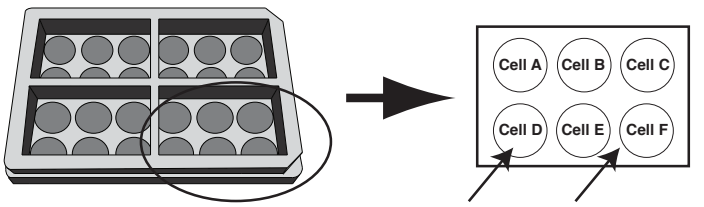
Integrated discrete Multiple Organ Co-culture (IdMOC™) Plate 4 Chamber: 24 Well

Overview: The Integrated discrete Multiple Organ Co-culture (IdMOC™) is an in vitro experimental model for intercellular or paracrine communication. This product (patents US 7,186,548 B2, JAPAN 4609799, CHINA 626030) was developed based on the concept that multiple organs in a human being are physically separated but interconnected by the systemic circulation. IdMOC™ uses a wells-in-a-well concept, with cells from individual organs seeded into each of the inner wells, bound by a Matrigel™ overlay and interconnected by flooding the outer chamber with an overlying medium. IdMOC™ can be used to evaluate paracrine signaling, drug toxicity, metabolism, distribution and mechanism of action. It represents a more complete in vitro experimental system than the commonly used single-cell-type in vitro systems.



Protocol:

1. In a sterile environment, remove the plate from the bag and open lid. Seed cells in the inner wells of an IdMOC™ plate at desired cell density using a seeding volume of 300µl. Add cells directly to the center of the well and do not shake. For non-proliferating cells such as human hepatocytes seed 2–3 X 10^5 cells/well or 5–6 X 10^4 cells/well of proliferating NIH3T3-L1 preadipocytes to obtain 90–100% confluence within 24 hours.
2. Place the plates carefully in a tissue culture incubator at 37°C and 5% CO_2 and incubate for 4–6 hours to allow attachment.
3. Remove culture medium and replace with 100µl of medium containing 0.25–1mg/ml BD Matrigel™ Basement Membrane Matrix (BD Biosciences, Sparks, MD). Note Matrigel™ will gel rapidly at 22°C to 35°C. Therefore thaw overnight at 4°C on ice. Mix Matrigel™ to homogeneity and dilute to desired concentration in culture medium. A final concentration of 1mg/ml is recommended.
4. Incubate at 37°C and 5% CO_2 for 1 hour (or overnight, as required) to allow Matrigel™ to solidify.
5. Optional: Aspirate unbound material and rinse gently using culture medium.
6. To initiate well-to-well communication, remove medium from individual inner wells and flood outer well with 4ml of medium. Incorporate desired drug or chemical into the flooding medium before addition to the plate.
7. Incubate at 37°C and 5% CO_2 until required. A 24–48hr treatment period is recommended for drug evaluations.
8. Swirl plate gently at regular intervals to facilitate uniform distribution of paracrine factors.
9. Harvest media and/or cells as required.

References:

Downloadable pdfs available at www.invitroadmet.com.

1. Li AP. In vitro evaluation of human xenobiotic toxicity: scientific concepts and the novel integrated discrete multiple cell co-culture (IdMOC) technology. ALTEX. 2008;25(1):43-9.
2. Li AP, Bode C, Sakai Y. A novel in vitro system, the integrated discrete multiple organ cell culture (IdMOC) system, for the evaluation of human drug toxicity: comparative cytotoxicity of tamoxifen towards normal human cells from five major organs and MCF-7 adenocarcinoma breast cancer cells. Chem Biol Interact. 2004 Nov 1;150(1):129-36.