CARLO COSIMO CAMPA:

*Multiplexed genome engineering by Cas12a and CRISPR arrays encoded on single transcripts*

**ABSTRACT:**
The ability to modify multiple genetic elements simultaneously would help to elucidate and control the gene interactions and networks underlying complex cellular functions. However, current genome engineering technologies are limited in both the number and the type of perturbations that can be performed simultaneously. Here, we demonstrate that both Cas12a and a clustered regularly interspaced short palindromic repeat (CRISPR) array can be encoded in a single transcript by adding a stabilizer tertiary RNA structure. By leveraging this system, we illustrate constitutive, conditional, inducible, orthogonal and multiplexed genome engineering of endogenous targets using up to 25 individual CRISPR RNAs delivered on a single plasmid. Our method provides a powerful platform to investigate and orchestrate the sophisticated genetic programs underlying complex cell behaviors.

**REFERENCE:**
Multiplexed genome engineering by Cas12a and CRISPR arrays encoded on single transcripts. Campa et al., *Nature Methods*, 2019

**BRIEF BIOGRAPHY:**
My background lies in industrial biotechnology (B.Sc. and M.Sc. - University of Turin). I started my PhD studies at the PI3Ks Signalling Laboratory of University of Turin (Prof. Emilio Hirsch). For my postdoc, I moved to ETH Zurich at the Laboratory of Biological Engineering (Prof. Randall J. Platt - ETH Zurich) where I focus my research activities on the development of novel genome engineering tools.


By conducting investigations at the interface between biology, mathematics and engineering, I aim at defining both the design principles and the molecular mechanisms by which cells make decisions.