PRINCIPE FELIPE
CENTRO DE INVESTIGACION

The Future of Biomedical Research Lecture Series

Integrating single-cell technologies for high-resolution analysis of immunity in health and disease

Speaker: **Dr. Iyadh Douagi**
Karolinska Institutet, Stockholm, Sweden
Date: **12/05/2017 12:30h**
Place: Salón de Actos CIPF

Abstract: A hallmark of adaptive immunity is the diversity in the repertoire of B and T cell receptors, which forms the grounds for immune recognition of vast numbers of self and non-self antigens. Today, B cells are widely recognized as major effectors of adaptive immunity, playing central roles in both protective and pathogenic immune responses. By ensuring maintenance of long-term antibody responses, B cells are also critical for protective immunity against pathogens. However, many of the cellular and molecular mechanisms involved in B-cell mediated immune protection remain poorly defined. Furthermore, the origin, diversity and contribution, at the cellular level, of antigen-specific responses to serum antibody responses continue to be challenging to capture. Interestingly, most currently licensed vaccines confer protection via the elicitation of serum antibodies, yet, the cellular and molecular composition of the human serum antibody repertoire to vaccine antigens remains unknown. The complex cellular heterogeneity combined with the very low frequencies of antigen-specific cells remain two of the major constraints to interrogate the genetic record of humoral responses.

The onset of single-cell analysis technologies allows measurements of cellular heterogeneity at unprecedented dimensionality. Here, I will illustrate how the integration of single technologies based on high-resolution flow cytometry and next generation sequencing (NGS) can provide new opportunities to interrogate the immune repertoire at a single-cell level. Using selected examples I will also discuss how high-content single cell analysis approaches can contribute to decipher immunological mechanisms following “perturbations” in the context of vaccination or immune-diseases.

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