PREVIOUS WINNERS

2017 **DR. KARIM ADIPRASITO**
Einstein Institute of Mathematics, Faculty of Science
Interplay between Combinatorial and Continuous Structures in Mathematics

2016 **PROF. NATHALIE Q. BALABAN**
Racah Institute of Physics, Faculty of Science
Biological Physics of Self-Replication

2015 **PROF. RE'EM SARI**
Racah Institute of Physics, Faculty of Science
Understanding Our Universe

2014 **PROF. MICHAL BIRAN**
Departments of Asian Studies, and Islamic and Middle Eastern Studies, Institute of Asian and African Studies, Faculty of Humanities
Inner Asian History: Mobility Empire and Cross-Cultural Contacts in Mongol Eurasia

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Institute of Chemistry and Fritz Haber Minerva Research Center for Molecular Dynamics, Faculty of Science
Developing New Theoretical and Computational Techniques that Enable Determination of the Energy Levels of Charge Carriers in Large Molecular Systems and Nanocrystals

2012 **DR. ERAN MESHORER**
Department of Genetics, Silberman Institute of Life Sciences, Faculty of Science
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Institute of Criminology, Faculty of Law
Pioneering Research on White Collar Crime, Policing, and Crime Prevention

2010 **PROF. MERAV AHISSAR**
Department of Psychology and Program in Cognitive Sciences, Faculty of Social Sciences
The Neuro-Cognitive Basis of Reading Disability - The "Anchoring-Deficit" Hypothesis

2009 **PROF. ISAIAH TUVIA (SHY) ARKIN**
Department of Biological Chemistry, Silberman Institute of Life Sciences, Faculty of Science
Structural Biology of Membrane Proteins, Focusing on Pathogen's Ion Channels and Ion Pumps

2008 **PROF. URI BANIN**
Institute of Chemistry and the Center for Nanoscience & Nanotechnology, Faculty of Science
Major Advancements in the Science and Technology of Nanocrystals and the Development of Hybrid Multifunctional Nanoparticles

2007 **PROF. HOWARD (CHAIM) CEDAR**
Department of Developmental Biology and Cancer Research, Institute for Medical Research Israel-Canada, Faculty of Medicine
Establishing the Cornerstone of Epigenetics and Its Role in Human Development

The Hebrew University of Jerusalem
The Authority for Research and Development
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THE KLACHKY PRIZE

FOR THE ADVANCEMENT OF THE FRONTIERS OF SCIENCE

AT THE HEBREW UNIVERSITY OF JERUSALEM

THE HEBREW UNIVERSITY OF JERUSALEM

RESEARCH WORK IN A BIOCHEMISTRY LAB

Campus: Mount Scopus

Jan 1, 1935

Photo by Orient Press

100 Years of KNOWLEDGE

The Hebrew University of Jerusalem

Board of Governors 2018

תשע"ח 2018

KLACHKY PRIZE

for the Advancement of the Frontiers of Science

The Klachky Prize for the Advancement of the Frontiers of Science is an annual prize founded by the late Ms. Rachel Klachky. The prize is given to Hebrew University faculty members or academic units for their achievements in:

The Advancement of Science
The Advancement of Scientific Research
The Advancement of Scientific Knowledge
The Advancement of the Frontiers of Science
New Academic Developments
Academic Ventures

The Donor

Rachel Klachky (1925-2001) was born in Mexico. Married to the late Engineer Manuel Klachky, she was a central figure in the Jewish community of Mexico, and was one of the founding members of the Mexican Friends of The Hebrew University.

In 1997, she received an Honorary Fellowship from The Hebrew University for her outstanding contributions to the State of Israel and The Hebrew University of Jerusalem. She wholeheartedly supported worthy causes, including the absorption of new immigrants, scholarships for students, and support of various scientific research projects, and studies on superconductivity at The Hebrew University.

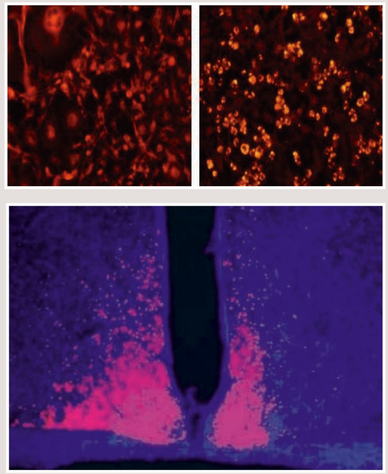
After she passed away, her sons, Roberto and Leopoldo, continued her legacy of support to The Hebrew University of Jerusalem. The Klachky Prize has been awarded since 2003.

PROF. OREN FROY

The Institute of Biochemistry Food Science and Nutrition
The Robert H Smith Faculty of Agriculture, Food and Environment

Oren Froy undertook his Ph.D. studies at Tel-Aviv University in protein structure-function and his post-doctoral studies at Harvard Medical School and the University of Massachusetts Medical School in neurosciences. In 2003, he joined the faculty of The Hebrew University, establishing the chronobiology and metabolism group at the Institute of Biochemistry, Food Science and Nutrition. Among several prizes he has received throughout his career is the Krill Prize from the Wolf Foundation. He was the head of the Amirim program, the honors program for undergraduate students, at the Robert H. Smith Faculty of Agriculture, Food and Environment. Currently, Dr. Froy is the director of the Institute of Biochemistry, Food Science and Nutrition and the chairperson of the Institute Review Board (IRB) for the Use of Human Subjects in Research.

The Klachky Prize for 2018

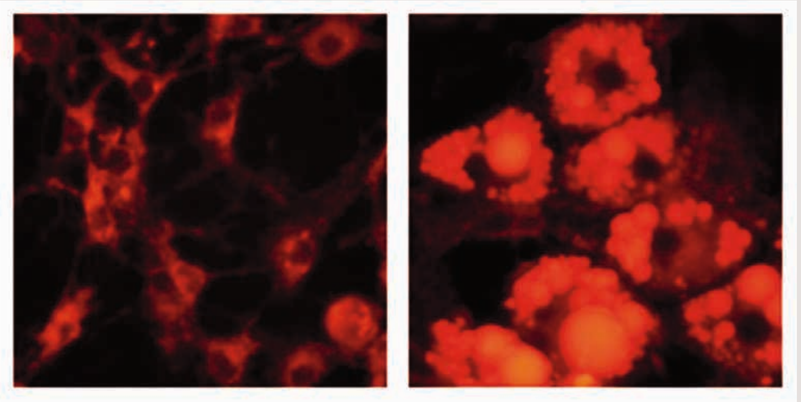


Among his published works are:

Jakubowicz D, Wainstein J, Landau Z, Raz I, Ahren B, Chapnik N, Ganz T, Menaged M, Barnea M, Bar-Dayan Y, Froy O. (2017). Influences of breakfast on clock gene expression and postprandial glycemia in healthy and diabetic individuals: a randomized clinical trial. Diabetes Care, 40:1573-1579.

Genzer Y, Dadon M, Burg C, Chapnik N, Froy O. (2016). Effect of dietary fat and the circadian clock on the expression of brain-derived neurotrophic factor (BDNF). Mol Cell Endocrinol, 430:49-55.

Interplay between the Circadian Clock and Metabolism



Mammals have developed an endogenous circadian clock located in the anterior hypothalamus that responds to the environmental light-dark cycle. Similar clocks exist in peripheral tissues, such as the liver, intestine, and fat tissue, regulating cellular and physiological functions. The circadian clock regulates metabolism and energy homeostasis by mediating the expression and/or activity of certain metabolic enzymes and transport systems. In turn, key metabolic enzymes and transcription activators interact with and affect the core clock mechanism.

Dr. Froy has shown that timed feeding provides a time cue and resets the circadian clock leading to better health. In contrast, a high-fat diet leads to disrupted circadian expression of metabolic factors and obesity. Furthermore, Dr. Froy discovered that a combination of a clock-resetting feeding regimen with a clock-disrupting high-fat diet resulted in reduced body weight suggesting that the timing of food intake is extremely important. This included the remarkable finding that an isocaloric feeding can lead to a different body weight if given at different times throughout the day. Applied and corroborated in clinical trials, i.e., a high-calorie breakfast with reduced intake at dinner, this novel concept was beneficial and useful for the management of obesity and the metabolic syndrome in obese women, in lean women with polycystic ovary syndrome and in type 2 diabetes patients. Dr. Froy showed that breakfast consumption acutely affected clock and clock-controlled gene expression leading to normal oscillation, whereas breakfast skipping adversely affected clock and clock-controlled gene expression and led to increased postprandial glycemic response in both healthy individuals and individuals with diabetes.

In addition, Dr. Froy found that the energy status of the organism can shift the phase of the circadian clock, i.e., fasting leads to phase advances, and a high-fat diet to phase delays. Changes in the phase and daily rhythm of clock genes and metabolic pathways, as a result of high-fat diet, may lead to obesity and may explain the disruption of other clock-controlled output systems, such as blood pressure and sleep/wake cycle, usually associated with metabolic disorders. Furthermore, he showed that activation of the signaling pathway of AMP-activated protein kinase (AMPK), the cellular energy sensor, is the key metabolic gauge that can shift circadian rhythms.