
100. Alqudah, M., Graham, S.M., and Ballas, Z.K.: High Prevalence of Humoral Immunodeficiency Patients with Refractory Chronic Rhinosinusitis". *Am J Rhinol Allergy* 24(6): 409-412, 2010.
101. Zent, Clive S., Smith, Brian J., Ballas, Zuhair K., Wooldridge, James E., Link, Brian K., Call, Timothy G., Shanafelt, Tait D, Bowen, Deborah A, Neil, Kay E, Witzig, Thomas E, Weiner, George J: A Phase I Clinical Trial of CpG Oligonucleotide 7909 (PF-03512676) in Patients with Previously Treated Chronic Lymphocytic Leukemia. *Leukemia and Lymphoma* (In Press).

**Zuhair K. Ballas, M.D.**

**III. SCHOLARSHIP (Cont.)**

Non-peer reviewed papers

None

III. SCHOLARSHIP (Cont.)

Books:

Chapters:

1. Ballas, Z.K., and Henney, C.S.: Relationship Between Lymphokines and Cell-Mediated Cytotoxicity. In: Biology of Lymphokines, (E. Pick, J. Oppenheim, and S. Cohen, eds.), Academic Press, New York, p. 165, 1979.
2. Henney, C.S., Ballas, Z.K., and Ozato, K.: Hapten Recognition by Cytotoxic T Cells: The Modifying Influence of the Major Histocompatibility Complex. In: Current Trends in Histocompatibility, (S. Ferrone and R. Reisfeld, eds.), Plenum Press, pp. 59-80, 1981.
3. Nasrallah, H.A., Ballas, Z.K., Kronfol, A., and Chapman, S.M.: Natural Killer Cell Activity in Major Depression. In: Viruses, Immunity and Mental Disease, (E. Kurstak, Z.J. Lipowski, and P.V. Morozov, ed.), Marcel Dekker, Inc., New York, pp. 369-372, 1987.
4. Ballas, Z.K.: Asthma in the Adolescent and the Adult. In: Conn's Current Therapy 1988, (R.E. Rakel, ed.), W.B. Saunders, Philadelphia, pp. 628-633, 1988.
5. Cowdery, J.S., Kemp, J.D., Ballas, Z.K., and Weber, S.P.: Interleukin 1 Selectively Induces IgA Secretion in Cultured Murine Peyer's Patch Cells. In: Inflammatory Bowel Disease: Current Status and Future Approach, (R.P. McDermott, ed.), Elsevier Science Publishers, pp. 165-170, 1988.
6. Ballas, Z.K., and Weiler, J.M.: Biology of the Immune System. In: The Merck Manual, 16th Ed., (R. Berkow, ed.), Merck Sharp and Dohme Research Laboratories, Rahway, Virginia, pp. 279-303, 1992.
7. Ballas, Z.K. and Weiler, J.M.: Biology of the Immune System. In: The Merck Manual of Medical Information, (R. Berkow, ed), Merck Research Labs, Whitehouse Station, NJ, pp. 807-816, 1997.
8. Ballas, Z.K. and Weiler, J.M.: Biology of the Immune System. In: The Merck Manual, 17<sup>th</sup> Ed., (M.H. Beers, and R. Berkow, eds), Merck Research Laboratories, Whitestation Station, NJ, pp. 1001-1023, 1999.
9. Ballas, Z.K. and Rasmussen, W.L. In: Natural Killer Cell Protocols: Cellular and Molecular Methods. [K.S. Campbell and M. Colonna (eds)]. Humana Press: Totowa, NJ 2000, pp 39-47.
10. Kline, J.N. and Ballas, Z.K.: DNA Immunomodulation of Asthma. In: Inflammatory Mechanisms in Allergic Diseases, (B. Zweiman and L.B. Schwartz, eds), Marcel Dekker Inc: New York, NY 2001, pp 551-564.
11. Ballas, Z.K.: Immunology and Cellular Defense Mechanisms in the Lung. In: Basic Mechanisms of Pediatric Respiratory Disease, 2<sup>nd</sup> ed, G.G. Haddad, S.H. Abman, and V. Chernick (eds), Hamilton, Ontario, Canada: BC Decker, 2002, pp 465-471.

III. SCHOLARSHIP (Cont.)

12. Azar, A., and Ballas, Z.K.: Immune Function in Older Adults. In: UpToDate, Basow, D.S. (ed), UpToDate, Waltham, MA 2011.

Electronic publications:

Author: UPC (University Pathology Consortium) Medical Diagnosis, an online publication (<http://upcmd.com/index.html>) Allergic Rhinitis, 2000  
Asthma, 2000

Editor, A/I, e-medicine:

Author: UPTODATE, "T-Cell Receptor Complex Disorders Causing Immunodeficiency"

Hare, N.D., Smith, B.J., and Ballas, Z.K.: Antibody Response to Pneumococcal Vaccination as a Function of Preimmunization Titer. *J Allergy Clin Immunol*, EPub Oct 23, 2008.

Laccheo M, Szecsei D, Ruggle T and Ballas ZK. iGout, an iPhone App, July 8, 2011.

Abstracts:

1. Ballas, Z.K., and Kuppers, R.C.: Naturally Occurring Antibodies Recognizing TNBS-Modified Cell Surface But Not the Trinitrophenol Moiety. Presented at F.A.S.E.B., *Fed. Proc.*, 39:1140, 1980.
2. Ballas, Z.K.: Restrictions of Recognition of Autologous, TNBS-Modified, Target Cells by Alloantigen-Activated Cytotoxic T Lymphocytes. Presented at F.A.S.E.B., *Fed. Proc.*, 40:1148, 1981.
3. Ballas, Z.K., and Ahmann, G.B.: Interleukin 2 Induces the Generation of MHC-Restricted Cytotoxic T Lymphocytes in the Absence of Antigen. Presented at F.A.S.E.B., *Fed. Proc.*, 41:957, 1982.
4. Ahmann, G.B., and Ballas, Z.K.: Whole Body Ultraviolet (UV) Irradiation Decreases Natural Killer (NK) Activity. Presented at F.A.S.E.B., *Fed. Proc.*, 41:601, 1982.
5. Klassen, L.W., Ahmann, G.B., and Ballas, Z.K.: Inhibition of Interleukin 2 Activity by Normal Serum. Presented at F.A.S.E.B., *Fed. Proc.*, 41:563, 1982.
6. Ballas, Z.K., and Ahmann, G.B.: Generation of Cytotoxic T Lymphocytes Against "Modified-Self" by Interleukin 2, in the Absence of Antigen. Presented at the 15th International Leukocyte Culture Conference, Monterey, CA, December, 1982. *Immunobiology*, 163:386, 1982.
7. Ballas, Z.K.: Interleukin 2 in the Generation of Allogeneic vs. Syngeneic, TNBS-Specific, Cytotoxic T Lymphocytes. Presented at F.A.S.E.B., Chicago, IL, April, 1983. *Fed. Proc.*, 42:450, 1983.

III. SCHOLARSHIP (Cont.)

8. Ballas, Z.K.: Differential Effect of Cyclosporine on the Generation of Allogeneic vs. Syngeneic Cytotoxic T Lymphocytes. Presented at the 1st International Congress on Cyclosporine, Houston, TX, May, 1983.
9. Ballas, Z.K., Feldbush, T.L., and Weiler, J.M.: Effect of C3 Fragment(s) on Human Cytotoxic T Lymphocytes. Presented at the Xth International Complement Workshop, Mainz, Free Republic of Germany, May, 1983.
10. Shanley, J.D., and Ballas, Z.K.: Characterization of Lung Lavage Fluids During Murine CMV-Induced Interstitial Pneumonitis. Eastern Regional AFCR, 1983.
11. Shanley, J.D., Ballas, Z.K. and Pesanti, E.L.: Immunological Parameters of Lung Lavage Cells During Murine CMV-Induced Interstitial Pneumonitis. University of Connecticut Symposium on Immunology in Man, Farmington, CT, 1983.
12. Ballas, Z.K.: The Use of 5 Azacitidine to Establish Constitutive Interleukin 2-Producing Clones of the EL4 Thymoma. (FASEB, 1984), Fed. Proc., 43:1500, 1984.
13. Reyes, V.E., Ballas, Z.K., Klimpel, K.D., and Klimpel, G.R.: Interleukin 2 Induces Interferon  $\alpha/\beta$  Production in Murine Bone Marrow Cells. (FASEB, 1984), Fed. Proc., 43:1437, 1984.
14. Nasrallah, H.A., Ballas, Z.K. and Chapman, S. NK Cell Activity, Hypercortisolemia and Depression. Society for Neuroscience Abstracts, 10: 724, 1984.
15. Ballas, Z.K. and Feldbush, T.L.: 8 Mercaptoguanosine as a Killer Helper Factor, *In Vitro*. (FASEB, 1985), Fed. Proc., 44:1537, 1985.
16. Lafrenz, D., Van Ness, B., Feldbush, T.L., and Ballas, Z.K.: Cyclosporin A Effects on B Cell Activation: Analysis of IgM mRNA Species and B Cell Proliferation. (FASEB, 1985), Fed. Proc., 44:1296, 1985.
17. Ballas, Z.K.: Tumorigenicity Versus Immunogenicity of a Constitutive Interleukin 2-Producing Tumor Clone. Presented at the 1st International Symposium on Natural Immunity and Biological Response Modification. Nat. Immun. Cell Growth Regul., 4:237, 1985.
18. Ballas, Z.K., and Marshall, G.D.: Lymphokine-Activated Killers (LAK) Vs. Natural Killer (NK) Cells and Cytotoxic T Lymphocytes (CTL). Fed. Proc., 45:488, 1986.
19. Marshall, G.D., and Ballas, Z.K.: Ontogenic Studies of Human Lymphokine Activated Killers (LAK) Using Cord Blood and Thymic Lymphocytes. Fed. Proc., 45:630, 1986.
20. Marshall, G., Shulan, D., Gingrich, R., and Ballas, Z.: A Prospective Study of Immediate Skin Reactivity in Bone Marrow Transplantation: Early Findings. J. Allergy Clin. Immunol., 77(Suppl.):231, 1986.



III. SCHOLARSHIP (Cont.)

21. Ballas, Z.K.: Heterogeneity of Lymphokine-Activated Killer (LAK) Precursors: Phenotype Depends on the Target Cell. (#941) (FASEB, 1987), Fed. Proc., 46:478, 1987.
22. Ballas, Z.K.: Generation of Lymphokine-Activated Killers (LAK) from Thymus: A Possible Role in Thymocyte Maturation. 24th RES Meeting, Kauai, Hawaii, October, 1987.
23. Cowdery, J.S., Kemp, J.D., and Ballas, Z.K.: Interleukin-1 Selectively Induces IgA Secretion in Cultured Murine Peyer's Patch Cells. (Submitted for CSCR Meeting), 1987.
24. Ballas, Z.K., and Rasmussen, W.: A Possible Role for CD4<sup>-</sup>CD8<sup>-</sup>-Derived LAK in Thymic Maturation. (#6754) Fed. Proc., 2:A1459, 1988.
25. Casale, T., Ballas, Z., Kaliner, M., and Keahey, T.: Humans Given Intravenous (IV) Endotoxin Have Increased Interleukin (IL)1, Cortisol, and  $\beta$ -Endorphin Levels. Presented at XIII International Congress of Allergology & Clinical Immunology, Montreux, Switzerland, October 16, 1988.
26. Thompson, R.A., and Ballas, Z.K.: 8-Mercaptoguanosine (8MG) Is An "Interleukin-2 (IL2)-Sparing" Agent in the Generation of Lymphokine-Activated Killers (LAK). Accepted for Mid-West Autumn Immunology Conference, St. Louis, MO, October 28-30, 1988.
27. Kemp, J.D., Turner, J.M., and Ballas, Z.K.: Recurrent Warts & Epithelial Malignancy in a Patient With Functional NK Deficiency and An Expanded CD3<sup>+</sup>CD4<sup>-</sup>CD8<sup>-</sup> Population. Accepted for CIS Conference, San Francisco, CA, November, 1988.
28. Ballas, Z., Turner, J.M., and Kemp, J.D.: Selective Cell-Mediated Immune Deficiency: Functional NK Deficiency and an Expanded CD3<sup>+</sup>CD4<sup>-</sup>CD8<sup>-</sup> Population. J. Allergy Clin. Immunol., 83:275, 1989.
29. Thompson, R.A., and Ballas, Z.K.: 8 Mercaptoguanosine (8MG) Synergizes with Minimal Doses of IL2 in the Generation of Lymphokine Activated Killers (LAK) *In Vitro*. FASEB J., 3:A490, 1989.
30. Ballas, Z.K., and Rasmussen, W.: Characterization of Lymphokine-Activated Killers (LAK) Derived from CD4<sup>-</sup>CD8<sup>-</sup> Thymocytes. FASEB J., 3:A490, 1989.
31. Ballas, Z.K., and Rasmussen, W.L.: B220 Expression by Lymphokine-Activated Killer (LAK) Subsets. J. Cell Biochem., Suppl. 14B:79, 1990.
32. Ballas, Z.K., and Kemp, J.D.: Abnormal CD4<sup>+</sup> CD45RA<sup>+</sup> Subset Distribution Can be a Transient Phenomenon. J. Allergy Clin. Immunol., 87:314, 1991.
33. Cook, R.T., Ballas, Z.K., Waldschmidt, T.J., Booth, B.M., and Stewart, B.C.: Natural Killer Cells in Alcoholics. Alcoholism and Experimental Research, 15:372, 1991.

III. SCHOLARSHIP (Cont.)

34. Ballas, Z.K., and Kemp, J.D.: Lack of Correlation of Natural Killer (NK) Cell Numbers and Function. *J. Allergy Clin. Immunol.*, 89:266, 1992.
35. Ballas, Z.K., and Rasmussen, W.: Induction and Characterization of Murine NK1.1<sup>+</sup> CD8<sup>+</sup> MHC-Non-Restricted Killer Cells. Presented at NK Cell Workshop, October, 1992.
36. Hutson, J.A., and Ballas, Z.K.: Delayed Type Hypersensitivity (DTH): Comparison of Intradermal Skin Tests with a Commercially Available Device. *J. Allergy Clin. Immunol.*, 91:204, 1993.
37. Ballas, Z.K., and Hutson, J.A.: Hepatitis A, B, and C Seroconversion in Patients Receiving Intravenous Immunoglobulin (IVIG). *J. Allergy Clin. Immunol.*, 91:148, 1993.
38. Carolan, E.J., Ballas, Z.K., and Casale, T.B.: Mediator-Stimulated Expression of CD62 on Endothelium. *J. Allergy Clin. Immunol.*, 91:177, 1993.
39. Cook, R.T., Waldschmidt, T.J., Cook, B.L., Booth, B.M., LaBrecque, D.R., Byers, C., and Ballas, Z.K.: The Adhesion Amplifier, CD31 is Reduced on T Cells of Alcoholics. *Alcoholism: Clinical and Experimental Research*, 17:506, 1993.
40. Cook, R.T., Ballas, Z.K., Vanderstein, D., LaBrecque, D.R., and Cook, B.L.: Natural Killer Cell Subsets in Alcoholics. *Alcoholism: Clinical and Experimental Research*, 18:439, 1994.
41. Stapleton, J.T., Klinzman, D., Ballas, Z.K., and Cook, R.: Effects of Acute Ethanol Ingestion on HIV-1 Replication *In Vitro*. 35th ICAAC, ASM, San Francisco, 1995.
42. Ballas, Z.K., Rasmussen, W.L., and Krieg, A.M.: Induction of Natural Killer Activity in Murine and Human Lymphocytes by CpG Motifs in Oligodeoxynucleotides and Bacterial DNA. *Natural Immunity*, 14:77, 1995.
43. Karaz, S.S., Cornelius, A.S., and Ballas, Z.K.: An Unusual Case of Castleman's Disease. *Ann. Allergy*, 74:64, 1995.
44. Karaz, S.S., Go, E.S., and Ballas, Z.K.: Natural Killer (NK) Cell Deficiency: An Unexpected Presentation. *J. Allergy Clin. Immunol.*, 95(1):236, 1995.
45. Go, E.S. and Ballas, Z.K.: Anti-polysaccharide Antibody Response in Normal Subjects: A "Meta-analysis". *J. Allergy Clin. Immunol.*, 95(1):240, 1995.
46. Wooldridge, J.E., Hsing, Y., Ballas, Z., Krieg, A.M., and Weiner, G.J.: Select Unmethylated CpG Oligodeoxynucleotides Improve Antibody Dependent Cellular Cytotoxicity *In Vitro* of Both Murine and Human B Cell Lymphomas. *Blood*, 86(Supp. I):722A, 1995.

**III. SCHOLARSHIP (Cont.)**

47. Field, E.H., Rouse, T., Chang, B., and Ballas, Z.: Possible Role of Thymic NK Cells During the Induction Phase of Tolerance. Presented at Am. Soc. Transplant Physicians, May 10, 1997.
48. Ballas, Z.K.: Ontogeny of Thymic NK1.1+(TNK) Cells. Presented at IV Meeting of the Society of Natural Immunity, Helsinki, Finland, May 29, 1997. *Natural Immunity* 15:169, 1997.
49. Segura, T. and Ballas, Z.K.: Natural Killer (NK) Cell Deficiency in a Patient with Chronic Mucocutaneous Candidiasis. *J. Allergy Clin. Immunol.*, 101(1):S74, 1998. (#313)
50. Ballas, Z.K., Rasmussen, W.L., and Krieg, A.: CpG Oligodeoxynucleotides Prolong Survival of Tumor Bearers. Fifth annual meeting of the Society of Natural Immunity, Warrenton, VA, Oct. 17, 1998.
51. Thomas, R.D., Graham, S.M., and Ballas, Z.K.: Efficacy of Prophylactic Antibiotics and IVIG in Chronic Refractory Sinusitis. Presented to Triological Society, 7/31/01.
52. Link, B.K., Ballas, Z.K., Weisdorf, D, Albert, G, Shannon, M., Rasmussen, W.L., Venhaus, R.R., Eaton, C, Krieg, A., and Weiner, G.J. Phase I Study to Assess Safety and Activity of Oligodeoxynucleotide CpG 7909 (Promune™) in Patients with Previously Treated Non-Hodgkin's Lymphoma. Submitted to American Society of Hematology (Dec, 2001).
53. Ballas, Z.K., Link, B.K., Weiner, G., Krieg, A.M., Rasmussen, W.L., and Alber, C.: CpG-Induced Activation of NK Cells in Mice and Humans. Presented at symposium: Activating Immunity with CpG Oligos, Amelia Island, FL 10/7/01-10/10/01.
54. Guduri, S., Barcellos, S., Ballas, Z.K.: Treatment of IVIG-Induced Migraine-Type Headaches. *Ann Allergy, Asthma Immunol* 88:102, 2001. (#P11).
55. Botta, R.S., Grant, J.A., Jain, V.V., Ballas, Z.K., and Hussain, I.: Role of Montelukast in Chronic Idiopathic Urticaria. *Ann Allergy, Asthma Immunol* 88:114, 2001 (#P55).
56. Guduri, S., and Ballas, Z.K.: Deficient NK-Cell Function in Adult Patients with Recurrent Non-Invasive Mucosal Candidiasis. *J Allergy Clin Immunol* 109:S331, 2002 (#1026).
57. Botta, R.S., Ballas, Z.K., and Hussain, I.: Development of Nasal Polyposis in Immunosuppressed Patients. *J. Allergy Clin. Immunol.* 109:S319, 2002 (#985).
58. Brown, H.C., Hussain, I., and Ballas, Z.: Rapid Cephalosporin Desensitization. *Ann Allergy Asthma Immunol* 90:150, 2003 (#P123).

**III. SCHOLARSHIP (Cont.)**

59. Brown.H.C., Ballas, Z.K.: Intravenous Immunoglobulin (IVIG)-Associated Thromboembolism in Antibody Deficient Patients. *J Allergy Clin Immunol* 111:S116, 2003 (#389).
60. Lu, E., and Ballas, Z.K.: Immuno-Modulation in the Treatment of Eosinophilic Gastroenteritis. *J Allergy Clin Immunol* 111:S262, 2003 (#777).
61. Brown, C.L., Thomas, R.D., and Ballas, Z.: Common Variable Immunodeficiency: Two Subgroups Defined by IgE Levels. *J. Allergy Clin Immunol* 111:S228, 2003 (#636).
62. Orange, J.S., Brodeur, S.R., Jain, A., Ballas, Z.K., Schneider, L.C., Bonilla, F.A. and Geha, R.S.: The Spectrum of Clinical Phenotype and Immunodeficiency due to NF $\kappa$ B Essential Modifier (NEMO) Mutation. *J Allergy Clin Immunol* 111:S190, 2003 (#490).
63. Wooldridge, J., Link, B., Weisdorf, D., Ballas, Z., Shannon, M., Albert, G., Rasmussen, W., Krieg, A., and Weiner, G.: Phase I Study of Oligodeoxynucleotide CpG 7909 (ProMune TM) in Patients with Previously Treated Non-Hodgkin's Lymphoma. Presented at College of Medicine Research Day, UIHC, March, 2003.
64. Lu, E., and Ballas, Z.K.: Immune Dysfunction in Camurati-Engelmann Disease. *J Allergy Clin Immunol* 113:S126, 2004. (#399)
65. Doshi, D.R., Lu, E., and Ballas, Z.K.: NK Cell Dysfunction and Hypogammaglobulinemia in a Patient Presenting with Invasive Rhinocerebral Mycomycosis. *J Allergy Clin Immunol* 113:S128, 2004 (#407).
66. Hatab, A.Z., Gantz, B.J., and Ballas, Z.K.: Cyclosporine Treatment for Autoimmune Sensorineural Hearing Loss. *J Allergy Clin Immunol* 132:S130, 2004 (#419).
67. Coleman, D.M., Jr, Pfab, D., Reed, S., Ballas, Z.K. and Hussain, I. : Prevalence of Obstructive Airway Diseases Among Self-Reporting County and State Fair Attendees in Iowa. *J Allergy Clin Immunol* 113:S181, 2004 (#624).
68. Coleman, D.M., and Ballas, Z.K.: NK Cell Dysfunction and Hypogammaglobulinemia in Two Patients Presenting with Invasive Fungal CNS Infections, Treated with GM-CSF. *Ann Allergy* 94:136, 2005 (#P56)
69. Hatab, A.Z., and Ballas, Z.K.: Caseating Granulomatous Disease in Common Variable Immunodeficiency Treated with Infliximab. *J Allergy Clin Immunol* 115:S80, 2005 (#322).
70. Doshi, D.R., Ballas, Z.K., Tabata, Y., Filipovich, L., and Zavazava, N.: A Near Fatal Adenoviral Infection Caused by a Previously Unrecognized SH2D1A Mutation. *J Allergy Clin Immunol* 115:S77, 2005 (#308).

**III. SCHOLARSHIP (Cont.)**

71. Meidinger ,R.R., Shey, M.R., Ballas Z.K., Schmidt W.N. Assessment of TH1 and TH2 Cytokines During Antiviral Therapy for HCV Mixed Cryoglobulinemia. *Hepatology* 44(4), 333A-334A. 2007.
72. Hare, N., and Ballas, Z.K.: Effectiveness of Epinephrine in Protracted Anaphylaxis. *Ann Allergy Asthma Immunol* 98:A113, 2007. (P302)
73. Dowden, A.M., and Ballas, Z.K.: Eosinophilic Fasciitis Masquerading as Angioedema. *J Allergy Clin Immunol* 119:S200, 2007 (#788).
74. Azar, A.E., and Ballas, Z.K.: Reversible Pan-Hypogammaglobulinemia Associated with the Antiepileptic Levetiracetam (Keppra). *J. Allergy Clin Immunol* 119:S250, 2007 (#980).
75. Moore, J.C., and Ballas, Z.K.: Lymphedema Presenting as Recurrent Angioedema: A Novel Therapy. *Ann Allergy Asthma Immunol* 100:A60, 2008 (#P140).
76. Halwani, A.S., and Ballas, Z.K.: Delayed Recovery of T Cell Response Post Cyclosporine Therapy. *J Allergy Clin Immunol* 121:S87, 2008. (#336)
77. Hare, N.D., Smith, B., and Ballas, Z.: Does a Protective Pneumococcal Antibody Titer Preclude a Four-fold Response to Vaccination? - A Retrospective Analysis. *J Allergy Clin Immunol* 121:S169, 2008. (#648)
78. Moore, J.C., and Ballas, Z.K.: Lymphedema Presenting as Recurrent Angioedema: A Novel Therapy. *Ann Allergy Asthma Immunol* 100:A60, 2008. (P140)
79. Halwani, A., and Ballas, Z.K.: Progression of Selective IgM Deficiency to Common Variable Immunodeficiency. *J Allergy Clin Immunol* 123 (2): S89, 2009 (#334).
80. Moore, J.C., and Ballas, Z.K.: Hypereosinophilia, A Case with an Elusive Etiology. *Ann Allergy Asthma Immunol* 102:A67, 2009. (#P155)
81. Wilson, S.P., and Ballas, Z.K.: Progression of Specific Antibody Deficiency (SAD) to Common Variable Immunodeficiency (CVID). *J Allergy Clin Immunol* 125(2):(S1):AB73, 2010.

Reviews:

1. Kline, J.M., and Ballas, Z.K.: DNA Immunomodulation of Asthma. *Clin Allergy Immunol* 16:551-564. 2002.
2. Heusel, J.W., and Ballas, Z.K.: Natural Killer Cells: Emerging Concepts in Immunity to Infection and Implications for Assessment of Immunodeficiency. *Curr Opin Pediatr* 15:586-593, 2003.

**III. SCHOLARSHIP (Cont.)**

3. Bonilla, F.A., Bernstein, I., L., Khan, D.A., Ballas, Z.K., et al. Practice Parameter for the Diagnosis and Management of Primary Immunodeficiency. *Ann Allergy, Asthma Immunol.* 94(Suppl 1):S1-S63, 2005.
4. Orange, J.S., and Ballas, Z.K.: Natural Killer Cells in Human Health and Disease. *Clin Immunol* 118:1-10, 2006. PMID 16337194
5. Azar, A.E., and Ballas, Z.K.: Evaluation of the Adult with Suspected Immunodeficiency. *Am J Med* 120:764-768, 2007.
6. Mohannad Alqudah, M.D., Scott M. Graham, M.D., and Zuhair K. Ballas, M.D.: High prevalence of humoral immunodeficiency patients with refractory chronic rhinosinusitis. *Am J Rhinol Allergy* 24, 409-412, 2010.

Other:

**B. Areas of Research Interest and Current Projects**

Tumor immunology, transplantation, autoimmunity, thymic ontogeny.  
Regulation of natural killer and lymphokine-activated killer cells.  
Primary immunodeficiency.  
Regulation and therapy of allergic disease.  
Reproductive immunology.  
Regulation of T-cell subsets by immunosuppressive agents with emphasis on cyclosporin A.  
Characteristics of lymphokine-activated killer cells *in vitro* and *in vivo*.  
Role of LAK in thymic maturation.  
Thymic selection in autoimmunity.  
Effect of pesticides/herbicides on the immune system.  
IL4 regulation of IgE synthesis.  
NK cell function in patients with recurrent infections.  
CpG oligonucleotides as immunomodulators.  
Immunologic effects of alcohol.

**C. Published Reviews of Scholarship**

None

**D. Grants Received**

*(If you are not the PI, state the name of PI and your role or contributions – in a few sentences):*

Federal:

<u>Title: (Include source in parenthesis)</u>	<u>Amount</u>	<u>Period</u>	<u>% Effort</u>	<u>% Salary</u>
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**Zuhair K. Ballas, M.D.**

**III. SCHOLARSHIP (Cont.)**

"Effect of Cyclophosphamide on Cytotoxic Immune Responses" (VA RAG.)	\$30,000	1980-81		
"Effect of Cyclophosphamide on Cytotoxic Immune Responses" (VA Merit Review)	\$15,000/yr	1981-85		
VA Research Associate Career Award (VA)	Full salary + \$5,000/yr	1981-84		
"Cytotoxic T Lymphocytes: Mechanism of Generation" (NIH R01), Z. Ballas, P.I.	\$210,084	1982-85		
VA Clinical Investigator Career Award, Z. Ballas, P.I.	Full salary + \$20,000/yr	1984-87		
"Cyclosporin A: Differential Effect on Immunity" (Am Heart Assoc #84-934), Z. Ballas, P.I.	\$30,000/yr	1984-87		
"Cellular Immune Responses: Differential Regulation and Modulation" (VA Merit Review), Z. Ballas, P.I.	\$76,000	1985-88		
"Cellular Immune Responses: Differential Regulation and Modulation" (VA Merit Review), Z. Ballas, P.I.	\$73,000	1988-91		
"Cellular Immune Responses: Differential Regulation and Modulation" (VA Merit Review). Z. Ballas, P.I.	\$90,000	1991-97		
"Differential Effect of Cyclosporine on Lymphocyte Subsets" (NIH:R01 AI26460), Z. Ballas, P.I.	\$120,393	1988-91		
"Differential Effect of Cyclosporine on Lymphocyte Subsets" (NIH:R01 AI26460), Z. Ballas, P.I.	\$120,000	1992-95		
"Gene Therapy in Cystic Fibrosis" (NIH, Project 2 of PPG) M. Welsh, P.I.	\$100,000/year	1993-98		
"Alcoholism: Modulation and Function of Lymphocyte Subsets" (NIH/NIAAA: R01 AA09598-11)	\$33,700	9/25/97-8/31/01	10%	10%
Robert Cook, M.D., Ph.D., P.I. Z.K. Ballas, M.D., Co-Investig	\$44,385	9/01/01-8/31/06	10%	
"Effect of Herbicide Exposure on Natural Killer Cells" (USPHS:NIH R03 ES08566) Z. Ballas, P.I.	\$50,000	1996-98	3%	

**Zuhair K. Ballas, M.D.**

**III. SCHOLARSHIP (Cont.)**

<p>"Oligodeoxynucleotides in Cancer Immunotherapy" (VA Merit Review). Z. Ballas, P.I.</p>	<p>\$99,000/yr</p>	<p>1997-2002</p>	<p>20%</p>	
<p>Program title: "Activation of Innate Immunity by CpG DNA for Broad Spectrum Protection Against Pathogens" (CpG Pharmaceuticals). A. Krieg, P.I. Task 2: "Identification of CpG Motifs for Activation of Innate Immune Responses" (DOD: BAA98-25-F-040), Z. Ballas, CoPI</p>	<p>\$98,642/yr (2 yrs)</p>	<p>1999-2002</p>	<p>5%</p>	<p>5%</p>
<p>Program title: "Cancer Center Support Grant" (NIH: NCI). (1 P30 CA086862). Prog Dir: George Weiner. Director Flow Cytometry: Z. Ballas</p>	<p>\$103,697/yr</p>	<p>2000-2005</p>	<p>10%</p>	<p>10%</p>
<p>Program title: "Acquisition of State of the Art Flow Cytometry Sorting" (USPHS/NIH). (1S10RR012955-01A2). Zuhair K. Ballas, P.I.</p>	<p>\$465,286</p>	<p>2001</p>		
<p>Program title: VA Shared Instrument Grant (ShEEP) Zuhair K. Ballas, P.I.</p>	<p>\$123,000</p>	<p>2002</p>		
<p>Program title: "Lymphomas Specialized Program of Research Excellence" (SPORE) (NIH:NCISEP)(1 P50 CA097274-04) G. Weiner, P.I. Z.K. Ballas: Director: Core 4 Immunol</p>	<p>\$84,352/yr</p>	<p>11/11/02- 6/30/07</p>	<p>8%</p>	
<p>Prog title: "Oligodeoxynucleotides as Cancer Immunotherapeutic Agents" (VA Merit Review) Z.K. Ballas, P.I.</p>	<p>\$135,000/yr</p>	<p>10/1/02- 09/30/07</p>	<p>20%</p>	
<p>Prog. title: "Killer Cells and Alcohol" (NIH:NIAAA) (1 R01 AA014418-02) Z.K. Ballas, P.I.</p>	<p>\$225,000/yr</p>	<p>5/15/04- 2/28/10</p>	<p>40%</p>	
<p>Program title: "Cancer Center Support Grant" (NIH: NCI). (1 P30 CA086862). Prog Dir: George Weiner. Director Flow Cytometry: Z. Ballas</p>	<p>\$117,602/yr</p>	<p>2005-2010</p>	<p>10%</p>	<p>10%</p>
<p>Program title: "Cancer Center Support Grant" (NIH: NCI). (1 P30 CA086862). Prog Dir: George Weiner. Program Leader: Z. Ballas</p>	<p>\$9,330/yr</p>	<p>2005-2010</p>	<p>5%</p>	<p>5%</p>



**Zuhair K. Ballas, M.D.**

**III. SCHOLARSHIP (Cont.)**

Prog title: "Immune Abnormalities in Newly Diagnosed Non-Hodgkin's Lymphoma (NHL)" SPORE P50 CA97272 & RJ & L Carver College of Medicine	\$24,000	2/1/07-1/31/09		
Program title: "Lymphomas Specialized Program of Research Excellence" (SPORE) (NIH:NCISEP )(1 P50 CA097274) G. Weiner, P.I. Z.K. Ballas: Co-Investigator: Project One	\$9,330/yr	9/15/07-6/30/12	5%	5%
Prog. title: "Oligodeoxynucleotides as Cancer Immunotherapeutic Agents" (VA Merit Review) Z.K. Ballas, P.I.	\$125,000/yr	10/01/08-09/30/12	20%	

State

<u>Title: (Include source in parenthesis)</u>	<u>Amount</u>	<u>Period</u>	<u>% Effort</u>	<u>% Salary</u>
None				

College of Medicine

<u>Title: (Include source in parenthesis)</u>	<u>Amount</u>	<u>Period</u>	<u>% Effort</u>	<u>% Salary</u>
Prog title: "Immune Abnormalities in Newly Diagnosed Non-Hodgkin's Lymphoma (NHL)" SPORE P50 CA97272 & RJ & L Carver College of Medicine	\$24,000	2/1/07-1/31/09		

Other

<u>Title: (Include source in parenthesis)</u>	<u>Amount</u>	<u>Period</u>	<u>% Effort</u>	<u>% Salary</u>
A.C.S. Institutional Research Grant	\$5,000	1981-82		
"Evaluation of Two Formulations of Flunisolide Nasal Spray in patients with Perennial Allergic Rhinitis". (Syntex Laboratories) Prot 01-7388, Z. Ballas, P.I.	\$15,516	10/87-9/88		
"Examine the Effect of New Ophthalmic Solution on Ragweed Allergic Conjunctivitis" (Syntex Laboratories). Prot ICM1626, Z. Ballas, P.I.	\$64,236	7/88-11/88		

**Zuhair K. Ballas, M.D.**

**III. SCHOLARSHIP (Cont.)**

"Subcutaneous IL2 for Extensive Small Cell Lung Cancer: A Limited Phase II Study". (CALGB 9133). P.I. Gerald Clamon		8/92-7/94		
"Regulation of Immune Responses by Oligodeoxynucleotides (CpG)", Qiagen Dr. Arthur Krieg is P.I.	\$90,000	7/96-6/97	1%	1%
Program: "Identification of Optimal CpG Motifs for Induction of NK and LAK Lytic Activity" (CpG Immunopharmaceuticals) Dr. Arthur Krieg is Program P.I. Project: "Regulation of Human Immune Responses by Oligodeoxynucleotides (CpG)", Z. Ballas, P.I.	\$90,000/yr	7/97-6/00	5%	
"A Randomized, Double-Blind, Multicenter, Parallel Group Trial Comparing the Safety and Efficacy of IGIV-Chromatography, 10% (Experimental) with IGIV-Solvent Detergent Treated, 10% 9(Control) I Patients with Primary Immune Deficiency" (Bayer Pharmaceuticals). Protocol 100175 Z. Ballas, P.I.	\$10,500	4/99-10/00	<1%	<1%
Prog title: "Phase: Double Blinded, Placebo-Controlled, Efficacy and Safety Evaluation of Allergen Immunotherapy Co-Administered with Omalizumab, an Anti-IgE mAb", Protocol: ITN019AD (Immune Tolerance Network) T.B. Casale, P.I., Creighton Z. Ballas, P.I. for mechanistic studies	\$46,897	1/3/03-6/30/04	<1%	
Prog Title: "Induction of Granzyme B Production by CLL Cells". (Lymphoma Research Foundation) G. Weiner, P.I.; Z.Ballas, Co-Investigator. (Pending)	\$246,170/yr	2007-2010	5%	

**III. SCHOLARSHIP (Cont.)**

**E. Invited Lectures**

Conference presentations:

1. Chair: Minisymposium on "Natural Killer Cells." FASEB, 1985.
2. Co-chair: "Natural Killer Cells and Tumor Immunology I." Midwest Autumn Immunology Conference, 1986.
3. Co-chair: "Natural Killer Cells and Tumor Immunology II." Midwest Autumn Immunology Conference, 1986.
4. Speaker: "Immunotherapy of Tumors." Current Topics in Clinical and Pulmonary Immunology Conference, University of Iowa, November 13, 1986.
5. Invited Speaker: "Heterogeneity of Lymphokine-Activated Killer Cells." Cleveland Clinic, Cleveland, Ohio, January 27, 1987.
6. Speaker: "New Things in Immunology." Broadlawns Medical Center, Des Moines, Iowa, March 10, 1987.
7. Invited Speaker: "LAK: Not Just for Tumor Anymore." Department of Microbiology, University of Texas Medical Branch, Galveston, Texas, April, 1987.
8. Speaker: "Interleukins and Biological Response Modifiers." Current Topics in Clinical and Pulmonary Immunology Conference, University of Iowa, October 1, 1987.
9. Speaker: "Management of Urticaria." Progress in Internal Medicine, University of Iowa, Department of Medicine, September 22, 1988.
10. Speaker: "Workup of Suspected Cell-Mediated Immune Deficiencies." Current Topics in Clinical and Pulmonary Immunology Conference, University of Iowa, November 3, 1988.
11. Speaker: "Mechanisms of Drug Allergy." Current Topics in Clinical and Pulmonary Immunology Conference, University of Iowa, November 4, 1988.
12. Invited Speaker: "T Lymphocyte Subsets." American Academy of Allergy and Immunology, San Antonio, Texas, February 25, 1989.
13. Moderator: Clinical Abstracts Session, North Central Allergy Society, University of Iowa, April 9, 1989.
14. Invited Speaker: "Lymphokine-Activated Killers: From the Spleen to the Thymus." Department of Internal Medicine, University of Nebraska, Omaha, Nebraska, April 14, 1989.

**III. SCHOLARSHIP (Cont.)**

15. Invited Speaker: "Allergic and Non-Allergic Drug Reactions." Dubuque Co. Medical Soc., September 12, 1989.
16. Speaker: "Evaluating the Patient for Drug Reactions: Allergic and Otherwise." Progress in Internal Medicine, University of Iowa, October 24, 1989.
17. Speaker: "Evaluation of Cell-Mediated Immunity." Current Topics in Clinical and Pulmonary Immunology Conference, University of Iowa, October 12, 1990.
18. Speaker: "Clinical Indications for Gamma Globulin Therapy." Current Topics in Clinical and Pulmonary Immunology Conference, University of Iowa, September 27, 1991.
19. Speaker: "Newer Approaches for Evaluating the Immune System." Progress in Internal Medicine, University of Iowa, October 17, 1991.
20. Speaker: "Asthma is a T Cell Mediated Disease ... Not?" Current Topics in Clinical and Pulmonary Immunology Conference, University of Iowa, October 9, 1992.
21. Invited Speaker: "Overview of Immunology for the Practitioner." Des Moines VA, October 31, 1992.
22. Co-Chair: "Cell Activation and Adhesion." Annual Meeting of the American Academy of Allergy and Immunology, Chicago, IL, March, 1993.
23. Co-Chair: "Phenotypic and Functional Properties of T Cells." Annual Meeting of the American Academy of Allergy and Immunology, Anaheim, CA, March, 1994.
24. Speaker: "Cytokines for the Practicing Allergist." Breakfast Seminar, Annual Meeting of the American Academy of Allergy and Immunology, Anaheim, CA, March, 1994.
25. Moderator: "Immunopathogenesis of HIV." Presidential Plenary Symposium, Annual Meeting of the American Academy of Allergy and Immunology, Anaheim, CA, March, 1994.
26. Invited Speaker: "Is Asthma a T Cell Mediated Disease?" Part of Postgraduate Course "Asthma: Pathogenesis and Therapy." American Lung Association/American Thoracic Society International Conference, Boston, MA, May, 1994.
27. Distinguished Lecture Series: Controversies in Asthma: "Asthma is not a T Cell Mediated Disease." American Lung Association/American Thoracic Society International Conference, Boston, MA, May, 1994.

**III. SCHOLARSHIP (Cont.)**

28. Distinguished Lecturer: "Immunology for the Chest Physician: Why Immunocompromised Hosts Are Susceptible to Infection." Annual International Scientific Assembly of the American College of Chest Physicians, 1994.
29. Distinguished Lecturer: "The Pathogenesis and Management of HIV Disease." American College of Osteopathic Family Physicians Spring Conference, Dallas, TX, March 19, 1995.
30. Speaker: "Immunology for the Physician Assistant: Why Immunocompromised Hosts are Susceptible to Infections." American Academy of Physician Assistants Annual Conference, Las Vegas, NV, May 31, 1995.
31. Speaker: "Immunodeficiency: Evaluation and Treatment." Overview of the Immune System as it Relates to Allergy and Infection. Annual Meeting of the American Academy of Allergy Asthma and Immunology, New Orleans, LA, March 15, 1996.
32. Co-Moderator: "Introduction to Cytokines and Their Role in Allergy (For the Practicing Physician)." Annual Meeting of the American Academy of Allergy Asthma and Immunology, New Orleans, LA, March 16, 1996.
33. Co-Moderator: "Clinical Controversies in the Management of Allergic Disease in HIV Positive Patients." Annual Meeting of the American Academy of Allergy Asthma and Immunology, New Orleans, LA, March 17, 1996.
34. Invited Lecturer: "Overview of the Immune System." Update in Allergy and Immunology at Nassau County Medical Center, East Meadow, NY, October 17, 1996.
35. Co-Speaker: "Introduction to Cytokines and Their Role in Allergy." Annual meeting of the American Academy of Allergy, Asthma & Immunology, San Francisco, February, 1997.
36. Invited Lecturer: The 5<sup>th</sup> Annual Naji Sahyoun Memorial Lecture: "The Immune System: From Innate to Cognate." American University of Beirut, Lebanon, May 10, 1997.
37. Invited Lecturer: "Molecular Basis of Selected Immunodeficiencies," 32<sup>nd</sup> Middle East Medical Assembly, Beirut, Lebanon, May 10, 1997.
38. Workshop Speaker: "The Role of NK Cells in Disease", 54<sup>th</sup> annual meeting of the American Academy of Allergy, Asthma and Immunology, Washington, D.C., March 16, 1998.
39. Co-Moderator: "Molecular Biology: From the Membrane to the DNA", Fellows-in-Training symposium, American Academy of Allergy, Asthma & Immunology annual meeting, Orlando, FL, February 26, 1999.

**III. SCHOLARSHIP (Cont.)**

40. Co-Moderator: Fellows-in-Training program, "Contract Negotiation: Point/Counterpoint", American Academy of Allergy, Asthma & Immunology annual meeting, Orlando, FL, February 26, 1999.
41. Co-Moderator: "Immune Deficiency", Fellows-in-Training symposium, American Academy of Allergy, Asthma & Immunology annual meeting, Orlando, FL, February 26, 1999.
42. Co-Moderator: Symposium on "Cancer therapy in the Next Millennium, American Academy of Allergy, Asthma & Immunology, Orlando, FL, February 27, 1999.
43. Co-Chair: "Immune Regulation", Poster Symposium, American Academy of Allergy, Asthma & Immunology, Orlando, FL, March 2, 1999.
44. Invited Speaker: Effect of CpG on NK Cells. CpG Workshop, Bavaria, September 26, 1999.
45. Co-Moderator: FIT Breakfast Program on "Innate Immunity", American Academy of Allergy, Asthma & Immunology mtg., San Diego, CA, March 3, 2000.
46. Co-Moderator: Lunch Seminar: "ITAMs and ITIMs - Mechanism by which IgG Modulates Immune Responses Through  $\gamma$ Fc Receptors", American Academy of Allergy, Asthma & Immunology, San Diego, CA, March 5, 2000.
47. Moderator: FIT/AAAI Symposium: "Vasculitis", American Academy of Allergy, Asthma & Immunology mtg., San Diego, CA, March 6, 2000.
48. Co-Moderator: Afternoon symposium (CIS/PAGID): "Molecular Immunodeficiencies: The Y2K Crop", American Academy of Allergy, Asthma & Immunology mtg., San Diego, CA, March 7, 2000.
49. Invited Speaker: "NK Cell Deficiency", Northwest Allergy Forum, Victoria, British Columbia, May 20, 2000.
50. Invited Speaker; "Immunodeficiency: Case Studies", Northwest Allergy Forum, Victoria, British Columbia, May 20, 2000.
51. Invited Speaker: "Upstream Modulation of the Immune System: (Debate) Risky Business". ATS International Conf 2001, San Francisco, May 18, 2001.
52. Invited Speaker: "Immunology and Surgical Failures". Advanced Concepts in Functional Endoscopic Sinus Surgery, 9<sup>th</sup> annual UIHC Oto course, June 8, 2001
53. Invited Speaker: "CpG-Induced Activation of NK Cells in Mice and Humans", Activating Immunity with CpG Oligos Symposium, Amelia Island, FL 10/7/01-10/10/01.

**III. SCHOLARSHIP (Cont.)**

54. Co-Moderator, didactic workshop: “Autoimmunity Due to Single Gene Defects”, American Academy of Allergy, Asthma & Immunology annual meeting, New York, NY, March 2, 2002.
55. Co-Chair, Minisymposium, “Molecular Biology of Allergy/Immune Response”, American Academy of Allergy, Asthma & Immunology annual meeting, New York, NY, March 5, 2002..
56. Co-Moderator, Oral Abstract Session, “BCI 2003: From Cells to Genes”, American Academy of Allergy, Asthma & Immunology annual meeting, Denver, CO, March 10, 2003.
57. Moderator, Workshop, “Stevens-Johnson’s Syndrome and Toxic Epidermal Necrolysis: is there a Role of IVIG?” American Academy of Allergy, Asthma & Immunology annual meeting, Denver, CO, March 10, 2003.
58. Symposium Moderator, “Physiology of the Human Immune Response: 60 Years of Progress”, American Academy of Allergy, Asthma & Immunology annual meeting, Denver, CO, March 11, 2003.
59. Co-Chairman, “”Animal Models of Disease” in the Free Communication Session at World Allergy Organization (WAO) Congress XVIII ICACI, Vancouver, Canada, September 7, 2003.
60. Consultant, NIH: Asthma Phenotypes Initiative mtg., San Francisco, CA, March 19, 2004.
61. Discussion Leader, Seminar: “NK Cells in Health and Disease”, American Academy of Allergy, Asthma & Immunology ann. mtg., San Francisco, March 23, 2004.
62. Moderator: “Overview: Cytokines and their Receptors” – State-of-the-Art Session, American Academy of Allergy, Asthma & Immunology annual mtg., San Antonio, Texas March 19, 2005.
63. Discussion Leader: “Is an Immune Workup Necessary and Appropriate in Chronic Rhinosinusitis?”, Breakfast seminar, AAAAI ann. mtg., San Antonio, March 20, 2005.
64. Moderator: “Homeostatic Regulation of T Cells” BCI Interest Section Forum, AAAAI ann. mtg., San Antonio, Texas, March 20, 2005.
65. Invited speaker: World Allergy Congress, “Strategies to Inhibit IgE Synthesis” at ACAAI Symposium-Future Therapies in Allergic Airways Diseases. Munich, Germany, June 29, 2005.
66. Moderator: “Seeing is Believing: Host and Hostility”, Plenary Session, AAAAI ann. mtg., Miami Beach, FL March 4, 2006.
67. Chair: “Molecular Scalpels for Immune Modulation”, Plenary Session, AAAAI annual mtg., San Diego, CA, Feb 27, 2007.

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**III. SCHOLARSHIP (Cont.)**

68. Chair, Satellite Symposium, 2007 FOCIS annual mtg., San Diego, June 2007.
69. Moderator: “Therapeutic Manipulation of the Immune System with Vaccines: Allergic Disease, Influenza and Infectious Diseases”, Plenary session, AAAAI annual mtg., Philadelphia, PA, March 16, 2008.
70. Speaker: “Advancing to Leadership: From the Towers or the Trenches”, course: Reaping the Rewards of Academic Allergy & Immunology at AAAAI annual mtg, Washington, DC, March 13, 2009.

Visiting Professorships:

- |          |  |
|----------|--|
| 3/31/97  | (College of Medicine): “Primary Immunodeficiency for the Practicing Physician.” Broadlawns Medical Center, Des Moines, IA.           |
| 11/20/98 | Invited Medicine Grand Rounds Speaker: "Antibody Deficiency Syndromes". East Carolina University Medical School, Greenville, NC.     |
| 6/18/04- | Invited speaker: Breakfast Seminar: Asthma and Allergy Society of  |
| 6/20/04  | Virginia, Virginia Beach, VA and Medical College of Virginia, Richmond, VA   |
| 4/19/06  | Invited Medicine Grand Rounds speaker: “When to Suspect Primary Immunodeficiency in an Adult”, Creighton University, Omaha, Nebraska |

**Pending Decisions** (grant proposals, book contracts)



#### IV. SERVICE

##### A. Offices Held in Professional Organizations

Editorships:

2002-2007 Editorial Board, Journal of Allergy and Clinical Immunology  
2010-Present Associate Editor, Journal of Allergy and Clinical Immunology

Review panels:

1982-present Reviewer, *Science*  
1987-present Reviewer, *Journal of Immunology*  
1987-present Reviewer, Veterans Administration Merit Review Proposals  
1987-present Reviewer, *Cancer Research*  
1990-1996 Reviewer, *Journal of Immunotherapy*  
1990-present Reviewer, *Chest*  
1990-present Reviewer, *Immunopharmacology*  
1990-present Reviewer, *Annals of Otolaryngology, Rhinology and Laryngology*  
1991-present Reviewer, *Schizophrenia Research*  
1991-present Reviewer, *Immunology and Infectious Diseases*  
1992-present Reviewer, *Journal of Allergy and Clinical Immunology*  
1994-present Reviewer, *Clinical Infectious Diseases*  
1995-present Reviewer, *J of Neuropathology and Experimental Neurology*  
1996-present Reviewer, *Spine*  
1997-present Primary Reviewer, *Journal of Immunology*  
2004-present Reviewer, *Allergy and Asthma Proceedings*  
2010 Reviewer, NIH/NIAID, Special Emphasis Panel, R34 grants.

Professional Affiliations:

1975- New York Academy of Science  
1975- American College of Physicians, Fellow  
1978- American Academy of Allergy, Asthma & Immunology, Fellow  
1981- American Association of Immunology  
1983-2004 American Federation for Medical Research  
1985- Central Society for Clinical Research  
1985- Iowa Society of Allergy and Immunology  
1990-92 Vice President  
1992-94 President  
1987- Clinical Immunology Society  
1988- American Society for Clinical Investigation  
1991- Association of Medical Laboratory Immunologists  
1993- The Society for Natural Immunity  
2004 American College of Allergy, Asthma & Immunology, Fellow

Departmental, collegiate, or university committees:

Research and Development Committee, Iowa City VA Medical Center (1983-86)

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**IV. SERVICE (Cont.)**

Chairperson of "Committee of Animal Research," Iowa City VA Medical Center (1985-89)  
Department of Internal Medicine Fellowship Recruiting Committee, University of Iowa College of Medicine  
Holden Comprehensive Cancer Center, Member (1980-present)  
University of Iowa Cancer Center Research Committee  
FACS Advisory Committee, University of Iowa, (1987-present)  
Executive Committee, Immunology Group, U of I (1989-94)  
Director: University of Iowa Flow Cytometry Facility (1991-present)  
Steering Committee, Immunology Graduate Program (1993-94)  
Graduate Studies Committee, Immunology Graduate Program (1993-94)  
Biotechnology Drug Advisory Subcommittee (1993-present)  
Otolaryngology Departmental Review Committee (1994)  
Otolaryngology, Chair Search Committee (1994)  
University of Iowa Faculty Senate, Member (1996-02)  
Iowa City VA R & D Committee, Member (1996-98)  
Interdisciplinary PhD Program in Immunology, Member (1997-2003)  
Comprehensive Exam Committee, Immunology Graduate Program (1998-99; 2001-2002; 2009-2011)  
Iowa City VA R & D Committee, Chair (1998-99)  
University of Iowa Faculty Senate, Senator (2000-2003)  
House Staff Affairs Subcommittee, Member (2002-2003)

Regional / National Committees:

Committee on AIDS, American Academy of Allergy and Immunology (1988-92)  
Committee on *In Vitro* Tests, American Academy of Allergy and Immunology (1988-93)  
Audiovisual Committee, American Academy of Allergy and Immunol (1989-92)  
Program Committee, Basic Science Interest Section, American Academy of Allergy and Immunology (1989-90 & 1992-93)  
Primary Immune Deficiency Committee, American Academy of Allergy, Asthma and Immunology (1990-99)  
Vice President, Iowa Society of Allergy & Immunology, (1990-92)  
Immunology Merit Review Board, Veterans Affairs, (1991)  
Member, John Sealy Memorial Endowment Fund Review Panel, Department of Microbiology, University of Texas Medical Branch, Galveston, Texas (1991-present)  
Investigator, Cancer and Leukemia Group B (1992-present)  
President, Iowa Society of Allergy & Immunology, (1992-94)  
Public Relations Committee, American Academy of Allergy and Immunology (1992-95)  
Chair, HIV Committee, American Academy of Allergy & Immunology (1993-99)  
Member, Committee to Grant Research Awards, American Academy of Allergy and Immunology (1993-96)  
Member, Autoimmunity Committee, American Academy of Allergy & Immunology (1994-98)  
Member, In-Training Examination Subcommittee, American Academy of Allergy, Asthma & Immunology, Member (1996-02)  
Associate Chair, Professional Education Council, American Academy of Allergy, Asthma & Immunology (1998-2002)  
Member, Program Committee, American Academy of Allergy, Asthma & Immunology (1998-2003)  
Asthma Consultant, Wellmark Blue Cross Blue Shield of Iowa, 1998-present

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**IV. SERVICE (Cont.)**

Secretary, BCI Interest Section, American Academy of Allergy, Asthma & Immunology (1999-2001); Vice-Chair (2002-2003); Chair (2004-2005).  
Representative, ABIM, to Clinical and Laboratory Immunology (CLI) Joint Testing Committee, 2002-2003.  
Member, Training Program Directors' Executive Council, American Academy of Allergy, Asthma & Immunology (2001-2003).  
Charter Member, NIAID Data and Safety Monitoring Board (DSMB) for the Asthma and Allergic Diseases Component of the Immune Tolerance Network. (7/00- )  
Vice Chair, Professional Education Council, American Academy of Allergy, Asthma & Immunology (2002-2004)  
Member, International Health Care Delivery Committee Interest Section, American Academy of Allergy, Asthma & Immunology (2002-2006)  
Member, Board of Directors, American Board of Allergy and Immunology (2003-2008). Chair: 2007.  
Member, VA Merit Review Oncology Subcommittee, (2003-2006).  
Member, Immunomodulation Committee, American Academy of Allergy, Asthma & Immunology (2004-2006)  
Chair, Annual Meeting Program Committee, American Academy of Allergy, Asthma & Immunology (2004-2006)  
Chair, Abstracts Subcommittee, American Academy of Allergy, Asthma & Immunology (2004-2006)  
Nominating Committee, American Academy of Allergy, Asthma & Immunology 2005  
Member, American Academy of Allergy, Asthma & Immunol, Board of Directors, 2007-2011.  
Ad hoc member, NIH Fogarty International Study Section, 2007.  
Member, Committee on Certification, Subcertification, Recertification and Maintenance of Certification (COCERT), American Board of Medical Specialties [ABMS] (6/1/08 - 3/30/2011)  
Member, Nominating Committee, Clinical Immunology Society, 2009-present.  
Member, Medical Advisory Committee, Immune Deficiency Foundation, 2009-2011.  
Consultant, IDF Consulting Immunologist Program, Immune Deficiency Foundation, 2010-  
Member, AAAAI Web Oversight Group, for Website Review Panel, 2011-

Relevant community involvement

Member, Kidneeds Scientific Advisory Board, GCRC Foundation, Cedar Rapids, IA

Other:

**B. Clinical assignments (last 5 years)**

Inpatient:

1995-2003	Primary Immunodeficiency Consults, On-call continuous
1995-96	General Internal Medicine wards - 5BT-1 GH
1995-96	General Internal Medicine wards - Reserve
9/96	General Internal Medicine Wards - Reserve
8/97	General Internal Medicine Wards, 6RCE-1 GH

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**IV. SERVICE (Cont.)**

9/97

General Internal Medicine Wards - Reserve

4/2000

General Internal Medicine Wards, 6RCE-1 GH

Outpatient

2001-2002

Allergy-Immunology Clinic/Immunodeficiency Clinic:  
1 day a week

Allergy-Immunology Consults: 2 months/year

Primary Immunodeficiency Consults: On-Call

2002-2003

Allergy-Immunology Clinic/Immunodeficiency Clinic:  
1 day a week

Allergy-Immunology Consults: 2 months/year

Primary Immunodeficiency Consults: On-Call

2003-2004

Allergy-Immunology Clinic/Immunodeficiency Clinic:  
1 day a week

Allergy-Immunology Consults: 2 months/year

Primary Immunodeficiency Consults: On-Call

2004-2005

Allergy-Immunology Clinic/Immunodeficiency Clinic:  
1 day a week (7/04-11/04)

Allergy-Immunology Clinic/Immunodeficiency Clinic:  
1/2 day a week (12/04-6/05)

Allergy-Immunology Consults: 2 months/year

Primary Immunodeficiency Consults: On-Call

2005-2006

Allergy-Immunology Clinic/Immunodeficiency Clinic:  
1/2 day a week

Allergy-Immunology Consults: 2 months/year

Primary Immunodeficiency Consults: On-Call

2006-2007

Allergy-Immunology Clinic/Immunodeficiency Clinic:  
1/2 day a week

Allergy-Immunology Consults: 2 months/year

Primary Immunodeficiency Consults: On-Call

2007-2008

Allergy-Immunology Clinic/Immunodeficiency Clinic:  
1/2 day a week

Allergy-Immunology Consults: 1 month/year

Primary Immunodeficiency Consults: On-Call 24/7

2008-2009

Allergy-Immunology Clinic/Immunodeficiency Clinic:  
1/2 day a week

Primary Immunodeficiency Consults: On-Call 24/7

2009-2010

Allergy-Immunology Clinic/Immunodeficiency Clinic:  
1/2 day a week

Primary Immunodeficiency Consults: On-Call 24/7

7/2010-9/2010

Allergy-Immunology Clinic/Immunodeficiency Clinic:  
1/2 day a week

Primary Immunodeficiency Consults: On-Call 24/7