

Cell culture systems as *in vitro* model of the intestinal barrier

SENIOR SCIENTISTS :

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Research Field and Subjects

The research is focused on developing and using cell culture systems as *in vitro* models of the intestinal barrier. Cell culture systems are indeed increasingly used to investigate the transport as well as the interactions of various substances, nutrients, drugs, xenobiotics, with the cell physiology.

In particular, in the case of the intestinal barrier, cultured Caco-2 cells allow to set up *in vitro* models of the human intestinal barrier that are widely used in pharmaco-toxicology. Such systems have been validated and serve now routinely to evaluate the absorption of substances across the intestinal barrier and to predict their bioavailability as well as possible toxic effects, drug interactions, ... More recently, the experimental conditions have been adapted to also set up a model of the M cells, characteristic of the FAE (follicle-associated epithelium).

The systems based on Caco-2 cells are currently used :

1. to perform mechanistic studies, at the cellular and molecular level, of the passage of nutrients, drugs or xenobiotics across the human intestinal barrier
2. to determine the modulation of the expression of the genes and of the activities of proteins related to biotransformation, efflux and apoptosis by drugs and xenobiotics in human intestinal cells
3. to target nanoparticules to human M cells, for a more selective delivery of therapeutic proteins or antigens

Products and Services

- ▶ Cell culture system as *in vitro* model of the human intestinal barrier
- ▶ *In vitro* testing of intestinal permeability and biotransformation of substances
- ▶ *In vitro* evaluation of drug interaction and intestinal gene regulation by xenobiotics

Main Equipment

- ▶ Animal cell technology
- ▶ Equipment for cell biochemistry

- ▶ Access to mass spectrometry and laser scanning confocal microscopy

Representative References

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Partnership

- ▶ Partner of *Institut des Sciences de la Vie* (ISV), Louvain-la Neuve, Belgium

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