Wednesday November 9, 2022 – 17:00 CET

Location
56 rue des Sts-Pères – 75007 Paris
Amphithéâtre Goguel

Ecosystems as Infrastructures?

The challenges raised by large-scale genome engineering in the nuclease age.

Conference by Prof. Rodolphe Barrangou on new genome editing technologies followed by a Q&A session on the transformations of ecosystems and their potential integration as the infrastructures of the future.

About the event

Genome engineering have yielded important technological advances which have been successfully scaled up. The artificial synthesis of insulin is often quoted as a major progress. The covid-19 pandemic has highlighted how recent techniques, such as faster DNA sequencing and mRNA vaccines, can be deployed continent-wide. As such, they have arguably passed an infrastructural threshold: herd immunity, while it has limitations, is functionally the result of a network of agents deciding that their immune systems collectively benefit from maintaining themselves as part the structure they belong to. Genome engineering techniques such as CRISPR open new perspectives in this domain. The advent of programmable nucleases raises the question of changing ecosystems on a molecular level to serve social welfare.

After a presentation on the state-of-the-art of genome editing, the Q&A session will focus on how these techniques could or couldn't be deployed to pursue such goals at an ecosystemic level. Could forestry be enhanced by giving genes to plants that make them less vulnerable to parasites or to forest fire? And if so, how does a society should go about investing in modifying organisms such as trees, whose traits will only appear several decades after the engineering was done?

About Rodolphe Barrangou

Prof. Barrangou is the Todd R. Klaenhammer Distinguished Professor at North Carolina State University. His laboratory focuses on the biology and genetics of CRISPR-Cas immune systems in bacteria. Using microbiology, molecular biology and genomics approaches, he investigates the use of CRISPR-Cas systems for three types of applications:

- The exploitation of CRISPR spacer hypervariability for genotyping and phylogenetic studies of beneficial and pathogenic bacteria
- Leveraging CRISPR-mediated interference for building up phage resistance in probiotic strains and starter cultures used in food manufacturing
- Harnessing of Cas9-mediated, re-programmable dsDNA cleavage for genome editing in bacteria

These activities provide insights into the genetic and molecular processes that drive CRISPR-mediated adaptive immunity in bacteria and generate novel tools for the manipulation of industrially relevant organisms for food and biotechnological applications.