HUB ORGANOIDS

HUB Organoids in Preclinical Toxicology

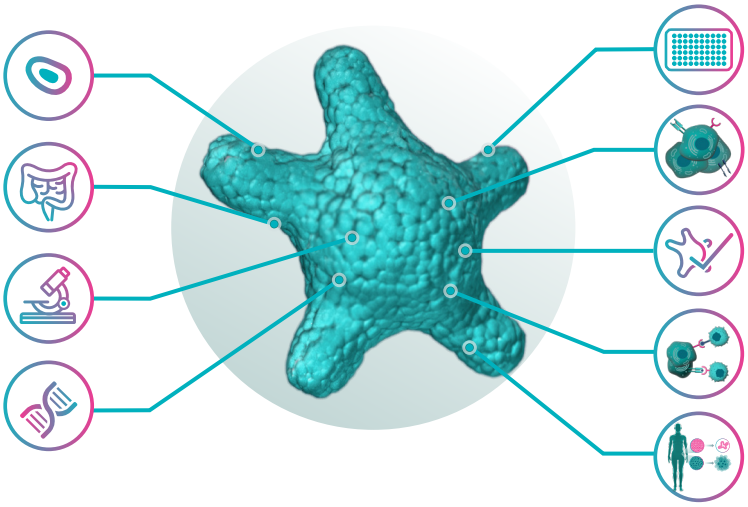
About 30% of drugs fail human trials because of toxicity, despite promising preclinical safety tests

The high attrition rate can be attributed to the poor predictive value of conventional preclinical models. 2D cell cultures, like Caco-2 cells, often fail to replicate the cellular complexity of human tissues, and animal models do not fully represent human-specific toxicities due to species differences.

A patient in the lab

Patient avatars that bridge the gap between the lab and the clinic

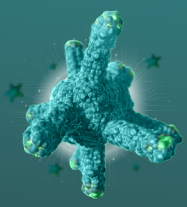
- Derived from adult stem cells
- Physiologically relevant
- Genetically and phenotypically stable
- Suitable for genetic manipulation



- Expandable for large-scale screens
- Preserves patient- and disease-specific antigens
- Can be developed from virtually any preclinical species
- Amenable to co-cultures with immune, stromal cells or bacteria
- Detects off-target toxicities in matched normal diseased organoids

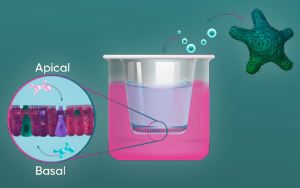
HUB Portfolio

Customizable toxicology solutions at your fingertips



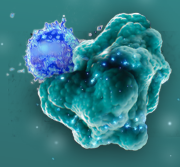
Organoids

Uncover unwanted on-target and off-target toxicities



Organoid Monolayer

Test compounds that disrupt barrier function



Organoid Co-Cultures

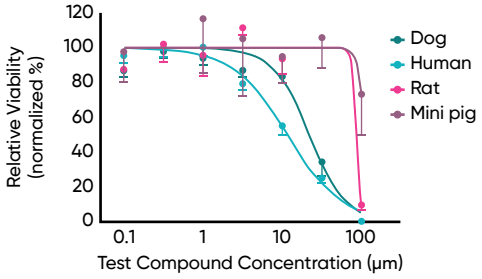
Investigate complex hypotheses involving stromal, epithelial, and immune cell interactions

Applications

End-to-end service offering to de-risk your early-stage development and translate late-stage findings

Make an educated animal model selection based on optimal translatability to human

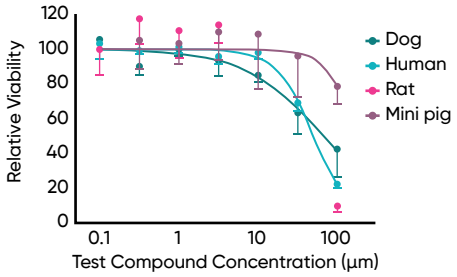
To ensure drug safety, regulatory bodies require toxicity testing in mammals. Selecting the right animal species is critical, as responses can vary greatly. In this case study, we identified a suitable animal model for a client's drug. An *in vitro* gastrointestinal (GI) toxicology study compared human-derived organoids with organoids from dogs, mini-pigs, and rats. The dog organoids displayed the most comparable toxicity profile to human organoids, leading the client to select dogs for further *in vivo* safety testing.



In vitro viability assay reveals that canine organoids mirror human toxicity response profile

Understand animal-to-human translatability

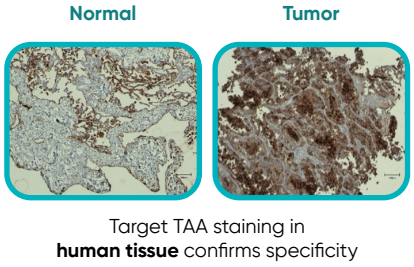
When preclinical animal studies reveal discordant toxicity profiles, drug developers face a crucial challenge in determining if the toxicity translates to humans. Our client's *in vivo* data showed GI tox susceptibility in dog but not rat. We tested the compound in an *in vitro* screen featuring organoids from humans, dogs, mini-pigs, and rats. Our findings indicated that dogs exhibited a comparable toxicity profile as humans, helping our clients identify a potential therapeutic window for their compound.



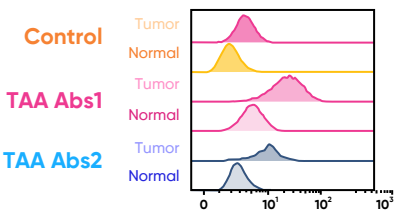
Representative graph shows that canine organoids have comparable toxicology profile as human organoids

Evaluate on-target and off-target toxicity using patient relevant models

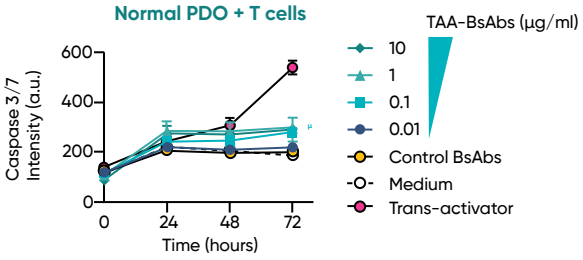
Anticipating human response to treatment at an early stage of drug development can improve R&D productivity. HUB Organoid Technology allows the detection of off-target toxicity and determination of therapeutic window by simultaneously testing in matched normal and diseased organoids derived from the same patient.

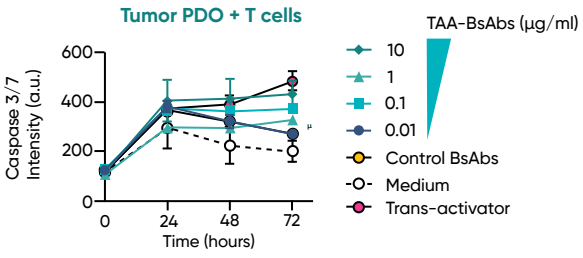


Target TAA staining in **human tissue** confirms specificity



PDO model selection: Target TAA expression verified across 3 pairs of **matched normal/tumor PDOs**





Sample data demonstrates the use of organoid and T cell co-cultures, derived from both normal and tumor tissues, to evaluate the safety profile of anti-tumor associated antigen (TAA) bispecific T cell engager

Discover the transformative potential of patient-derived organoid technology in your preclinical toxicology research

talk to an expert