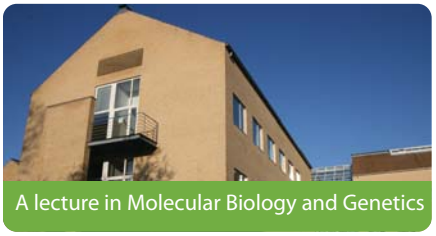
A KJELDGAARD LECTURE



Thursday 27 October 2016 at 13:15
1632-201 AIAS auditorium
Same location for the PhD session

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UK

Fun with cell maps

Intracellular proteins exist in controlled micro-environments where they fulfil different roles dependent on their local environment. To gain a complete functional analysis of the proteome, the possible sub-cellular niches in which a protein may reside must be determined. Moreover, the ability to map changes in location in response to perturbation such as drug treatment or cell stress is of paramount importance to our understanding of cellular mechanisms.

We have created hyperLOPIT, which couples quantitative mass spectrometry methods with advanced machine-learning tools. This method enables the simultaneous assignment of the steady-state location of thousands of proteins to multiple subcellular compartments to create a high resolution map of a cell. HyperLOPIT maps have revealed sub-organellar detail and the location of protein complexes and the steady state location of members of signalling and metabolic pathways. Our data has revealed that over half of the proteome is located in multiple places giving insight into spatially dependent functionality of proteins.

I will give examples of how we have applied this method to give a high resolution maps of several systems including mouse embryonic stem cells, and Saccharomyces cerevisiae. I will show how our data compare with other large scale cell maps which have been created using orthogonal methods. Lastly I will demonstrate the breadth of information that can be acquired when interrogating these maps, for example plotting the steady state location of metabolic pathway components, how intrinsically disordered proteins partition in the cell and give insight into the spatial specificity of E3 ligases.

Host: Emøke Bendixen, Protein Science
Department of Molecular Biology and Genetics, Aarhus University

The lecture will be followed by a chalk-board session for PhD students

The Kjeldgaard Lecture Series is organised by
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