286 Exosome-prevention of MAPK phosphorylation

Asset Overview

Product Type	Others
Indication	Alzheimer's disease, Rheumatoid Arthritis
Current Stage	Proof-of-Concept
Target(MoA)	Prevention of MAPK phosphorylation
Brief Description	• The Fraunhofer researchers developed EVs to design new targeted therapies for a wide variety of diseases • They are specialized at customizing and testing MSC-EVs. These findings could open a new way for novel cell-free therapeutics to prevent CNS chronic inflammation • We are looking for industry partners interested in testing new EV technologies
Organization	Fraunhofer IZI

Differentiation

□ **MSC-MVs inhibit the activation of the BV-2 cell line upon LPS stimulation**

- MSC-MVs prevent transcription and secretion of pro-inflammatory cytokines, stopping upregulation of cell surface molecules and stimulating the transcription of anti-inflammatory cytokines
- Transcription of pro-inflammatory genes by PM in response to LPS was prevented in the presence of MSC-MVs
- MSC-MVs inhibited the production of the pro-inflammatory cytokines TNF-a, IL-1b, and IL-6 in response to LPS

□ **Use of MSC-MVs and exosomes as a tool for regeneration induction**

- MSCs can be modified for the introduction of interest molecules that will be naturally packaged in the MSC-Evs
- Modified MSCs and MSC-EVs are molecularly and functionally characterized (proteins, microRNAs, effect on cell-model of interest)
- MSC-EVs exosomes might represent a novel cell-free therapy with compelling advantages over parent MSCs such as no risk of tumor formation and lower immunogenicity

□ **Proprietary pipeline (Ongoing)**

- ExoTherAI: Extracellular Vesicles as therapy for Alzheimer
- EVRA: Extracellular Vesicles for Rheumatoid Arthritis

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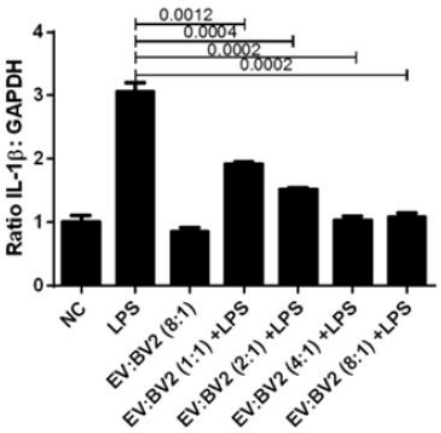
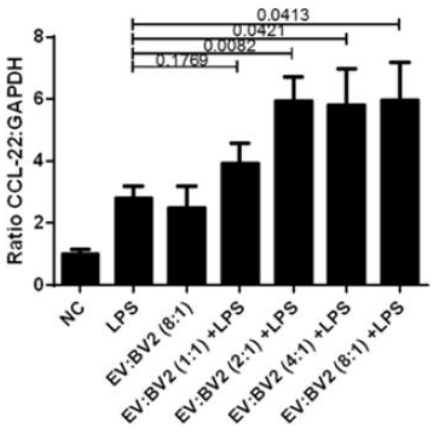
Key Data

MSC-EVs modulate microglia activation by LPS

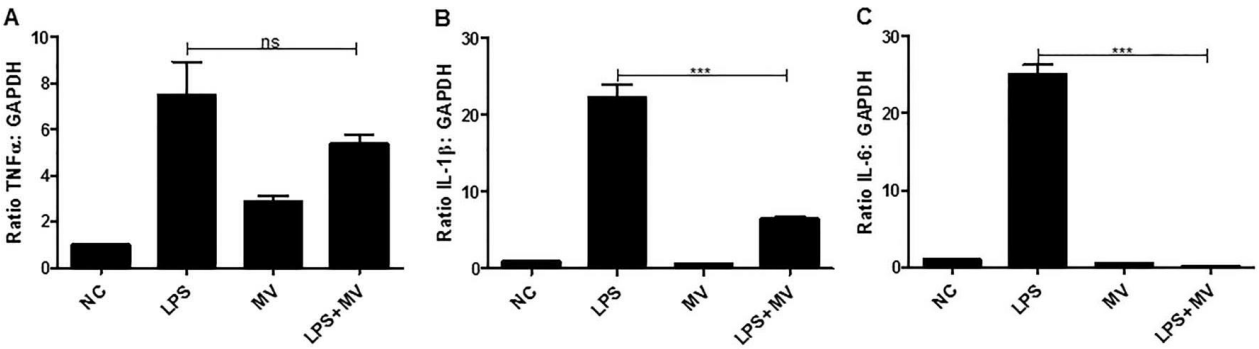
Pro-inflammatory gene transcription



Anti-inflammatory gene transcription



Gene transcription by primary microglia (PM) cells after stimulation with LPS in the presence and absence of mesenchymal stem cells-derived MVs (MSC-MVs)



Expression ratio evaluated by real time PCR of the house keeping gene GAPDH versus transcripts encoding the (A) TNF-a, (B) IL-1b, and (C) IL-6 by PM cells in response to stimulation with LPS in the absence or presence of MSC-MVs at a ratio 8:1 MSC-MV: PM. Statistical significances are shown as *, p<.05; **, p<.01; ***, p<.001. Abbreviations: GAPDH, glyceraldehyde-3-phosphate dehydrogenase; IL-1 b, interleukin-1b; IL-6, interleukin-6; LPS, lipopolysaccharides; MV, microvesicles; NC, negative controls.

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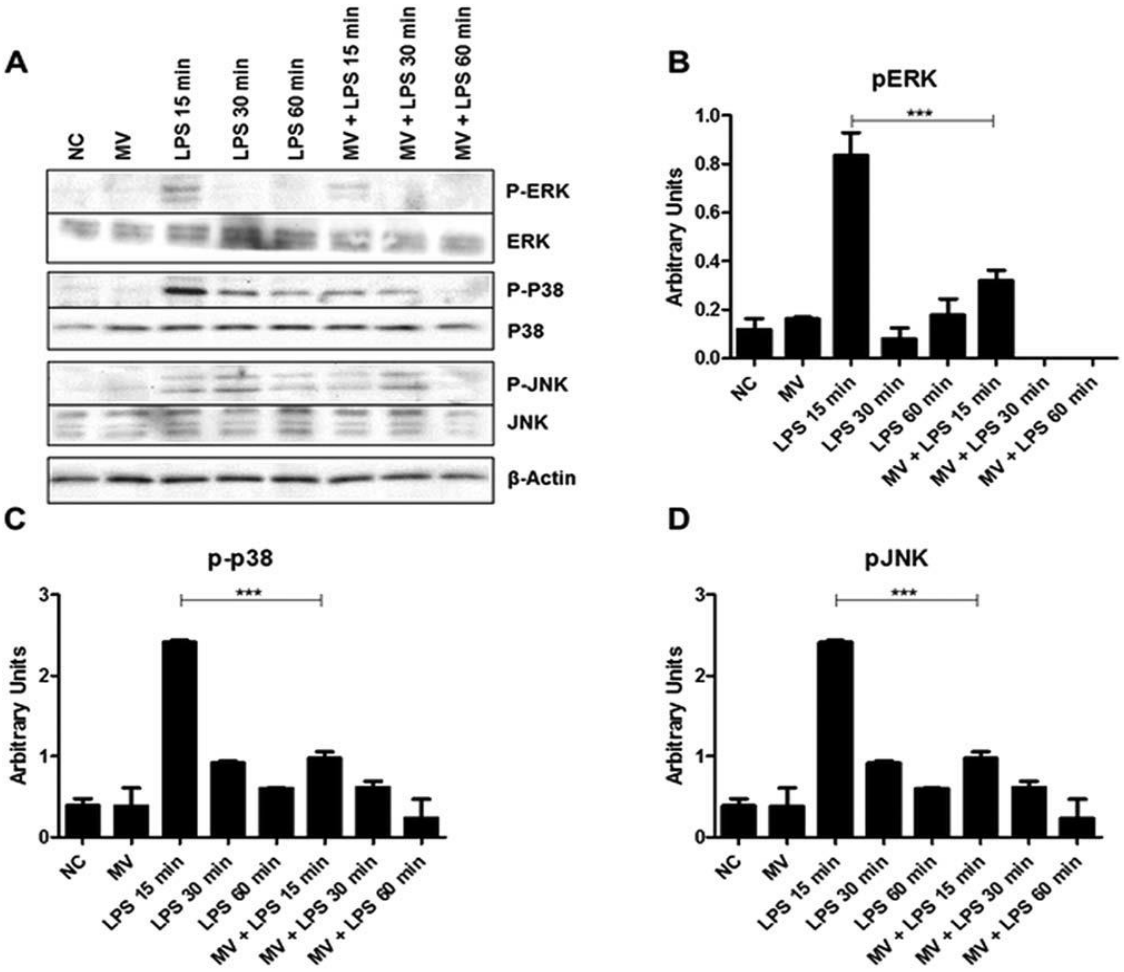
MAPK activation in BV2 cells after LPS stimulation in the presence and absence of mesenchymal stem cells-derived MVs (MSC-MVs)



Phosphorylation of ERK, p38, and JNK was evaluated by (A) Western blot after stimulation of BV2 cells with LPS during 15, 30, and 60 minutes in the absence and presence of MSC-MVs. Beta actin concentrations were used as controls. Densitometry quantification represented in arbitrary units of (B) p-ERK, (C) p-p38, and (D) p-JNK. Statistical significances are shown as *, p<.05; **, p<.01; ***, p<.001. Abbreviations: LPS, lipopolysaccharides; MV, microvesicles; NC, negative controls; pERK, phosphorylated extracellular signal kinases; p-p38, phosphorylated-p38; P-JNK, phosphorylated c-Jun N-terminal kinases.

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Intellectual Property

Patent No.	
Application Date	
Status	
Country	

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