A model of inflamed primary human synoviocytes for the evaluation of compounds in the physiopathology of joint diseases

Commonly used acronym: *Model of inflamed synoviocytes*

Created on: 16-01-2024 - Last modified on: 17-01-2024

Contact person

Julie Uerlings

Organisation

Name of the organisation ARTIALIS

Department Preclinical Department

Country Belgium

Geographical Area Walloon

SCOPE OF THE METHOD

The Method relates to	Human health
The Method is situated in	Translational - Applied Research
Type of method	In vitro - Ex vivo

Used species	Human
Targeted organ system or type of research	Joint health

DESCRIPTION

Method keywords

inflammation

cartilage catabolism

short-term

mode of action

screening

Scientific area keywords

joint health

anti-inflammatory properties

medical devices

visco-supplements

anti-catabolic properties

osteoarthritis

drugs

food supplements

Method description

The culture of primary human synoviocytes provides an excellent cellular model for studying the normal and pathological physiology of synoviocytes and the development of joint diseases. Human primary synoviocytes can either be provided by commercial suppliers or isolated from fresh biological

material (synovial membrane tissue sampled during total knee replacement surgeries). Primary synoviocytes are cultured in monolayer, for short-term periods (usually from 24h to 72h), in presence of IL-1b which is efficient to induce a pro-inflammatory environment and pro-catabolic conditions. This short-term model is used to assess the mode of action of several novel therapeutic solutions intended for joint diseases such as osteoarthritis (drugs, food supplements, medical devices, ATMP). It can also be used as a rapid screening model before moving on to *in vivo* experiments (in view of the 3Rs). Dexamethasone is used as positive control to counter the pro-inflammatory and pro-catabolic status of the inflamed synoviocytes.

Lab equipment

- Laminar flow hood and CO2 incubator (for cell culture),
- qPCR machine (for molecular biology analyses),
- Spectrophotometer and fluorometer (for NO and DNA measurements, respectively).

Method status

History of use

Internally validated

PROS, CONS & FUTURE POTENTIAL

Advantages

- Short-term, cheap and efficient screening model,
- Easy access to the HFLS (commercial supplier).

Challenges

Inter-variability between donors (primary cultures).

Modifications

This model could be adapted into a co-culture model with chondrocytes to better mimic the joint articulation.

Future & Other applications

This model is currently adapted to other species in our facilities (dog, horse, ...) for the testing of veterinary products.

REFERENCES, ASSOCIATED DOCUMENTS AND OTHER INFORMATION

Associated documents

In vitro culture of primary human synoviocytes.pdf

Coordinated by

Financed by