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IVI FOUNDATION DEMONSTRATES, FOR THE FIRST TIME, COMMUNICATION BETWEEN THE FUTURE MOTHER AND THE EMBRYO PRIOR TO IMPLANTATION

- **This discovery confirms that the mother-to-be is capable of modifying the genetics of her future child.**

- **The habits of the mother prior to conception may be relevant for the future health of the baby for better or worse.**

VALENCIA, 22 SEPTEMBER 2015

A study by the IVI Foundation (FIVI), Valencia, Spain entitled *Hsa-miR-30-d, secreted by the human endometrium, is taken up by the pre-implantation embryo and might modify its transcriptome*, published in *Development* scientific journal by IVI researchers Felipe Vilella and **Carlos Simón** – Scientific Director of FIVI – has shown, for the first time, an early extension of the Barker theory postulated in 1990 suggesting that "what happens in the maternal uterus is more important that what happens at home after the birth":

This study demonstrates that the future mother through molecules secreted in her uterus can modify the genetic information of the future child. This finding can be extensive when the ovum is from a donor or between an expectant surrogate mother and the embryo of the biological mother, which completely changes the paradigm of ovodonation and surrogacy. It opens the door for the genetic input of mothers who have to rely oocyte donation in order to fulfil their desire to have children and alerts those who must use surrogacy for medical reasons due to the importance of the surrogate mother for their genetic offspring..

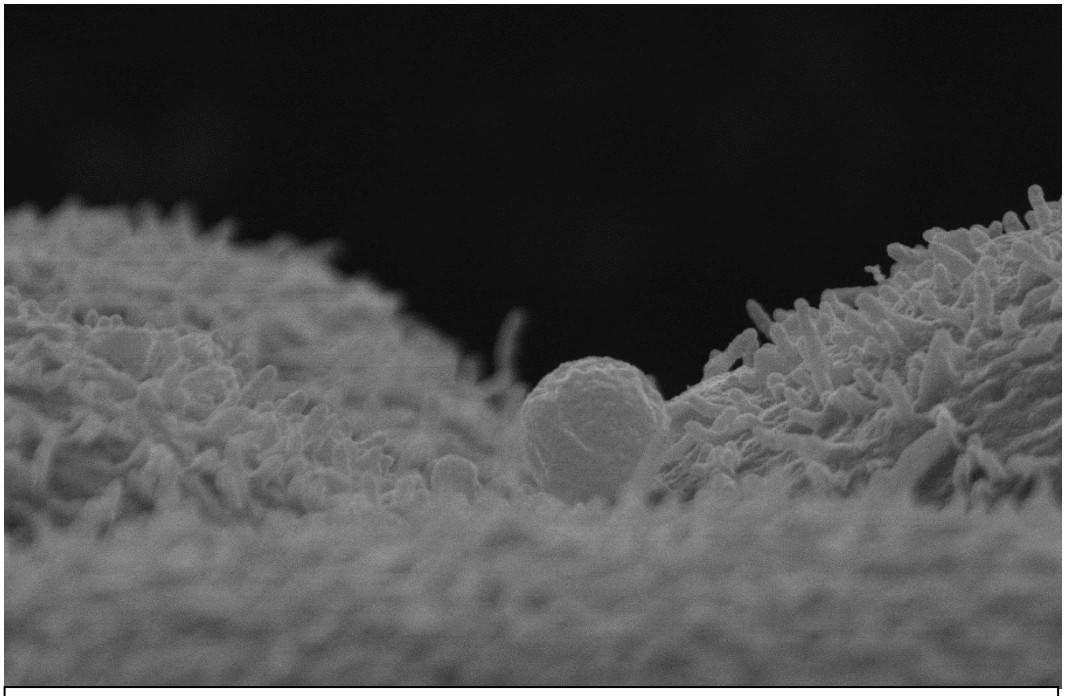
"These findings show us that there is an exchange between the endometrium and the embryo, which is something that we already suspected as a result of the coincidence of certain physical characteristics between mothers and children born through egg donation and also due to the incidence of diseases in children related to maternal pathologies during pregnancy, such as obesity or cigarrete smoking", explained researcher Felipe Vilella.

Certain conditions to which women are exposed end up modifying their cells (including those of the endometrium): smoking and obesity both do this. This in turn causes changes to the endometrial fluid and its secretion; genetic information from the pregnant woman is released, which is taken up by the embryo, thus modifying its development.

"This communication may cause specific functions to be expressed or inhibited in the embryo," explained the researchers. "As such, this publication opens up the possibility to understand this maternal "epigenetic" regulation. Knowing that this transmission exists, in the future we will be able to detect how to interrupt it, putting an end to the

trend of obese mothers, obese children. In countries where surrogacy is permitted we will be able to attribute more importance to the history of the pregnant woman's habits prior to pregnancy."

Figure 1



Electron microscope image showing a maternal exosome from human endometrial fluid binding to the mouse trophoectoderm. The embryo receives the contents of the maternal exosome to establish the first communication between the mother and the embryo in the period prior to implantation.

About IVI

Grupo IVI was set up in 1990 as the first medical institution in Spain to specialise exclusively in human reproduction. It currently has more than 40 clinics in 10 countries and is a European leader in reproductive medicine.

About the Fundación IVI

The Fundación IVI is the first foundation in Spain devoted to basic applied research in the field of human reproduction and it provides a service that is scientific, educational and social in nature. It is part of the Parc Científic*, the cluster of science and technology businesses at the University of Valencia and it is the research and scientific support department of IVI.*

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