Organisms
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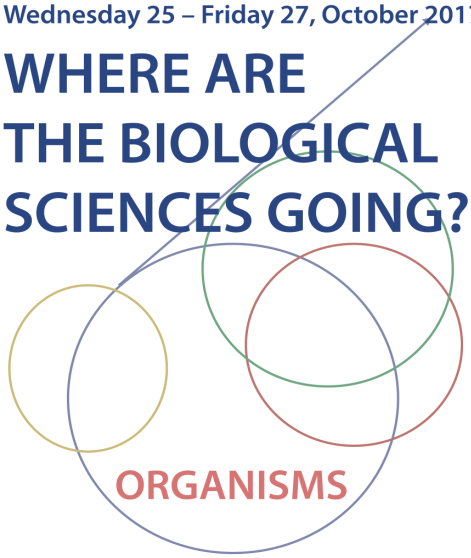
INFO

Wednesday 25 – Friday 27, October 2017

WHERE ARE THE BIOLOGICAL SCIENCES GOING?



http://ls-institute.org/rome-meeting-2017/

Honorary presidents of the Meeting: Carlos Sonnenschein, Ana Soto

Organizing Committee: Systems Biology Group Lab, Sapienza University, Rome, Italy
Mariano Bizzarri, Marta Bertolaso, Alessandro Giuliani

Conference secretariat: Simona Dinicola, Sara Proietti, Virginia Todde, Maria Grazia Masiello, Andrea Pensotti, Salome Espinola, Gabriella Rosati

Location: Pontifical Urbaniana University, Rome (via Urbano VIII, n. 16, Roma)

Under the Patronage of: Sapienza University, Rome

SAPIENZA UNIVERSITÀ DI ROMA

Where are the biological sciences going?

The meeting "Where are the biological sciences going"", was held in Rome on October 25-27, based on the following vision:

The nature should be analysed in terms of hierarchical levels of complexity that range from subatomic particles and molecules to ecosystems and beyond. This implies that, in order to explain the features and behaviour of a whole system, a theory might be required that would operate at the corresponding hierarchical level, where self-organization processes take place. In the last decades, biological research has mostly focused on questions that could be answered through a reductionist approach. The organism (and its development) was considered an epiphenomenon of its genes. However, the awareness of the limits reached by a strictly reductionist approach in biological sciences became almost a common place among scientists. A profound rethinking of the biological paradigm is now underway.

The nature of the strategies to overcome this bottleneck remain controversial. Some are confident that the brute force of big data can provide a solution 'for free' by the simple 'rational organization' of raw information. Yet, besides the relevance of new computer-based tools, it is unlikely that mere technological improvements could give a comprehensive solution. Rather, what we need is a conceptual revolution.

This 'paradigm change' will have profound scientific and philosophical consequences, given that it implies the search for general principles on which a cogent theory of biology might be built on. Because much of the logic of living systems is located at higher levels, it is imperative to focus on them. Indeed, both evolution and physiology work at these levels. A genuine Systems Biology approach is needed to address such a complexity. Accordingly, this new perspective will entail revisiting epistemological and methodological issues as well. Within this context, Systems Biology cannot be considered a 'simple' 'gradual' extension of Molecular Biology.

On the contrary, the explanatory weight of experiments and simulations in the biological sciences should be reconsidered and thus become based on solid biological principles.

This is the viewpoint underlying the upcoming meeting entitled "Where are the biological sciences going". In these three Roman days, physicians, biologists, physicists, mathematicians and philosophers will share their ideas on this organism-centred" biology to come.

Wednesday 25 October:

08.30 Welcoming addresses:

- Leonardo Sileo – Pontifical Urbaniana University, Rector

- Eugenio Gaudio – *Sapienza* University, Rector

- Mariano Bizzarri – Sapienza University: *Rethinking Science*

09.00 – 11.00 Session I – State of the art in biology

Chairpersons: Y. Soen and Y. Lazebnik

- Manfred Drack: *Organisms versus machines: the role of reductionism*

- Erez Braun: *Universality, complexity and the praxis of biology*

11.30 Session II - On living organisms: a foundational perspective

Chairpersons: S. Koutrofinis and I. Licata

- Raphael Vicuňa: *Current thoughts on the origin of the organismic life*

13.30 – 15.00 Session III – Short Communications

Chairpersons: R. Taramelli and A. Colosimo

A. Laffranchi – N. Cherdyntseva – O. Naimark – C. Rauch – R. Taramelli – J. Brabek – A. Pensotti – G. Gorga

Thursday 26 October:

8.30 -13.00 Session IV – On living organisms: a foundational perspective

Chairpersons: E. Jablonka and O. Naimark

- Giuseppe Longo: *Emergence and reduction in physics and biology*

- Olaf Wolkenhauer: *Where are the biological sciences heading? Not in my direction*

- Ana Soto: *From the century of the genome to the century of the organism: New theoretical approaches*

11.00 - 12.00

- Scott Gilbert: *A Biology of Relationships and Composite Individuals*

- Silvia Caianello *Robustness and Organismic Levels*

14.45 – 17.00 Session V – The meaning of Systems Biology

Chairpersons: M. Montévil and R. Negri

- Kumar Selvarajoo: *Microscopic and Macroscopic Insights from Dynamic Cell Behavior*
- Lilia Alberghina: *Complex biological functions: Systems Biology approach*

Friday 27 October:

08.30 -10.30 Session VI – Re-thinking carcinogenesis from an organismic perspective

Chairpersons: S. Filippi and B. Rosslenbroich

- Fojo T. Antonio: *A pervasive me-too*

- Carlos Sonnenschein: *Crisis in biology. Its impact on development and carcinogenesis*

10.30 – 11.30 Session VII - Epistemological aspects of integrative biology

Chairpersons: A. Paldi and M. Mossio

- Alessandro Giuliani: *Where to look for interesting biological facts*

- Marta Bertolaso *Biological Complexity and Scientific Practice in Cancer Research*

12.00 - **Concluding remarks** – Carlos Sonnenschein and Ana Soto.