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

SCOPE OF THE METHOD

<table>
<thead>
<tr>
<th>The Method relates to</th>
<th>Human health</th>
</tr>
</thead>
<tbody>
<tr>
<td>The Method is situated in</td>
<td>Translational - Applied Research</td>
</tr>
<tr>
<td>Type of method</td>
<td>In vitro - Ex vivo</td>
</tr>
<tr>
<td>This method makes use of</td>
<td>Human derived cells / tissues / organs</td>
</tr>
<tr>
<td>Used species</td>
<td>Human</td>
</tr>
<tr>
<td>Targeted organ system or type of research</td>
<td>Joint health</td>
</tr>
</tbody>
</table>

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

PARTNERS AND COLLABORATIONS

Organisation
Name of the organisation ARTIALIS
Department Preclinical Department
Country Belgium
Geographical Area Walloon