

## The Jacques Loeb Centre for the History and Philosophy of the Life Sciences

, inaugurated March 2008, supports advanced research covering relevant topics related to the life sciences. It pursues a wide range of investigations into the history and philosophy of modern research. The Centre organizes international workshops whose proceedings have been published as special editions and sections of leading scientific and historical journals. Seminars provide an interdisciplinary forum for historians and philosophers of science, as well as scientists to present and discuss new research related to science with a special focus on the life sciences.

The Centre offers post-doctoral and graduate fellowships in the history and philosophy of modern biological, biochemical and medical sciences. Particular attention is given to the history of ideas and practices in modern life sciences, to the role of individuals in scientific advancement and also in dead ends, to the role of Jewish scientists in 19th and 20th century German science, to scientific practices, achievements, failures, and their individual and social-political backgrounds, and to the mutual impact of science and politics.

For further information and updates please visit <http://web.bgu.ac.il/Eng/Centers/loeb>.

## The National Institute for Biotechnology in the Negev

**Ltd. (NIBN)** was established in November 2009 with the mission to bridge the gap between basic and applied research and developing biotechnology. It is the first independent research entity of its kind to be established in Israel, seeking to link top-level multidisciplinary basic research to applied interests at very early stages. The innovative structure of the NIBN within Ben-Gurion University of the Negev encourages NIBN scientists to cross the academic barriers that separate traditional research disciplines and to engage in synergistic biotechnology research.

The NIBN conducts multi-disciplinary, convergent research projects with clear biotechnology goals. In other words, the NIBN is designed to enable new advances in biotechnology and to serve as the glue that links academia and industry. The NIBN is steered by its own international Scientific Advisory Board (SAB). The SAB, in consultation with the University Advisory Board, has endorsed the research topics to be pursued within the Institute: Structural Biotechnology, Computational Biotechnology, Human Genetic Disorders, Nano-Medicine and Immune-System Biotechnology.

At present, the NIBN academic staff is comprised of 23 investigators organized in the above five research groups comprising together with graduate student and technical staff about 120 members. Recruitment of additional 5-7 scientists is planned in the coming years. In addition, the NIBN includes several core facilities providing access to equipment and services in many cases not found elsewhere in the country, as detailed in our website <http://www.bgu.ac.il/nibn>.

**Minerva Foundation**

**Jacques Loeb Centre for the History and Philosophy of the Life Sciences**

**The National Institute for Biotechnology in the Negev**

**Minerva-Gentner Symposium**



# Synthetic Life

**A Concept in Pure and Applied Biology  
Historical Origins, Philosophical Questions,  
Current Developments and Ethical Issues**

W.A. Minkoff Senate Hall  
BGU Marcus Family Campus, Beer-Sheva

**5-6 March, 2012**

**Monday, March 5**

**9:00-10:00**

Conference registration  
and morning coffee

**10:00-10:15**

Greeting and opening remarks

**Prof. Zvi HaCohen**, Rector,  
Ben-Gurion University of the Negev

**Prof. Ute Deichmann**, Director,  
Jacques Loeb Centre for the History  
and Philosophy of the Life Sciences,  
Ben-Gurion University of the Negev

**Prof. Varda Shoshan-Barmatz**,  
Director, NIBN, Ben-Gurion University  
of the Negev

**10:15-12:15**

*I. From Origin of Life to  
Synthetic Life: Historical and  
Philosophical Reflections on  
“What is Life” and Synthetic  
Life Research*

Chair: **Manfred Laubichler**, Arizona  
State University, USA

**10:15**

**Michel Morange**, École normale  
supérieure, Paris, France

*Synthetic Biology and Evolution:  
Engineering vs. Tinkering?*

**10:55**

**Ute Deichmann**, Ben-Gurion  
University of the Negev

*Crystals, Colloids or Molecules? Early  
Controversies about the Origin of Life  
and Synthetic Life*

**11:35**

**Ulrich Charpa**, Ruhr University  
Bochum, Germany

*Parts, Wholes, and Synthesis: Cases for  
Mereology and the Golem*

**12:15-13:35**

*II. Synthetic Life: Perspectives  
and Challenges for Applied  
Research*

Chair: **Rony Armon**, University of Haifa

**12:15**

**John Glass**, Craig Venter Institute,  
USA

*Synthetic Genomics and the  
Construction of a Synthetic Bacterial  
Cell*

**12:55**

**Lital Alfonta**, Ben-Gurion University of  
the Negev

*In-vivo and ex-vivo Incorporation  
of Unnatural Amino Acids into  
Recombinant Proteins*

**13:35-14:50**

Lunch break

**14:50-16:10**

*II. Synthetic Life: Perspectives and Challenges for Applied Research (continued)*

**14:50**

**Gregory Linshitz**, Joint BioEnergy Institute, California, USA

*Microfluidic Devices and Synthetic Biology: Looking for Killing Application*

**15:30**

**Wilfried Weber**, University of Freiburg, Germany

*Programming Mammalian Cells with Synthetic Gene Networks*

**16:10-16:25**

Coffee break

**16:25-18:25**

*III. Ethical Considerations*

Chair: **Yitzhak (Yanni) Nevo**, Ben-Gurion University of the Negev

**16:25**

**David Heyd**, Hebrew University of Jerusalem

*Is there Anything Unique about the Ethics of Synthetic Biology?*

**17:05**

**Bracha Rager**, Ben-Gurion University of the Negev

*Ethical Challenges Posed by Synthetic Biology*

**17:45**

**Shimon Glick**, Ben-Gurion University of the Negev

*Synthetic Biology: God's Partner or Devil's Accomplice*

**18:35**

Musical interlude, reception and dinner (at the University) for invited speakers

**Tuesday, March 6**

**9:00-10:20**

*IV. Synthetic Life: Perspectives and Challenges for Basic Research*

Chair: **Dan Mishmar**, Ben-Gurion University of the Negev

**9:00**

**Manfred Laubichler**, Arizona State University, USA

*How Conceptual, Computational and Experimental Advances Transform the Life Sciences of the 21st Century*

9:40

**Eric Davidson**, California Institute of Technology, Pasadena, USA

*Understanding Evolution by Re-engineering Development: A Boolean Model Provides the Principle*

10:20-10:50

Coffee break

10:50-12:50

*IV. Synthetic Life: Perspectives and Challenges for Basic Research (continued)*

Chair: **Tony Travis**, Hebrew University of Jerusalem

10:50

**Uri Alon**, Weizmann Institute of Science

*Design Principles of Biological Circuits*

11:30

**Petra Schwill**, Technische Universität, Dresden, Germany

*Bottom-up Synthetic Biology of Cell Division*

12:10

**Siegfried Roth**, University of Cologne, Germany

*Function and Information in Biology: New Approaches to Reductive Explanations*

12:50-14:00

Lunch break

14:00-16:00

*IV. Synthetic Life: Perspectives and Challenges for Basic Research (continued)*

Chair: **Tony Travis**, Hebrew University of Jerusalem

14:00

**Aharon Fait**, Ben-Gurion University of the Negev

*Reducing Metabolic Complexity via Network Analysis*

15:40

**Allan Witztum**, Ben-Gurion University of the Negev

*Long Lived Species*

15:20

**Ehud Shapiro**, Weizmann Institute of Science

*What Do We Know about Computers, Compared to What We Know about Life?*

16:00-16:30

*V. Round-Table Discussion: Issues & Challenges for the Future*

19:30

Dinner for invited speakers