Video presenting the Biorapid project

Presented by Johannes Gladisch, Acreo Laboratory of Organic Electronics

The BioRapid project aims to develop a platform to optimize and predict each step for producing new biopharmaceuticals. A video was produced to introduce the project in a generally intelligible fashion.

Disposable biosensors for downstream processing

Johannes Gladisch, ITN Laboratory of Organic Electronics & RISE Acreo

The majority of nowadays blockbuster drugs are biologicals. Biologicals are produced in bioreactors. In order to achieve a high quality product and a high yield, defined process control is very important. We try to develop a disposable biosensor that meets the needs of pharmaceutical companies for process control. The envisaged biosensor is printed and disposable. Preliminary results on studies of surface modification strategies will be presented.

Can help with:
- electrochemistry
- illustrations
- printed electronics
- biosensors

Needs help with:
- interpreting impedance spectroscopy results
- Surface functionalization
- printed electronics
- biosensors

E-mail: johannes.gladisch@ri.se

Software sensors for online monitoring and control bioprocesses

Judit Randek, IFM Biotechnology

Software sensors are a combination of mathematical models and hardware sensors attached to the bioreactor like pH and DO electrode, gas analyzer and biomass probes. The soft sensor is able to predict and estimate different variables, which cannot be measured directly in the reactor (for example state of the cells or intracellular protein). By that, they becomes a feasible possibility for following different reactions, monitoring and control the process.

I work with E. coli and CHO cells, and test different sensors (a capacitance and an optical density probe) to try to find the best sensor that fits the needs of the companies that I collaborate with.

The capacitance sensor is able to follow viable cells while the optical density probe measures the total cell number. Both of them have their advantages and disadvantages which I will present you with the results of my experiments.
Can help with:
- Culturing cells (bacteria, fungi, plant, algae, mammalian)
- HPLC
- Give motivation and support

Needs help with:
- Simulink

E-mail: judit.randek@liu.se

Disposable, printed L-lactate biosensor for monitoring of lab-scale cell-cultivation
Lorenz Theuer, Laboratory of organic electronics & RISE Acreo

Optimal process control of mammalian cell cultures in bioreactors requires monitoring of the important process parameters. Some of them, like temperature, dissolved oxygen and pH are being measured continuously and standardly in every cultivation system on the market today. Other important parameters like glucose and lactate concentrations have not yet found a simple and stable enough online measurement method and are in many places still determined once or twice a day by hand. Herein we report on the development of a biosensing platform for at-line monitoring of lactate. The proposed platform exploits the latest advances in printed electronics to achieve low cost, fast, sensitive and accurate single-measurement bio-sensors.

In the reported work the development of an amperometric L-lactate biosensor, based on lactate oxidase and its preliminary application to cell culture monitoring is presented.

Finally, our long term vision, based on hybrid printed system, for the at-line monitoring of metabolites (e.g. lactate) will be introduced.

Can help with:
- LabVIEW
- Pipetting robots
- Programming and automation

Needs help with:
- Optimism

E-Mail: lorenz.theuer@acreo.se

Creating a Video for the BioRapid project
Presented by Johannes Gladisch, Acreo Laboratory of Organic Electronics

The BioRapid project aims to develop a platform to optimize and predict each step for producing new biopharmaceuticals. A video was produced to introduce the project in a generally intelligible fashion. We want to share our journey of making the video happen.