Improving Human Health Through Collaborative Scientific Discovery

The Life Sciences Institute serves as Michigan's hub for collaborative biomedical research on human health problems. The LSI harnesses the strength and tradition of academic excellence at the University of Michigan by forging links between the health sciences, basic sciences, engineering, the social sciences, and the humanities.

Interdisciplinary science is the feature of LSI's annual symposia. They are designed to encourage the exchange of ideas and to provide the opportunity for students and scientists alike to interact with and learn from prominent scientific leaders about recent developments.

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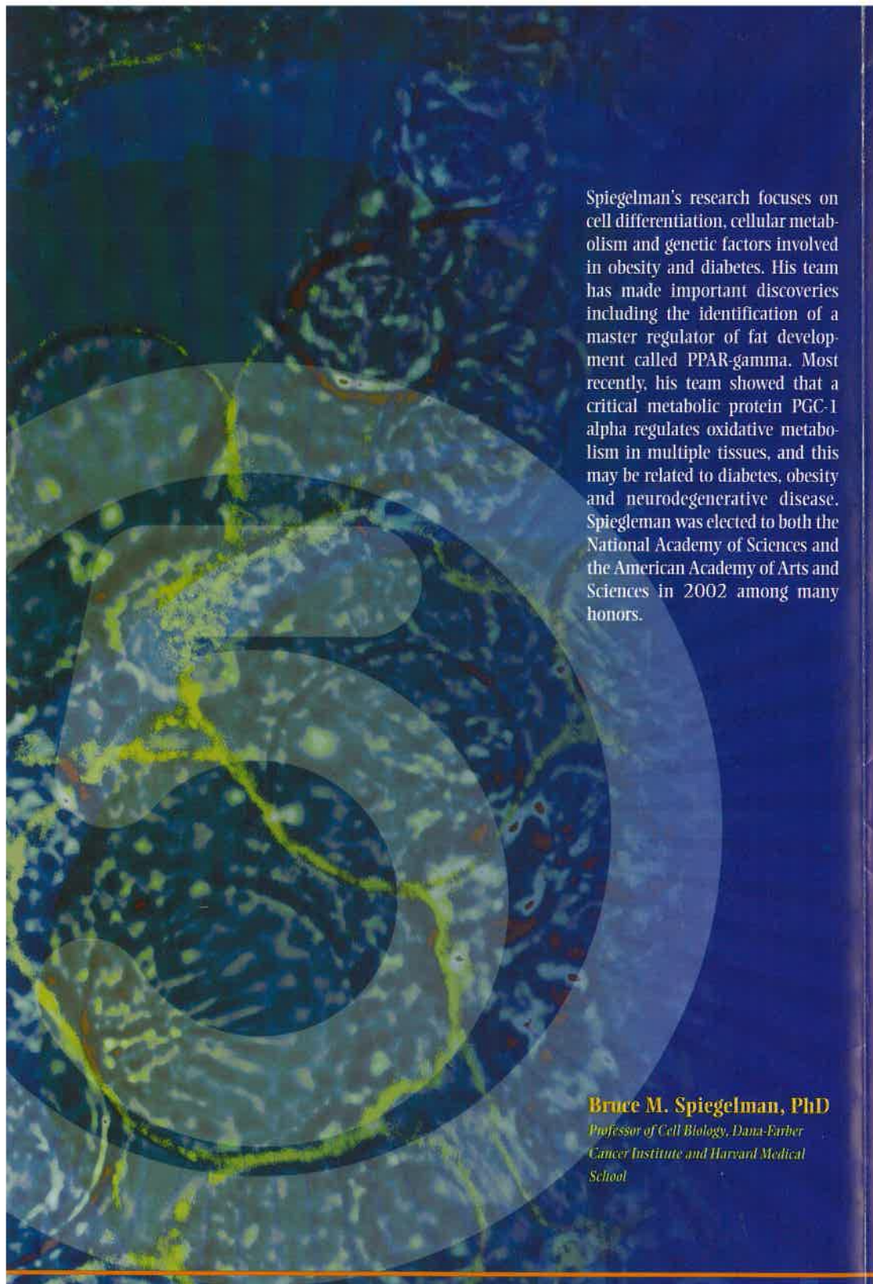
May 11, 2006

Thursday 9:00 am - 5:00 pm
Forum Hall, Palmer Commons

Molecular Insights into Metabolic Disease

MICHIGAN LIFE SCIENCES INSTITUTE
5TH ANNUAL SYMPOSIUM



Spiegelman's research focuses on cell differentiation, cellular metabolism and genetic factors involved in obesity and diabetes. His team has made important discoveries including the identification of a master regulator of fat development called PPAR-gamma. Most recently, his team showed that a critical metabolic protein PGC-1 alpha regulates oxidative metabolism in multiple tissues, and this may be related to diabetes, obesity and neurodegenerative disease. Spiegleman was elected to both the National Academy of Sciences and the American Academy of Arts and Sciences in 2002 among many honors.

Bruce M. Spiegelman, PhD
Professor of Cell Biology, Dana-Farber Cancer Institute and Harvard Medical School

Pessin has made numerous contributions to our understanding of the molecular basis of insulin action. His initial efforts were focused on developing detailed understanding of the mechanism by which extracellular insulin binding can activate the intracellular tyrosine kinase domain of the insulin receptor. More recently, his studies have encompassed the identification of intracellular effector proteins that are activated by insulin and their ultimate regulation of glucose transporter gene transcription. These findings also have important implications for understanding the metabolic and mitogenic properties of other growth factor receptors. Pessin is currently Editor-in-Chief of Endocrinology and earned the Outstanding Scientific Achievement award of the American Diabetes Association and Eli Lilly Outstanding Investigator Award from the American Diabetes Association among many other honors.

Jeffrey E. Pessin, PhD
Professor and Chair, Department of Pharmacological Sciences, SUNY-Stony Brook

Hall's research interests include signal transduction and cell growth control in yeast and mammalian cells. He discovered TOR (Target of Rapamycin) and is one of the leaders in the cell growth field. TOR is a conserved, nutrient- and insulin-activated protein kinase and a central controller of cell growth. In collaboration with colleagues Markus Rüegg and Yves-Alain Barde, his team is also studying the role of TOR signaling in the postmitotic growth of muscle and neuronal cells. Through combined research efforts, they hope to determine the molecular mechanisms by which TOR senses and signals nutrient availability. Hall recently began studying the role of TOR in the regulation of organismal metabolism. These studies have interesting implications when considering hormone- and nutrient-related processes such as appetite regulation and aging. Among many honors and awards, Hall is a member of the European Molecular Biology Organization and was awarded the Clöetta Prize for his contributions in biomedical research.

Michael N. Hall, PhD
Professor and Chair of Biochemistry, Biozentrum of the University of Basel, Switzerland

Kenyon studies the regulation of aging in the small soil roundworm, *C. elegans*. In 1993, she discovered that a gene that is similar to the human insulin and IGF-1 receptors regulates the life span of this animal, thus demonstrating that aging is controlled hormonally. She showed that inhibiting receptor activity doubles life span and greatly extends youthfulness by changing the expression of downstream antioxidant, antimicrobial, chaperone, and metabolic genes. Her work led to the discovery that mammalian aging is also regulated hormonally by insulin and IGF-1 endocrine systems. Her studies catalyzed a fundamental shift in the way we view the aging process, from one that is inevitable to one that is plastic and subject to regulation. These long-lived mutants have been found to be resistant to several age-related diseases, raising the possibility of a new therapeutic strategy based on the ability to postpone the onset of age-related disease by slowing the aging process itself. She is a member of the National Academy of Sciences, and she has received many awards for her contributions to medical research.

Cynthia Kenyon, PhD
American Cancer Society Professor; Director, Hillblom Center for the Biology of Aging, Department of Biochemistry and Biophysics, University of California, San Francisco

Dr. Flier discovered that auto-antibodies to the insulin receptor and mutations within the insulin receptor gene were causes of insulin resistant diabetes in man. His research has produced major insights into the molecular pathophysiology of obesity, including key aspects of the physiology of leptin as a starvation signal, and the molecular basis for leptin resistance, in particular the role of SOCS3. Among other honors, he is an elected member of the American Society for Clinical Investigation, the Association of American Physicians, the American Academy of Arts and Sciences, and the Institute of Medicine of the National Academy of Sciences.

Jeffrey S. Flier, MD
Chief Academic Officer, Harvard Faculty Dean for Academic Affairs, Beth Israel Deaconess Medical Center; George C. Resiman Professor of Medicine, Harvard Medical School

As one of the country's leading diabetes investigators, Dr. Kahn's research has had a major impact on understanding the molecular mechanisms underlying type 2 diabetes and the cellular and physiologic processes that render obesity a major risk factor for type 2 diabetes. Her lab has identified novel pathways (eg the AMP-activated protein kinase pathway) by which specialized cells in the brain respond to nutrients and hormones and send out signals that regulate food intake and body weight. Most recently, the Kahn lab identified a novel protein secreted from fat cells that may be a new target for treatment or prevention of type 2 diabetes. She was elected to the Institute of Medicine of the National Academy of Sciences in 2005 and is an elected member of the American Society for Clinical Investigation and the Association of American Physicians as well as many other honors and awards.

Barbara B. Kahn, MD
Chief, Division of Endocrinology, Diabetes and Metabolism, Beth Israel Deaconess Medical Center; Professor of Medicine, Harvard Medical School

Co-sponsored with the Michigan Comprehensive Diabetes Center and the Michigan Diabetes Research and Training Center at the University of Michigan

Morning Moderator: **Peter Arvan**
William K and Delores S Brehm Professor of Type I Diabetes Research and Professor of Internal Medicine, UM Medical School

Afternoon Moderator: **Alan Saltiel**

9:00 am
Welcome
Alan Saltiel
Director, Life Sciences Institute

9:15
Mary Sue and Kenneth Coleman Life Sciences Lecture: Transcriptional Control of Systemic Energy Homeostasis

Break

10:30
Uncoupling of Insulin-Regulated Glucose Sensitivity from Fatty Acid Metabolism

11:30
TOR Signaling and Control of Cell Growth in Yeast and Mammals

Lunch on Your Own

1:30
Genes and Cells that Regulate the Lifespan of *C. elegans*

2:30
The Periphery and the Brain in Energy Balance: Recent Initiatives

Break

3:45
A Novel Adipocyte-Secreted Molecule Involved in Insulin Resistance in Obesity and Type 2 Diabetes: Retinol Binding Protein 4

Immediately following:
The Michigan Diabetes Research and Training Center Poster Session 2006
follows the symposium in Great Lakes Room.