



HAL
open science

Epigenetics and phenotypic variability:interesting insights from birds and long-term effects of embryonic environment in avian species

Anne Collin, Vincent Coustham, Laure Fresard, Thomas Loyau, Mireille Morisson, Jean- Michel Brun, Tatiana Zerjal, Francis Minvielle, Aline Bertin, Frederique Pitel

► To cite this version:

Anne Collin, Vincent Coustham, Laure Fresard, Thomas Loyau, Mireille Morisson, et al.. Epigenetics and phenotypic variability:interesting insights from birds and long-term effects of embryonic environment in avian species. Incubation and Fertility Research Group (IFRG) Meeting, Sep 2014, Lunteren, Netherlands. 2014. hal-01193974

HAL Id: hal-01193974

<https://hal.science/hal-01193974>

Submitted on 2 Jun 2020

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.

PRESENTERS INDICATED THUS *

Incubation and Fertility Research Group Meeting



29th and 30th September 2014

Lunteren, the Netherlands

Abstracts (in order of presentations)

Epigenetics and phenotypic variability: insights from birds and long-term effects of embryonic environment in avian species

***Anne Collin¹, Vincent Coustham¹, Laure Frésard², Thomas Loyau¹, Mireille Morisson², Jean-Michel Brun², Tatiana Zerjal³, Francis Minvielle³, Aline Bertin⁴, Frédérique Pitel²**

¹INRA, UR83 Recherches Avicoles, F-37380 Nouzilly, France, ²INRA, UMR1388 GenPhySE, 24 Chemin de Borde Rouge, 31326 Castanet-Tolosan, France, ³INRA, UMR1313 Génétique animale et biologie intégrative, F-78350 Jouy-en-Josas, France, ⁴INRA, UMR85 Physiologie de la Reproduction et des Comportements, F-37380 Nouzilly, France.

The chicken genome was one of the first genome of agronomic interest to be sequenced and annotated (although incompletely), and is characterized by a relatively small size, the existence of micro- and macro-chromosomes with contrasting epigenetic properties, and a different sex determinism as compared to mammals. Although epigenetic mechanisms such as DNA methylation, histone modifications and chromatin regulators appear to be conserved in chicken, some mechanisms may be differing compared to mammal species. For instance, the absence of imprinted genes in birds was suggested by several studies.

The avian embryo is a unique model for developmental studies given its potential for *in ovo* manipulation. The embryo is sensitive to environmental influences that can be of maternal (yolk hormones and egg nutrients...) or external origin (incubation conditions including temperature, relative humidity, light colour, gas concentrations...) that have long been known to affect the liveability, development and metabolism of embryos and later chicks. Breeder nutrition and environmental temperature may alter the offspring feeding behaviour, growth or body composition. However, information is scarce about the molecular mechanisms involved in the interaction between environment and the developing embryo. While global and local epigenetic changes have been shown to be involved in the setting of thermoregulation in the chick, the role of such mechanisms in embryo metabolic plasticity and phenotypic variability, and their long term or transgenerational effects remain to be explored.