Epigenetics and Periconception Environment - EPICONCEPT

FA1201

Start date: 01/02/2013

End date: 31/01/2017

Year: 2

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Chair

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Scientific context and objectives (1/2)

- **Background / Problem statement:** Parental stress around after conception period induces epigenetic changes in embryos, which may adversely affect the future health and fertility of offspring in food-producing animals. EPICONCEPT will inform the general public on the importance of periconception environment in future food production.
- **Brief reminder of MoU objectives:**

1. Develop an epigenomic toolbox of epigenetic changes in embryos.
2. Define the optimal periconception environment to ensure healthy offspring.
3. Compare the susceptibility of different species (livestock, poultry, fish) and different model systems (*in vivo* vs *in vitro*) to epigenetic disturbances.
4. Interact with industry to improve breeding and gamete/embryo handling and inform the public on the possibilities created by altering the epigenome

Scientific context and objectives (2/2)

Research directions:

- Increasing collaboration through STSMs, workshops and conferences will lead to more focused research and more scientific breakthroughs
- Disseminate results through collaborative publications linking to social media and the Action website

Innovation

- The Action is truly innovative by its combination of research on epigenetics and reproduction and its focus on different animal species (mammals, birds, fish, invertebrates)

Working groups

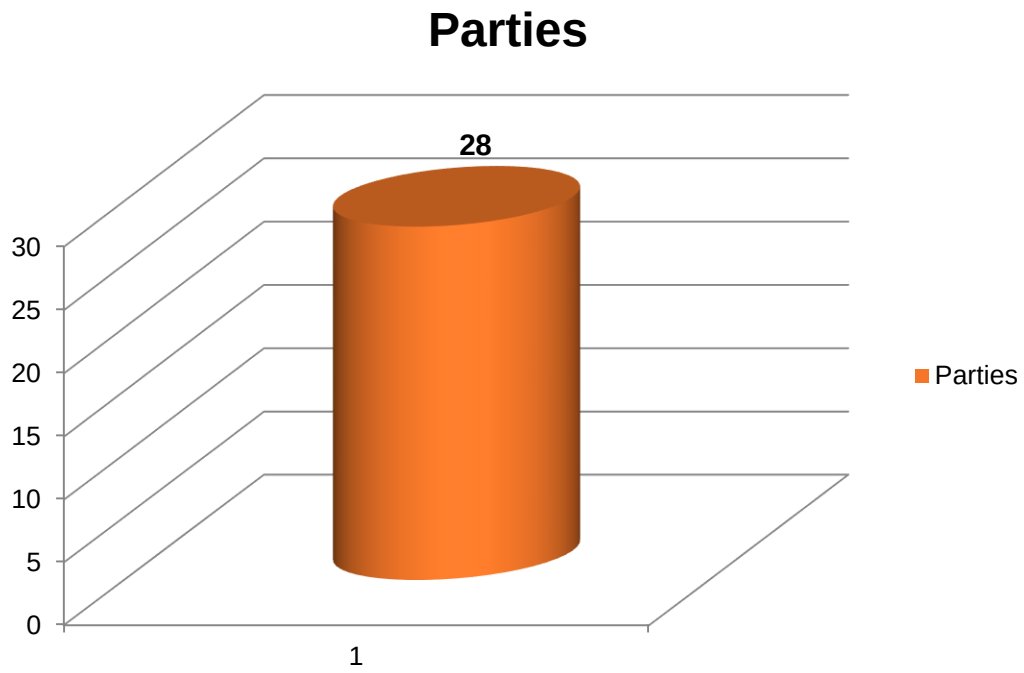
1. WG1 : Epigenomic tools : Trudee Fair (deputy Alfonso Gutierrez-Adan)

2. WG2 : Periconception environment : Kevin Sinclair (deputy Anne Navarrete-Santos)

3. WG3 : Cross-species epigenetics, Gametogenesis and Embryogenesis : Amos Tandler (deputy Pascale Chavatte-Palmer)

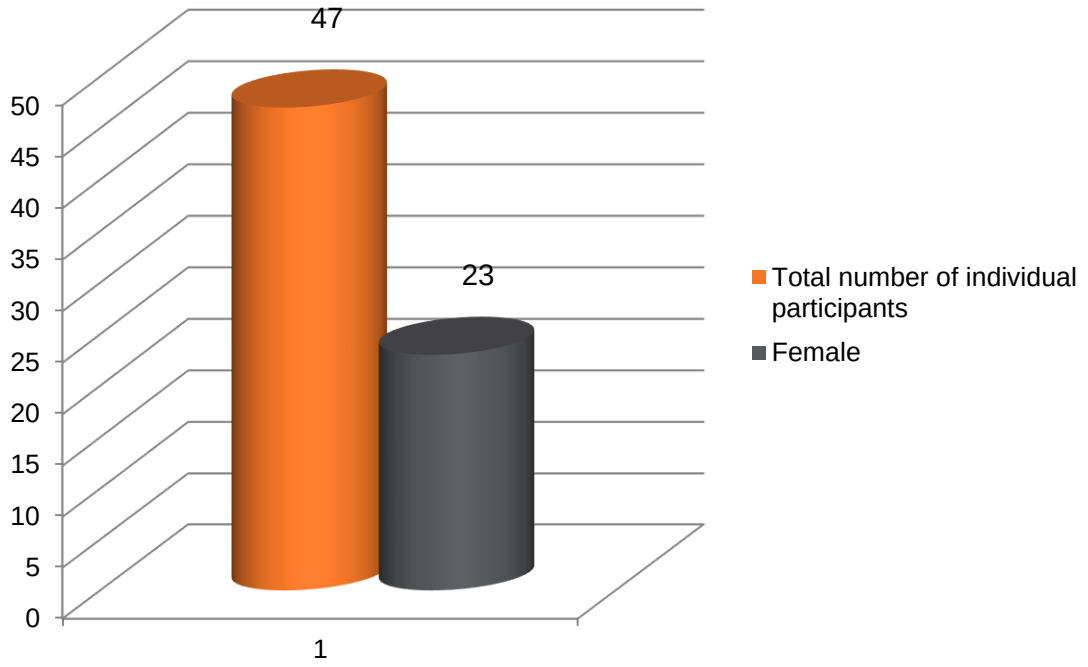
4. WG4 : Public, Periconception and Epigenome : Tiziana Brevini (deputy Anita Franczak)

Action Parties



Grant Holder:
Sheffield University
Alireza Fazeli
United Kingdom

Action participants



Use of COST Instruments

Activity (No.)	Year 1	Year 2	Year 3	Year 4
MC/WG Meetings	3	3 planned		
STSMs	16	In progress		
Training Schools	0	0		
Workshops or Conferences	2	2 planned		
Joint Publications	~15	~Research Front in preparation		

Results vs. Objectives

- Epigenetic modifiers have been identified which can be applied for scientific and commercial applications, scientists and public have been informed on progress by lectures and by social media

- Networking between 28 countries has led to new research collaborations and to gain more insight in other model systems like fish and shrimp, in which epigenetic manipulations can result in commercial applications for animal breeding – this could not have been achieved without the COST network

Significant Highlights in Science or Networking (1/2)

Highlight in Science :

- STSM Elena Manzoni – Column Walsh - Epigenetic changes involved in the conversion of one adult cell type to another lineage

- Publication : Pennarossa et al . Brief demethylation step allows the conversion of adult human skin fibroblasts into insulin-secreting cells. Proc Natl Acad Sci U S A. 2013 May 28;110(22):8948-53.

Significant Highlights in Science or Networking (2/2)

- Planned workshop in Gran Canaria 'Epigenomic Toolbox: from Methods to Models' May 2014. The programme will include highly regarded speakers in the fast developing area of epigenetics and provide ESRs with a platform to exchange ideas and to build new co-operations. ~ 100 participants
- Research Front in Reproduction Fertility and Development on Epigenetics in preparation to inform scientists and public about the possible impact on our lives

Challenges

- STSM requests are constrained by the way in which the work plan and budget is approved on an annual basis (and unexpected changes in the budget)
- Critical topics to be addressed for the upcoming year are :
  - Finishing the Research Front
  - Organizing a training school
  - Informing the public and industry about seminal developments in science