



# ICGEB

International Centre for Genetic  
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Knowledge

## ICGEB International SEMINAR PROGRAMME 2018

Friday, 29 June 2018 | 12:00 am | ICGEB Seminar Room, W building | Padriciano, 99, Trieste, ITALY



### Renato OSTUNI

*Genomics of the Innate Immune System  
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Macrophages are specialized cells capable of translating complex environmental signals into specific and partially reversible activation states. Yet, while the genomic features of responses to individual immune stimuli are well characterized, it remains unclear how complex inputs, entailing multiple signals with distinct biological properties, are computed and translated into transcriptional outputs. Here, we used bulk and single-cell genomics to show that macrophages are intrinsically able to integrate relevant combinations of immune stimulatory and suppressive signals into coherent gene expression programs. This type of response was globally homogeneous, generalizable across multiple combinations of stimuli, and resulted in the acquisition of unique and emerging transcriptional features distinct from those of cells exposed to individual stimuli. Mechanistic analyses revealed common principles underlying selectivity and specificity of transcriptional cross-antagonisms, which we incorporated into gene therapy approaches for functional macrophage reprogramming in cancer. Our analyses expand the spectrum of macrophage activation states by investigating a novel dimension, namely integration of antagonistic stimuli into emerging and unique transcriptional programs. Since macrophages, *in vivo*, are invariably exposed to multiple stimuli at the same time, we argue that these data will help to better interpret macrophage polarization in homeostasis and disease.

**“Single-cell dissection of genomic cross-regulatory interplays in macrophages”**

Host: F. Benvenuti

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Open event - Free entrance

