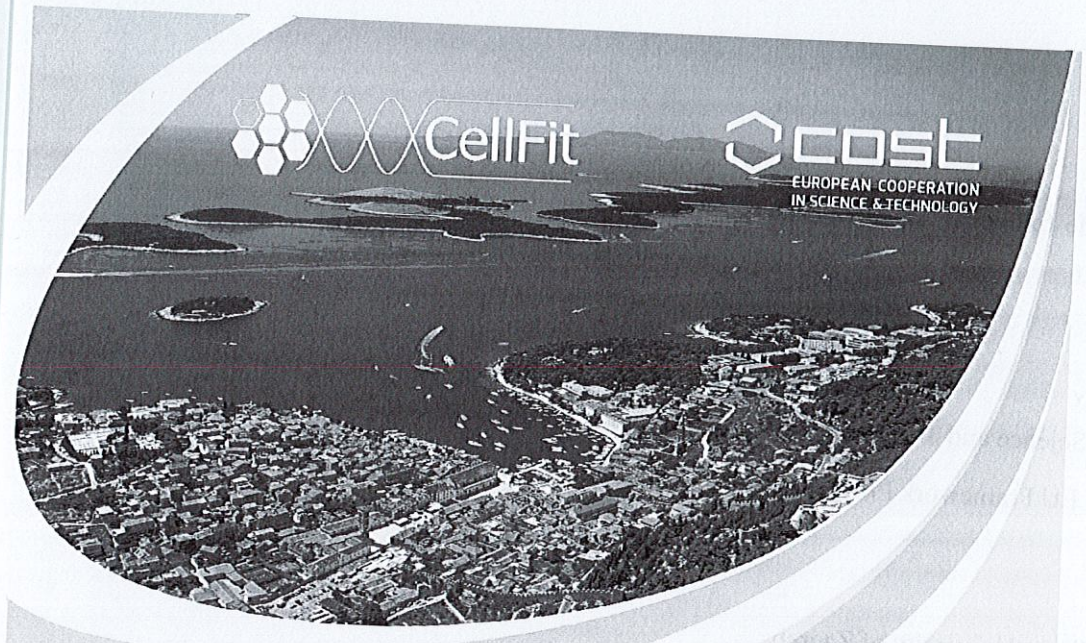
A new culture model of rabbit trophoblastic cells to explore cell function and transplacental transfers

Guenhaël Sanz, Nathalie Daniel, Vincent Brochard, Marie-Christine Aubrière, Martine Letheule, Anne Couturier-Tarrade, Pierre Adenot, Véronique Duranthon, Pascale Chavatte-Palmer, Alice Jouneau



IN VITRO 3-D TOTAL CELL GUIDANCE AND FITNESS

PROCEEDINGS OF CellFit MEETING 2018

2nd-3rd of October 2018 | **Hvar Island** Croatia

Editors
Tiziana Brevini, Alireza Fazeli, Ana Katusic, Ana Vidos, Georgia May

We would like to thank the following organizations for their support:

European Cooperation in Science and Technology

COST is supported by the EU Framework Programme Horizon 2020

Publisher: School of Medicine University of Zagreb

Book Title: In Vitro 3D Total Cell Guidance and Fitness

Year of Publication: 2018

ISBN: 978-953-6255-70-2

978-953-6255-69-6

Poster Presentation (P-26)

Sanz, Guenhaël
(presented by Alice Jouneau and Anne Couturier-Tarrade)
UMR Developmental Biology and Reproduction, INRA, 78350 Jouy-en-Josas, France

Co-Authors:
Daniel Nathalie, Brochard Vincent, Aubrière Marie-Christine, Letheule Martine, Couturier-Tarrade Anne, Adenot Pierre, Duranthon Véronique, Chavatte-Palmer Pascale, Jouneau Alice

A new culture model of rabbit trophoblastic cells to explore cell function and transplacental transfers

The placenta controls exchanges between the mother and the fetus and therefore fetal development and growth. The maternal environment (nutrition, exposure to pollutants...) can lead to disturbance of placental functions, with consequences for the health of the offspring. To limit the use of animal experiments to study transplacental transfers and to investigate the mechanistic aspects of placental function, we are developing a cell culture model to mimic the placental barrier. Since the rabbit placenta is closest to that of humans, rabbit experiments can provide biomedical data regarding human placental function. Thus, our cellular model uses rabbit trophoblastic cells, which allows to compare in vitro data to results from in vivo experiments in rabbits. To work with cells close to primary cells, we chose to derive trophoblastic stem cells from rabbit blastocysts and to differentiate them into mature

trophoblastic cells. In particular, these cells are cultured in the presence of a flow of medium, that promotes the appearance of microvilli on the cell surface, the fusion of cytotrophoblasts into syncytiotrophoblasts and the formation of lipid droplets. The cell transcriptome is being characterized. Thereby, the culture model allows mimicking the in vivo conditions in which maternal blood flow exerts mechanical forces on trophoblastic cells and influences their phenotype.