ΙΤΕ/ΕΙΧΗΜΥΘ

ΠΡΟΣΚΕΚΛΗΜΕΝΗ ΟΜΙΛΙΑ

ΠΡΟΣΚΕΚΛΗΜΕΝΗ ΟΜΙΛΙΑ

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ΥΠΕΥΘ. ΠΡΟΣΚΛΗΣΗΣ: **Dr. Μαρία Κλάπα**, Κύρια Ερευνήτρια ΙΤΕ/ΕΙΧΗΜΥΘ

ΘΕΜΑ: **Modelling and Monitoring Tools for Bioprocess Optimization and Control.**

ΤΟΠΟΣ: Αίθουσα Σεμιναρίων ΙΤΕ/ΕΙΧΗΜΥΘ

ΗΜΕΡΟΜΗΝΙΑ: **Τετάρτη, 29 Ιουνίου 2011**

ΩΡΑ: **12:00**

ΠΕΡΙΛΗΨΗ:

There is a need for the development of a predictive tool that can be useful to the optimization of a medium composition or feeding strategy, to test and identify hypotheses on “optimal” genetic modification(s), or even to monitor and/or to control cell behaviour in in vitro culture. We are developing a kinetic-metabolic model to describe Chinese hamster ovary (CHO) cells' behaviour in bioreactor culture, following an approach that has been recently used to simulate as well as to control and optimize plant cell cultures for the production of secondary metabolites. Recent results suggest our model to be used for different CHO cell lines.

In parallel, we are developing new sets of monitoring tools in order to maximise the model throughput for bioprocess optimization and control. In the recent years, we have

developed an innovative and automated method for the at-line monitoring of secreted protein. The monitoring platform combines a Surface Plasmon Resonance-based biosensor and a bioreactor.

The proof of concept was performed by following at-line the relative concentration of a secreted protein produced by transient transfection of mammalian cells in a bioreactor. Our results suggest that this approach can be readily applied to the at-line determination of both protein concentration and bioactivity. In parallel, we are also developing a predictive model describing the cell metabolic behaviour, a model that can eventually be used as an on-line monitoring tool to follow and to fine-tune and control a bioreactor culture. The experimental setup and modelling strategy can thus satisfy the needs related to the development of novel bioprocess control protocols in the context of the new process analytical technology that arises in the biopharmaceutical industry.

SHORT BIO

MARIO JOLICOEUR is professor of chemical engineering at Ecole Polytechnique of Montreal since 1998. He is internationally recognised for his contributions in the design of batch and perfusion bioreactors at different scales (mL to L) for shear sensitive cells and tissues, and for cell culture monitoring tools (e.g. in vivo NMR). He holds a Canada Research Chair in applied metabolic engineering. His research interests are to characterize and mathematically describe the cells' metabolic and energetic regulation and to develop tools maximizing cell culture reproducibility. He also uses the tools he is developing for research in various biomedical areas.