



EU research funding on African swine fever: State of play and plan

***PAFF
February 2020***

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Unit B2 Research and Innovation***



EU Framework Programmes for Research

Legislation proposed by the Commission; main acts adopted by the Council and Parliament (co-decision)

Detailed work-programmes with annual calls/topics adopted by comitology procedure

FP1: 1984-1987

FP2: 1987-1991

FP3: 1991-1994: 6 Billion €

FP4: 1994-1998: 13 Billion €

FP5: 1998-2002: 14 Billion €

FP6: 2002-2006: 18 Billion €

FP7: 2007-2013: 53 Billion €

H2020: 2014-2020: 79 Billion €

Horizon Europe: 100 Billion € (***EC proposal***)

Horizon 2020



1. Health, demographic change and wellbeing

2. Food security, sustainable agriculture and forestry, marine and maritime and inland water research and the bio-economy (€3.8 billion 2014-2020) – **SC2**

3. Secure, clean and efficient energy

4. Smart, green and integrated transport

5. Climate action, resource efficiency and raw materials

6. Inclusive, innovative and reflective societies

7. Secure societies

H2020 sub-programmes

Part I Excellent Science

1. European Research
Council

2. Future and Emerging
Technologies

3. Marie Skłodowska-Curie
Actions

4. Research
Infrastructures

Part II Industrial Leadership

1. Enabling
& Industrial Technologies

1.1 Information and
communication
technologies

1.2 Nanotechnologies

1.3 Advanced materials

1.4 Biotechnology

1.5 Advanced
manufacturing 1.6 Space

2. Access to Risk Finance

3. Innovation in SMEs

Part III Societal Challenges

1. Health and wellbeing

2. **Food security,
sustainable
agriculture, marine
research and the
bioeconomy**

3. Secure, clean and
efficient energy

4. Smart, green and
integrated Transport

5. Climate Action,
Environment, Resource
Efficiency

6. Inclusive, innovative
and reflective societies

7. Secure societies

Implementation

Picture for **ASF** /animal health

- Collaborative projects (*transnational; open to non EU participants*)
 - **SWINOSTICS, DEFEND, VACDIVA**



- Other:

- Infrastructure project: **VetBioNet**; (*InfraVec2; Transvac2*)
- COST (networks): **ASF-STOP**



- Co-funds (*public-public partnerships; country co-funding*): ERANET (*EMIDA/ANIHWA under FP7*)

- **ICRAD**



- International cooperation: (*FP very open*)

- **STAR-IDAZ International Research Consortium** (IRC), with **SIRCAH** coordination&support action

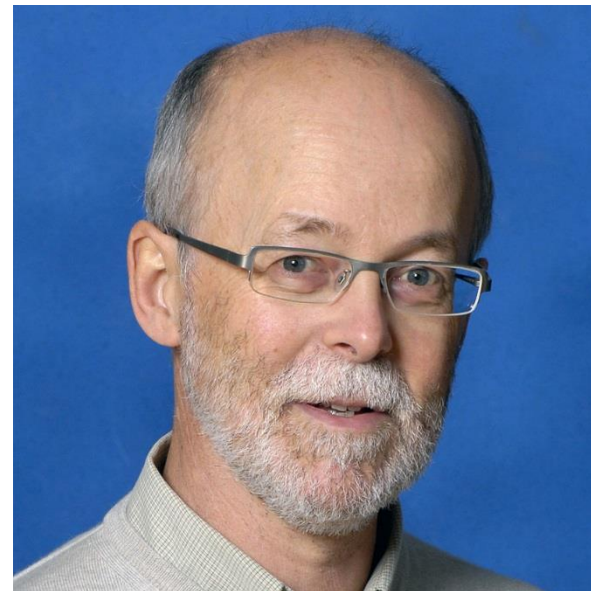


DEFEND: *Addressing the dual emerging threats of African swine fever and lumpy skin disease in Europe*

Aim: to control ASFV and LSDV by understanding the drivers behind their emergence, and by generating research outputs which underpin novel diagnostic tools and vaccines, and authenticate appropriate and rapid responses by decision-makers



Dr Pip Beard – Consortium Lead
The Pirbright Institute



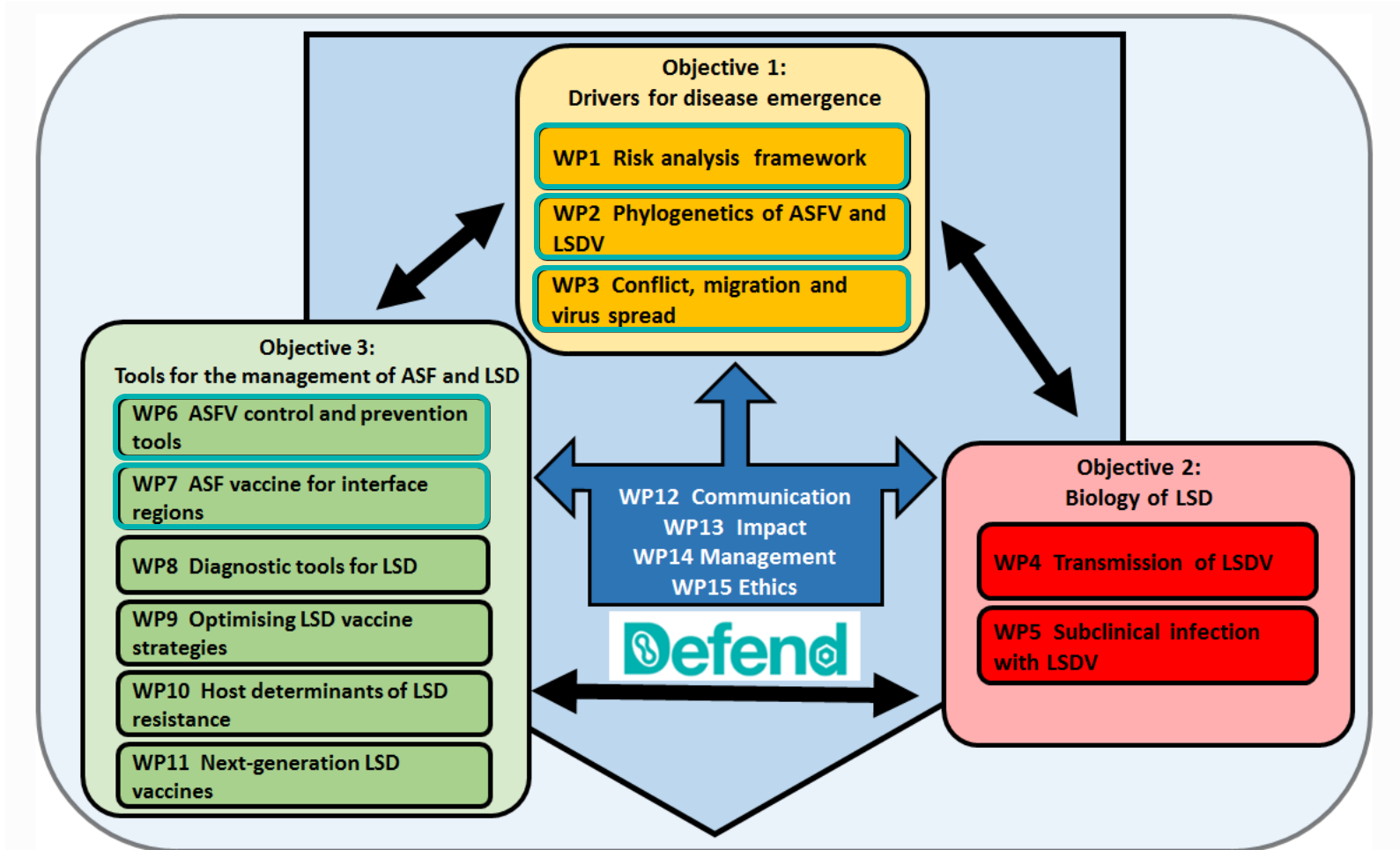
Dr Kris De Clercq – Co-lead
Sciensano



EU contribution: €5,5mio
Website: www.defend2020.eu
Email: defend@pirbright.ac.uk



DEFEND: Objectives and Work Packages



ASF related work packages: WP1, WP2, WP3, WP6, WP7

WP1: Risk analysis framework

Aim: to develop risk assessments, taking factors into account that might play a role in the emergence of ASF or LSD in Europe

Progress at 18M: literature review completed



WP2: Phylogenetics of ASFV and LSDV

Aim: apply cutting-edge phylogenetic analyses to a database of ASFV and LSDV full genome sequences, in order to understand the evolution and spread of the viruses and develop tools for disease control

Progress at 18M: established protocols and collected samples



WP3: Conflict, migration and virus spread

Aim: to generate sound and consistent data/knowledge around how human (and animal) migration, mobility and trade routes and dynamics are affected by conflicts – and what this implies in terms of risks related to disease spread in conflict areas

Progress at 18M: selected mission areas, defined entry pathways



WP6: ASFV prevention and management

Aim: to develop evidence-based, practical strategies to prevent the spread of ASF in Europe and neighbouring countries

Progress at 18M: literature review completed, identified risk factors at farm-based level, wild boar studies due to begin in 2020



WP7: A novel ASF vaccine for interface regions

Aim: to develop a viral vectored vaccine against the strain of ASFV that is infecting domestic pigs and wild boar in Eastern Europe

Need to identify immunogenic proteins suitable for inclusion in viral vectored vaccine.

Generated genotype II immune pigs using low virulent genotype I virus



WP7: A novel ASF vaccine for interface regions

Screened lymphocytes from protected pigs using genotype II peptide library (>5000 individual peptides)

Identified immunodominant proteins by interferon gamma ELIspot assay.

Will filter screen results through flow cytometry panel to phenotype ASFV-specific lymphocytes.



VACDIVA CONSORTIUM



Lithuania

Portugal

Spain

Italy

Czech Republic

Estonia

Germany

Hungary

Latvia

National Food and Veterinary Risk Assessment Institute (NFVRAI)

Faculdade de Medicina Veterinária (FMV)

European Coordination Via Campesina (ECVC)

Universidad Complutense de Madrid (UCM)
Instituto Nacional de Investigación y Tecnología Agraria y Alimentaria OA MP (INIA)
Inmunología y Genética Aplicada SA (INGENASA)
HORIZCIENCE SL (HORIZCIENCE)

Intervet International BV (MAH)
Stichting Wageningen Research (WR)

Istituto Zooprofilattico Sperimentale della Sardegna G. Pegreffi (IZS)
Istituto Zooprofilattico Sperimentale dell'Umbria e delle Marche (IZSUM)

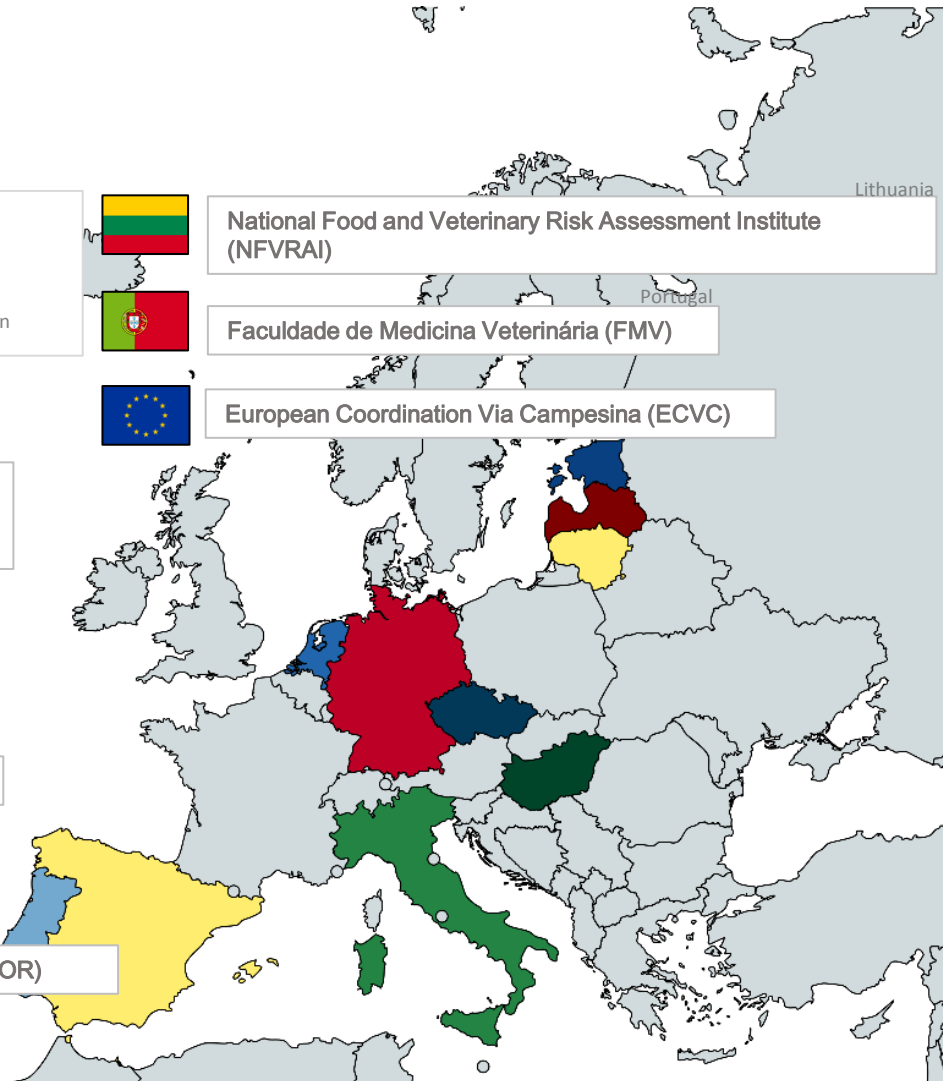
State Veterinary Institute Jihlava (SVI)

Veterinaar Ja Toidulaboratorium (VFL)

Max-Planck-Gesellschaft Zur Forderung Der Wissenschaften EV (MPG)

National Food Chain Safety Office (NFCSSO)

Partikas Drosibas, Dzīvnieku Veselības Un Vides Zinatniskais Institūtsbior (BIOR)

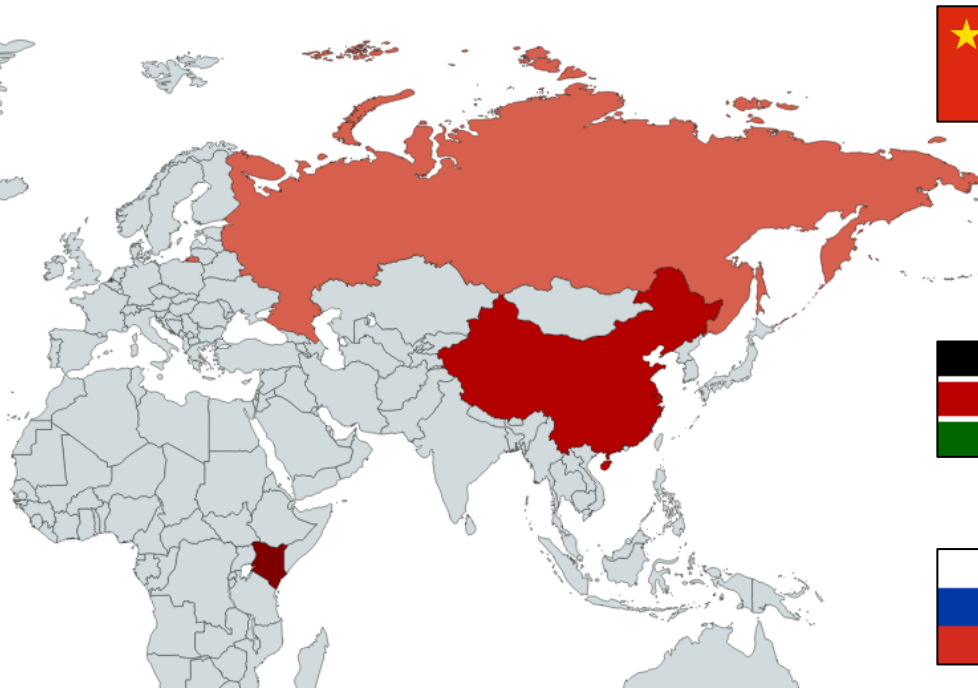


KICK OFF MEETING, 18-19 November 2019, Madrid



Funded by the European Union's Horizon 2020 research and innovation programme under grant agreement No 862874

Three partners from non-EU countries



China

Institute of Animal Science (IAS), Chinese Academy of Agricultural Sciences (CAAS)

China Animal Health and Epidemiology Center (CAHEC)



Kenya

International Livestock Research Institute (ILRI)



Russia

FGI Federal Center for Animal Health (FGI ARRIAH)



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OBJECTIVES

1

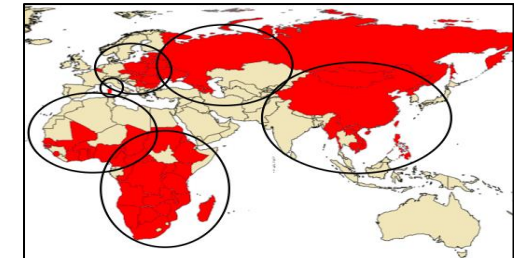
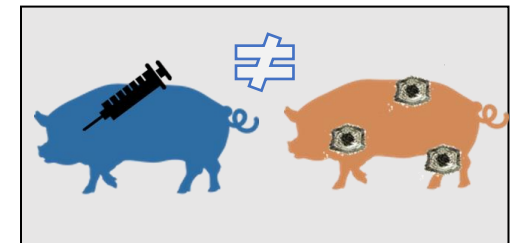
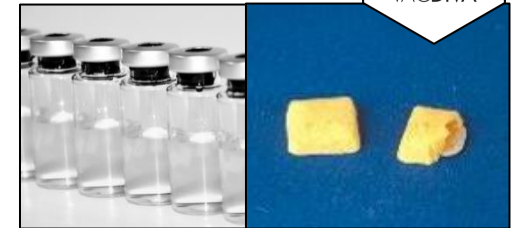
To provide **effective and safe vaccine(s)** for **wild boar and domestic pigs** ready for registration.

2

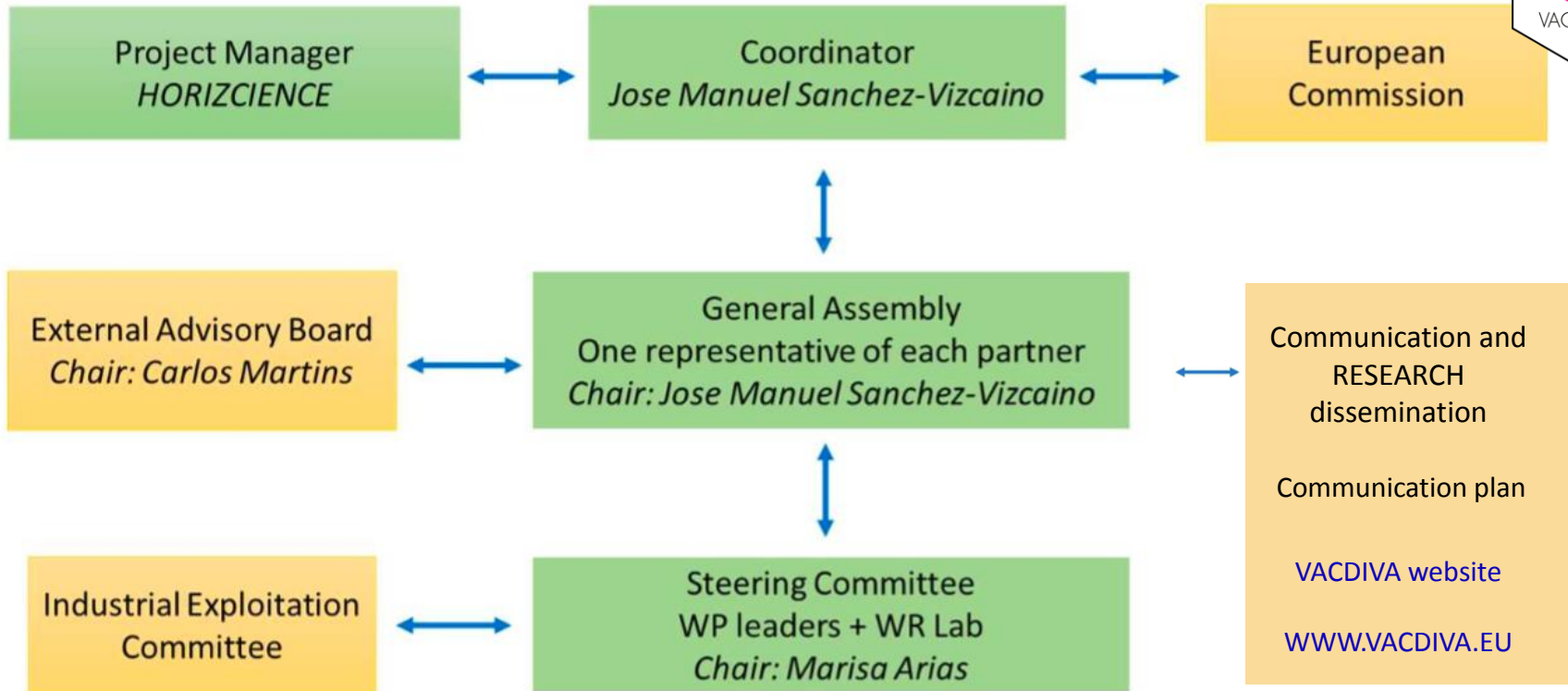
To develop **DIVA test** to allow an accurate monitoring of the effectiveness of the vaccine.

3

To design **ASF control and eradication strategies** in different epidemiological scenarios worldwide and **test the pilot vaccine** in real environments (including buspigs and warthogs).



MANAGEMENT STRUCTURE



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NFC SO

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INGENASA	WR
IZS	FGI ARRIAH
NFC SO	IASCAAS
VFL	ILRI
SVI	CAHEC
BIOR	ECVC
NFVRAI	HORIZCIENCE



Start month	1
End month	42

WP2

ASF modified DIVA Vaccine

To **develop** safer vaccine prototypes (3 different prototype will be evaluated) with marker properties from the original vaccine candidates by genome editing.

Specific objectives:

- To generate **genetically** modified LAVs with improved **safety** and **DIVA** characteristics.
- To establish cell lines and vaccine seeds.
- To assess the genetic stability of the LAVs candidates.

4 TASKS

7 DELIVERABLES



Vaccinated

Infected



WP3

LAV Lv17/Rie1 DIVA Vaccine for Wild Boar

Efficacy and safety studies. "in vivo" experiments.



UCM

To carry out the "*in vivo*" testing requirements needed following EMA regulations to prepare a final **vaccine prototype** for wildboar, and to design of the vaccination formula to be safe delivered in the field.

Animal experiments will be carried out at the **biosafety level 3 (BSL3)** animal facilities of UCM.

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3 TASKS

5 DELIVERABLES



Start month

1

End month

42

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WP4

Efficacy and safety studies of marker vaccines

To select the most promising marker vaccine/s built under WP2 throughout **“in vivo” experimental efficacy and safety studies in domestic pigs (DP)** as animal model for vaccination.

3 TASKS

4 DELIVERABLES



INIA



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Start month

12

End month

42

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WP5

Vaccine production



MAH

To develop a **manufacturing process for the prototype vaccine/s** with the immunological products previously tested under WP2, WP3 and WP4, safe and effective enough following the requirements of the **European Medicine Agency** and **authorizing agencies of countries outside EU**.

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NFVRAI	HORIZCIENCE



Start month	6
End month	48

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WP6

Development of companion DIVA tests to the candidate vaccines: Evaluation and validation.



INGENASA

To develop companion **DIVA tests**, associated with the prototype vaccines, that will allow the **differentiation of vaccinated from infected animals**. All assays will be adapted to be used with wild boar and domestic pig samples.

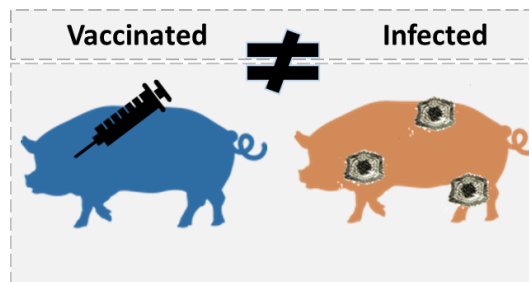
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BIOR	ECVC
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4 TASKS

5 DELIVERABLES



Samples



Start month

1

End month

48

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WP7

Control of ASF in different scenarios:

Vaccination and spread models + Field trials

To identify the **different vaccination scenarios** from ASF prevention or control, frame the **target vaccination populations** in each scenario and model different **vaccine and control strategies** to obtain a roadmap with the most cost-efficient methods towards ASF control with vaccination.

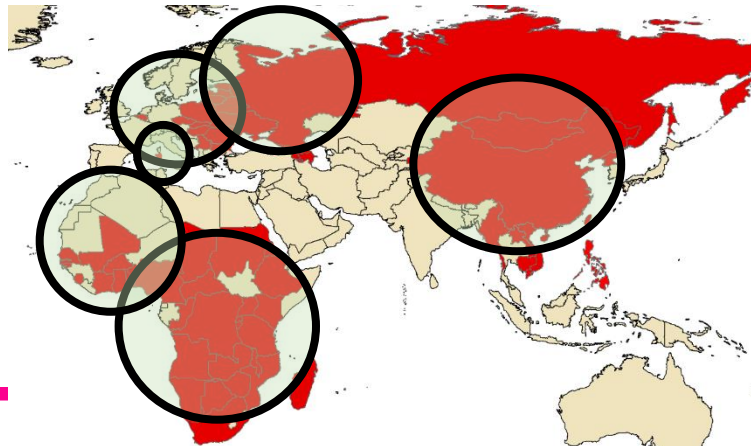


UCM

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NFVRAI	HORIZCIENCE

3 TASKS

7 DELIVERABLES



Start month

1

End month

48

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WP8

Exploitation and Innovation Management



HORIZCIENCE

- Manage **IP** and innovation.
- **Facilitate agreements** for the protection and exploitation of the results.
- Ensure and **efficient exploitation and dissemination of the results** of the project.
- Update **business plans** and identify **exploitation and dissemination activities** and updte them regularly.
 - **Follow-up risks** for the exploitation of results.
 - **Engage stakeholders.**



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5 TASKS

7 DELIVERABLES

Start month	1
End month	48

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Diagnostic tools

SWINOSTICS : Swine diseases field diagnostics toolbox



2017-2021; 3 million € <http://swinostics.eu/>

*Develop a novel field diagnostic device, based on advanced, proven, bio-sensing technologies to tackle viruses. Planned 6 swine diseases (PRRS, Swine Influenza H1N1, PCV2 and Porcine Parvovirus, **ASF**).*

Network: **COST action**

ASF-STOP (May2016-May2020): <https://www.asf-stop.com/>



Better manage and control wild boar populations.

Develop methods of surveillance to increase the early detection of ASF into new areas

Understand the epidemiology of ASF in the unique European context; to determine the epidemiological role of wild boar, ticks vectors of the virus, and the environment

Develop and improve management tools; such as an ASF vaccine and novel diagnostics, determine how to involve stakeholders and the general public in preventing ASF spread and determine how policy and legislation can contribute to prevention, control&eradication of ASF

Infrastructure project

VetBioNet (March 2017-Feb 2022; €10mio; 9MSs+CH,AU,KE)



Aims to establish and maintain a comprehensive network of pre-eminent research facilities, academic institutes, international organisations and industry partners that is dedicated to advance research on highly relevant diseases and to promote technological developments.

Promote and facilitate Transnational Access (TNA) to the infrastructure resources, including BSL3 animal experimental facilities and laboratories, technological platforms, and sample collections. Communication platform for bidirectional exchange with industry stakeholders. Enhance the preparedness of the major European BSL3 research infrastructures to accelerate the response to (re)emerging epizootic and zoonotic threats by sharing capacities beyond the infrastructures. Harmonise Best Practices and promote the use of global standards in European BSL3 infrastructures. Forge cooperative relationships with non-European BSL3 infrastructures, research institutes, industrial partners, international organisations, and policy makers. Carry out Joint Research Activities (JRAs) designed to improve the scientific and technological standards of the integrated services provided by the network infrastructures, etc.

VetBioNet is a follow-up to NADIR (ended in 2013), which worked on e.g. ASF

Several partners work/worked on ASFv (some were in ASForce) and offer TNA to their facilities for studies using ASFv (FLI, TPI-Pirbright, ANSES, IRTA, WBVR-Wageningen).

ASFv considered in WP2 (leader FLI) : preparedness plan allowing a quick mobilisation of the resources of the project and an efficient distribution of tasks to the partners in case of an (re)emerging outbreak:

ASFv to be used as model in WP8, Task 2 (screening Tand B celled by high throughput sequencing (Moredun).

What are the Research Infrastructures?

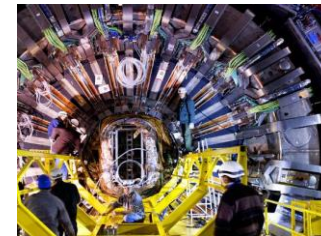
Research infrastructures are facilities, **resources and services** that are used by the research communities to conduct research and foster innovation.

Could be "**single sited**", "**distributed**" or "**virtual**"

- To **open access** to existing RIs located in individual MS to European researchers
- To **avoid duplication of effort** and to **coordinate** and **rationalise the use** of these RIs
- To trigger the **exchange of best practice**, develop **interoperability** of facilities and resources, develop the **training** of the next generation researchers

Major scientific equipments

Knowledge-based resources



e-infrastructures

ICRAD ERA-NET

“International coordination of research on infectious animal diseases”:

EU funding instruments to coordinate public research programmes of countries/regions. They support public-public partnerships in the preparation, implementation and coordination of joint activities.

ERA-NET consortia are mostly composed on programme owners / funding agencies, who usually fund their own research centres when they are part of transnational projects selected under the joint call (“Virtual common pot”)

Other entities (public, private) can be part of selected research projects, but normally have to bring their own resources.

1. Improved understanding of endemic and emerging infectious animal diseases

- **ASF**, Animal Influenzas and other priority diseases
- Host/pathogen interactions, Epidemiology (wildlife), Host immunology

2. Generic technology platforms for producing novel and/or improved vaccines

- Including in relation to reduced use of anti-microbials

3. Rapid, accurate and easy to use in-field diagnostics technology

01/10/2019 – 30/09/2024

20 countries; 28 partners

*Co-funded call **now open**: expected +/- EUR million 16 (country funders) + 8 (EU co-funding)*

ICRAD Participating countries

- ICRAD participants
- ICRAD and ANIHWa participants



Created with mapchart.net ©

International Research Consortium on Animal Health : STAR-IDAZ IRC

Follow up to an FP7 project aimed to coordinate research funders at global level: STAR-IDAZ.

Mainly a network. EU funding ended early 2015

Agreement to create an International Research Consortium (i.e. alliance) with higher level of commitment.

Launching event in January 2016

Objectives and deliverables



The overall objective of STAR-IDAZ IRC is to coordinate research at international level to contribute to new and improved animal health strategies for at least 30 priority diseases/infections/issues.

The deliverables include :

- candidate vaccines, and/or
- diagnostics, and/or
- therapeutics and other animal health products, and/or
- procedures and/or
- key scientific information/tools to support risk analysis and disease control

STAR-IDAZ International Research Consortium



STAR-IDAZ IRC Members

- Agreed **minimum level of investment** (\$US 10 million over 5yrs)
- Agreed **delivery targets**
- Agreed to **coordinate/align funding** to deliver these targets
- Agreed to **share research results**

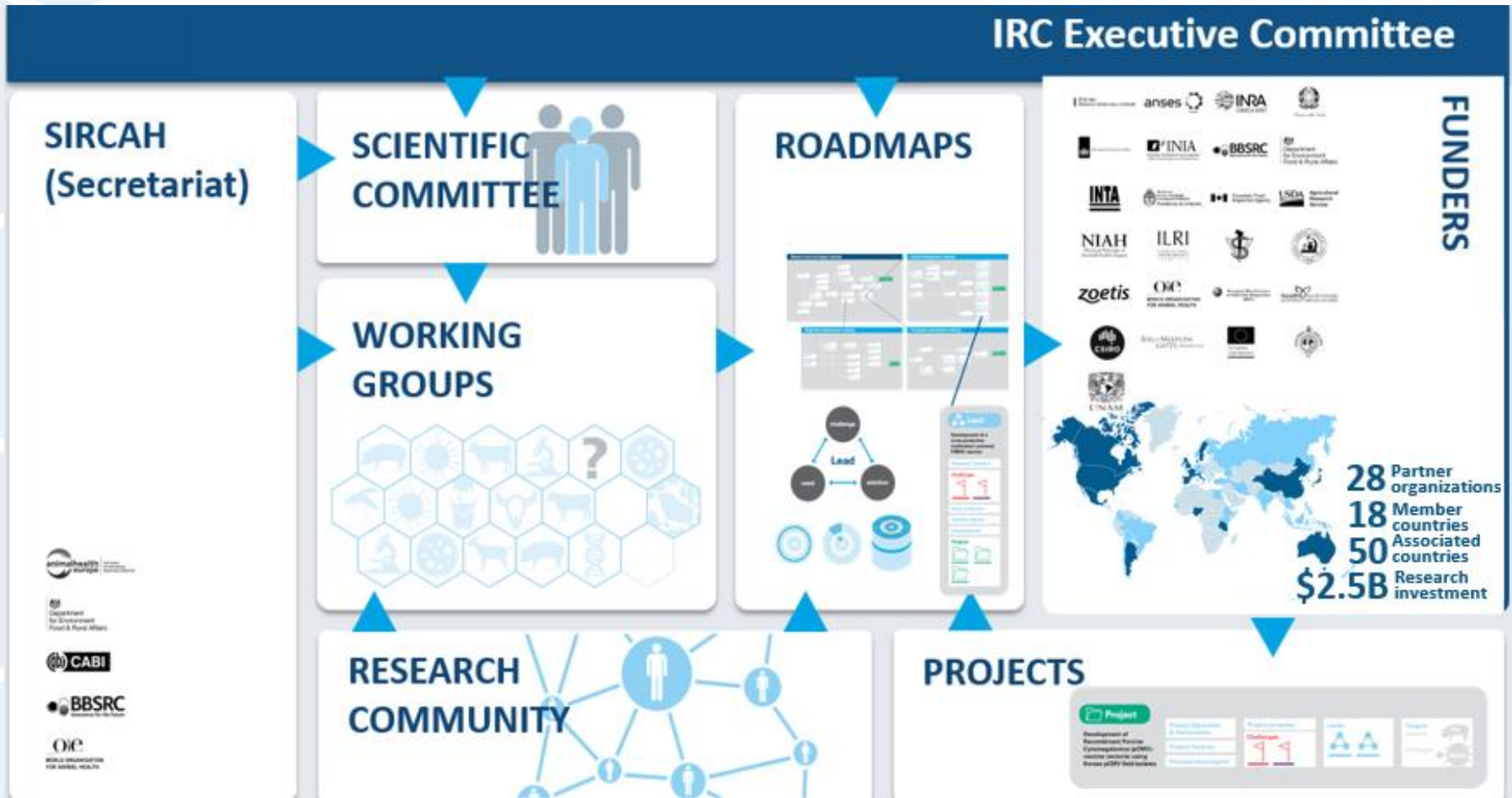
Partner organisations
Member countries
Associated countries
Research investment

Total combined research budget > **\$US 2.5 billion**

28
18
50
\$2.5B

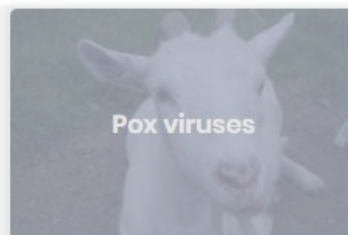
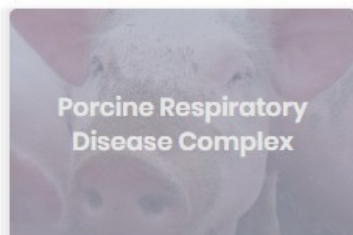
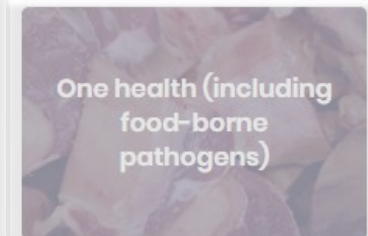
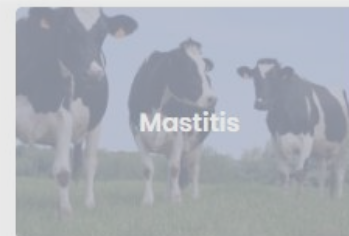
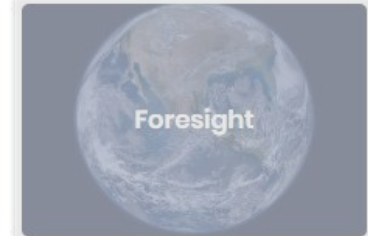
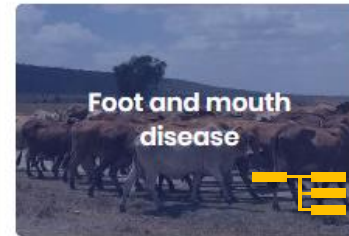
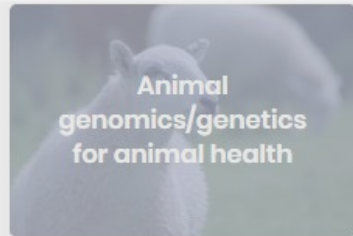


STAR-IDAZ IRC: structure and way of working





IRC Priority diseases/infections/issues Roadmaps



Global ASF Research Alliance (GARA)

4th Annual scientific workshop
Cagliari, Italy, 11-13 April, 2018



Gap Analysis Report

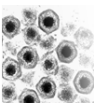
November 2018

Over 60 recommendations for research on:

virology (4), viral pathogenesis (5), immunology (8), epidemiology (11), surveillance (5), diagnostics (11), vaccines (11), biotherapeutics (1), disinfectants (2), feral swine and wild Suidae (1), tick vector (3)

<https://www.ars.usda.gov/GARA/reports.htm>

Next meeting: 14-16 April 2020, Kampala, Uganda



Horizon Europe (2021-2027)

- Proposed overall budget of €100 billion of which €10 billion would go to Cluster 6 (Food, Bioeconomy, Natural Resources, Agriculture and the Environment)
- Collaborative Projects and Coordination and Support Actions to continue.
- Up to 50% of the funding for any “area” can go into **European partnerships**.
- Among the 49 partnerships proposed, by the EC one is on “**Animals and Health**” (Cluster 6 lead). Another one is “One Health AMR” (Cluster 1 lead)
- The partnership would foster research coordination on infectious animal diseases and their impact (e.g. zoonoses, Anti-microbial resistance), so to generate key knowledge and its exploitation for innovative products and evidence based policy making.
- Ideally this should involve Public-Private as well as Public-Public cooperation.

**Thank you for your
kind attention!**

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