Objective

Animal welfare is a topic of highest societal and scientific priority. Here, I propose to use genomic and epigenetic tools to provide a new perspective on the biology of animal welfare. This will reveal mechanisms involved in modulating stress responses. Groundbreaking aspects include new insights into how environmental conditions shape the orchestration of the genome by means of epigenetic mechanisms, and how this in turn modulates coping patterns of animals. The flexible epigenome comprises the interface between the environment and the genome. It is involved in both short- and long-term, including transgenerational, adaptations of animals. Hence, populations may adapt to environmental conditions over generations, using epigenetic mechanisms. The project will primarily be based on chickens, but will also be extended to a novel species, the dog. We will generate congenic chicken strains, where interesting alleles and epialleles will be fixed against a common background of either RJF or domestic genotypes. In these, we will apply a broad phenotyping strategy, to characterize the effects on different welfare relevant behaviors. Furthermore, we will characterize how environmental stress affects the epigenome of birds, and tissue samples from more than 500 birds from an intercross between RJF and White Leghorn layers will be used to perform an extensive meth-QTL-analysis. This will reveal environmental and genetic mechanisms affecting gene-specific methylation. The dog is another highly interesting species in the context of behavior genetics, because of its high inter-breed variation in behavior, and its compact and sequenced genome. We will set up a large-scale F2-intercross experiment and phenotype about 400 dogs in standardized behavioral tests. All individuals will be genotyped on about 1000
genetic markers, and this will be used for performing an extensive QTL-analysis in order to find new loci and alleles associated with personalities and coping patterns.

Field of Science

/social sciences/psychology/cognitive psychology/mental processes/personality
/natural sciences/biological sciences/genetics and heredity
/natural sciences/biological sciences/genetics and heredity/genome
/agricultural sciences/animal and dairy science/pets

Programme(s)

FP7-IDEAS-ERC - Specific programme: "Ideas" implementing the Seventh Framework Programme of the European Community for research, technological development and demonstration activities (2007 to 2013)

Topic(s)

ERC-AG-LS9 - ERC Advanced Grant - Applied life sciences and biotechnology

Call for proposal

ERC-2012-ADG_20120314

See other projects for this call

Funding Scheme

ERC-AG - ERC Advanced Grant

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Activity type
Higher or Secondary Education Establishments

EU Contribution
€ 2 499 827,77

Beneficiaries (1)

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