

Organotoxicity

Department of Extracorporeal Therapy Systems

The Department of Extracorporeal Therapy Systems offers a wide range of analytical and diagnostic methods. Cell-based biosensors are used for the early detection of organ failure and assessment of prognosis in critically ill patients, especially for the following organs and systems:

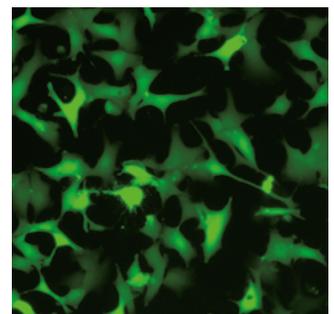
- Liver
- Kidney
- Nervous system
- Immune system

Liver failure

Liver failure is associated with a high mortality rate and can be caused by acute liver diseases or by aggravation of an existing liver disease.

However, medication such as paracetamol, may also cause acute liver failure. Liver damage caused by medication is the most common reason for withdrawing drugs that have already been approved for the market.

Currently used animal models are rather unreliable to detect early stages of liver failure. We therefore developed a microtiter plate assay based on human liver cells which can be used to detect liver failure at an early stage in a clinical setting. It is also suitable to evaluate the toxicity of drugs and medical devices. By optimizing and standardizing the procedure, reliable assessments can be made with regard to exogenous as well as endogenous toxicity.



In vitro test systems

In vitro test systems are implemented to replace, reduce and refine (3R principle) animal trials. The assays can be used to address needs of the pharmaceutical (toxicology, drug development, efficacy testing, bioactivity assays, quality control) and chemical industry (toxicity testing). Moreover, the test systems are versatile tools for basic research.

In vitro test systems are established for the investigation of

- Hepatotoxicity
- Neurotoxicity
- Leukocyte immunoparalysis

Biological risk assessment of medical devices is done according to EN ISO 10993-5:2009 and the procedures used in the in vitro testing adhere to quality standards like ISO 17025.

Equipment

The department is fully equipped for cell culture experimentation.

- Diverse cell lines
- State-of-the-art clean benches
- Fluorescent microscopy
- FACS analysis
- Live cell imaging
- Photometer, chemiluminescence- and fluorescence measurement

We have close links to the University Medicine Rostock and their facilities. Moreover, via our network of scientific partners we also have access to additional state-of-the-art technologies.

Selected references

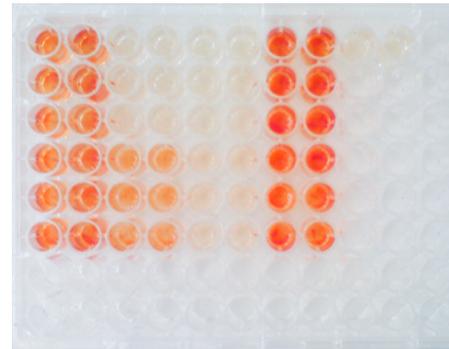
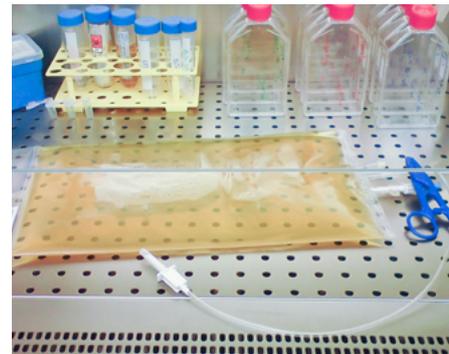
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