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► To cite this version:

Laurent Galio, Kais Hussain Al-Gubory, Juliette Cognie, Pierrette Reinaud, Corinne Giraud-Delville, et al.. Implantation-related genes in the ovine endometrium are regulated by extracellular vesicles from earlypregnant uterine fluids. 1.Meeting of French Society for Extracellular Vesicles, French Society for Extracellular Vesicles (FSEV). FRA., Nov 2017, Paris, France. 91 p. hal-02736841

HAL Id: hal-02736841

<https://hal.inrae.fr/hal-02736841>

Submitted on 2 Jun 2020

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Lawson S.

FSEV 2017 - PARIS

French Society of Extracellular Vesicles

MEETING

06 & 07th of November 2017 - ASIEM Paris



ABSTRACTS BOOK

Implantation-related genes in the ovine endometrium are regulated by extracellular vesicles from early pregnant uterine fluids

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Abstract :

Extracellular vesicles (EVs) may play important role in the delivery of messages during the pre-implantation period of pregnancy. EVs have been isolated from uterine luminal fluid (ULF) in human and sheep. Recent data showed that EVs from ovine ULF could penetrate endometrial epithelial cells after 6-days infusion in vivo. Nevertheless, embryo implantation involves rapid and dynamic changes in molecular interactions with the endometrium. Our present work aims to determine whether ULF EVs interact with endometrial cells and modify cell physiology after a short time of in vitro and in vivo incubation conditions.

Primary cultures of epithelial cells were derived from ovine endometrium collected at Day 12 post-oestrus. EVs were purified from ovine ULFs at Day 14 of pregnancy and were labeled with lipophilic PKH26 fluorescent dye and then incubated with epithelial cells from 30 min to 24h. Confocal microscopy analyses revealed an uptake of EVs as early as 30 minutes after incubation. For the in vivo study, PKH26-labeled Day 14 ULF EVs were infused into the uterine lumen of cyclic ewes at Day 12 post-oestrus. After 24h, epithelial cells from the luminal layer and superficial glands exhibited an intensive fluorescence signal. No signal was detectable in the stroma. The functional impact of EVs on endometrial function was investigated by quantifying mRNA levels of selected genes. Transcript expression of two endometrial genes, including MX1 (Myxovirus-Resistance Protein) was up-regulated following EVs infusion. This work provides first evidence that ovine EVs from pregnant ULF can (i) enter in endometrial epithelial cells within 30 min in vitro or 24h in vivo (ii) modulate expression of endometrial gene expression known to be critical for embryo implantation. These results suggest a critical role for EVs in the preparation of endometrium when implantation initiates.

Acknowledgments: PFIE, INRA Nouzilly, France

This research was supported by INRA Phase Division

Keywords : implantation / endometrium