

EuroFAANG

The European Functional Annotation of Animal Genomes

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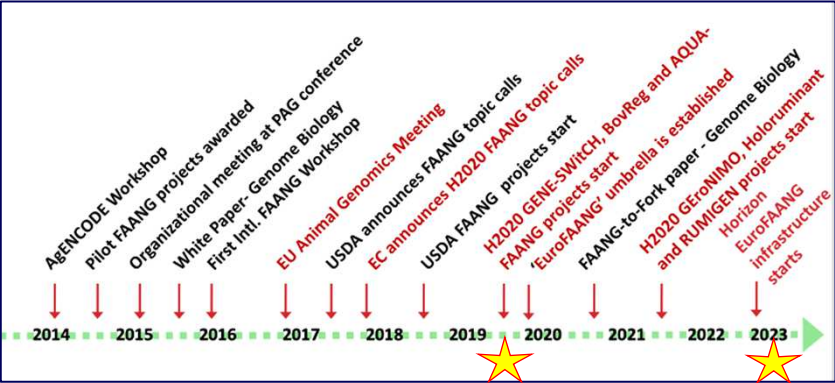
The EuroFAANG RI Project – main features and possible collaboration with EUGENA network

Michèle Tixier-Boichard
on behalf of the EuroFAANG Research Infrastructure Project Consortium

Meeting of the ex situ working group of ERFP, 23 April, 2024

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A little bit of history about “EuroFAANG” initiatives



- COST action FAANG-Europe

- EuroFAANG cluster from H2020 funded projects

- the new EuroFAANG RI project



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EuroFAANG – A European infrastructure for farmed animal genotype to phenotype research


Horizon Europe infrastructure concept development project


Funded via Horizon Europe INFRA-DEV funding stream - **Developing, consolidating and optimising the European research infrastructures landscape, maintaining global leadership**

Run time: 2023 – 2025
Total funding: €2.86 million

Coordinator: FBN, Germany
Co-Coordinator: UEDIN, United Kingdom

Aim: Establish the concept for an infrastructure to facilitate research and innovation for genotype to phenotype research in farmed animals to achieve sustainable, efficient and socially accepted farmed animal production in Europe





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The ESFRI environment ‘Health and Food’

16 infrastructures : 12 established ‘landmarks’
4 ‘projects’

Only 5 in the sub-domains ‘biological resources and production systems’

- ✓ EMBRC for marine biological resources
- ✓ MetroFOOD for metrology in food & nutrition
- ✓ IBISBA for synthetic biology
- ✓ AnaEE for managed and unmanaged ecosystems
- ✓ EMPHASIS for plant phenotyping

NONE on DOMESTIC ANIMALS !


But 3 in the field of biological resources :

- One on animal models : INFRAFRONTIER
- One on human biobanks : BBMRI
- One on microbial resources : MIRRI

Strategy Report on Research Infrastructures RoadMap 2021 – Landscape of ‘Health and Food’


- The remit of the ESFRI ‘Health and Food’ research infrastructures:
“generate readiness to meet the current challenges and demands in the Agri-Food sector in Europe.”
- **Outcome of the 2021 Roadmap landscape review:**
“Concerted effort to continue bringing together national facilities at the pan-European level in the field of animal genetic resources, phenotyping and breeding, animal health is needed to contribute to address the challenge to produce safe, healthy and sustainable food.”

The need to bring together national facilities at the pan-European level in the field of animal genetic resources, phenotyping, breeding, and animal health was identified as a gap.



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European Strategy Forum on Research Infrastructures

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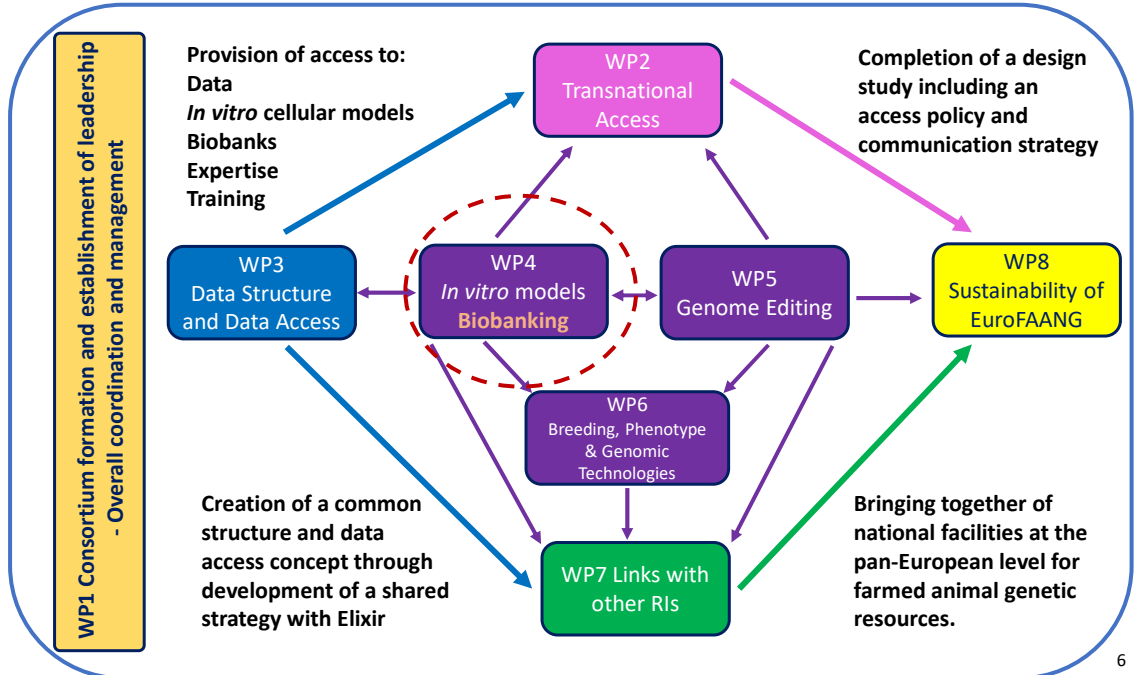
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The EuroFAANG Research Infrastructure project has four main objectives:

- 1. Creation of a **common data structure and data access** - through supporting the FAANG Data portal and establishing an Elixir community for ‘Domestic animal genomes and phenomes’.
- 2. **Development of a European framework for curation and biobanking of *in vitro* cellular models.**
- 3. Sharing and expanding capabilities in new breeding, phenotyping, and genomic technologies.
- 4. Connecting with existing projects and infrastructures to consolidate G2P research in farmed animals across Europe and globally.




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Main features of a Research Infrastructure :



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▶ Define its users' community and scientific value

▶ Define an access policy :

1. Access to data, including genomic and phenotype data, and sample metadata.

2. Access to biobanks of reference samples, including organoids and genome edited cell lines.

3. Access to in vitro methodologies and tools to bridge G2P knowledge gaps.

4. Access to world leading expertise in G2P research for farmed animals.

5. Access to training, to establish the next generation of researchers in farmed animal science.


▶ Demonstrate its added value as compared to existing infrastructures :

other biobanking infrastructures or networks : EUGENA

animal phenotyping infrastructures

animal health infrastructures

Get support from States and Research Institutions




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Achievements so far



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▶ A survey of animal biobanks (internship of Temitope IGE) :
inspired from IMAGE survey, was distributed to ERFP members

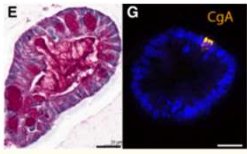
▶ A summer school on cellular models to understand the Genotype to Phenotype relationship
underlined the need of in vivo studies to validate in vitro models
and the advantage of in vitro models to reduce animal experiments

▶ The validation by ELIXIR of the focus group 'Domestic animal Genomes and Phenomes'


▶ A think tank on cellular models
Organoids are multicellular structures that mimic a whole organ, ex gut

E

G



▶ A think tank on gene editing
Ex: modify a gene and assess the impact on a cellular model instead of creating a whole animal



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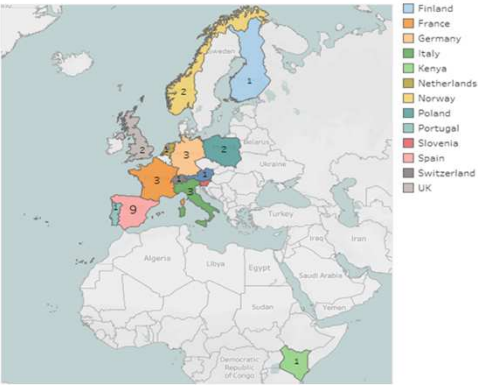
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Biobanking survey (1)



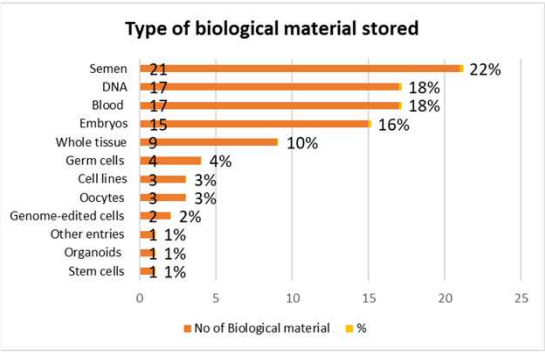
31 organizations representing 14 countries

Map of the Respondents' Countries



More than 15 species
Mammals, birds, fish, shellfish

A diversity of Biological Materials
but few cellular models



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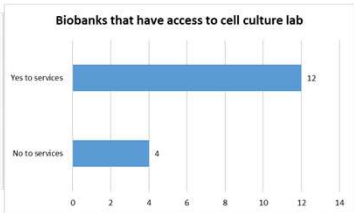
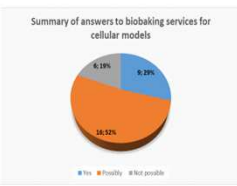
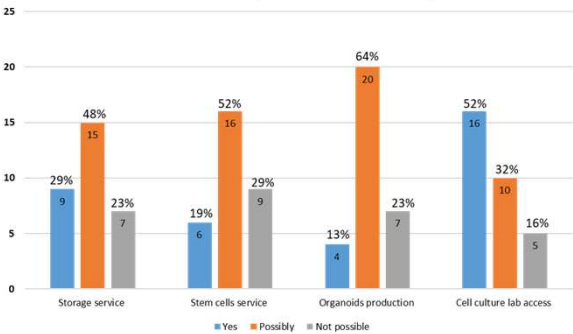
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Biobanking survey (2)



Views on biobanking services for cellular models

No of biobanks that responded to the biobanking services



- 9(29%) of the 31 biobanks can offer at least one of the services, 16(52%) would need support to do it and the remaining 6(19%) are not interested.
- Those biobanks which expressed their willingness to offer at least one of the services received the second step of EuroFAANG survey about sanitary aspects, data management, quality management, fee policy



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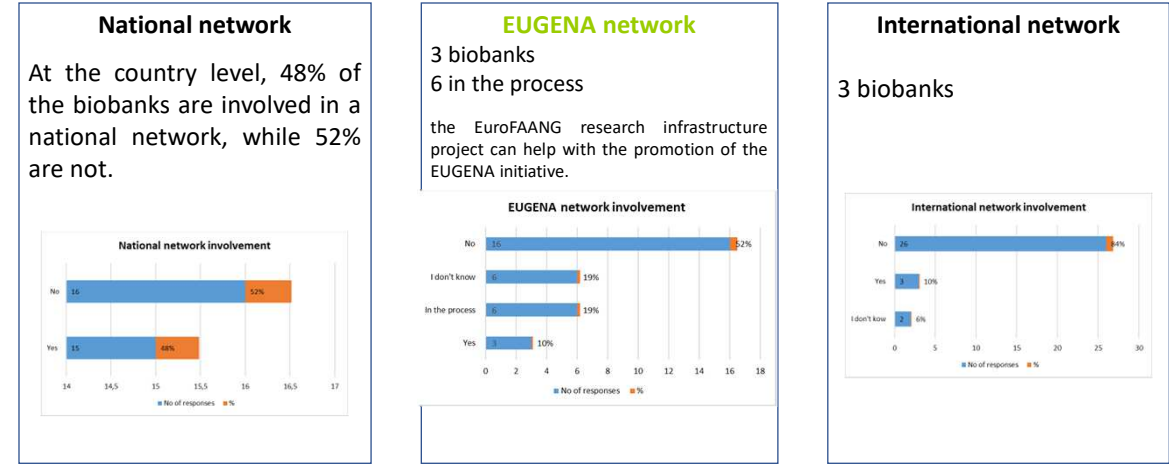
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Biobanking survey (3)

Involvement in a network



Example of a network for animal biobanks in France : <https://crb-anim.fr/access-to-collection/#>

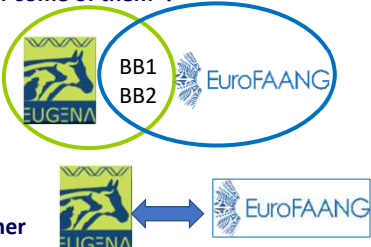


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Possible collaboration with EUGENA



- ▶ Members of EUGENA have expertise in cryopreservation of germ cells
sanitary aspects, quality control, FAO policy on animal genetic resources
- ▶ Different objectives :
EUGENA: ex situ conservation of animal genetic resources for sustainable use of livestock in Europe
EuroFAANG : support research on animal genetic resources for improved knowledge and support to sustainable breeding in Europe
- ▶ Could biobanks of EUGENA become also members of EuroFAANG RI ? All, or some of them ?
subscribe to access policy
apply quality control protocols
governance issues : institutional membership to a RI
- ▶ Could EUGENA collaborate with EuroFAANG RI as a whole ?
share protocols
EUGENA biobanks may act as mirror sites
reciprocal communication : one improves the notoriety of the other
in different users' communities across a large number of countries



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Next steps



- ▶ Biobanks from ERFP / EUGENA interested to collaborate with EuroFAANG can still get the survey
- ▶ EuroFAANG has a deliverable due at end of June 2024 (WP4, T4.3 led by EFFAB)
D4.5 : Collaborative framework with EUGENA and industry users,

Set up of calendar of discussion with EUGENA governance :
 - feedback from this meeting
 - discuss two options of ‘intersection’ or ‘reciprocal information’, do not need to decide by June but analyse pros and cons for each option
- ▶ Training workshop : February 2025
One session devoted to preparation of tissue samples to preserve cell viability
+ training on FAANG data standards for data harmonization and data sharing
Members of EUGENA will receive the information to register



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EuroFAANG partners thank you for your attention



Martien Groenen
Marta Godia
Martijn Derks
Richard Crooijmans



Norwegian University
of Life Sciences

Sigbjorn Lien
Joseph Robertson

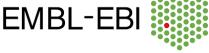


EFFAB
European Forum of
Farm Animal Breeders

Ana Granados-Chapatte
Cagla Kaya
Geena Cartick



Klaus Wimmers
Tina Hartwig
Eduard Murani



Peter Harrison
Alexey Sokolov



Elisabetta Giuffra
Michelle Tixier-Boichard
Temitope-Oluwafisayo Ige



Emily Clark

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