

REWIRING LIFE

The future implications of engineering biology

March 18-20, 2024. La Cristalera (Miraflores de la Sierra, Madrid)

LifeHUB.CSIC organizes a symposium on one of the most transformative ongoing revolutions in science and technology: that of the engineering of Biology, from the nanoscale to the scale of ecosystems and planets, with implications that are still difficult to fathom.

Program.

Monday 18

Arrival and lunch (1pm)

Afternoon, Workshop #1: **“The Dark Proteome 2.0”**.

Conductor: Rosa Fernández (IBE, Barcelona)

Tuesday 19

Morning, Workshop #2: **“Origins, diversity, and synthesis of living Intelligence: Unraveling the emergence and evolution of biological learning systems”**.

Conductor: Alfonso Jaramillo, (I2sysbio, Valencia)

lunch

Afternoon, Workshop #3: **“Where do the limits of prediction in Biology lie?”**

Conductor: Juan F. Poyatos (CNB, Madrid)

walk & dinner

Wednesday 20

Morning, Workshop #4: **“Frontiers in engineering Biology”**.

Conductors: Germán Rivas (CIB, Madrid) & Miguel Manzanares (CBM-SO, Madrid)

- Each workshop will comprise a series of presentations followed by a brainstorming session.
- **Interested in contributing** to any of the workshops? Please, contact the “conductor/s”.
- For registration, contact Encarni Carrillo (e.carrillo@csic.es)
- Travel, housing and meals covered for LifeHUB members (up to 2 people per group)
- Transportation by bus from Madrid to Miraflores (on the 18th) and back (on the 20th) will be arranged for those participants interested (please, let Encarni Carrillo know).

REWIRING LIFE: The future implications of engineering Biology

18th March- Bus to Miraflores at 12:00h, Estación de Atocha C/Méndez Álvaro

13:00h Arrival to “La Cristalera”

13:30-15:30h- Lunch and settling in

15:30-19:30h- Workshop #1 “The Dark Proteome 2.0”

15:30-15:35h- Introductory remarks

15:35-15:55h- [Rosa Fernández](#) (IBE, Barcelona)

“The dark proteome project: origins, updates and new lines of action”

15:55-16:15h- [Ana Rojas](#) (CABD, Sevilla) (virtual)

“Decoding proteome functional information in model organisms using protein language models”

16:15-16:35h- [Aureliano Bombarely](#) (IBMCP, Valencia)

“Exploring the dark proteome of plants”

16:35-17:00h- Coffee break

17:00-17:20h- [Ramon Crehuet](#) (IQAC, Barcelona)

“Understanding function in intrinsically disordered proteins”

17:20-17:40h- [Sergi Valverde](#) (IBE, Barcelona)

“A complex system approach to investigating the dark proteome”

17:40-19:30h- Open Discussion

20:30h- Dinner

19th March

08:00h-Breakfast

09:30h-13:30h- Workshop #2 “Origins, diversity, and synthesis of living Intelligence: Unraveling the emergence and evolution of biological learning systems”

09:30-09:35h- Introductory remarks

09:35-10:10h- [Rafael Lahoz-Beltrá](#) (UCM, Madrid)

“Bacterial intelligence: synthesis and programming of 'smart' bacteria”

10:10-10:45h- [Alfonso Jaramillo](#) (I2SysBio, Valencia)

“Engineering bacteria for learning algorithms”

10:55-11:25h- Coffee break

11:25-12:00h- [Alfonso Rodríguez-Patón](#) (UPM, Madrid)

“Programmed evolution of biocircuits”

12:00-12:35h- [Ben Shirt-Ediss](#) (DIPC, San Sebastián)

“Emergence and evolution of protometabolic systems with potential for regulation and learning”

12:35-13:30h- Open Discussion

13:30-15:00h- Lunch

15:00-19:30h- Workshop #3 “Where do the limits of prediction in Biology lie?”

15:00-15:05h- Introductory remarks

15:05-15:40h- [Alberto Pascual](#) (CNB, Madrid)

“Predictability in the composition-function relationship of complex bacterial communities”

15:40-16:15h- [Juan G. Rubalcaba](#) (UCM, Madrid)

“Mechanistic forecasts of organismal responses to environmental change: Breaking the barriers of statistical inference”

16:15-16:45h- Coffee break

16:45-17:20h- [Fernando Soler Toscano](#) (US, Sevilla)

“Informational structures and informational fields in ecology and neuroscience. Possibilities for prediction and classification”

17:20-17:55h- [Aurelien Fabrice Decelle](#) (UCM, Madrid)

“Generative neural networks for genomic and proteomics data”

17:55-18:30h- [Josep Sardanyés Cayuela](#), (CRM, Barcelona)

“Dynamics around tipping points: about Early and Late warning signals”

18:30h-19:30h- Open Discussion

20:30h- Dinner

20th March

08:00h- Breakfast

09:00- 13:30h- Workshop #4 “Frontiers in engineering Biology”

09:00-09:05h- Introductory remarks

09:05-09:30h- [Andrés de la Escosura](#) (Univ. Autonoma, Madrid)

“The protometabolic nature of prebiotic chemistry”

09:30-09:55h- [Eva García Ruiz](#) (ICP-CSIC, Madrid)

“Engineering life via evolutionary tools: manipulating from biological macromolecules (enzymes) to yeast genome

09:55-10:20h- [James Pelletier](#) (CNB, Madrid)

“Essential physiological processes in a genomically minimal cell”

10:20-10:45h- [Javier Buceta](#) (I2SysBio, Valencia)

“The mechanobiology of bacterial filamentation”

10:55-11:25h- Coffee break

11:25-11:50h- [Luciano Marcón](#) (CABD-CSIC, Sevilla)

“Exploring the self-organizing landscape of the epiblast: the future of tissue engineering”

11:50-12:15h- [Miriam Muñoz Rojas](#) (Univ. Sevilla)

“Emerging soil microbial-based strategies for restoring biodiversity and enhancing climate resilience of degraded ecosystems”

12:15-13:30h- Open Discussion

13:30-15:30h- Lunch

16:00h Bus to Atocha-arrival at 17:00h