

**Date Prepared:** 7/1/19  
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**Place of Birth:** New York City, NY

**Education:**

<u>Year</u>	<u>Degree</u>	<u>Field of Study</u>	<u>Institution</u>
1986	B.S.	Biology (Honors)	Cornell University
1994	M.D.	Medicine	University of Michigan
1994	Ph.D	Cell and Mol Biology (Laboratory of Dr. Ronald Koenig)	University of Michigan

**Postdoctoral Training:**

Clinical Training:

<u>Year</u>	<u>Title</u>	<u>Institution</u>
1994-1995	Intern in Medicine	Brigham and Women's Hosp.
1995-1996	Resident in Medicine	Brigham and Women's Hosp.
1996-1999	Fellow in Endocrinology and Metabolism	Massachusetts General Hosp.

Research Training:

<u>Year</u>	<u>Title</u>	<u>Institution</u>
1997-2001	Postdoctoral Fellow (Laboratory of Dr. Bruce Spiegelman)	Dana-Farber Cancer Institute

**Faculty Academic Appointments:**

<u>Year</u>	<u>Position</u>	<u>Institution</u>
1999-2002	Instructor in Medicine	Harvard Medical School
2002-2010	Assistant Professor of Medicine	Harvard Medical School

2003-	Member, Ph.D Program in Biological and Biomedical Sciences	Harvard Medical School
2004-2014	Associate Member	Broad Institute
2014-	Institute Member	Broad Institute
2010-2014	Associate Professor of Medicine	Harvard Medical School
2014-	Professor of Medicine	Harvard Medical School

### **Appointments at Hospitals/Affiliated Institutions:**

<u>Year</u>	<u>Position</u>	<u>Institution</u>
1999-2001	Attending Physician	Massachusetts General Hospital Diabetes Unit
2001-	Attending Physician	BIDMC

### **Other Professional Positions:**

<u>Year</u>	<u>Role</u>	<u>Company</u>
1999-2005	Medical Director, Diabetes	Veritas Medicine, Inc.
1999-	<i>Ad hoc</i> consultant for Astra-Zeneca, Synta Pharmaceuticals, Novartis, Fidelity Biosciences, Orbimed, Atherogenix, FoldRx	

### **Major Administrative Leadership Positions:**

<u>Year</u>	<u>Position</u>	<u>Institution</u>
2002-2006	Organizer, Endocrine Grand Rounds	BIDMC
2006-2016	Program Director, Fellowship in Endocrinology and Metabolism	BIDMC
2009-	Associate Director, Endocrinology T32	BIDMC
2018-	Chief, Division of Endocrinology, Diabetes, and Metabolism	BIDMC

### **Committee Service:**

#### ***Local***

<u>Year</u>	<u>Committee</u>	<u>Role</u>	<u>Institution</u>
2003-2006	Clinical Oversight Committee	Member	Joslin
2002-2006	Endocrine Grand Rounds	Organizer	BIDMC
2003	Faculty Search Committee	Member	HSPH
2010	Faculty Search Committee	Member	TCH
2010	Faculty Search Committee	Chair	BIDMC
2010-2017	HST Interviewer	Member	HMS
2012-2015	Research Cores Advisory Committee	Member	BIDMC
2013-2015	Broadnext10 Leadership Team	Member	Broad Institute
2014-	Institutional Partnership Committee	Member	Broad Institute
2018	Search Committee, Endocrine Division Chief	Member	MGH

## ***Regional***

<u>Year</u>	<u>Committee</u>	<u>Role</u>	<u>Institution</u>
2017-	COBRE External Advisory Committee Maine Medical Ctr	Member	University of

## **Professional Societies:**

<u>Year</u>	<u>Society</u>	<u>Role</u>
1994-	Massachusetts Medical Society	Member
1997-	AAAS	Member
2000-	American Diabetes Association	Member
2003, 2008-2015		Abstract Reviewer
2009-	Endocrine Society	Member
2012, 2017		Abstract Reviewer

## **Grant Review Activities:**

<u>Year</u>	<u>Committee</u>	<u>Role</u>	<u>Institution</u>
2003-2006	SBIR Review Committee	Member	NIH/NIDDK
2003	Internal Site Review	Member	NIH/NICHD
2011	CADO Study Section	Ad Hoc Member	NIH/NIDDK
2012-2016	CADO Study Section	Standing Member	NIH/NIDDK
2012, 2018	Special Emphasis Panel	Member	NIH/NIDDK
2018	4D Nucleome Needs Assessment Panel	Member	NIH/NIDDK
2018, 2019	Special Emphasis Panel	Member	NIH/NIDDK

*Ad hoc* reviewer for EMBH Zurich, Wellcome Trust, Cambridge UK, Univ. of Michigan, UCSF Diabetes Center, MGH BADERC, BNORC, University of Indiana Diabetes Center, Swiss National Foundation.

## **Editorial Activities:**

### ***Editorial Board***

*Molecular Endocrinology*

### ***Guest editor***

*PNAS*

### ***Ad hoc reviewer***

*Nature, Science, Cell, Cell Metabolism, New England Journal of Medicine, Nature Medicine, eLife, Science Translational Medicine, Science Signaling, Molecular Cell, Developmental Cell, Nature Communications, Cell Reports, EMBO Journal, Journal of Biological Chemistry, Genes and Development, Journal of Clinical Investigation, Molecular and Cellular Biology, PNAS, Journal of Clinical Endocrinology and Metabolism, Endocrinology, Diabetes, Molecular Endocrinology, American Journal of Physiology, Diabetologia, PLoS*

*Biology, PLoS Genetics, PLoS One, FASEB Journal, Trends in Endocrinology and Metabolism, Adipocyte, Molecular Metabolism*

**Honors and Prizes:**

<u>Year</u>	<u>Award</u>
1982-1986	National Merit Corporate Scholar
1986-1994	N.I.H. Medical Scientist Training Program Fellowship
1989	Burton Baker Memorial Award, University of Michigan
1992	Nichols New Investigator Award, Endocrine Society
1994	George R. DeMuth MSTP Award for Excellence
2003	Charles E. Culpeper Scholar in Medical Science
2009	Election to American Society of Clinical Investigation (ASCI)
2015	Election to Association of American Physicians (AAP)
2015	Endocrine Society Visiting Professorship in Obesity (Indiana U)
2016	Henry Brasza Lectureship in Diabetes Research (Wayne State Univeristy)
2016	Henderson Lectureship in Diabetes Research (University of Minnesota)
2017	Ray A. and Robert L. Kroc Lecturer in Diabetes and Endocrinology (UAB)
2018	Election to Interurban Clinical Club

**REPORT OF FUNDED AND UNFUNDED PROJECTS**

**Past Funding:**

- 1997-2002      “Adipogenic action of PPAR $\gamma$ : control by covalent modification”  
NIH/NIDDK    K08 DK02535  
PI  
This grant focused on the role of the master transcriptional regulator PPAR $\alpha$  in adipose conversion.
- 2000-2002      “Role of PPAR $\gamma$  in lineage determination and physiology”  
NIH/NIDDK    R03 DK58850  
PI  
This was an adjunct grant for the K08 (above), allowing me to hire a technician.
- 2001-2005      “Mechanisms and Strategies for Insulin Resistance in AIDS”  
NIH/NIDDK    R01DK59535  
Co-P.I.  
This grant allowed us to determine mechanisms by which anti-retroviral drugs affect adipose biology.
- 2002-2004      “Novel Transcriptional Pathways in Adipogenesis”  
NIH/NIDDK    BADERC Pilot and Feasibility Award  
PI  
This grant explored the role of new candidate transcription factors in adipocyte development.

- 2002-2007 “Novel Transcriptional Pathways in Adipogenesis”  
NIH/NIDDK R01DK63906  
PI  
This project involved using various genomic approaches to identify new transcription factors involved in adipocyte development.
- 2003-2006 “Comparative Genomic Approaches to Understanding the Transcriptional Basis of Adipogenesis”  
Rockefeller Brothers Fund Charles E. Culpeper Scholarship in Medical Science  
PI  
This grant allowed us to generate key animal models useful for studying adipose biology *in vivo*, based on BAC transgenesis.
- 2004-2006 “Role of O/E Proteins in Adipogenesis and Metabolism”  
Astra-Zeneca  
PI  
This project was directed at exploring the role of EBF proteins (then called O/E proteins) play in adipogenesis.
- 2005-2010 “Generation of humanized mice bearing risk alleles for Type 2 diabetes”  
ADA Pinnacle award (subcontract through Broad Institute)  
Co-PI
- 2007-2009 “Adipose Expression of Lipocalin 2 and Insulin Resistance”  
Takeda Pharmaceuticals  
PI  
This project addressed the role of the novel adipokine Lcn2 on systemic insulin sensitivity.
- 2008–2010 “Genomic Determinants of Leptin Expression”  
NIH/NIDDK R21DK078881  
PI  
This grant enabled us to identify novel transcriptional pathways regulating leptin expression.
- 2008- 2012 “Identification of Transcriptional Pathways in Adipogenesis and Obesity Using Genome-Wide DNase Hypersensitivity Analysis”  
American Diabetes Association Career Development Award  
PI  
This grant enabled us to establish expertise in epigenomics and metabolism, and led to a comprehensive epigenomic analysis of adipogenesis and insulin resistance.
- 2008-2012 “EBF Proteins in Adipocyte Differentiation and Metabolism”  
NIH/NIDDK R01DK078061  
PI  
This grant focused on the role of Ebf1 in adipocyte biology.

- 2009-2014 “Epigenomics of Human Insulin Resistance”  
NIH/NIEHS Roadmap R01 ES017690  
PI  
This grant allowed us to map epigenomic changes in insulin resistant mouse and human adipocytes and to identify novel causal transcriptional pathways.
- 2015-2017 “Calibrating Human Adipocyte Assays for Type 2 Diabetes Target Validation”  
Collaboration between Broad Institute and Merck Research Labs  
PI

**Current Funding:**

- 2010-2019 “Regulation of Nutrient Homeostasis by IRF4”  
NIH/NIDDK R01DK085171  
PI
- 2015-2024 “Transcriptional Basis of Human Insulin Resistance”  
NIH/NIDDK R01DK102173  
PI
- 2015-2020 “Role of IRF3 in Energy and Glucose Homeostasis”  
NIH/NIDDK R01DK102170  
PI
- 2017-2022 “TGFβ-mediated Transcriptional Reprogramming of Mature Adipocytes in Obesity”  
NIH/NIDDK R01DK1113669  
PI
- 2018-2023 “Generation of an Adipose Tissue Atlas in Mouse and Man”  
NIH/NIDDK RC2DK116691  
PI

**REPORT OF LOCAL TEACHING AND TRAINING**

**Teaching of Students in Courses**

2006-2009	Med Sci 220--Pathophysiology of disease BBS Graduate Students	HMS 2 hrs/year
2008-2016	Integrated Human Physiology HMS 1 <sup>st</sup> Year Medical Students	HMS 2 sessions/year
2011-	BCMP/HTMB235 BBS Graduate Students	HMS 2 sessions/year

### **Clinical Supervisory and Training Responsibilities**

2002-	BIDMC Endocrine Consult Service	2-4 weeks/year
2004-2010	BIDMC Ambulatory Endocrine Clinic Preceptor, Medical Residents	approx. 10 sessions/year
2005-2008	BIDMC Ambulatory Endocrine Clinic Clinic Preceptor, Dr. Jody Dushay	1 session/week

### **Laboratory and Other Research Supervisory and Training Responsibilities**

2002-	Supervision of post-doctoral research fellows (average 6-8/yr)	Daily mentorship
2005-	Supervision of Harvard graduate students (average 1/yr)	Daily mentorship

### **Formally Supervised Trainees**

2001-2007	Nicholas Houstis, MD, Ph.D Ph.D co-mentor (with Eric Lander) Cardiology Fellow, MGH	
2003-2007	Qing-Wu Yan, Ph.D Post-doctoral mentor Instructor, Tufts University Med Ctr	
2003-2006	Maria Jimenez, Ph.D Post-doctoral mentor Fellowship from the Swiss National Research Foundation, as well as an AHA Post-doctoral award. Instructor, University of Lausanne	
2003-2005	Songtao Yu, Ph.D Post-doctoral mentor Research Assistant Professor, Northwestern University	
2007-2009	Deepanwita Prusty, MD, Ph.D Post-doctoral mentor Private Endocrine Practice	
2005-2011	Jun Eguchi, MD, Ph.D Post-doctoral mentor AHA Post-doctoral award winner	

Currently Assistant Professor and Chief of Medical Staff, Okayama University  
Graduate School of Medicine, Japan

- 2005-2011 Zhao Xu, Ph.D  
Post-doctoral mentor  
AHA Post-doctoral award winner  
Currently Senior Scientist, Arrowhead Research
- 2007-2011 Lucy Jun  
BBS graduate student thesis advisor  
AHA Pre-doctoral award winner.  
Thesis: “Mechanisms of Insulin Resistance: A Possible Role for Lipocalin 2?”  
Currently Senior Scientist, Vertex Pharmaceuticals
- 2007-2012 Xun Wang  
BBS graduate student thesis advisor  
Venture Capitalist  
Thesis: “IRF3 is a Critical Regulator of Adipose Glucose and Energy Homeostasis”
- 2008-2015 Sona Kang, Ph.D  
Post-doctoral mentor  
AHA Post-doctoral award winner, AHA Scientist Development Award winner  
Currently Assistant Professor, Dept. of Nutritional Sciences, UC Berkeley
- 2008-2013 Michael Griffin, Ph.D  
Post-doctoral mentor  
NIH F32 recipient  
Currently Assistant Professor, Midwestern University
- 2009-2011 Christiane Wrann, DVM, Ph.D  
Post-doctoral mentor  
DFG Fellowship recipient from the German Research Foundation  
Currently Assistant Professor, Massachusetts General Hospital and Harvard Medical School
- 2009-2016 Linus Tsai, MD, Ph.D  
Post-doctoral mentor  
AHA Post-doctoral award winner, Catalyst grant winner, DoD Innovation Award winner  
Currently Assistant Professor, Beth Israel Deaconess Medical Center and Harvard Medical School
- 2010-2017 Xingxing Kong, Ph.D  
Post-doctoral mentor



AHA Post-doctoral award winner, AHA Scientist Development Grant winner,  
K99/R00 recipient  
Currently Assistant Professor, UCLA

- 2011-2013 Eleanna DeFilippis, MD, Ph.D  
Post-doctoral mentor  
EFF award winner  
Currently Assistant Professor, Mayo Clinic Arizona
- 2012-2017 Manju Kumari, Ph.D  
Post-doctoral mentor  
Currently Junior Group Leader, University of Hamburg-Eppendorf
- 2012-2019 Hyun Cheol Roh, Ph.D  
Post-doctoral mentor  
Charles A. King Trust Post-doctoral award winner  
ADA Post-doctoral Award winner  
Currently Assistant Professor, Indiana University School of Medicine
- 2015- Frankie Heyward, Ph.D  
Post-doctoral mentor  
AHA Post-doctoral Award winner
- 2016-2018 Jin Li, Ph.D  
Post-doctoral mentor  
Currently Assistant Professor, Fudan University
- 2017- Shuai Yan, Ph.D  
Post-doctoral mentor
- 2018- Margo Emont, Ph.D  
Post-doctoral mentor
- 2018- Suraj Patel, MD, Ph.D  
Post-doctoral mentor
- 2018- Anlu Chen, Ph.D  
Post-doctoral mentor
- 2018- Nufar Edinger, Ph.D  
Post-doctoral mentor
- 2018- Erwei Li, Ph.D  
Post-doctoral mentor

Pre-qualifying exam committees:

Year                      Name

2006	Lorena Mora-Blanco
2007	Lydia Finley
2008	Jessica Hall
2017	Jiunn Song

Thesis Advisory Committees:

2003-2007	Lindsay Rohas (Lab of B. Spiegelman) (Committee Chair)
2006-2011	Joshua Baughman (Lab of V. Mootha)
2008-2010	Shannon Reilly (Lab of C.H. Lee)
2009-2011	Dina Fomina (Lab of S. Schreiber)
2011-2014	Meric Ericki (Lab of G. Hotamisligil)
2013-2016	Victor Rusu (Lab of D. Altshuler/S. Schreiber)
2014-2016	Michael Guo (Lab of J. Hirschhorn)
2014-2017	Xiaoji Wu (Lab of Y. Zhang)

Thesis Defense Committees:

2004	Melina Fan (Lab of B. Spiegelman)
2005	James Rhee (Lab of B. Spiegelman)
2005	Ji Luo (Lab of L. Cantley)
2006	Kathryn Wellen (Lab of G. Hotamisligil)
2011	Joshua Baughman (Lab of V. Mootha)
2016	Ozlem Senol-Cosar (Lab of M. Czech, UMass)
2017	Victor Rusu (Lab of D. Altshuler/S. Schreiber)
2017	Mustafa Yilmaz (Lab of G. Hotamisligil)

**Local Invited Presentations**

*No presentations below were sponsored by outside entities.*

- 2002 “Role of PPARgamma in Adipogenesis”  
Research seminar, Harvard School of Public Health
- 2008 “Novel Transcriptional Pathways in Adipocyte Biology”  
Research seminar, Joslin Diabetes Center
- 2008 “Genomic Analysis of Insulin Resistance”  
Endocrine Grand Rounds, Massachusetts General Hospital
- 2008-2011 “Biomedical Careers for Geneticists”  
Panel discussion, Broad Institute of Harvard and MIT
- 2009 “Roadmap to a Successful Research Collaboration”  
Panel Discussion, Center for Faculty Development, BIDMC
- 2009 “Interferon Regulatory Factors and Adipose Tissue”  
Invited speaker, National VA Research Week Symposium, West Roxbury VAMC

- 2010 “Epigenomic Approaches to Adipocyte Biology”  
Research Seminar, BIDMC Research Day
- 2010 “Epigenomic Approaches to Adipocyte Biology”  
Research Seminar, Medical and Population Genetics Group, Broad Institute
- 2010 “Epigenomic Approaches to Adipocyte Biology”  
Research Seminar, CVBR, BIDMC
- 2011 “An Epigenomic Basis for Metabolic Dysfunction: Changes Taken out of Sequence”  
Endocrine Grand Rounds, BIDMC
- 2011 “An Epigenomic Basis for Metabolic Dysfunction: Changes Taken out of Sequence”  
Research Seminar, Joslin Diabetes Center
- 2012 “An Epigenomic Basis for Metabolic Dysfunction: Changes Taken out of Sequence”  
Endocrine Grand Rounds, MGH
- 2012 “An Epigenomic Basis for Metabolic Dysfunction: Changes Taken out of Sequence”  
Research Seminar, Forsyth Institute
- 2013 “Epigenomics of Metabolism in Health and Disease”  
Keynote Speaker, Appasani Research Conference on Diabetes, Obesity and Cardiovascular Diseases
- 2013 “Epigenomics of Metabolism in Health and Disease”  
Invited speaker, John B. Little Symposium, Harvard School of Public Health
- 2013 “Epigenomics of Insulin Resistance”  
Invited speaker, Joslin International Symposium on Diabetes
- 2014 “Epigenomics of Insulin Resistance”  
Visiting Scientist, Brigham and Women's Hospital Divisions of Cardiovascular Medicine, Diabetes, and Metabolism
- 2014 “Epigenomics of Insulin Resistance”  
Invited speaker, Division of Cardiology, BIDMC
- 2014 “Epigenomics of Insulin Resistance”  
Invited speaker, Division of Genetics, Brigham and Women’s Hospital
- 2015 “The Skinny on Fat”  
Invited speaker, Medical Grand Rounds, BIDMC
- 2015 “Epigenomics of Insulin Resistance”  
Invited speaker, Insulin Resistance in Common Diseases, Boston, MA

Sponsored by the Royal Swedish Academy of Sciences

- 2015 “Epigenomics of Insulin Resistance”  
Interurban Clinical Club, Boston, MA
- 2016 “Transcriptional Basis of Insulin Resistance”  
Invited speaker, Harvard School of Dental Medicine
- 2016 “Adventures in Adipose Biology”  
Invited speaker, Acceleron Pharmaceuticals
- 2016 “The Skinny on Fat”  
Invited speaker, Medical Grand Rounds, MetroWest Medical Center
- 2017 “Insights from Epigenomic Analysis of Human and Murine Adipose Tissue”  
Invited speaker, Whittier Cardiovascular Institute, BU School of Medicine
- 2017 “Epigenomic Approaches to Adipose Biology”  
Medical Population Genetics Group, Broad Institute, Cambridge, MA
- 2017 “Insights from Epigenomic Analysis of Human and Murine Adipose Tissue”  
Invited speaker, Novartis
- 2018 “The Skinny on Fat”  
Endocrine Grand Rounds, BU School of Medicine
- 2019 “Brown, White, and Beige Adipose Tissue: Biological and Therapeutic Implications”  
Blackburn Obesity Course, Harvard Medical School

**REPORT OF REGIONAL, NATIONAL AND INTERNATIONAL INVITED TEACHING AND PRESENTATIONS**

*No presentations below were sponsored by outside entities.*

**Regional Invited Presentations and Courses**

- 2004 “Role of ROS in Insulin Resistance”  
Research Seminar, Synta Pharmaceuticals, Lexington, MA
- 2005 “Role of ROS in Insulin Resistance”  
Research Seminar, BONRC, Boston University
- 2006 “Role of ROS in Insulin Resistance”  
Research Seminar, Novartis, Cambridge, Mass
- 2009 “Epigenomic Analysis of Adipogenesis”  
Endocrine Grand Rounds, Yale University, New Haven, CT

- 2009 “Pathway Discovery in Adipose Biology Using Epigenomics”  
Research Seminar, UMass Medical School, Worcester, MA
- 2010 “Pathway Discovery in Adipose Biology Using Epigenomics”  
Research Seminar, Maine Medical Research Institute, Portland, ME
- 2011 “An Epigenomic Basis for Metabolic Dysfunction: Changes Taken out of Sequence”  
Research Seminar, BONRC, Boston University
- 2012 “Epigenetics and Metabolism”  
BONRC Research Day, Boston University
- 2013 “Epigenetics and Metabolism”  
Endocrine Grand Rounds, Brown University, Providence, RI
- 2014 “Epigenomic Approaches to Adipose Biology”  
Yale University Program in Integrative Cell Signaling and Neurobiology of Metabolism
- 2016 “Interferon Regulatory Factors in Obesity and Adipose Biology”  
Research Seminar, BONRC, Boston University
- 2016 “Epigenomic Approaches to Adipose Biology”  
University of Massachusetts School of Medicine

### **National Invited Presentations and Courses**

- 2002 “Adipogenesis and the Lymphatic System”  
Symposium on ‘The Lymphatic Continuum’, NIH, Bethesda, MD
- 2006 “Therapeutic Strategies Involving PPAR Modulators”  
Symposium speaker, Endocrine Society Annual Meeting, Boston, MA
- 2006 “A Genomic Approach to Insulin Resistance”  
Symposium speaker, Obesity Society Annual Meeting, Boston, MA
- 2006 “A Genomic Approach to Insulin Resistance”  
Research Seminar, University of Michigan, Dept. of Physiology, Ann Arbor, MI
- 2007 “A Genomic Approach to Insulin Resistance”  
Endocrine Grand Rounds, Columbia University, New York City, NY
- 2007 “A Genomic Approach to Insulin Resistance”  
Endocrine Grand Rounds, UCSF, San Francisco, CA
- 2007 “Role of ROS in Insulin Resistance”  
Invited speaker, Gordon Conference on Oxidative Stress, Ventura, CA

- 2007 “A Genomic Approach to Insulin Resistance”  
Symposium speaker, American Diabetes Assn Annual Meeting, Chicago, IL
- 2008 “A Genomic Approach to Insulin Resistance”  
Invited speaker, Keystone Symposium on Oxidative Stress and Longevity  
Copper Mountain, CO
- 2008 “Novel Transcriptional Pathways in Adipose Biology”  
Invited speaker, Gordon Conference on Adipose Biology, Ventura, CA
- 2008 “Pathway Discovery in Adipose Biology Using Epigenomics”  
Symposium speaker, Obesity Society Annual Meeting, Phoenix, AZ
- 2009 “Pathway Discovery in Adipose Biology Using Epigenomics”  
Research Seminar, Morehouse University, Atlanta, GA
- 2009 “Pathway Discovery in Adipose Biology Using Epigenomics”  
Research Seminar, UT Southwestern, Dallas, TX
- 2009 “Pathway Discovery in Adipose Biology Using Epigenomics”  
Research Seminar, NYU Langone School of Medicine, NYC, NY
- 2009 “Pathway Discovery in Adipose Biology Using Epigenomics”  
Symposium speaker, Endocrine Society Annual Meeting, Washington, D.C.
- 2010 “Pathway Discovery in Adipose Biology Using Epigenomics”  
Research Seminar, University of Pennsylvania, Philadelphia, PA
- 2010 “Epigenomic Approaches to Metabolic Disease”  
Invited speaker, NIH Roadmap Meeting, Bethesda, MD
- 2011 “Epigenomic Analysis of Adipogenesis”  
Invited speaker, Keystone Symposium on Adipose Biology, Keystone, CO
- 2011 “Pathway Discovery in Adipose Biology Using Epigenomics”  
Research Seminar, University of Washington, Seattle, WA
- 2011 “Pathway Discovery in Adipose Biology Using Epigenomics”  
Research Seminar, UCSF, San Francisco, CA
- 2011 “Epigenomic Approaches to Metabolic Disease”  
Invited speaker, Gordon Conference on Epigenetics, Easton, MA
- 2011 “Mechanisms of Adipogenesis”  
Symposium speaker, American Society of Nephrology, Philadelphia, PA

- 2012 “Epigenomics of Adipogenesis”  
Co-organizer and speaker, Keystone Symposium on Obesity, Santa Fe, NM
- 2013 “An Epigenomic Basis for Metabolic Dysfunction: Changes Taken out of Sequence”  
Endocrine Grand Rounds, University of Chicago, Chicago, IL
- 2013 “Epigenomics of Insulin Resistance”  
Symposium speaker, Keystone Symposium on Nutrition, Epigenetics, and Human Disease, Santa Fe, NM
- 2013 “Epigenomics of Insulin Resistance”  
Symposium speaker, Endocrine Society Annual Meeting, San Francisco, CA
- 2013 “Target Identification in Obesity Through Epigenomics”  
Invited speaker, American Diabetes Association Symposium: Biologic Responses to Weight Loss and Weight Regain, Washington, DC
- 2013 “Epigenomic Approaches to Metabolic Disease”  
Research Seminar, University of California, Berkeley, Berkeley, CA
- 2013 “Epigenomics of Insulin Resistance”  
Invited speaker, NIH Roadmap meeting (held in Boston)
- 2013 “Epigenomic Approaches to Metabolic Disease”  
Research Seminar, University of Illinois, Champaign-Urbana, IL
- 2014 “Epigenomic Approaches to Metabolic Disease”  
Research Seminar, University of Texas Southwestern Medical Center, Dallas, TX
- 2014 “Epigenomic Approaches to Metabolic Disease”  
Research Seminar, University of Kentucky Medical Center
- 2014 “Epigenomic and Transcriptional Aspects of Insulin Resistance”  
ASBMR Special Symposium on Insulin Resistance and Bone, Houston, TX
- 2015 “Epigenomics of Insulin Resistance”  
Levine Symposium, City of Hope, Duarte, CA
- 2015 “Role of Interferon Regulatory Factors in Metabolism”  
Research Seminar, University of New Mexico
- 2015 “Epigenomics of Insulin Resistance”  
Cincinnati Children’s Hospital Research Foundation
- 2015 “Epigenomic and Transcriptional Aspects of Insulin Resistance”  
University of Oklahoma Medical Research Foundation

- 2015 “Epigenomic and Transcriptional Aspects of Insulin Resistance”  
Duke University
- 2015 “IRF4-- a Key Thermogenic Regulator”  
Symposium speaker, American Diabetes Association 75<sup>th</sup> Scientific Sessions  
Boston, MA
- 2015 “Epigenetic and Transcriptional Basis of Insulin Resistance”  
Endocrine Society Visiting Professor, University of Indiana
- 2015 “Epigenetic and Transcriptional Basis of Insulin Resistance”  
Baylor University
- 2015 “Epigenetic and Transcriptional Basis of Insulin Resistance”  
Albert Einstein Medical College
- 2015 “Epigenetic and Transcriptional Basis of Insulin Resistance”  
Cornell University Medical School
- 2015 “Interferon regulatory factors as key transcriptional mediators of metabolism”  
Pennington Biomedical Research Center
- 2016 “Epigenomic Approaches to Adipose Tissue Biology”  
National Institutes of Health
- 2016 “Epigenomic and Transcriptional Approaches to Adipose Tissue Biology”  
9<sup>th</sup> Annual Brasza Lectureship  
Wayne State University
- 2016 “Epigenomic Approaches to Adipose Tissue Biology”  
Chair and Speaker, Imprinting of Cardiometabolic Network Memory in Obesity  
NHLBI Working Group
- 2016 “Interferon regulatory factors as key transcriptional mediators of metabolism”  
2016 Henderson Lectureship  
University of Minnesota
- 2016 “Epigenomic Approaches to Adipose Tissue Biology”  
University of Michigan
- 2016 “Epigenomic Control of Adipocyte Biology”  
American Thyroid Association Meeting, Basic Science Series for Trainees, Denver, CO
- 2017 “Epigenomic Insights into Mouse and Human Adipose Tissue”  
Invited Speaker, Keystone Symposium on Obesity and Adipose Tissue Biology,  
Keystone, CO



- 2017 “Epigenomic Approaches to Insulin Resistance in Mouse and Man”  
Vanderbilt University
- 2017 “Epigenomic Approaches to Insulin Resistance in Mouse and Man”  
Ray A. and Robert L. Kroc Lecturer in Diabetes and Endocrinology  
University of Alabama, Birmingham Comprehensive Diabetes Center
- 2017 “Epigenomic Approaches to Insulin Resistance in Mouse and Man”  
Northwestern University
- 2017 “A novel paradigm of brown adipose tissue-skeletal muscle cross-talk mediated by IRF4”  
Columbia University
- 2017 “A novel paradigm of brown adipose tissue-skeletal muscle cross-talk mediated by IRF4”  
University of California, San Francisco
- 2017 “A novel paradigm of brown adipose tissue-skeletal muscle cross-talk mediated by IRF4”  
FASEB Glucose Transporter Biology Meeting, Snowmass, CO
- 2017 “Epigenomic basis of plasticity in beige adipocytes”  
Co-organizer and speaker, ADA Research Conference on Epigenetics
- 2018 “Epigenomic basis of plasticity in beige adipocytes”  
Invited Speaker, Keystone Symposium on Obesity and Adipose Tissue Biology,  
Keystone, CO
- 2018 “Epigenomic Insights into Mouse and Human Adipose Tissue”  
Case Western Reserve School of Medicine
- 2018 “Novel Insights into Brown Fat Function Controlled by IRF4”  
University of Utah School of Medicine
- 2018 “Interferon regulatory factor 4 (IRF4): a key regulator of adipocyte function in health and  
disease”  
Washington University School of Medicine
- 2019 “Interferon regulatory factor 4 (IRF4): a key regulator of adipocyte function in health and  
disease”  
City of Hope, Duarte, CA
- 2019 TBD  
University of Chicago
- 2019 TBD  
University of Illinois, Chicago
- 2019 TBD

Cornell University

2020 TBD  
University of Iowa

2020 TBD  
Mt. Sinai School of Medicine

### **International Invited Presentations and Courses**

2003 “Transcriptional Basis of Adipogenesis”  
Research Seminar, AstraZeneca, Molndal, Sweden

2004 “Novel Transcriptional Pathways in Adipogenesis”  
Invited speaker, Keystone Symposium on Adipose Biology, Banff, Alberta, Canada

2004 “PPAR Modulators in Clinical Practice”  
Invited speaker, Japanese Endocrine Society, Kyoto, Japan

2004 “ROS and Insulin Resistance”  
Research Seminar, Nippon Medical School, Dept. of Biochemistry, Tokyo, Japan

2004 “Novel transcriptional Pathways in Adipogenesis”  
3<sup>rd</sup> Throne Holst Symposium on Obesity, University of Oslo, Oslo, Norway

2005 “ROS and Insulin Resistance”  
Research Seminar, AstraZeneca, Molndal, Sweden

2006 “Genomic Approach to Insulin Resistance”  
Invited speaker, Keystone Symposium on Obesity, Vancouver, Canada

2006 “Update in Management of Type 2 Diabetes”  
“Update in Management of Obesity”  
Harvard Medical International Course on Endocrinology, Dubai, UAE

2008 “Novel Transcriptional Pathways in Adipose Biology”  
Co-organizer and Speaker, Keystone Symposium on Adipose Biology  
Banff, Alberta, Canada

2008 “A Genomic Approach to Insulin Resistance”  
Research Seminar, Okayama University, Okayama Japan

2008 “Novel Transcriptional Pathways in Adipose Biology”  
Invited speaker, 5<sup>th</sup> Annual Insulin Resistance and Metabolic Syndrome Study Group  
Tokyo, Japan

- 2009 “Pathway Discovery in Adipose Biology Using Epigenomics”  
Invited speaker, Novel Insights in Adipose Cell Functions, Paris, France
- 2010 “Pathway Discovery in Adipose Biology Using Epigenomics”  
Invited speaker, European Society of Human Genetics, Gothenburg, Sweden
- 2010 “Pathway Discovery in Adipose Biology Using Epigenomics”  
Research Seminar, AstraZeneca, Molndal, Sweden
- 2011 “Epigenomic Analysis of Adipogenesis”  
Research Seminar, Dept. of Clinical Biochemistry, Cambridge University, England
- 2011 “Epigenomic Analysis of Adipogenesis”  
Research Seminar, Max-Planck-Institute of Immunobiology, Freiburg, Germany
- 2012 “Epigenomic Analysis of Obesity and Insulin Resistance”  
Invited speaker, Adipose Tissue in Health and Disease, Benzon Foundation, Copenhagen
- 2012 “An Epigenomic Basis for Metabolic Dysfunction: Changes Taken out of Sequence”  
Symposium speaker, Dasman Diabetes Institute, Kuwait
- 2012 “An Epigenomic Basis for Metabolic Dysfunction: Changes Taken out of Sequence”  
Symposium speaker, Sixth Diabetes Leading-edge Conference, Chiba, Japan
- 2012 “An Epigenomic Basis for Metabolic Dysfunction: Changes Taken out of Sequence”  
Research Seminar, Karolinska Institut, Stockholm, Sweden
- 2013 “Epigenomics of Insulin Resistance”  
Invited speaker, Keystone Symposium on Nuclear Receptors, Alpbach, Austria
- 2013 “Epigenomics of Insulin Resistance”  
Invited speaker, World Diabetes Congress, Melbourne, Australia
- 2014 “Epigenomics of Insulin Resistance”  
Invited speaker, Xiangya Diabetes and Immunology symposium  
Xiangya Hospital, Changsha, China
- 2014 “Epigenomics of Insulin Resistance”  
Invited speaker, Peking Union Medical College
- 2014 “Epigenomics of Insulin Resistance”  
Invited speaker, Tsinghua University
- 2015 “Epigenomic Approaches to Adipose Tissue Biology”  
Invited Speaker, World Diabetes Congress, Vancouver
- 2016 “Epigenomic Approaches to Adipose Tissue Biology”

- Invited Speaker, McGill University
- 2016 “Epigenomic Approaches to Adipose Tissue Biology”  
Invited Speaker, University of Toronto
- 2017 “Epigenomic Approaches to Insulin Resistance in Mouse and Man”  
Invited Speaker, CNIO, Madrid, Spain
- 2018 “Epigenomic basis of plasticity in beige adipocytes”  
The 2nd Annual Conference for Chinese Society of Lipid Metabolism and Bioenergetics  
Invited Speaker, Shanghai, China
- 2018 “Adipose tissue: what the clinician needs to know”  
Metabolism Symposium  
Invited Speaker, Xi An Jiaotong University, China
- 2018 “Temperature-dependent Reprogramming of Beige Adipocytes”  
24<sup>th</sup> IUBMB Congress  
Invited Speaker, Seoul, South Korea
- 2018 “Temperature-dependent Reprogramming of Beige Adipocytes”  
Symposium on Immunometabolism  
Invited Speaker, Daegu, South Korea
- 2019 “Multifunctional Roles of Interferon Regulatory Factors in Metabolism”  
Invited Speaker, Keystone Symposium on Immunometabolism, Vancouver, BC
- 2019 “A novel adipose-lymphatic axis that regulates thermogenesis”  
Invited Speaker, Keystone Symposium on Diabetes, Whistler, BC
- 2019 “Novel Mechanisms of Adipose Thermogenesis”  
Diabetes and Insulin Resistance Congress, Tokyo, Japan

## **REPORT OF CLINICAL ACTIVITIES AND INNOVATIONS**

### **Current Licensure and Certification**

1996-	Massachusetts State License
1997-2007	ABIM Certification, Internal Medicine
1999-	ABIM Certification, Endocrinology and Metabolism (last renewed May, 2019)

### **Practice Activities**

Ambulatory Care	Outpatient Clinic	Adult Endocrinology Clinic	Once monthly
Endocrine Consults	Inpatient Service	Adult General Endocrine Service	4 weeks/year

## **REPORT OF TECHNOLOGICAL AND OTHER SCIENTIFIC INNOVATIONS**

### ***Patent PCT/US2007/018992***

“Use of Lipocalin 2 in the Regulation of Insulin Sensitivity”

## **REPORT OF SCHOLARSHIP**

### **Publications**

#### ***Peer-reviewed publications***

#### ***Research Investigations***

1. Binienda Z, **Rosen ED**, Kelleman A, Sadowsky DW, Nathanielsz PW, and Mitchell MD. Maintaining fetal normoglycemia prevents the increase in myometrial activity and uterine 13,14-dihydro-15-keto-prostaglandin F2alpha production during food withdrawal in late pregnancy in the ewe. *Endocrinology* 1990; 127: 3047-3051.
2. O'Donnell AL, **Rosen ED**, Darling DS, Koenig RJ. Thyroid hormone receptor mutations that interfere with transcriptional activation also interfere with receptor interaction with a nuclear protein. *Mol. Endocrinol.* 1991; 5: 94-99.
3. Arscott P, **Rosen ED**, Koenig RJ, Kaplan MM, Ellis T, Thompson N, Baker JR. Immunoreactivity to *Yersinia enterocolitica* antigens in patients with autoimmune thyroid disease. *J. Clin. Endocrinol. Metab.* 1992; 75: 295-300.
4. **Rosen ED**, O'Donnell AL, and Koenig RJ. Ligand dependent synergy of thyroid hormone and retinoid X receptors. *J. Biol. Chem.* 1992; 267: 22010-22013.
5. **Rosen ED**, Beninghof EG, and Koenig RJ. Dimerization interfaces of thyroid hormone, retinoic acid, vitamin D, and retinoid X receptors. *J. Biol. Chem.* 1993; 268: 11534-11541.
6. Wu Z, **Rosen ED**, Brun R, Hauser S, Adelmant G, Troy AE, McKeon C, Darlington GJ, and Spiegelman BM. Cross-regulation of C/EBPalpha and PPARgamma controls the transcriptional pathway of adipogenesis and insulin sensitivity. *Molecular Cell.* 1999; 3: 151-158.
7. **Rosen ED**, Sarraf P, Troy AE, Moore K., Bradwin G., Milstone DS, Spiegelman BM and Mortensen R. PPARgamma is required for the differentiation of adipose tissue in vivo and in vitro. *Molecular Cell.* 1999; 4: 611-617.
8. Yoon JC, Chickering TW, **Rosen ED**, Dussault B, Qin Y, Soukas A, Friedman JM, Holmes WE, and Spiegelman BM. Peroxisome proliferator-activated receptor gamma target gene encoding a novel angiopoietin-related protein associated with adipose differentiation. *Molecular and Cellular Biology.* 2000; 20: 5343-5349.
9. Moore K, **Rosen ED**, Fitzgerald ML, Randow F, Andersson LP, Altshuler D, Milstone DS, Mortensen RM, Spiegelman BM, and Freeman M. Role of PPARgamma in macrophage differentiation and cholesterol uptake. *Nature Medicine.* 2001; 7: 41-47.

10. **Rosen ED**, Hsu CH, Wang X, Sakai S, Freeman MW, Gonzalez FJ, and Spiegelman BM. C/EBPalpha induces adipogenesis through PPARgamma: a unified pathway. *Genes and Development*. 2002; 16:22-26.
11. Mueller E, Drori S, Aiyer A, Yie J, Sarraf P, Chen H, Hauser S, **Rosen ED**, Ge K, Roeder RG, and Spiegelman BM. Genetic analysis of adipogenesis through peroxisome proliferator-activated receptor g isoforms. *J. Biol. Chem.* 2002; 41925-41930.
12. Norris AW, Chen L, Fisher SJ, Szanto I, Ristow M, Jozsi AC, Hirshman MF, **Rosen ED**, Goodyear LJ, Gonzalez FJ, Spiegelman BM, Kahn CR. Muscle-specific PPARgamma-deficient mice develop increased adiposity and insulin resistance but respond to thiazolidinediones. *J Clin Invest*. 2003;112:608-18.
13. **Rosen ED**, Kulkarni RN, Sarraf P, Ozcan U, Okada T, Hsu CH, Eisenman D, Magnuson MA, Gonzalez FJ, Kahn CR, and Spiegelman BM. Targeted elimination of peroxisome proliferator-activated receptor gamma in beta cells leads to abnormalities in islet mass without compromising glucose homeostasis. *Molecular and Cellular Biology*. 2003; 23: 7222-7229.
14. Place AE, Suh N, Williams CR, Risingsong R, Honda T, Honda Y, Gribble GW, Leesnitzer LM, Stimmel JB, Willson TM, **Rosen E**, and Sporn MB. The novel synthetic triterpenoid, CDDO-imidazolide, inhibits inflammatory response and tumor growth in vivo. *Clin Cancer Res*. 2003; 9:2798-2806.
15. Mix KS, Coon CI, **Rosen ED**, Suh N, Sporn MB, Brinckerhoff CE. Peroxisome proliferator-activated receptor-gamma-independent repression of collagenase gene expression by 2-cyano-3,12-dioxooleana-1,9-dien-28-oic acid and prostaglandin 15-deoxy-delta(12,14) J2: a role for Smad signaling. *Mol Pharmacol*. 2004 ;65:309-18.
16. Xie J, Zhu H, Larade K, Ladoux A, Seguritan A, Chu M, Ito S, Bronson RT, Leiter EH, Zhang CY, **Rosen ED**, Bunn HF. Absence of a reductase, NCB5OR, causes insulin-deficient diabetes. *Proc Natl Acad Sci U S A*. 2004; 101:10750-5.
17. Costa-Guda J, **Rosen ED**, Jensen RT, Chung DC, Arnold A. Mutational analysis of *PPARG* as a candidate tumour suppressor gene in enteropancreatic endocrine tumours. *Clin Endocr*. 2005. 62; 603-606.
18. Sastre M, Dewachter I, Rossner S, Bogdanovic N, **Rosen E**, Borghgraef P, Evert BO, Dumitrescu-Ozimek L, Thal DR, Landreth G, Walter J, Klockgether T, van Leuven F, Heneka MT. Nonsteroidal anti-inflammatory drugs repress beta-secretase gene promoter activity by the activation of PPARgamma. *Proc Natl Acad Sci U S A* 2006; 103:443-448.
19. Houstis NE, **Rosen ED\***, Lander ES\*. Reactive oxygen species play a causal role in multiple forms of insulin resistance. *Nature*. 2006; 440:944-948. \*co-senior authors
20. Jimenez MA, Akerblad P, Sigvardsson M, **Rosen ED**. A critical role for Ebf1 and Ebf2 in the adipogenic transcriptional cascade. *Molecular and Cellular Biology*. 2007; 27:743-757.
21. Mukherjee A, Sidis Y, Mahan A, Raher MJ, Xia Y, **Rosen ED**, Bloch KD, Thomas MK, Schneyer AL. FSTL3 deletion reveals roles for TGF-beta family ligands in glucose and fat homeostasis in adults. *Proc Natl Acad Sci USA*. 2007;104:1348-53.
22. Yan QW, Yang Q, Mody N, Graham TE, Hsu CH, Xu Z, Houstis NE, Kahn BB, **Rosen ED**. The adipokine lipocalin 2 is regulated by obesity and promotes insulin resistance. *Diabetes*. 2007; 56: 2533-40.

23. Eguchi J, Yan QW, Schones DE, Kamal M, Hsu CH, Zhang MQ, Crawford GE, **Rosen ED**. Interferon regulatory factors are transcriptional regulators of adipogenesis. *Cell Metabolism*. 2008; 7:86-94.
24. Xu Z, Yu S, Hsu CH, Eguchi J, **Rosen ED**. The orphan nuclear receptor chicken ovalbumin upstream promoter-transcription factor II is a critical regulator of adipogenesis. *Proc Natl Acad Sci USA*. 2008; 105: 2421-2426.
25. Mikkelsen TS, Xu Z, Zhang X, Wang L, Gimble JM, Lander ES, and **Rosen ED**. Comparative epigenomic analysis of murine and human adipogenesis. *Cell*. 2010. 143; 156-169.
26. Bock J, Fukuyo Y, Kang S, Phipps ML, Alexandrova LB, Rasmussen KØ, Bishop AR, **Rosen ED**, Martinez JS, Chen HT, Rodriguez G, Alexandrov BS, and Usheva A. Mammalian stem cells reprogramming in response to terahertz radiation. *PLoS One*. 2010; 5: e15806.
27. Eguchi J, Wang X, Yu S, Kershaw EE, Chui PC, Dushay J, Estall JL, Klein U, Maratos-Flier E, and **Rosen ED**. Transcriptional control of adipose lipid handling by IRF4. *Cell Metabolism*. 2011; 13: 249-259.
28. Jun LS, Siddall CP, and **Rosen ED**. A minor role for lipocalin 2 in high fat diet-induced glucose intolerance. *American Journal of Physiology: Endocrinology and Metabolism*, 2011; 301: E825-35.
29. Wrann CD, Eguchi J, Bozec A, Xu Z, Mikkelsen T, Gimble J, Nave H, Wagner EF, Ong S-E, and **Rosen ED**. FOSL2 promotes adipocyte-specific leptin gene expression in humans and mice. *Journal of Clinical Investigation*, 2012; 122:1010-1021.
30. Kang S, Akerblad P, Kiviranta R, Gupta RK, Kajimura S, Griffin MJ, Min J, Baron R, **Rosen ED**. Regulation of early adipose commitment by Zfp521. *PLoS Biology*, 2013;10(11): e1001433.
31. Lee K, Russell S, Ussar S, Boucher J, Vernochet C, Mori M, Smyth G, Rourk M, Cederquist C, **Rosen E**, Kahn B, and Kahn CR. Lessons on conditional gene targeting in mouse adipose tissue. *Diabetes*, 2013; 62:864-74.
32. Kiviranta R, Yamana K, Saito H, Ho DK, Laine J, Tarkkonen K, Nieminen-Pihala V, Hesse E, Correa D, Määttä J, Tessarollo L, **Rosen ED**, Horne WC, Jenkins NA, Copeland NG, Warming S, Baron R. Coordinated transcriptional regulation of bone homeostasis by Ebf1 and Zfp521 in both mesenchymal and hematopoietic lineages. *J Exp Med.*, 2013; 210:969-85.
33. Eguchi J, Kong X, Tenta M, Wang X, Kang S, and **Rosen ED**. Interferon regulatory factor 4 regulates obesity-induced inflammation through regulation of adipose tissue macrophage polarization. *Diabetes*, 2013; 62:3394-403.
34. Ziller MJ, Gu H, Müller F, Donaghey J, Tsai LT-Y, Kohlbacher O, De Jager PL, **Rosen ED**, Bennett DA, Bernstein BE, Gnirke A, and Meissner A. Charting a dynamic methylation landscape of the human genome. *Nature*, 2013; 500:477-481.
35. Bozec A, Bakiri L, Jimenez M, **Rosen ED**, Catala-Lehnen P, Schinke T, Schett G, Amling M, Wagner E. Osteoblast-specific expression of Fra-2/AP-1 controls adiponectin/osteocalcin expression and affect metabolism. *J Cell Sci*. 2013, 126:5432-40.
36. Griffin MJ, Zhou Y, Kang S, Zhang X, Mikkelsen TS, **Rosen ED**. Early B-cell factor-1 (Ebf1) is a key regulator of metabolic and inflammatory signaling pathways in mature adipocytes. *J Biol Chem*. 2013, 288:35925-39. PMID: PMC3861642

37. Kong X, Banks A, Liu T, Kazak L, Rao RR, Cohen P, Wang X, Yu S, Lo JC, Tseng Y-H, Cypess AM, Xue R, Kleiner S, Kang S, Spiegelman BM and **Rosen ED**. IRF4 is a key thermogenic transcriptional partner of PGC-1 $\alpha$ . *Cell*, 2014, 158:69-83.
38. Long JZ, Svensson KJ, Tsai L, Zeng X, Roh HC, Kong X, Rao RR, Lou J, Lokurkar I, Baur W, Castellot JJ, **Rosen ED**, and Spiegelman BM. A smooth muscle-like origin for beige adipocytes. *Cell Metabolism*, 2014, 19:810-20.
39. Majithia AR, Flannick J, Shahinian P, Guo M, T2D-GENES Consortium, SIGMA Consortium, **Rosen ED**, and Altshuler D. Rare variants in *PPARG* with decreased activity in adipocyte differentiation are associated with increased risk of type 2 diabetes. *Proc Natl Acad Sci USA*, 2014, 111:13127-32.
40. Jeffery E, Berry R, Church CD, Yu S, Shook BA, Horsley V, **Rosen ED**, Rodeheffer MS. Characterization of Cre recombinase models for the study of adipose tissue. *Adipocyte*, 2014, 3:206-11.
41. Kang S, Tsai L, Zhou Y, Everitts A, Xu S, Griffin MJ, Issner R, Whitton HJ, Garcia BA, Epstein CB, Mikkelsen TS, and **Rosen ED**. Identification of nuclear hormone receptor pathways causing insulin resistance by transcriptional and epigenomic analysis. *Nature Cell Biology*, 2015, 17:44-56.
42. Kumari M, Wang X, Lantier L, Lyubetskaya A, Eguchi J, Kang S, Tenen D, Roh HC, Kong X, Kazak L, Ahmad R, and **Rosen ED**. Adipose inflammation, insulin resistance and browning are linked through IRF3. *Journal of Clinical Investigation*, 2016, 126:2839-54.
43. Majithia AR, Tsuda B, Agostini M, Gnanapradeepan K, Rice R, Peloso G, Patel KA, Zhang X, Broekema MF, Patterson N, Duby M, Sharpe T, Kalkhoven E, **Rosen ED**, Barroso I, Ellard S; UK Monogenic Diabetes Consortium, Kathiresan S; Myocardial Infarction Genetics Consortium, O'Rahilly S; UK Congenital Lipodystrophy Consortium, Chatterjee K, Florez JC, Mikkelsen T, Savage DB, Altshuler D. Prospective functional classification of all possible missense variants in *PPARG*. *Nature Genetics*. 2016, 48:1570-75.
44. Roh HC, Tsai LT-Y, Lyubetskaya A, Tenen D, Kumari M, and **Rosen ED**. Simultaneous transcriptional and epigenomic profiling from specific cell types within heterogeneous tissues *in vivo*. *Cell Reports*, 2017, 18:1048-1061.
45. Campbell JN, Macosko EZ, Fenselau H, Pers TH, Lyubetskaya A, Tenen D, Goldman M, Verstegen AMJ, Resch JM, McCarroll SA, **Rosen ED**\*, Lowell BB\*, Tsai L\*. A Molecular Census of Arcuate Hypothalamus and Median Eminence Cell Types. *Nature Neuroscience*, 2017, 20:484-96. \*co-senior authors.
46. Guillermier C, Fazeli PK, Kim S, Lun M, Zuflacht JP, Milian J, Lee H, Francois-Saint-Cyr H, Horreard F, Larson D, **Rosen ED**, Lee RT, Lechene CP, and Steinhauser ML. Imaging mass spectrometry demonstrates age-related decline in human adipose plasticity. *JCI Insight*. 2017, 2:e90349.
47. Kazak L, Chouchani E, Stavrovskaya I, Lu G, Jedrychowski M, Egan D, Kumari M, Kong X, Erickson B, Szpyt J, **Rosen ED**, Murphy M, Kristal B, Gygi S, Spiegelman BM. UCP1-deficiency causes brown fat respiratory chain depletion and sensitizes mitochondria to calcium overload-induced dysfunction. *PNAS*. 2017, 114:7981-7986.
48. Shen Y, Roh HC, Kumari M, and **Rosen ED**. Adipocyte glucocorticoid receptor is important in lipolysis and insulin resistance due to exogenous steroids, but not insulin resistance caused by high fat feeding. *Molecular Metabolism*. 2017, 6:1150-1160.



49. Kazak L, Chouchani ET, Lu GZ, Jedrychowski MP, Bare CJ, Mina AI, Kumari M, Zhang S, Vuckovic I, Laznik-Bogoslavski D, Dzeja P, Banks AS, **Rosen ED**, Spiegelman BM. Genetic depletion of adipocyte creatine metabolism inhibits diet-induced thermogenesis and drives obesity. *Cell Metabolism*. 2017, 26:660-671.
50. You D, Nilsson E, Tenen D, Lyubetskaya A, Lo J, Jiang R, Deng J, Dawes BA, Scheele C, Ling C, **Rosen ED**, Kang S. Dnmt3a is an epigenetic mediator of adipose insulin resistance. *eLife*, 2017 Nov 1;6. pii: e30766.
51. Roh HC, Tsai, LT-Y, Shao M, Tenen D, Shen Y, Kumari M, Lyubetskaya A, Jacobs C, Dawes B, Gupta RK, and **Rosen ED**. Warming induces significant reprogramming of beige, but not brown, adipocyte cellular identity. *Cell Metabolism*, 2018, 27:1121-1137.
52. Ahmad R, Al-Roub A, Kochumon S, Akther N, Thomas R, Kumari M, Koshy MS, Tiss A, Hannun YA, Tuomilehto J, Sindhu S<sup>§</sup>, and **Rosen ED**. The synergy between palmitate and TNF- $\alpha$  for CCL2 production is dependent on the TRIF/IRF3 pathway: Implications for metabolic inflammation. *Journal of Immunology*, 2018, 200:3599-3611.
53. Kong X, Yao T, Zhou P, Kazak L, Tenen D, Lyubetskaya A, Dawes BA, Tsai L, Kahn BB, Spiegelman BM, Liu T, and **Rosen ED**. Brown adipose tissue controls skeletal muscle function via the secretion of myostatin. *Cell Metabolism*, 2018, 28:631-643.
54. De Filippis EA, Li T, and **Rosen ED**. Exposure of Adipocytes to Bisphenol-A *in vitro* Interferes with Insulin Action without Enhancing Adipogenesis. *PLoS One*, 2018;13(8):e0201122.
55. Kazak L, Rahbani J, Samborska B, Lu G, Jedrychowski M, Lajoie M, Zhang S, Ramsay L, Dou F, Tenen D, Chouchani E, Dzeja P, Watson I, Tsai L, **Rosen ED**, and Spiegelman BM. Ablation of adipocyte creatine transport impairs thermogenesis and causes diet-induced obesity. *Nature Metabolism*, 2019; *in press*.
56. Jiao Y, Ahmed U, Sim MFM, Bejar A, Zhang X, Talukder MMU, Rice R, Flannick J, Podgornaia AI, Reilly DF, Engreitz JM, Kost-Alimova M, Hartland K, Mercader J-M, Georges S, Wagh V, Tadin-Strapps M, Doench JG, Edwardson M, Rochford J, **Rosen ED**, Majithia A. Discovering metabolic disease gene interactions by correlated effects on cellular morphology. *Molecular Metabolism*, 2019; Mar 13. pii: S2212-8778(19)30118-8.

Other Peer-reviewed publications

1. **Rosen ED**, Puigserver P, Walkey CJ, Spiegelman BM. Transcriptional control of adipogenesis. *Genes and Development*, 2000; 14: 1293-1307.
2. **Rosen ED** and Spiegelman BM. Peroxisome-proliferator-activated receptor gamma ligands and atherosclerosis: ending the heartache. *Journal of Clinical Investigation*, 2000; 106: 629-631.
3. **Rosen ED**, Spiegelman BM. PPARgamma: A nuclear regulator of metabolism, differentiation, and cell growth. *J Biol Chem*. 2001; 276: 37731-4.
4. **Rosen ED** and MacDougald OA. Adipocyte differentiation from the inside out. *Nature Reviews Molecular and Cellular Biology*, 2006; 7:885-896.
5. **Rosen ED** and Spiegelman BM. Adipocytes as regulators of energy balance and glucose homeostasis. *Nature*, 2006; 444: 847-853.
6. **Rosen ED**, Xu Z, and Eguchi J. Transcriptional targets in adipocyte biology. *Expert Opinion on Therapeutic Targets*, 2009; 13:979-86.

7. Gupta RK, **Rosen ED**, and Spiegelman BM. Identifying novel transcriptional components controlling energy metabolism. *Cell Metabolism*, 2011;14:739-45.
8. Wrann CD and **Rosen ED**. New insights into adipocyte-specific leptin gene expression. *Adipocyte*, 2012; 1:168-172.
9. Kang S, Kong X, and **Rosen ED**. Adipocyte-specific transgenic and knockout models. *Methods in Enzymology*, 2014, 537:1-16.
10. **Rosen ED** and Spiegelman BM. What we talk about when we talk about fat. *Cell*, 2014, 156:20-44.
11. Kang S, Tsai L-T, and **Rosen ED**. Nuclear mechanisms of insulin resistance. *Trends in Cell Biology*, 2016, 26:341-351.
12. **Rosen ED**. Epigenomic and transcriptional control of insulin resistance. *J Internal Med*. 2016, 280: 443-456.
13. **Rosen ED**, Kaestner KH, Natarajan R, Patti ME, Sallari R, Sander M, and Susztak K. Epigenetics and Epigenomics: Implications for Diabetes and Obesity. *Diabetes*. 2018;67(10):1923-1931.

### ***Non Peer-reviewed publications***

#### ***Reviews, chapters, monographs and editorials***

1. **Rosen ED**, O'Donnell AL, Koenig RJ. Protein-protein interactions involving erbA superfamily receptors: through the TRAPdoor. *Mol. Cell. Endo*. 1991; 78: C83-C88.
2. **Rosen ED** and Spiegelman BM. Tumor necrosis factor-alpha as a mediator of the insulin resistance of obesity. *Curr. Opin. Endocr. Diab*. 1999; 6: 170-176.
3. **Rosen ED** and Spiegelman BM. Molecular regulation of adipogenesis. *Annual Review of Cell and Developmental Biology*, 2000; 16:145-171.
4. **Rosen ED**. The molecular control of adipogenesis, with special reference to lymphatic pathology. *Ann N Y Acad Sci*. 2002; 979:143-58.
5. **Rosen ED**. Energy balance: a new role for PPARgamma. *Current Biology*. 2003; 13:R961-3.
6. **Rosen ED**. New drugs from fat bugs? *Cell Metabolism*. 2006; 3:1-2.
7. **Rosen ED**. News and Views: Two paths to fat. *Nature Cell Biology*. 2015; 17:360-1.
8. Herman MA and **Rosen ED**. Making biological sense of GWAS data: Lessons from the FTO locus. *Cell Metabolism*. 2015; 22:538-9.
9. **Rosen ED**. Clinical Implications of Basic Research: Browning the fat by bugging the system. *New England Journal of Medicine*. 2016; 374:885-7.
10. **Rosen ED** and Su CC. *Principles of Hormone Action*. Williams Textbook of Endocrinology, 14<sup>th</sup> edition, 2018.

### **Doctoral Thesis**

*“Protein-protein interactions involving erbA superfamily members”*

Dept. of Cellular and Molecular Biology

University of Michigan

Lab of Dr. Ronald Koenig

### **NARRATIVE REPORT**

I spend the majority of my time (~70%) pursuing basic research. Other activities of note include administrative duties as Chief of the Division of Endocrinology, Diabetes and Metabolism (~25%) and patient care (~5%).

My research focuses on epigenomic and transcriptional pathways in metabolic health and disease, with a focus on adipocyte biology. My group has recent publications in *Cell*, *Nature*, *Cell Metabolism*, *Nature Cell Biology*, *PLoS Biology*, and *PNAS*. Additionally, I have authored several high profile reviews in my field, published in *Nature*, *Cell*, *Nature Reviews*, and *Cell Metabolism*. I have twice been selected as an organizer of the most important meeting in my field (the Keystone Symposium on Obesity and Adipocyte Biology; 2008 and 2012), and I have been an invited speaker at seven other Keystone Symposia and Gordon Conferences. Overall, I have presented our work at many national and international seminars and symposia spanning four continents. I have been continuously funded by the NIH (including PI of a Roadmap grant), and I am a past winner of an American Diabetes Association Career Development Award and a Charles E. Culpeper Scholarship. I was elected to the American Society of Clinical Investigation in 2009 and the Association of American Physicians in 2015. I have served as an *ad hoc* member of several NIH study sections and special emphasis panels, and from 2012-2016 I was a standing member of the CADO study section. Finally, I have been an Associate Member of the Broad Institute dating from the founding of that institution, and was recently named an Institute Member.

In addition to my research, I also participate in teaching at HMS and the BIDMC. The most prominent of these activities was my role as Director of the BIDMC-Joslin Diabetes Center Joint Fellowship Program in Endocrinology and Metabolism, a position I held from 2006-2016. During this time I implemented profound changes in the way we recruit and teach fellows. I also teach endocrinology to first year HMS students and to graduate students in the Leder Program. Finally, I have mentored many graduate students and post-doctoral fellows, several of whom are now junior faculty members at places like Harvard, UCLA, and UC Berkeley.

The most important of my significant supporting activities is my administrative work as Division Chief. Additionally, I am a clinical endocrinologist with a small but active practice, where I diagnose and treat numerous hormonal disorders ranging from diabetes to thyroid cancer to pituitary tumors. For one month each year I attend on the inpatient consult service, where I teach fellows and care for a variety of endocrinopathies. I have also served on a variety of HMS, BIDMC, and Broad committees, including the HST admissions committee.

I have been at an HMS-affiliated institution since 1994, as a resident (BWH), fellow (MGH), post-doc (DFCI), and faculty member (BIDMC, Broad). I have modeled my career after the great physician-scientists that I have encountered along the way, and I hope to continue to make contributions in research, clinical care, administration, and teaching.