

Simposio Internacional / *International Symposium:*

Nuevas perspectivas en la investigación sobre el cáncer
New insights in cancer discovery

Madrid, 26 y 27 de octubre de 2017 / *October 26-27, 2017*

ABSTRACT

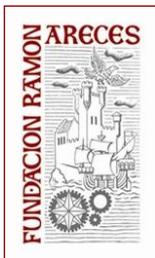
Recent advances in cryo-EM and its potential for drug development

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Important recent technological developments in microscopes, detectors and image processing tools have significantly improved the resolution of cryogenic electron microscopy (cryo-EM) on what has been termed the “resolution revolution”. These advances enabled the structural analysis of many elusive proteins and protein complexes to unprecedented level of detail, allowing for the study of their molecular mechanisms and the interactions with small molecules. As a result of these advances, cryo-EM has emerged as a key new tool for drug-discovery and thus the increasing interest from the pharma industry in the technique.

A good example of this is the partnership between Astex Pharmaceuticals, AstraZeneca, GlaxoSmithKline, Heptares Therapeutics, and UCB to form the “Cambridge Pharmaceutical Cryo-EM Consortium” with the aim of incorporating the new technologies into the companies’ pipelines with the help of experts from academia. The CNIO Structural Biology Programme will have access to state of the art microscopes and counts with the necessary expertise to carry out high-resolution studies. Combined with many other approaches already established at CNIO, we are using cryo-EM to study diverse macromolecular complexes involved in cancer with the aim to understand how they work and to move towards the generation of new compounds for therapies. In this seminar, I will introduce the technique and the key developments that nowadays allow us to visualize and understand the workings of protein-based molecular machines that could not be analysed before. I will lay out the general requirements needed to prepare samples for structural analysis using cryo-EM, the main difficulties that one may encounter, and how to overcome them.



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Finally, I will showcase the different insights that can be obtained with the technique in order to elucidate the molecular mechanisms behind cellular processes, and the potential of the technique for drug discovery using examples from recent publications and unpublished data.

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