Pebble Biotechnology Laboratories

Drug-Induced Liver Injury (DILI) Evaluation

At Pebble, our cutting-edge **LIVING-ORGAN systems** provide an advanced platform to accurately evaluate **Drug-Induced Liver Injury (DILI)**, crucial for drug development and safety assessments.

What is DILI?

Drug-induced liver injury (DILI) is a major issue in drug development, accounting for the failure in **30%** of clinical trials. This leads to significant **financial losses** and **delays** in drug availability. Preclinically, DILI is evaluated using a combination of in vitro assays and small animal models. These methods aim to predict hepatoxicity before clinical trials. The existing in vitro models, like human liver microsomes and hepatocyte cultures, **fail to replicate human liver metabolism** and **interactions** at a systemic level.

Small animal models, while providing more systemic context, **do not accurately predict human responses** due to differences in drug metabolism and toxicity pathways. These limitations result in insufficient predictions of drug safety, leading to **unexpected liver damage** in later trial phases or post-market.

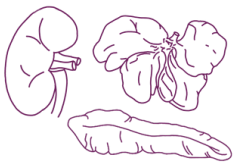
Understanding these gaps is crucial to **improve the accuracy** of DILI predictions and **reduce trial failures**. Pebble's LIVING-ORGAN systems address these challenges by providing relevant data through advanced replication of human liver physiology and multi-organ interactions.

Our Approach

Pebble's **LIVING-LIVER** system mimics human liver physiology, enabling detailed studies of drug toxicity and efficacy. By integrating multi-organ interactions, we offer a unique perspective on how substances affect liver health in the context of the **entire body.**

Pebble use three advanced methodologies to evaluate Drug-Induced Liver Injury (DILI). The first uses our LIVING-LIVER to provide an early indication of potential hepatotoxicity. This enables rapid modifications of drug candidates, thereby **enhancing safety** and **efficacy**.

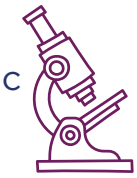
The second is the use of **Dynamic Testing Environments** that replicate the human liver's response to various conditions. This approach allows for the assessment of **liver function**, incorporating the complex interplay of liver enzymes, bile production, and hepatocyte viability. This dynamic assessment provides an accurate picture of how a drug might perform in a patient, reducing the risk of adverse effects once a drug is administered to human subjects.



Lastly, Pebble incorporates complex **MULTI-ORGAN systems** into the evaluation process. By using sophisticated systems incorporating a spleen, kidney, and circulating immune system, Pebble can predict the **likelihood** and **potential severity of multi-organ injury**, informing decision-making processes during drug development. These capabilities are integral to reducing the risk of late-stage trial failures, ensuring that only the most **promising** and **safe drug candidates** move forward in the development pipeline.

Key Features

Pebble's LIVING-LIVER systems offer a deeply integrated suite of assessments that aim to match, and potentially surpass, the depth of traditional in vivo tests. A comprehensive set of liver function parameters are routinely recorded, encompassing not just basic enzyme levels but also sophisticated **markers of liver metabolism** and **excretion** such as cytochrome P450 activity, glutathione levels for oxidative stress indication, and comprehensive bile acid profiles to assess cholestatic responses.



Functional assessments are recorded in real-time, including liver haemodynamics, to monitor changes in perfusion that often precede symptomatic injury. **Imaging** and **clinical pathology** assessments provide detailed descriptions of tissue morphology, cellular integrity, and severity of DILI, offering a parallel to histopathological examinations typically conducted post-mortem.

This suite of technologies promises to transform the landscape of hepatotoxicity testing by providing a more **ethical**, **efficient**, and **human-relevant** framework for the drug development process.

Contact Us

Learn more about how Pebble's innovative systems can transform your **drug safety evaluation** processes. Contact our expert team today to schedule a consultation or demo.