CRACK IT Solutions

Quasi-Vivo© Cell Culture

Kirkstall has recently launched the Quasi-Vivo© 500 Starter Kit for use by the research community. The dynamic nutrient flow means that unlike conventional static cell culture, cell to cell signalling is permitted between different cell and tissue types, whilst the bio-module design minimises the shear stress in the cell culture region, improving cell vitality and allowing longer duration experiments. We are looking for partners to help us develop better models of *in vitro* cell culture for studies of drug and chemical toxicity, disease, DMPK and stem cell differentiation.

What could your solution be used for?

The Quasi-Vivo© design principles are based on the allometric scaling of cell numbers and the mean residence times of molecules in metabolic tissues, as well as consideration of oxygen tension and shear stress, which together can be combined to establish organ and system models. By connecting together different chambers in series or parallel, it is possible to mimic different metabolic pathways and test multi-compartmental biological models *in vitro* without having to design dedicated equipment or culture chambers.

Combined with allometric scaling, the Quasi-Vivo© system could also find applications in a range of metabolic models including biotransformation, gas exchange and nutrient absorption models.

Need for collaboration

We need partners who wish to develop better models of *in vitro* cell culture for studies of drug and chemical toxicity, disease, DMPK and stem cell differentiation. Research institutes, universities or companies from the pharmaceutical and chemical sectors with existing models of kidney, lung, heart, blood-brain barrier, liver, etc are invited to contact us to participate in collaborative research.

Of particular interest are: (i) models for cell to cell and organ to organ interaction and (ii) studies that require long term cell culture over 28 days. We would particularly like to work with groups who have established excellent single tissue or organ models and now wish to extend these to include organ to organ interactions.

3Rs impact assessment

Use of the Quasi-Vivo© system for toxicity testing of drug metabolism in pharmaceutical development will reduce the need for *in vivo* studies, particularly on candidate drugs destined to fail later in development.

- As experience and validation with known compounds and toxicities grows, the potential for the eventual replacement of animal models in some applications exists, for example rodents in early stage drug toxicity screening.
- Human primary cells that more accurately represent the *in vivo* situation using the Quasi-Vivo© system could potentially replace the use of animals in later stage pre-clinical trials
- Different cell types from a single animal donor can be used in multiple experiments, thereby reducing the number of animals used per experiment.

To find out more or to connect with the technology developer contact crackitenquiries@nc3rs.org.uk

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