

COST Action no. FA1201

EPIGENETICS AND PERICONCEPTION ENVIRONMENT (EPICONCEPT)

2013 | 2016

Objectives

- **Develop** an epigenomic toolbox including novel sequencing technologies and bioinformatics
- **Define** the factors that can influence the epigenetic profile during the periconceptional period.
- **Define** the time-window at which most epigenetic changes take place
- **Identify** the range of optimum periconception environments to ensure healthy offsprings.
- **Compare** the susceptibility of livestock, poultry, fish species to epigenetic disturbances.
- **Interact** with the artificial insemination industry.
- **Inform** the scientific community and the public.

Main Achievements

- Developed an informative website
- Have a distribution list of over 200 researchers across Europe
- Organised 1st first annual conference in Antalya, Turkey
- Disseminated Epiconcept to the public in several countries

www.cost.eu/fa



Food and Agriculture (FA)

Participating countries

AT, BE, BG, CH, CZ DE, DK, EE, ES, FI, FR, DE, GR, HR, HU, IE, IL, IT, LT, MK, NL, NO, PT, SE, SK, SI, SL, TR, UK

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Website

www.cost-epiconcept.eu



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Working Group activities

Working Group 1 – Epigenomic tools

- **Identify** the state of the art molecular and imaging techniques for both large scale and focused screening of epigenetic modifications in developing gametes and embryos of livestock species
- **Develop** an epigenomic toolbox, including screening technologies, protocols for sample preparation and best practice experimental design and statistical analysis procedures for the study of epigenetic changes in gametes and embryos.
- **Establish** a species specific 'blueprint' of the epigenetic profile of livestock embryos from the gamete to implantation stages.
- **Develop** in vivo and in vitro methods for epigenetic intervention during embryo development.
- **Disseminate** the knowledge acquired through peer reviewed publications, workshops and summerschools.

Working Group 2 – Periconception Environment

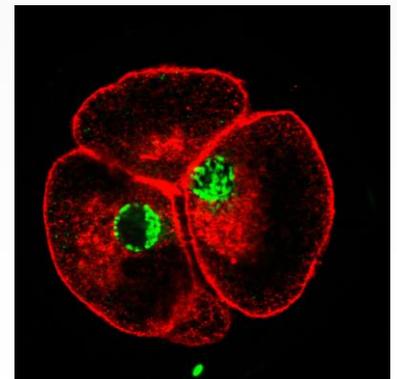
- **Identify** environmental factors that can lead to epigenetic modifications in gametes and pre-implantation mammalian embryos
- **Identify** stages of development during the periconceptional period that are particularly sensitive to epigenetic modifications
- **Characterise** the nature of epigenetic modifications induced
- **Understand** the long-term developmental consequences of periconceptional epigenetic modifications

Working Group 3 - Cross-species epigenetics, gametogenesis and embryogenesis

- **Establish** the inter-specific differences in their epigenetic response to environmental and nutritional cues and how subsequent environment and nutrition affects long term responses such as sex control, growth, malformations etc.
- **Compare** the potential of animals whose fertilization and embryonic development is external such as fish, limited by a shell such as birds and that of mammals whose fertilization and embryonic development are internal, in order to evaluate differences in epigenetic stability.
- **Identify** and evaluate the use of factors that promote epigenetic response in lower vertebrates such as fish for improved growth and health and quality in fish and farm animals
- **Establish** protocols for in vitro models for testing of epigenetic responses to chemical (pollutants) and nutritional factors

Working Group 4 – Public, periconception and epigenome

- **To translate** research activities into a dissemination strategy
- **To fill** the gap between researchers and non specialized people, in an attempt to more closely connect science to general public.
- **To identify** "target audiences" that may benefit from the dissemination of the results obtained within this Action.
- **To generate** awareness on the potential impact of scientific networks on society, derive recommendations in decisional area where science and technology play an important role, increase efficiency and productivity sharing the generated data with industry
- **To circulate** scientific information implementing collaborations and synergies, to encourage exchange and discussion through traditional approaches, to develop fast, real time, low cost dissemination/discussion through social networking



This is a 4-cell bovine embryo with labeled actin (red signal) and chromatin (green signal). Image was scanned by confocal microscopy Leica SP2.



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