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PROJECTE DE DOCTORAT INDUSTRIAL EXPEDIENT 2015 DI 050

DADES DE L'EMPRESA I DE L'ENTORN ACADÈMIC

Títol del projecte

Definition of an in vitro model to identify biomarkers of embryo-endometrium crosstalk

Empresa

EUVITRO S.L.U

Responsable de l'empresa

Rita Vassena

Universitat o Centre de Recerca

Universitat Autònoma de Barcelona

Director/a de tesi

Josep Santaló Pedro

Treballador/a de l'empresa i doctorand/a

Paula Vergaro Varela

BREU DESCRIPCIÓ DEL PROJECTE DE RECERCA

Infertility is a global disease of high prevalence and far reaching personal and social consequences. On average, 1 in 9 couples trying to conceive will have some difficulties and most will need assisted reproductive technologies (ART). Despite numerous technical advances, ART live birth rates are 30-35% worldwide, suggesting ART cycles remain suboptimal.

Embryonic implantation in the maternal uterus is a complex and poorly understood process by which the embryo trophectoderm makes contact with the endometrium; an initial mutual recognition between the two compartments, mediated by the expression and secretion of integrins and interleukins, is followed by embryo embedding and nidation.

The main objective of this industrial project is to develop and validate an in vitro model of human uterine implantation by endometrial primary cultures and pluripotent cells-derived trophoblast cells, in order to identify biomarkers of successful and unsuccessful implantation.

The specific objectives are:

- 1) Establish culture models of endometrial cells, and differentiation protocols towards extra embryonic fate in pluripotent cells
- 2) Test the interactions between the two cell compartments in relation to physical and biochemical properties



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3) To identify secreted biomolecules during decidualization and study their modulation according to trophoctodermal quality and endometrial source

The developed model will then be applied in order to identify differential responses to the trophoctoderm by endometrial cells from fertile and infertile women, in order to identify clinically relevant biomarkers of successful interaction between the two compartments.

This project will be carried out in collaboration with the Departamento de Biología Celular, Fisiología e Inmunología, Universidad Autónoma de Barcelona.