

Poster: 7th cosmetics amendment – can all goals be achieved in time?

## Cell based assay for label-free, long-term investigation of living cells as alternative testing method for toxicity

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For monitoring of the metabolic and morphologic activity of living cells a six channel version of a cell based assay called intelligent mobile lab (IMOLA) was prepared (Wiest et al., 2006). IMOLA employs biochips which contain microsensors for measurement of cellular respiration, extracellular acidification and changes in morphology of the cells. These parameters are monitored in the microenvironment of living cells using sensors for dissolved oxygen, pH and impedance. Due to a sophisticated system set-up the cells can be monitored label-free, parallel, continuously and in real-time. The measurement is performed in a stop- and go-mode. During the stop-mode (7 min) the microsensors detect the slope of oxygen consumption, acidification and morphological changes of the cells. Afterwards during a pump cycle (go-mode) cell culture media or a drug are transported toward the cells to supply them with fresh media and to recalibrate the microsensors. These cycles are repeated throughout the measurement which may last up to two weeks. In the presented experiment the toxicity of doxorubicin toward MCF-7 cells compared to a control was investigated. The vitality of the cells is reduced for 33% compared to the control after 30 h of exposition. To ensure validity of the data the experiment was stopped by adding Triton X-100. Here the vitality signals of both groups declined immediately. With the presented IMOLA system a new tool for dynamic investigation of vitality and morphology of living cells and their interaction with drugs, toxins or metabolites is available. One advantage of the system is the label-free and long term investigation method. Due to these properties it is possible to monitor the kinetic of the interactions between cells and toxins. With this cell based assay, unique in-vitro toxicity data can be determined without the use of animal experiments.

### References

Wiest, J., Stadthagen, T., Schmidhuber, M. et al. (2006). Intelligent Mobile Lab for Metabolics in Environmental Monitoring. *Analytical Letters* 39 (8), 1759-1771. DOI 10.1080/00032710600714089

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