

NICHE and ECLT in dialogue
February 9th, 3.00 pm
Ca' Bottacin, Dorsoduro 3911 Venice, and online
(link: <https://unive.zoom.us/j/81042642075>)

What is missing in the language and tools we use to study and describe planetary health?

With Uri Hershberg and Roberta Raffaetà

Starting point for our conversation:

Uri Hershberg: As a visiting researcher at ECL, I am interested in studying and creating theories of living system but also in how we can describe them more clearly across scientific disciplines and to the public. I think the pandemic has shown us that we are not doing a very good job of this and that we need to improve. For this I hope to enlist the help of people in the social science but also beyond (in the humanities and art).

Roberta Raffaetà: I am an interdisciplinary scholar too, being an anthropologist who studies science & technology and the relationship between the biological and the social. I am coordinating an ERC project and one of my main motivations to come to Cà Foscari has been its potential for interdisciplinary research through NICHE and ECLT, and their cooperation

UH: My first experiences in Venice where the ECLT meeting and Roberta's NICHE kick off meeting. Both events were populated with very excited and driven researchers who wanted to help solve the burning problems of our society which could in some way be called health. Be it health from disease of the individual, health for society protected from a pandemic or global health in the face of climate crisis. To my surprise although both communities have very different scientist. Physicists, computational biologists and roboticists at ECLT and social scientists at NICHE, both identified a similar problem that we need to address to move forward. –

The shared problem is how to tell biology in a different way, what language/imagination and measures can we use to make sense of biology and medicine in a way that enable us to go beyond current limitations which silo discussion by scale and field and divide answers into static dichotomies of healthy and unhealthy rather than describing dynamics across scales of time and interaction.

RR: What a story becomes when the protagonist is not anymore, a specific entity (a microbe, a cell, an organ, a human body...) but a set of relations?

And maybe we even have to change our idea of what a protagonist is.

UH: So, today Roberta and I – together with all of you - will discuss what is health if we consider it as a property of an ecosystem and we'll approach this from our specific disciplinary perspectives

Questions

To help prepare the audience for our conversation we present here also two sets of questions from our two research projects that relate to the conversation we hope to have.

Roberta Raffaetà:

1. How does health come to be reconfigured in a world entangled through microbial data? (The theme of her funded ERC project)
2. What is an environment? Biosocial and multiscale
3. How to help biocomputational scientists to put the social aspects inside their (computational) models? Using insights from the social sciences to select the right variables rather than overcomplicating with additional variables

Uri Hershberg:

1. How can we create a measure of biosystem health that incorporates change at multiple scales, from the cellular through the individual to the ecosystem? how do we make such metrics concrete? how do we describe our metrics of biological change and our research of biology and health to scientists and to the public at large?
2. What are the patterns of change in a healthy immune response? how do these relate to the homeostatic state of the immune system?
3. What are healthy interactions of our immune system and the microbiome in the body and in the environment at large?

Related reading

1. Yaari, G., Flajnik, M. & Hershberg, U. Questions of Stochasticity and Control in Immune Repertoires. *Trends in Immunology* **39**, 859–861 (2018).

<https://www.sciencedirect.com/science/article/pii/S1471490618301662?via%3Dihub>

2. Cohen, I. R. & Marron, A. The evolution of universal adaptations of life is driven by universal properties of matter: energy, entropy, and interaction. *F1000Research* (2020).

<https://doi.org/10.12688/f1000research.24447.3>