MAPK inhibition selectively mitigates inflammatory mediators production in disc cells co-cultured with activated macrophage-like THP-1 cells

We have no financial relation with any commercial interest related to the content of this activity
Molecular basis of Symptomatic disc degeneration

- Disc injury
  - TNF-α
  - IL-1β
  - NGF

- Sensitization
  - IL-1β
  - TNF-α
  - IL-8, VEGF, et al

- Angiogenesis
  - IL-6, IL-8, IL-1, INOS, et al

- Nerve in-growth
  - IL-8, VEGF, et al

- PG/Collagen synthesis
  - Enhance caseinase
  - Enhance neutral proteinase
  - Upregulation of ADAMTS-4
  - Inhibit PG synthesis
  - Up-regulation of MMP-1, 3, 9

- 

Mechanism of MAPK

Purpose of study

To find out **MAPK influence in disc degeneration**
Materials and methods (1)

Schematic Figure of experiment

AF

2000 RPM x 5 min

7 days

THP-1

PMA treatment
For 3 days

NP

2000 RPM x 5 min

7 days

ELISA assay

AF-Mφ

Co-culture for 48 hrs with SB202190/PB98059/SP600125

AF

AF-Mφ

NP-Mφ

NP

Mφ

SB202190: p38 MAPK inhibitor
SP600125: JNK MAPK inhibitor
PB98059: ERK inhibitor
Results (I)

Inflammatory mediators production during co-culture

**TNF-α**

<table>
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<tr>
<th></th>
<th>AFM</th>
<th>NPM</th>
<th>MØ</th>
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<tbody>
<tr>
<td>ng/ml</td>
<td>12</td>
<td>6</td>
<td>9</td>
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0.04

**IL-1β**

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**IL-6**

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0.001

**IL-8**

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**NO**

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<td>2</td>
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Results (II)

p38 inhibitors during co-culture

* : p<0.05
JNK inhibitors during co-culture

* : p<0.05

Results (III)
ERK inhibitors during co-culture

Results (IV)

* : p<0.05

TNF-α

IL-1β

IL-6

IL-8

μM

ng/ml

μM

ng/ml

μM

ng/ml

μM

ng/ml

μM

ng/ml
p38 inhibitors on macrophage-exposed disc cells

Results (V)

IL-6

IL-8

AF(МФ)  NP(МФ)
JNK inhibitors on macrophage-exposed disc cells

Results (VI)

IL-6

IL-8

AF(MΦ)  NP(MΦ)

AF(MΦ)  NP(MΦ)
ERK inhibitors on macrophage-exposed disc cells

**IL-6**

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<th>AF(Мφ)</th>
<th>NP(Мφ)</th>
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**IL-8**

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Results (VII)

0.04
MAPKs’ role during inflammation of disc