

Pr. Christophe SOLA

Microbiology and Genetic Institute UMR8621
Orsay University, Paris, France

Abstract

“CRISPR and RNA characterization on microspheres for academic and operational research in microbiology”

Pr. Christophe Sola

Institut de Génétique et Microbiologie, UMR8621, CNRS-Université Paris-Sud 11
Infection Genetics Emerging Pathogen Evolution (IGEPE) Team

Clustured Regularly Interspersed Palindromic Repeats (CRISPR) loci were discovered at the end of the 80s in *Escherichia coli*, though designated as such in 2002. Their link to adaptative anti-phage immunity in coordination with CRISPR-associated *cas* genes, and to other physiological mechanisms, created a boost in both applied and academic research in relation to these peculiar genetic structures. CRISPR-associated *cas* genes encode proteins with functional domains typical of nucleases, helicases, polymerases and polynucleotide-binding activities.

With the advent of prokaryotic RNA interference linked to CRISPR, regulation of gene expression in bacteria and archaea changed paradigm putting a new emphasis on new mechanisms of lateral gene transfer and phage-based gene flows, which are likely to play important functions in species physiology and evolution.

We will review recent discoveries gathered on CRISPR interference mechanisms in some Archaea and Bacterial models and provide more detailed information on how CRISPR systems can be characterized on microbead-based arrays whether for academic or for operational research.

In the field of academical research, we will describe new projects aimed at better understanding the role of RNA interference in the virulence of the pathogen agent *Staphylococcus aureus*.

In the field of operational research, including molecular diagnostics and epidemiological surveillance, we will present some recent results which may either improve the cost/benefit ratio or even replace older laborious and time-consuming laboratory methods for the diagnostics of two major pathogen agents, *Salmonella enterica*, a major agent of food-borne diseases, and *Mycobacterium tuberculosis* complex, the agent of human and animal tuberculosis.

Biography