

1. Institution: University College Dublin, Ireland

2. Principal investigator and contact person: Trudee Fair

3. Key personnel

NAME	EMAIL	RESEARCH AREA DETAILS
Prof Patrick Lonergan	Pat.lonergan@ucd.ie	Cow fertility: Embryo development & Maternal environment
Prof Alex Evans	Alex.evans@ucd.ie	Cow fertility: Follicle development, periconceptual environment
Dr Alan O'Doherty	Alan.odoherty@ucd.ie	Regulation of imprint methylation in bovine oocytes, embryos
Dr Niamh Forde	Niamh.forde@ucd.ie	Bovine uterine biology
Dr. Trudee Fair	Trudee.fair@ucd.ie	Bovine oocyte development, maturation, maternal – embryo interaction

4. Research profile:

The above named personnel are researchers within The Reproductive Biology Research Cluster (RBRC) in Ireland. The RBRC is a Science Foundation Ireland Strategic Research Cluster focused on investigating solutions to reproductive problems in cattle. The Cluster led by Professor Alexander Evans, comprises of members from agriculture, veterinary medical and basic science disciplines and is supported by an extensive research farm and world class centre for biomolecular and biomedical research (the Conway Institute). The overall objective is to identify molecules (e.g. genes, proteins and metabolites) in ovarian follicles, oocytes, embryos and the cervix and uterus that are responsible for, or are markers of, infertility. This is achieved by using established large animals of fertility/infertility, in vitro cell culture techniques and the latest technological advances in the biosciences to study the structure and function of complex molecules. In cooperation with our industrial partners, the knowledge generated will provide opportunities to develop new diagnostics and therapeutics to improve reproductive efficiency in cattle. These studies are directed at solving infertility problems in cattle but the results will also form the basis for new applications for assisted human reproduction.

5. Key technologies and tools:

In vivo and in vitro bovine embryo production
Global transcriptome profiling: Microarray & rnaseq
Proteomic and metabolomic analysis of blood, uterine flushings, follicular fluid.
Confocal and Electron microscopy.
Routine Molecular Biology technologies.

6. Selected publications (max. 5)

Mansouri-Attia N, Oliveira LJ, Forde N, Fahey AG, Browne JA, Roche JF, Sandra O, Reinaud P, Lonergan P, Fair T. 2012. Pivotal role for monocytes/macrophages and dendritic cells in maternal immune response to the developing embryo in cattle. *Biology of Reproduction* accepted, in press.

O'Doherty AM, O'Shea LC, Fair T. Bovine DNA methylation imprints are established in an oocyte size-specific manner, which are coordinated with the expression of the DNMT3 family proteins. *Biol Reprod.* 2012 Mar 19;86(3):67

Forde N, Mehta JP, Minten M, Crowe MA, Roche JF, Spencer TE, Lonergan P. Effects of Low Progesterone on the Endometrial Transcriptome in Cattle. *Biol Reprod.* 2012 Sep 26. [Epub ahead of print]. PMID:23018184

Mamo S, Carter F, Lonergan P, Leal CL, Al Naib A, McGettigan P, Mehta JP, Evans AC, Fair T. Sequential analysis of global gene expression profiles in immature and in vitro matured bovine oocytes: potential molecular markers of oocyte maturation. *BMC Genomics.* 2011 Mar 16;12:151.

Aparicio IM, Garcia-Herreros M, O'Shea LC, Hensey C, Lonergan P, Fair T. Expression, regulation, and function of progesterone receptors in bovine cumulus oocyte complexes during in vitro maturation. *Biol Reprod.* 2011 May;84(5):910-21.