



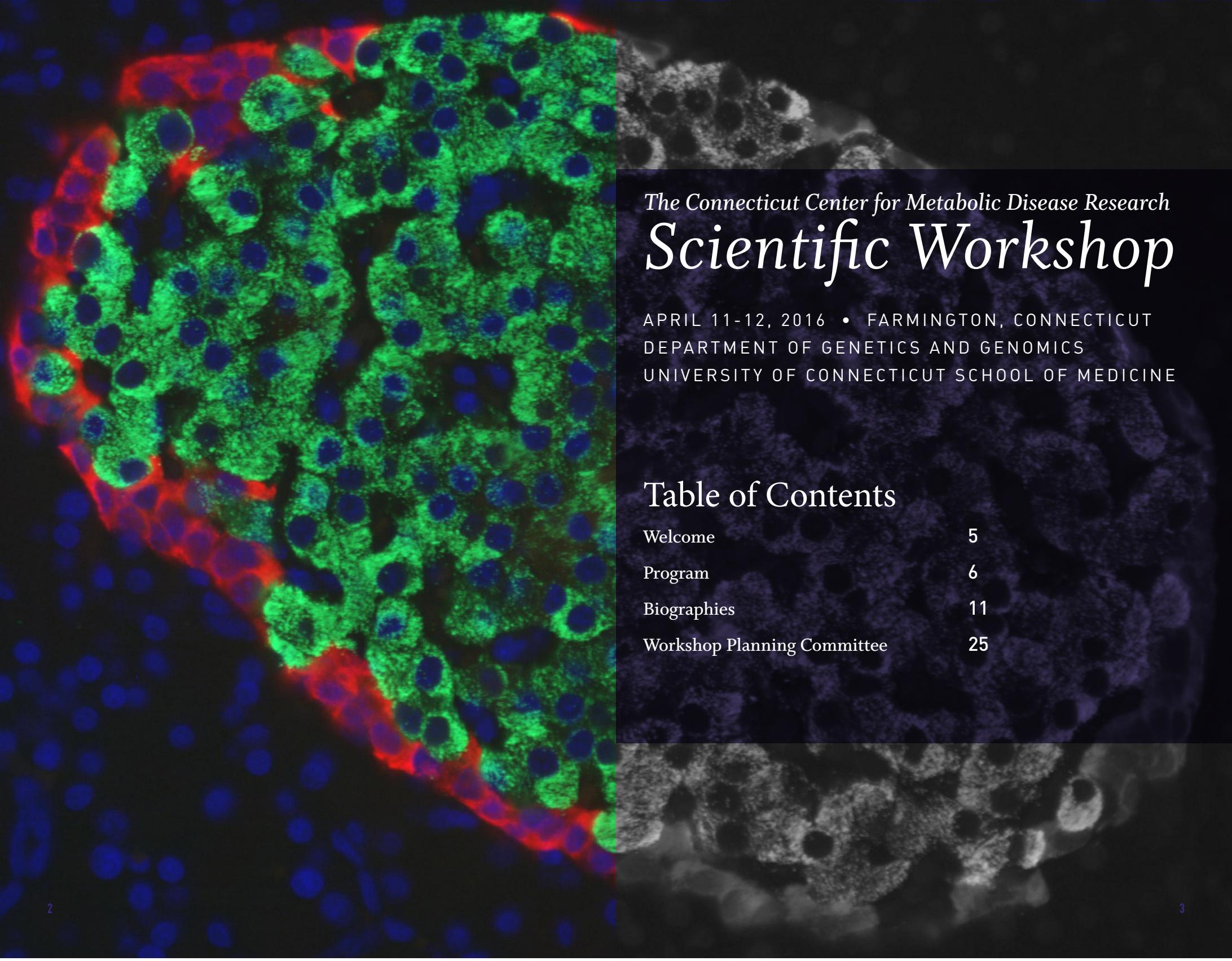
The Connecticut Center for Metabolic Disease Research

Scientific Workshop

APRIL 11-12, 2016 • FARMINGTON, CONNECTICUT

DEPARTMENT OF GENETICS AND GENOMICS

UNIVERSITY OF CONNECTICUT SCHOOL OF MEDICINE



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Welcome

The primary goal of the Connecticut Center for Metabolic Disease Research (CCMDR) is to fill a research void which exists because of a relative paucity of research being pursued in the area of metabolic diseases, especially pertaining to diabetes (T1D and T2D) and obesity. The CCMDR will mobilize the unique array of world class researchers from The Jackson Laboratory (JAX), the University of Connecticut (UCONN), Yale, and possibly other institutions, while blending their efforts into a focused endeavor to solve the riddles pertaining to metabolic diseases. It will also promote innovative opportunities in terms of translational science and entrepreneurship. This will entail a novel approach to coordinate existing and new expertise in the areas of immunobiology, cell biology, microbiota, and genomics. While the CCMDR will initially focus on diabetes and obesity, it will eventually be pursuing solutions to other metabolic disease entities while always seeking the development of new treatment options and commercial opportunities.

This undertaking is urgently necessary, especially since there are more than 350 million individuals worldwide suffering from diabetes and its devastating complications. In addition, the incidence of obesity has grown to enormous proportions. The World Health Organization estimates that at least a half billion people worldwide suffer from obesity. It has also been noted that one third of all Americans are obese. Making this worse is the fact that these two entities are growing exponentially and with catastrophic individual and societal effects and costs. Unfortunately, this crisis is occurring with relatively few new therapeutic options being developed for treating diabetes and obesity. This further emphasizes the compelling necessity for the creation of the CCMDR.

The CCMDR is projected to be a collaborative effort and to be fully integrated with work at Yale, UCONN, and JAX, as well as with other institutions, organizations, and companies. A clear objective of this effort will be to move metabolic research to a translational setting involving clinical application and commercialization. Its representative board will oversee funding opportunities and research initiatives to promote synergistic activities that will allow for discovery of new clinical approaches to alleviate disease and suffering from maladies such as diabetes and obesity, while also creating new entrepreneurial opportunities.

Dr. Milton Wallack



Yale



Special appreciation for funding this Workshop is extended to:
The Cohen Family UConn-Israel Start-up Fund

Program Day 1

MONDAY APRIL 11, 2016

The Edmund and Arlene Grossman Auditorium, Cell and Genome Sciences Building
University of Connecticut School of Medicine
400 Farmington Avenue, Farmington CT

8:30 am Registration and Continental Breakfast

9:00 am Welcoming Remarks

Bruce Liang, M.D.
Dean, University of Connecticut School of Medicine

Jeffrey Seemann, Ph.D.
Vice President for Research
University of Connecticut

Daniel Weiner, Ph.D.
Vice President for Global Affairs
University of Connecticut

State Representative Lonnie Reed

9:15 am Statement of Intent

Dr. Milton Wallack

SCIENTIFIC PRESENTATIONS / Session One

Moderator / Marc Lalande, Ph.D.

9:20 am *Weizmann Institute Metabolic Disease Research Overview*

Alon Chen, Ph.D., Weizmann Institute of Science

9:40 am *The role of the microflora in regulating tolerance and immune responses in humanized mice*

Kevan Herold, M.D., Yale School of Medicine

9:55 am *Endometrial mesenchymal stem cells: A novel stem cell for use in regenerative medicine*

Hugh Taylor, M.D., Yale School of Medicine

10:10 am Questions and Discussion

10:25 am Break

SCIENTIFIC PRESENTATIONS / Session Two

Moderator / Marc Lalande, Ph.D.

10:40 am *Loss of mitochondrial MTCH2 in muscle increases whole-body energy utilization and protects from diet-induced obesity*

Atan Gross, Ph.D., Weizmann Institute of Science

11:00 am *The Brain-Diabetes Connection*

Robert Sherwin, M.D., Yale School of Medicine

11:15 am *Molecular mechanisms of insulin resistance: Implications for obesity, lipodystrophy and type 2 diabetes*

Gerald Shulman, M.D., Ph.D., Yale School of Medicine

11:30 am Questions and Discussion

11:45 am Lunch

SCIENTIFIC PRESENTATIONS / Session Three

Moderator / Charles Lee, Ph.D.

1:00 pm *Brown adipose tissue macrophages control tissue innervation and homeostatic energy expenditure*

Sigalit Boura-Halfon, Ph.D., Weizmann Institute of Science

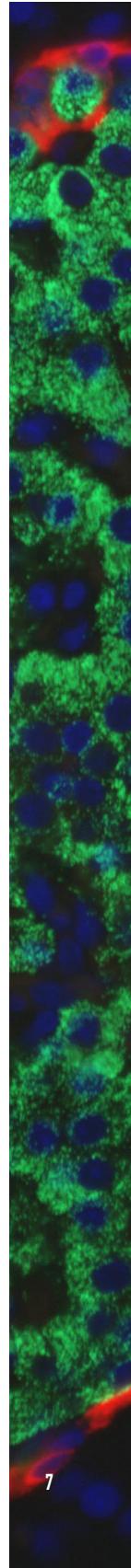
1:20 pm *Of mice and Neanderthals:*

Good genes gone bad in type 1 diabetes

David Serreze, Ph.D., The Jackson Laboratory

1:35 pm *Harnessing immune-metabolic interactions to enhance healthspan*

Vishwa Deep Dixit, DVM, Ph.D., Yale School of Medicine



Program Day 2

1:50 pm Questions and Discussion

SCIENTIFIC PRESENTATIONS / Session Four

Moderator / Charles Lee, Ph.D.

2:05 pm *Role of short chain fatty acids in beta cell function*

Michael Walker, Ph.D., Weizmann Institute of Science

2:25 pm *Glucose dysregulation in obese youth: A growing challenge*

Sonia Caprio, M.D., Yale School of Medicine

2:40 pm *Are eggs a healthy choice for diabetic patients?*

Maria-Luz Fernandez, Ph.D., University of Connecticut

2:55 pm Questions and Discussion

3:10 pm Break

SCIENTIFIC PRESENTATIONS / Session Five

Moderator / Charles Lee, Ph.D.

3:30 pm *CRFR1 inhibits AgRP neurons to allow appropriate sympathetic nervous system activity following challenge*

Yael Kuperman, Ph.D., Weizmann Institute of Science

3:50 pm *Privileged cells: Implications for disease and therapy*

Shangqin Guo, Ph.D., Yale School of Medicine

4:05 pm *T2D-associated sequence variant potentiates islet stretch enhancer activity in the C2CD4A/B/VPS13C locus*

Michael Stitzel, Ph.D., The Jackson Laboratory for Genomic Medicine

4:20 pm Questions and Discussion

6:00 pm Dinner

The Jackson Laboratory for Genomic Medicine

TUESDAY APRIL 12, 2016

The Edmund and Arlene Grossman Auditorium, Cell and Genome Sciences Building
University of Connecticut School of Medicine
400 Farmington Avenue, Farmington CT

8:30 am Continental Breakfast

SCIENTIFIC PRESENTATIONS / Session One

Moderator / Marc Lalande, Ph.D.

9:00 am *Novel players involved in cytokine-induced death of pancreatic beta cells*

Yehiel Zick, Ph.D., Weizmann Institute of Science

9:20 am *Fortifying effector T cell metabolism to combat cancer using costimulation and cytokines*

Anthony Vella, Ph.D.,
University of Connecticut School of Medicine

9:35 am *Status of human microbiome studies of metabolic disease*

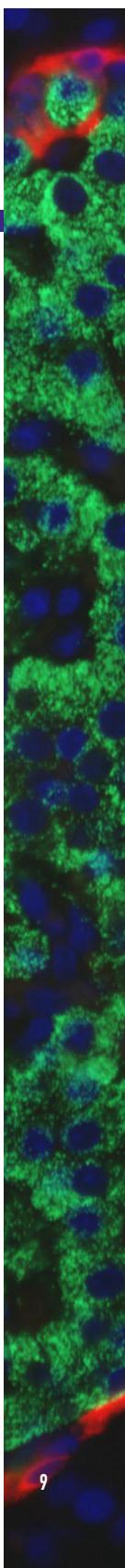
George Weinstock, Ph.D.,
The Jackson Laboratory for Genomic Medicine

9:50 am *The microbiota in systemic autoimmunity*

Martin Kriegel, M.D., Ph.D., Yale School of Medicine

10:05 am Questions and Discussion

10:20 am Break



Biographies

SCIENTIFIC PRESENTATIONS / Session Two

Moderator / Marc Lalande, Ph.D.

- 10:35 am *Protein tyrosine phosphatases and regulation of hypothalamic leptin receptor signaling*
Ari Elson, Ph.D., Weizmann Institute of Science
- 10:55 am *The intestine and metabolic disease*
Alison Kohan, Ph.D., University of Connecticut
- 11:10 am *Reinforcement to improve diabetes management*
Nancy Petry, Ph.D., University of Connecticut School of Medicine
- 11:25 am Questions and Discussion
- 11:40 am *From disease hypothesis to treatment prototype: Program in Innovative Therapeutics for Connecticut's Health [PITCH] and the Yale Center for Molecular Discovery*
Janie Merkel, Ph.D., Yale University
-
- 11:55 am Statement of Intent Reprise
Dr. Milton Wallack
- 12:05 pm Closing Remarks
Edison Liu, M.D.
President and CEO, The Jackson Laboratory
- 12:15 pm Lunch
- 1:00 pm Workshop Adjourns



Sigalit Boura-Halfon, Ph.D.
Assistant Staff Scientist,
Department of Immunology
Weizmann Institute of Science

Dr. Boura-Halfon was born in Israel. She studied life sciences for her B.Sc. at the Ben-Gurion University, Beer Sheva, where she graduated in 1993. In 1995, she completed her M.Sc. at the same institution, focusing on the isolation and characterization of mutants as genetic markers for protoplast fusion in red microalgae. In 1999, she began her Ph.D. research in Prof. Yehiel Zick's lab at the Department of Molecular Cell Biology at the Weizmann Institute, Rehovot, focusing on factors involved in the inhibition of insulin signaling and the induction of an insulin-resistant state. Specifically, she studied the role of insulin receptor substrate (IRS) and extracellular matrix (ECM) proteins, in regulating IR internalization. A parallel study aimed at unraveling the molecular basis of insulin resistance in an attempt to define the phosphorylation sites of IRS proteins involved in a negative feedback mechanism of insulin signaling. In this study she uncovered a novel Ser/Thr-rich domain, which mediates degradation of IRS-1. In addition, she identified five novel inhibitory serine residues of IRS-2 where their replacement by Ala generates an IRS-2 mutant (IRS-25A) that affords protection against the adverse effects of pro-inflammatory cytokines and improves β -cell function under stress. She completed her Ph.D. studies in Prof. Zick's lab in 2005, when she became a member of the research group. Then, she was involved in the development of a high-throughput small interfering RNA (siRNA) screen in human pancreatic β -cells focusing on novel transcription factors involved in pancreatic β -cell death. One prominent 'hit' revealed by this screen was Hairy and Enhancer of Split 4 (HES4). Specifically, she demonstrated that HES4 is an anti-apoptotic TF that attenuates inflammation and oxidative stress responses. In 2015, Dr. Boura-Halfon moved to Prof. Jung's lab in the Department of Immunology. Combining her skills with the expertise of her new host lab, she focuses as staff scientist on the role of macrophages in metabolic disorders and insulin resistance. In addition, she joined a project that studies the role of brown adipose tissue macrophages. Specifically, she has demonstrated a novel mechanism for CX3CR1+ macrophage-dependent steady-state maintenance of thermogenesis and metabolic balance that is linked to macrophage interference with BAT innervation.

Biographies



Sonia Caprio, M.D.
Professor of Pediatrics
Yale School of Medicine

Dr. Caprio is internationally recognized for her research addressing fundamental mechanisms at the bedside that are directly relevant to childhood obesity and type 2 diabetes (T2D) in youth. Her translational research program over these years has been continuously funded by NICHD, focusing on a) the identification of early metabolic disturbances implicated in the genesis of childhood obesity, b) the metabolic consequences of juvenile obesity and c) the pathogenesis of T2D in youth. In addition, she has been the recipient of a K24 Patient Oriented Award for 10 years. Realizing the need to understand the pathophysiology of T2D in obese youth, she has been investigating the role of insulin resistance and beta cell dysfunction at the earliest stage of T2D, namely Impaired Glucose Tolerance. Her research in pre-diabetes in obese children and adolescents has brought in focus at the national level the magnitude of the obesity problem in children in the US. This research demonstrated a much faster tempo of progression of beta cell failure in obese adolescents, which helped to stimulate the funding of two NIDDK clinical trials in obese youth, the TODAY and RISE studies, that are currently in progress. In recognition of the importance of her work she was awarded the prestigious "Distinguished Clinical Scientist Award" from the American Diabetes Association in 2008, and the "Distinguished Leader in Insulin Resistance" Award from the International Committee for Insulin Resistance in 2015. She has served as the primary mentor for more than 30 trainees and postdoctoral fellows, most of whom are full-time faculty members and three of whom have achieved the rank of professor.



Alon Chen, Ph.D.
Professor, Department of Neurobiology
Weizmann Institute of Science

Born in Israel in 1970, Prof. Alon Chen received a B.Sc. in biological studies from Ben-Gurion University of the Negev in 1995, and a Ph.D. from the Weizmann Institute of Science in the Department of Neurobiology, in 2001. Between 2001 and 2005, he served as a Research Associate in the Laboratories for Peptide Biology at the Salk Institute for Biological Studies, La Jolla, California. In 2005, he joined the Weizmann Institute in the Department of Neurobiology. In 2013 he was nominated as Director and Scientific Member at the Max Planck Institute of Psychiatry, Munich, Germany and as the Head of the Max Planck Society - Weizmann Institute of Science Laboratory for Experimental Neuropsychiatry and Behavioral Neurogenetics. Prof. Chen's research focuses on the Neurobiology of Stress, particularly the mechanisms by which the brain is regulating the response to stressful challenges and how this response is linked to psychiatric disorders. His lab has made discoveries linking the action of specific

stress-related genes with anxiety, depression, weight regulation and diabetes. Prof. Chen and his research team use both mouse genetic models and human patients to ultimately create the scientific groundwork for therapeutic interventions to treat stress-related emotional and metabolic disorders such as anxiety, post-traumatic stress, anorexia nervosa, and depression. His honors include a postdoctoral Rothschild Fellowship, and a postdoctoral Fulbright Fellowship (2001-2002). He received the 'Alon Fellowship'; the most prestigious Israeli fellowship for returning scientists, granted by the Israeli Council for Higher Education, 2007-2009, and the Novartis Prize in Neuroendocrinology in 2009 and the Hans Lindner Prize in 2011, both from the Israel Endocrine Society; as well as the Sieratzki-Korczyn Prize for Advances in Neuroscience in 2010. In 2011, he was awarded the Morris L. Levinson Prize in Biology by the Scientific Council of the Weizmann Institute and the Teva Research Prize granted by the Israel Science Foundation in 2011.



Vishwa Deep Dixit, DVM, Ph.D.
Professor of Comparative Medicine
and of Immunobiology
Yale School of Medicine

Dr. Dixit has received numerous awards for his research including Fellows Award for Research Excellence by NIH, Nathan Shock Young Investigator Awards from National Institute on Aging and Gerontological Society of America and a Young Investigator award from Endocrine Society. He received Honorary Masters of Arts (MA) from Yale University in 2014. He serves on several International scientific review panels (Holland, Italy, Germany and Israel), NIH study sections and has been invited for lectures to more than 50, International venues and Universities in past 5 years. Dixit's Laboratory is funded by the US, National Institutes of Health (the NIA, NIAID and NIDDK). Dr. Dixit's research is focused on immunometabolism with the goal to reveal molecular targets that can be harnessed to control inflammation and immune dysfunction as means to enhance the healthspan. He has discovered that longevity hormone FGF21 protects against thymic degeneration and T cell senescence during aging. His lab has helped define the role of innate immune sensor NLRP3 inflammasome in aging, insulin-resistance, type 2 diabetes and immune-senescence. His lab has also discovered ketone metabolite β -hydroxybutyrate (BHB) as a therapeutic target to lower the NLRP3 inflammasome-dependent chronic diseases. His work has been published in prominent journals including *Cell Metabolism*, *Cell Reports*, *PNAS*, *Journal of Clinical Investigation*, *Nature Immunology* and *Nature Medicine*.

Biographies



Ari Elson, Ph.D.

Professor, Department of Molecular Genetics
Weizmann Institute of Science

Prof. Elson was born in Tel Aviv, Israel. He studied for his B.Sc. degree in Chemistry at Tel Aviv University, and for his M.Sc. and Ph.D. degrees at the Weizmann Institute under the mentorship of Prof. Yoram Groner. Prof. Elson performed post-doctoral studies in the group of Prof. Philip Leder, Harvard Medical School; he returned to the Weizmann Institute in 1996 to assume an independent research position as a group leader in the Department of Molecular Genetics, where he remains to this day. Prof. Elson's long-term interests focus on understanding the molecular mechanisms by which protein tyrosine phosphatases (PTPs) regulate cellular and physiological functions, using molecular, cellular, and whole-animal methodologies. Among other systems, Prof. Elson has studied how PTPs affect cellular and whole-organism function in breast cancer and lymphoma, regulation of osteoclast function and bone mass, and regulation of leptin and insulin signaling *in vivo*. The group also studies regulation of PTPs themselves by physiological signals.



Atan Gross, Ph.D.

Professor, Department of Biological Regulation
Weizmann Institute of Science

Born in Philadelphia, Prof. Gross received his B.Sc. in biology at the Hebrew University of Jerusalem in 1987 and his M.Sc. and Ph.D. degrees in biochemistry in 1990 and 1995. From 1996 to 1998, he was a postdoctoral fellow at Washington University (St. Louis, Missouri). He continued his postdoctoral research training at the Dana-Farber Cancer Institute and Harvard Medical School. Prof. Gross joined the Weizmann Institute in 2000. Prof. Gross investigates the biology of mitochondria, the powerhouses of our cells that play a major role in regulating our metabolism. His research team is specifically interested in understanding how mitochondria regulate the fate of our cells with a focus on the fate of stem cells. Their recent findings reveal that increasing mitochondria metabolism activates stem cells in the bone marrow and protects them from programmed cell death, also known as apoptosis. Apoptosis is critical for the proper development and maintenance of tissues, as well as for preventing cancer. These findings that highlight a novel connection between metabolism and apoptosis are also linked to metabolic syndromes such as obesity and diabetes. Thus, if an appropriate "switch" could be found to control mitochondria metabolism in tissues, disease could be treated and life prolonged. He seems to have found such a switch—a new mitochondrial protein named MTCH2—and hopes to use this finding to develop novel therapeutic opportunities to treat metabolic syndromes and fight cancer. Prof. Gross received a special fellowship from the Leukemia Society of America in 1999, and an excellence grant in 2006 from the Israel Cancer Association. He also received the 2006 Lindner Prize of the Israel Endocrine Society.



Maria Luz Fernandez, Ph.D.

Professor, Department of Nutritional Sciences
University of Connecticut

Maria Luz Fernandez has been a Professor in the Department of Nutritional Sciences at the University of Connecticut since 2003. She is a leading authority on the role of dietary interventions on lipid and lipoprotein metabolism and their effects on dyslipidemias, oxidative stress and inflammation as it relates to cardiovascular disease, metabolic syndrome and type 2 diabetes. Her use of the guinea pig model for lipoprotein metabolism has supported the elucidation of the mechanisms by which different types of fat, dietary fiber, carbohydrate restricted diets and antioxidants reduce the risk for atherogenic lipoproteins, hepatic steatosis and atherosclerosis. Her research has been supported by the Federal Government, Industry and Food Commodities. She has co-authored 221 peer-reviewed papers, 12 book chapters plus over 220 scientific abstracts. She has been invited to present her research in the international arena including Argentina, Brazil, Canada, Colombia, Egypt, Ecuador, Korea, Mexico, Panama, Peru, Portugal, Spain, Saudi Arabia and United Arab Emirates. She has graduated 30 Ph.D. and 17 Master's students who currently have prominent positions in industry and academia.



Shangqin Guo, Ph.D.

Assistant Professor of Cell Biology
Yale School of Medicine

The Guo lab at the Yale Stem Cell Center and Department of Cell Biology is interested in understanding the cell fate control mechanisms using hematopoietic progenitors as the model system. They have established a unique live-cell imaging approach to visualize cell fate transitions at single cell resolution. This unique approach led to the discovery of the privileged somatic cells, characterized by an ultrafast cell cycle lasting about 8 hours/cycle. Her lab is currently investigating the molecular underpinning of the privileged cell state and exploring its relevance in disease and therapy. Specifically, they are testing whether cord blood cells contain privileged cells and explore their therapeutic potential since they represent the largest banked human cell types and are presumably in the pristine genetic and epigenetic state.

Biographies



Kevan Herold, M.D.
Professor of Immunobiology and of Medicine
Yale School of Medicine

Dr. Herold's research career has focused on translational immunology studies. He trained as a clinical endocrinologist and then pursued research training in basic immunobiology. His research has involved studies of the mechanisms of autoimmune disease in mouse models and studies in patients. The investigations have involved studies of cellular immune responses with a focus on cells and mediators of autoimmune diseases such as type 1 diabetes (T1D). He has also designed and carried out a number of clinical trials, including the initial studies of anti-CD3 mAb in T1D. He has studied the effects of the immune therapy on antigen specific T cells using Class I MHC tetramers with samples from patients in the trials. Thus, his investigative work consistently moves from patients to animal models and back to patients in order to refine and improve novel immune therapies and understand their mechanisms of action. For example, his work has also led to the identification of regulatory CD8+ T cells in patients treated with anti-CD3 mAb as well as studies in humanized mice that identified a novel mechanism whereby the drug induces these regulatory T cells.



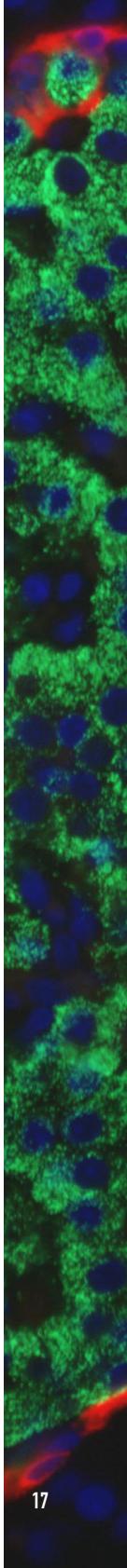
Alison Kohan, Ph.D.
Assistant Professor of Nutrition
Department of Nutritional Sciences
University of Connecticut

The Kohan research program focuses on the role of apolipoprotein C-III in mediating cardiovascular disease, and its regulation in the intestine by dietary factors. Major efforts in her research laboratory are focused on: (i) molecular mechanisms of dietary lipid absorption through the gastrointestinal tract, particularly the role of apolipoprotein expression and chylomicron secretion; and (ii) and the influence of plasma lipoproteins, particularly chylomicrons with apoC-III, on metabolic diseases including atherosclerosis and inflammation. Her laboratory has extensive experience in intestinal lipid absorption, lipoprotein synthesis and secretion, plasma lipoprotein metabolism, and more recently she has developed the primary intestinal organoid model for the study of lipoprotein synthesis and secretion. The overall goal of Dr. Kohan's research is to determine the mechanisms through which intestinal apolipoproteins impact disease in human populations, particularly metabolic disease and obesity.



Martin A. Kriegel, M.D., Ph.D.
Assistant Professor of Immunobiology
and of Medicine (Rheumatology)
Yale School of Medicine

Dr. Kriegel received his MD/PhD equivalent at the Friedrich-Alexander University of Erlangen, Germany, where he was the first to discover regulatory T cell defects in human polyglandular autoimmunity. Dr. Kriegel performed postdoctoral research in the HHMI laboratory of Richard Flavell at Yale. There he studied the *in vivo* role of T cell anergy and identified an E3 ubiquitin ligase as a mediator of mucosal tolerance to dietary antigen. Dr. Kriegel next completed a medicine internship and residency on the ABIM Research Track at Beth Israel Deaconess Medical Center and Harvard Medical School, followed by a rheumatology fellowship at Brigham and Women's Hospital. During this time, he investigated the role of sex differences in the gut microbiome of a model of organ-specific autoimmunity in the joint laboratory of Drs. Diane Mathis and Christophe Benoist in the Department of Microbiology and Immunobiology at Harvard Medical School. Dr. Kriegel returned to Yale in 2012 as a faculty member in the Department of Immunobiology and as an attending physician in rheumatology at Yale-New Haven Hospital. His NIH-funded laboratory studies currently the cross-reactive potential of human gut and skin commensals in systemic autoimmunity, and the role of genetics and diet in shaping microbiomes of autoimmune-prone hosts. Dr. Kriegel won the Novartis prize 'Young Endocrinology' and was an Emmy Noether Scholar of the German Research Foundation. He is currently an awardee of the Lupus Research Institute and the Arthritis Foundation. He is also an Arthritis National Research Foundation Scholar, a member of the American Association of Immunologists, the Society for Mucosal Immunology, and the American College of Rheumatology.



Biographies



Yael Kuperman, Ph.D.
Assistant Staff Scientist
Department of Veterinary Resources
Weizmann Institute of Science

Yael Kuperman, an Israeli born scientist, completed her B.Sc. in Nutrition and her M.Sc. in biochemistry, at the Hebrew University of Jerusalem in 1998 and 2001, respectively. Before continuing her academic studies, Dr. Kuperman worked as a research assistant and clinical dietitian at Diagnostic System Laboratories Israel Ltd. (now part of Beckman Coulter). From 2005 to 2010, she conducted her Ph.D. studies at the Department of Neurobiology at the Weizmann Institute of Science, under the supervision of Prof. Alon Chen. Her research focused on metabolic-related roles of central and peripheral corticotropin-releasing factor receptor type 2 (CRFR2) system. In 2011 Dr. Kuperman joined the Department of Veterinary Resources as the Head of the Weizmann Institute Metabolic Phenotyping facilities. She assists students from various Weizmann research groups in planning, conducting and analyzing data obtained from the metabolic facility. Her personal favorite field of research, in which she conducts her independent studies, is the central regulation of energy homeostasis and neuroendocrinology. In addition, Yael coordinates the activities of the Weizmann Metabolic Research Forum. Yael received the Sir Charles Clore Postdoctoral Fellowship for 2011-2012 and the Chowers Prize, granted by the Israel Endocrine Society in 2012.



Janie Merkel, Ph.D.
Director, Yale Center for Molecular Discovery
Yale University

Dr. Merkel directs the Yale Center for Molecular Discovery, which is a core facility that performs small molecule screening and medicinal chemistry to identify prototype drugs and support proof-of-concept work. The State of Connecticut has infused these efforts with a new 10 million dollar, three-year grant for applicants from Yale University and the University of Connecticut, called the Program in Innovative Therapeutics for Connecticut's Health (PITCH). The PITCH mechanism will support translational collaborations and promote economic development in Connecticut.



Nancy Petry, Ph.D.
Professor of Medicine
University of Connecticut School of Medicine

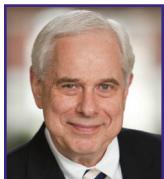
Nancy Petry earned a Ph.D. from Harvard University in 1994. In 1996, she joined the faculty of the University of Connecticut School of Medicine in the Calhoun Cardiology Center. Dr. Petry conducts research on the treatment of addictive disorders and patient adherence behaviors across numerous conditions, ranging from substance use to HIV and diabetes. She has published over 300 articles in peer-reviewed journals and four books. Her work is funded by the National Institute on Drug Abuse, the National Institute on Alcohol Abuse and Alcoholism, the National Institute of Diabetes and Digestive and Kidney Diseases, and the Eunice Kennedy Shriver National Institute of Child Health and Human Development. Dr. Petry serves as a consultant and advisor for the National Institutes of Health and the Veterans Administration, and she is the Editor-in-chief for Psychology of Addictive Behaviors. She received the American Psychological Association Distinguished Scientific Award for early career contributions to Psychology and the Joseph Cochin Award from the College of Drug Dependence.



David Serreze, Ph.D.
Professor
The Jackson Laboratory

The Serreze laboratory investigates the genetic control mechanisms allowing the immune system to recognize and destroy foreign pathogens, but not normal constituents of the body. Defects in these mechanisms underlie many autoimmune diseases, including type 1 diabetes. Using NOD (non-obese diabetic) inbred mice, they are investigating the process through which genes that normally elicit immune responses to foreign intruders can sometimes trigger autoimmune responses against the body's own cells, such as the pancreatic cells that make insulin. They have shown that some genes play a role in type 1 diabetes even when they do not contain deleterious mutations. Instead these are normal genes that only contribute to type 1 diabetes pathology when collected together in a specific fashion. The Serreze laboratory is also investigating defects in the differentiation of a particular type of leukocyte in NOD mice that subsequently allows for the development of autoimmune responses. This work may help identify the mechanisms and compounds that normally prevent autoimmunity, and hence reveal strategies for pharmacological interventions in humans at risk for type 1 diabetes.

Biographies



Robert Sherwin, M.D.
C.N.H. Long Professor of Medicine
Yale School of Medicine

Dr. Sherwin graduated from Albert Einstein College of Medicine and completed his residency in internal medicine at Mount Sinai Hospital (NY). After initiating his research career in metabolism and diabetes at the NIH, Dr. Sherwin moved to Yale as a postdoctoral fellow and was subsequently appointed to the Yale faculty. He currently serves as the Director of the CTSA-funded Yale Center for Clinical Investigation, the NIDDK-funded Diabetes Research Center, as well as the Chief of the Section of Endocrinology at Yale. His research activities span clinical and basic research and are focused on insulin-induced glucose counterregulation and alterations in brain function accompanying type 1 diabetes during insulin treatment and obesity. His studies dealing with glucose counterregulation focus on mechanisms regulating hypothalamic glucose sensing and activation of counterregulatory hormone release, whereas his studies on brain function utilize a variety imaging techniques (fMRI, spectroscopy, and PET) in patients with diabetes and obesity, and have shown major CNS adaptations in these conditions during changes in circulating glucose and insulin. Other work from his lab focused on immunology has led to the isolation of islet-specific T cell clones from type 1 diabetic mice that adoptively transfer diabetes. Dr. Sherwin has served as President of the American Diabetes Association, Chairman of the Medical Science Advisory Board of the JDRF, and served as chair of the FDA Advisory Committee for Endocrinologic and Metabolic Drugs. He has published over 400 articles in peer-reviewed journals. He is the recipient of the American Diabetes Association Banting Award for lifetime scientific achievement, the Novartis Award, Rachmiel Levine Award, Naomi Berrie Award, the Association of Clinical and Translational Science Edward H. Ahrens, Jr. Distinguished Investigator Award, as well as two MERIT Awards from the NIH.



Gerald Shulman, M.D., Ph.D.
George R. Cowgill Professor of Physiological Chemistry,
Medicine and Cellular & Molecular Physiology
Yale School of Medicine

Dr. Shulman is an Investigator of the Howard Hughes Medical Institute and Co-Director of the Yale Diabetes Research Center. Dr. Shulman completed his undergraduate studies in biophysics at the University of Michigan, and he received his M.D. and Ph.D. degrees from Wayne State University. Following internship and residency training at Duke University Medical Center, he did an endocrinology fellowship at the Massachusetts General Hospital and Harvard Medical School, and pursued additional postdoctoral work in molecular biophysics and biochemistry at Yale before joining the faculty at Harvard Medical School. He was subsequently recruited back to Yale and has remained there ever since. Dr. Shulman has pioneered the use of magnetic resonance spectroscopy to non-invasively examine intracellular glucose and fat metabolism in humans that have led to several paradigm shifts in our understanding of type 2 diabetes. Dr. Shulman is a Fellow of the American Association for the Advancement of Science and he has been elected to the American Society for Clinical Investigation, the Association of American Physicians, the Institute of Medicine and the National Academy of Sciences.



Michael Stitzel, Ph.D.
Assistant Professor
The Jackson Laboratory for Genomic Medicine

Type 2 diabetes (T2D) results from the combined contributions of genetic risk and environmental stressors. To dissect the genetic and cellular heterogeneity of islet dysfunction and T2D, the Stitzel laboratory combines epigenomic, transcriptomic, and genome editing approaches. The laboratory is analyzing the epigenomes and transcriptomes of primary human islets from multiple individuals to read-out effects of type 2 diabetes-predisposing DNA sequence variation (T2D GWAS SNPs) on islet gene regulatory elements controlling islet cell identity and function. Emerging evidence suggests that environment, both stimulus and stress conditions, can actually alter a cell's epigenome and lead to abnormal cellular functions. To this end, the Stitzel laboratory is investigating how acute and chronic environmental perturbations alter the islet epigenome to contribute to islet dysfunction. Finally, his laboratory is developing genome editing tools to dissect and manipulate the islet transcriptional regulatory network and to determine how experimental perturbation of islet regulatory elements contributes to their dysfunction and/or demise.

Biographies



Hugh Taylor, M.D.

Professor and Chair, Department of Obstetrics, Gynecology and Reproductive Science
Professor of Molecular, Cellular and Developmental Biology
Yale School of Medicine

Dr. Taylor is a board certified specialist in Obstetrics/Gynecology and in Reproductive Endocrinology. He received his undergraduate training at Yale University and received his medical degree from the University of Connecticut School Of Medicine. He completed his residency in Obstetrics and Gynecology at Yale. His postdoctoral training included a fellowship in Reproductive Endocrinology and Infertility as well as a fellowship in Molecular Biology, both at Yale. Dr. Taylor is a recipient of eight National Institutes of Health research grants and directs The Yale Center for Reproductive Biology. His clinical research centers on implantation, endometriosis and menopause. His basic science research focuses on uterine development, the regulation of developmental gene expression by sex steroids, endocrine disruption and on stem cells. Dr. Taylor has published more than 275 articles in leading medical journals. He is the Editor-In-Chief of *Reproductive Sciences* and an editor of *Endocrinology*. He serves on several editorial boards and as a reviewer for numerous scientific journals and is frequently invited as a speaker at national and international medical meetings. Dr. Taylor has received numerous awards including the IVI Foundation International Award for the Best Research in Reproductive Medicine and the Society for Gynecologic Investigation President Achievement Award. He has also served as the academic mentor of numerous trainees and has twelve times been awarded the Society of Gynecologic Investigation President Presenter's Award for this training. Dr. Taylor serves as president of the Society for Reproductive Investigation, on the Board of Directors of The American Society for Reproductive Medicine, Environment and Human Health, and the International Institute of Primate Research.



Anthony T. Vella, Ph.D.

Professor and Chair, Department of Immunology
University of Connecticut School of Medicine

Dr. Vella is the Associate Dean of Research Mentoring and Career Development at the University of Connecticut School of Medicine. He is a national leader in innovative research centered on T cell immunobiology. His research program is centered on understanding the basis of immune function during immunization, responses to cancer, and heightened systemic and mucosal inflammation. These studies have led to the development of approaches that enhance immunity by targeting specific T cell costimulatory and cytokine receptor pathways. Currently, the Vella research program is addressing the immunobiology of costimulated or adjuvanted T cells by interrogating the genetic and metabolic programs inside immune cells, while developing approaches to control functional readout outside of the cell.



Michael Walker, Ph.D.

Associate Professor, Department of Biological Chemistry
Weizmann Institute of Science

Dr. Walker was born in Glasgow, UK. He performed his undergraduate studies at Glasgow University, then went on to obtain M.Sc. and Ph.D. degrees in Life Sciences at the Weizmann Institute, Israel. Following this, he carried out post-doctoral training at the University of California, San Francisco in the laboratories of Prof. Howard Goodman and Prof. William Rutter, and was subsequently appointed Adjunct Assistant Professor at the University of California, San Francisco. He returned to Israel as senior scientist in the Department of Biochemistry at the Weizmann Institute. Prof. Walker's research focuses on the pancreatic beta cell, and its involvement in diabetes. He has studied in detail the transcriptional control mechanisms that regulate selective gene expression in pancreatic beta cells. More recently, he has analyzed mechanisms involved in regulated insulin secretion, in particular exploring the role of receptors to long chain and short chain fatty acids in beta cell function and dysfunction.



George Weinstock, Ph.D

Professor and Director of Microbial Genomics
The Jackson Laboratory for Genomic Medicine

Dr. Weinstock leads a research group devoted to genomic studies of infectious diseases and the human microbiome. The group collaborates extensively with clinicians to apply genomic analyses to a wide range of medical problems. The goal of the metagenomics projects is to determine the role of the microbiome in health and disease with the aim of providing new diagnostic and therapeutic approaches. His group played a leading role in the NIH Human Microbiome Project including both basic science and clinical studies and his current research follows on those projects. Dr. Weinstock was previously the co-director of the Human Genome Sequencing Center at Baylor College of Medicine in Houston where he was one of the leaders of the Human Genome Project. He has also directed a number of human and mammalian genetics projects aimed at determining genetic causes of conditions such as Retinitis Pigmentosa, Cleft Lip, susceptibility to infection, or the role of host genetics in control of the microbiome.

Workshop Planning Committee



Yehiel Zick, Ph.D.

**Professor and Head, Department of Molecular Cell Biology
Weizmann Institute of Science**

Dr. Zick received his Ph.D. degree at the Feinberg Graduate School of the Weizmann Institute of Science in 1980 and pursued a postdoctoral fellowship in the Diabetes Branch of the National Institutes of Health. His research program focuses on the cross talk between insulin resistance, animal lectins and bone remodeling. Using a combination of mouse models, cell biology and analysis of signaling pathways, projects underway in the Zick laboratory include investigating the role of animal lectins (particularly galectin-8) as regulators of bone remodeling and insulin action; the novel elements (Ndfip1; Otub2, TM7SF3) that modulate survival of pancreatic beta cells; and the IRS (insulin receptor substrate) proteins, insulin resistance, and beta cell function.

Kevan Herold, M.D.

Professor of Immunobiology and of Medicine
Yale School of Medicine

Marc Lalande, Ph.D.

Health Net Professor and Chairman
Department of Genetics and Genome Sciences
University of Connecticut School of Medicine

Charles Lee, Ph.D., FACMG

Scientific Director and Professor
The Jackson Laboratory for Genomic Medicine

Ophir Shahaf LL.B., MBA

Health Care Innovations, Israel Partnerships
Office of Global Affairs
University of Connecticut

Robert S. Sherwin, M.D.

C.N.H. Long Professor of Medicine
Yale School of Medicine

Dr. Milton Wallack

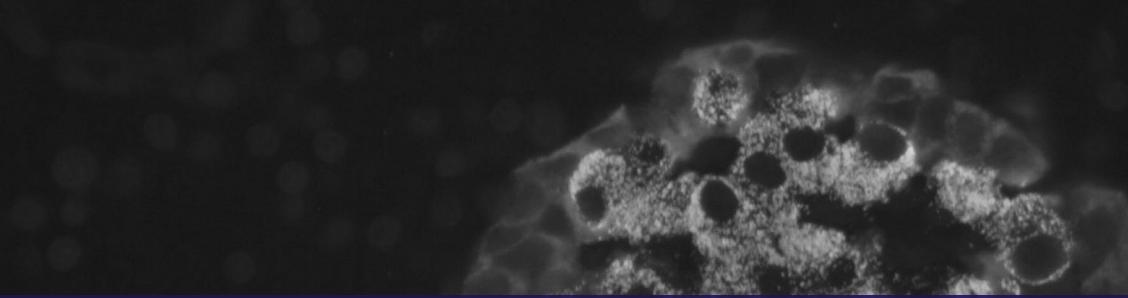
Founder of the CT Stem Cell Coalition

Daniel Weiner, Ph.D.

Vice Provost for Global Affairs
University of Connecticut

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The Connecticut Center for Metabolic Disease Research

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