

IdMOC™

Integrated Discrete Multiple Organ Culture

U.S. Patent Number: US 7,186,548 B2

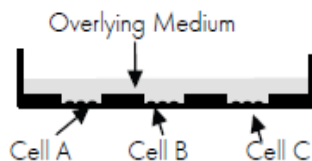


IdMOC, developed by Dr. Albert Li, Ph.D. of Advanced Pharmaceutical Sciences, Inc., is a novel technology allowing the culturing of cells from multiple organs in the same culture dish. Each organ's cells remain physically separated from those of other organs, so each can be cultured under optimal conditions. Cells from multiple organs can then be connected via an overlying medium.



(Figure 1)

specific effects of a drug and its metabolites (Figure 1). The IdMOC consists of multiple, inner wells within a larger interconnecting chamber. Multiple cell types are first individually cultured in the inner wells in media optimized for each cell type (Figure 2). On the day of experimentation, the individual media are removed and the chamber is filled with a single universal medium,



(Figure 2)

In previous in vitro systems, each cell type was studied in isolation, ignoring critical interactions between organs when metabolizing drugs. This led to the possibility of many factors such as inter-organ toxicity going unrecognized in drug evaluations. The IdMOC models in vivo multiple-organ interaction, thus allowing the evaluation of organ-

specific effects of a drug and its metabolites (Figure 1). The IdMOC consists of multiple, inner wells within a larger interconnecting chamber. Multiple cell types are first individually cultured in the inner wells in media optimized for each cell type (Figure 2). On the day of experimentation, the individual media are removed and the chamber is filled with a single universal medium,

flooding the inner wells and allowing well-to-well communication via the overlying medium. The test material is then added to the overlying medium. After experimentation, the overlying medium can be analyzed for overall metabolism of the test material, and individual cell types can be processed for the quantification of associated test material to evaluate possible organ-specific bioaccumulation, evaluation of cell viability for cytotoxicity, and efficacy.

Applications:

- Efficacy:** Evaluation of the desired on-target and off-target effects via the examination of pharmacological effects of a drug in cells from target organs as well as off-target organs
- Drug distribution:** Estimation of the potential differential drug distribution in multiple organs via the quantification of drugs in cells from multiple organs after exposure
- Drug metabolism:** Drug stability and metabolite formation after metabolism by cells from multiple organs
- Drug toxicity:** Simultaneous evaluation of toxic potential of a drug on cells from multiple organs under identical experimental conditions

IdMOC : A Novel In Vitro System for Routine Screening of ADMET Drug Properties.

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