

Tentative Outline

Special/Thematic Issue for the journal "Endocrine Metabolic & Immune Disorders - Drug Targets - EMIDDT"

Tentative Title: Cellular in vitro systems to predict chemically-induced adverse reactions in humans.

Guest Editor: Hilmi Orhan

Scope of the Thematic Issue:

The dilemma of safety sciences is predicting the potential adverse effects of mostly totally unknown chemical substances in the human body by testing them in nonhuman organisms. Rodents are widely used in such experiments because of their fast reproduction and much smaller body size that enables easy handling, efficient housing, and economical feeding, although there are myriad differences between humans and rodents. On the other hand, ethical issues regarding the use of animals in mostly painful and many times lethal experiments have motivated scientists to discover alternative approaches to animals for toxicity testing. One powerful alternative has been isolated cells from a living organism. Many different cell types have been isolated and used for decades both for scientific and regulatory purposes in predicting human health risks posed by chemicals. This reductionist approach offers various advantages by escaping the complexity of the whole organism in interpreting biological responses upon exposure to chemicals and, in some instances, clearly reveals the target cellular molecules and structures. On the other hand, the lack of organismal cell diversity in cultures of one cell type can result in critical shortcomings, even inaccurate conclusions. In cellular in vitro applications, various strategies have been implemented to overcome this potential source of inaccuracy, such as co-culturing different cell types to imitate a specific tissue, developing three-dimensional in vitro systems with the intention of better approximating histological integrity. These efforts have advanced toward organ-on-a-chip and body-on-a-chip systems. In this thematic issue, the history, progress, and current state of the art of in vitro cellular systems will be illustrated by both reviews and research articles.

Keywords: non-animal methods (NAM), in vitro, cell culture, 2D, 3D, organoids, adverse effect

Sub-topics:

- 1) (Bioactivation-associated) Toxicity Testing in vitro
 - a. Drugs
 - b. Herbal ingredients
 - c. Nanoparticles
 - d. Xenobiotics
- 2) Immunotoxicity Testing in vitro
- 3) Endocrine disruption
- 4) Use of cells in drug development/therapeutic intervention

Tentative titles of the articles

- Role of cytochrome P450s, reactive metabolites and oxidative stress in cytotoxicity & mitotoxicity of clozapine, diclofenac and nifedipine in CHO-K1 cells in vitro
- Mutated or wild-type cells for special applications: polyamine transport deficient Chinese hamster ovary cells and ocular cell lines in drug development and mechanistic toxicity studies (review article)
- Human liver organoid models for assessment of drug toxicity at preclinical stage (review article)

- Evaluation of endocrine related adverse effects of non-endocrine targeted pharmaceuticals in cellular systems (research article)
- Standardized reconstructed human 3D tissue models in regulatory toxicology: from initial idea to the regulatory acceptance (review article)
- New approach methodologies in immunotoxicology: challenges and opportunities (review article)
- In vitro immune modulatory effects of bisphenol analogs on human leukocytes (research article)
- Effects of high dose curcumin and quercetin on endoplasmic reticulum stress in breast cancer cell lines (research article)
- Metal nanoparticles with antimicrobial properties: toxicity response in mouse mesenchymal stem cells (research article)
- Effects of antimicrobial metal nanoparticles on characteristics and functions of mouse mesenchymal stem cells (research article)
- Persistence and dynamics of DNA damage response and cell fate in human lung cells after the exposure to genotoxic compounds (research article)

Schedule:

- ✧ Complete Thematic issue submission deadline: **July 1st 2022**

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