Présentation des projets financés au titre de l'édition 2009/2010 du Programme « ERA-Net EMIDA»

Titre du projet	**BRSV- DIVA** – Development and comparative evaluation of three new generation BRSV DIVA vaccines and a corresponding DIVA test

Résumé

Bovine Respiratory Syncytial Virus (BRSV) is a major viral respiratory pathogen of calves causing high morbidity and mortality in the European cattle industry. The extensive use of antibiotics to control secondary infections following BRSV increases the likelihood of the emergence of antibiotic-resistant bacteria. Consequently, the impact of BRSV on economics, animal welfare and public health makes the control of this virus a high priority. To control BRSV, sanitary measures need to be combined with effective vaccination. However, current vaccines are unsatisfactory, especially in young calves with maternally derived antibodies (MDA).

The project aims are to ameliorate and compare the three BRSV vaccine candidates; and to identify the safest and most efficient vaccine protocol that will induce early, long-lasting clinical and virological protection. This approach will be compatible with large scale use and will have a DIVA characteristic. This can only be achieved by combining the skills of the 4 partners through a strong collaboration, including extensive student/scientist exchanges.

This project will enable identification of the most appropriate vaccine to control BRSV infection. The DIVA approach will allow vaccine evaluation in the field and sero-epidemiological investigations. It will also provide key tools for any future control programme.

Partenaires

INRA Virologie et Immunologie Moléculaires, Jouy en Josas (FR)
Swedish University of Agricultural Sciences National Veterinary Institute (SE)
Institute for Animal Health, UK

Coordinateur

Sara Hägglun (SE)
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Aide de l'ANR

138 000 € (partenaire français)

Début et durée

mars 2011, 36 mois

Référence

ANR-10-EMIDA-005

Titre du projet	**CombatColibacillosis** – Combatting colibacillosis - a genomics based approach

Résumé

Avian pathogenic Escherichia coli (APEC) cause extraintestinal diseases in birds known as colibacillosis, which are costly for the poultry industry as they significantly reduce production. Although the most logical approach to control colibacillosis is through vaccination, typical inactivated vaccines have only provided partial protection against homologous challenge. Specific virulence factors may provide a vaccine target capable of protection to heterologous challenge. For this purpose, it is important to identify APEC factors involved in disease and in host recognition and to understand on the molecular level the interplay between APEC and eukaryotic cells resulting in establishment of an infection. This project focuses on the characterization of the molecular basis of APEC infection of poultry by proposing a global strategy to analyze the factors and traits involved in APEC pathogenesis. The overall scientific objective of this transnational, collaborative project is to apply genomic approaches to exploit genomic data of APEC for the improvement of preventive and therapeutic strategies as well as of strain typing and risk assessment. The expected achievements of this project are to improve current strategies to combat APEC infection. The results obtained could thus be translated into new vaccine or drug targets and therapeutic approaches.

Partenaires

UMR 1225 – INRA (FR)
University of Würzburg, Institute for Molecular Infection biology (DE)
Novartis Vaccines and Diagnostics (IT)
Tel Aviv University, Department of Molecular Microbiology and Biotechnology (IL)

Coordinateur

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Aide de l'ANR

152 000 € (partenaire français)

Début et durée

mars 2011, 36 mois

Référence

ANR-10-EMIDA-008

Titre du projet	**Early Detection Data** – Improving early detection of emerging vector borne diseases by using existing production and diagnostic data

Résumé

Increased trade and subsequently movement of animals as well as climate change may lead to (re-) establishment of several vector-borne diseases in Europe. The recent outbreak of BTV in North-western Europe in 2006 and 2007 highlights this concern and requires effective surveillance systems for early detection of vector-borne diseases. It is important to consider current capabilities and future needs to effectively address surveillance, preparedness and response strategies for vector-borne diseases that emerge and may become prevalent.

The aims of this project are to develop and evaluate a monitoring and early detection system for emerging vector-borne diseases in cattle, based on indicators derived from existing data, such as production records and diagnostic data. The project will also aim for cross-border cooperation regarding monitoring and surveillance of animal health.

The project will deliver statistical and modeling methods for existing production and diagnostic data to detect deviations from trends in time and space as indicators for emerging vector-borne diseases. These models will be used to design a surveillance system for early detection of emerging vector-borne diseases based on existing data. The surveillance systems for early detection of vector-borne diseases will be validated by using BTV as a case-study. The monitoring and surveillance systems (components) in the participating countries will be evaluated with scenario tree modeling and, where possible, economical (cost/benefit) impact will be determined. Eventually, a framework for an optimal mix per country and cooperation between the participating countries in a joint surveillance system for early detection of emerging vector-borne diseases will be proposed.

Partenaires

ONIRIS – Ecole Vétérinaire de Nantes Atlantique (FR)
Health Animal Service Deventer (NL)
Veterinary and Agrochemical Research Center (BE)

Coordinateur

Paul WEVER (NL)
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Aide de l'ANR

95 127 € (partenaire français)

Début et durée

mars 2011, 25 mois

Référence

ANR-10-EMIDA-007

Titre du projet	iPUD – Integrated systems approach for preventing uterine disease in dairy cattle

Résumé

Grant funding has been awarded by the EMIDA ERA-Net to prevent uterine disease in cattle. The project is valued at €3.2 million and involves groups at Swansea University and the University of Glasgow in the UK, Hannover University in Germany, INRA in France, and industrial collaborators Pfizer Animal Health. The project is lead by Prof Martin Sheldon in the School of Medicine at Swansea University, UK.

Bacterial infections of the uterus after parturition commonly cause uterine disease and infertility in dairy cattle. These infections cost the EU dairy industry about €1.4 billion/year. As well as the discomfort for the animals, the infertility also means more animals have to be kept as replacements for animals that don't conceive. This impacts the environment, with more greenhouse gas emissions, and land and water degradation. Research into uterine infection has been neglected compared with other major diseases. There are currently no vaccines or prevention strategies. However, new information about immunity and recent work by the research consortium has identified potential strategies to prevent uterine disease. This project aims to translate these novel strategies into potential products that limit the impact of uterine disease.

Partenaires

INRA Centre de Jouy en Josas (FR)
Pfizer Animal Health Europe (FR
Swansea University (UK)
Hannover University(DE)
Glasgow University (UK)
Pfizer GmbH (DE)

Coordinateur

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Aide de l'ANR

254 000 € (partenaires français)

Début et durée

janvier 2011, 36 mois

Référence

ANR-10-EMIDA-003

Titre du projet	**HealthyGut**– Multi focal strategies to improve gut health and reduce enteritis in poultry and pigs

Résumé

Infectious disease remains a major cause of livestock loss within the EU, the EEA and elsewhere. The size of the agricultural economy was estimated in 2005 to be €291 billion with exports valued at €25 billion and infectious disease is thought to lead to up to 10% of this in losses. Enteric infections caused by a variety of agents are estimated to cause ca 5% losses of the economic value of the animal. Enteric infections frequently involve several different agents simultaneously with negative consequences for immune or other approaches to controlling individual pathogens.

Colonisation of the intestine by enteric pathogens is enhanced during periods of heightened susceptibility, particularly immediately after hatching and at onset of lay in the chicken and immediately after weaning in pigs.

This international consortium which has collaborated closely for more than 10 years aims to increase the resistance to colonisation and enteritis by several pathogens during these times by applying two generic microbiological and immunological approaches through this project (HealthyGut).

Partenaires

INRA UR1282, Infectiologie Animale et Santé Publique (FR)
University of Nottingham (UK)
Czech Veterinary Research Institute (CZ)
Istituto Superiore de Sanita (IT)
Friedrich-Loeffler-Institute (DE)
Lohmann animal Health (DE)
Microbial Developments Ltd, UK

Coordinateur

Paul Barrow (UK)
Correspondent français : Anne-Christine Lalmanach

Aide de l'ANR

192 000 € (partenaire français)

Début et durée

mai 2011, 36 mois

Référence

ANR-10-EMID-001

AFAQ
ISO 9001

Titre du projet	MADISPREAD – Marek's Disease Virus Spread: In and Out of Chicken

Résumé

The objective of Madispread is to develop fundamental knowledge on Marek's disease virus (MDV) entry, shedding and immune prophylaxis in order to improve the control of a major viral pathogen. The main focus is on the prevention of MDV evolution toward increased pathogenicity, arguably the most important feature of this virus that has constantly jeopardized its control.

By addressing virus entry, shedding, and control of the latter by vaccination, we aim at answering to important questions on i) the interaction between MDV and differentiated cells mediating virus entry (hematopoietic lineage) or shedding (ectodermal lineage) and ii) the rationale to design vaccines, which protect against tumor development but also reduce virulent virus spread.

Partenaires

INRA Tours – UR 1282 Infectiologie Animale et Santé Publique (FR)
INRA UMR 1288 IGFL – ENS Lyon (FR)
Lohmann Tierzucht GmbH (DE)
Freie Universität Berlin (DE)
University of Munich, department for Basic Veterinary Sciences (DE)
Institute for Animal health, Avian Oncogenic Virus group, UK

Coordinateur

Jean-François VAUTHEROT (FR)

Aide de l'ANR

242 000 € (partenaires français)

Déb t et durée

février 2011, 36 mois

Référence

ANR-10-EMIDA-002

Titre du projet	**OrbiNet** – Combating Orbivirus infections of livestock: understanding of the molecular basis for protein function/virus phenotype, molecular epidemiology and improving diagnostic assays

Résumé

Since 1998, there have been multiple incursions of bluetongue into Southern, Central and Northern Europe. These outbreaks have involved at least 12 distinct bluetongue virus (BTV) strains, belonging to 9 different serotypes and have lead to the death of more than two million animals. In addition, significant economic losses have been incurred due to loss in productivity, restrictions in animal movements and trade as part of control programmes. These events demonstrate that the entire European Union is now at risk from further introductions of BTV, and potentially of other BTV-related related Orbiviruses, particularly those also transmitted by *Culicoides* vectors (including African horse sickness virus [AHSV], epizootic haemorrhagic disease virus [EHDV] and equine encephalosis virus [EEV]). Worryingly, AHSV, EHDV and EEV have been detected just outside the EU in Israel, Turkey, as well as North and West Africa and now pose a further significant threat to livestock in Europe.

This proposal will establish "OrbiNet", a network of 9 laboratories focussing on research on BTV and related orbiviruses in 8 European countries and Israel. The goals of OrbiNet are to provide training, share reagents and expertise, and conduct targeted research programmes with the overall aim to better understand orbivirus transmission, epidemiology, pathogenesis and develop better diagnostic techniques. OrbiNet will closely liaise with the scientific community, government agencies, the EU and industry in order to exploit the knowledge generated and help to inform animal health research policies and activities at the EU level.

Partenaires	ANSES Laboratoire de Santé Animale de Maison- Alfort (FR) Technical University of Denmark, National Veterinary Institute (DK) Qiagen (DE) Friedrich-Loeffler-Institut (DE) University of Glasgow Faculty of Veterinary Medicine, UK Institute of virology and Immunoprophylaxis, Switzerland Kimron Veterinary Institute (IL) Central veterinary Institute of Wageningen UR (CVI), (NL) Veterinary and Agrochemocal Research Center (BE) Istituto Zooprofilattico Sperimentale dell'Abruzzo e del Molise 'G.Caporale' (IZS A&M) (IT)
Coordinateur	Peter Mertens (UK) Correspondent français : Stéphen Zientara
Aide de l'ANR	208 000 € (partenaires français)
Début et durée	mai 2011, 36 mois
Référence	ANR-10-EMIDA-004

AF
AQ
ISO 9001

Titre du projet	**PathoFish** – Control Flavobacteriaceae infections in European fish farms

Résumé

This project focuses on two pathogenic bacteria of primary veterinary significance that impact human alimentation while remaining poorly studied. This status ensures a high impact of a large-scale genomics program (MLST and whole-genome sequencing). The results of this project will have important implications for the aquaculture industry and it specifically addresses the question of the evolutionary process of pathogen emergence at both the strain and species levels.

To improve the control of Fp and Tm infections, data at both the epidemiological and molecular levels are urgently needed. This project aims at filling this scientific gap and immediately investing the acquired knowledge to provide the fish-farming community with new tools for diagnostic and prophylactic methods. The amount of genomic sequences generated in this project is estimated to about 110 Mbp of high-quality sequences (i.e., 5 to 10 Mbp for the genotyping of 1,000 isolates through MLST and 100 Mbp for the whole-genome sequencing of 32 isolates). These sequences will be deposited in the EMBL Nucleotide Sequence Database (also known as EMBL-Bank) that constitutes Europe's primary nucleotide sequence resource and made freely available to the scientific community.

Partenaires

INRA Virologie et Immunologie Moléculaires (FR)
PHYLOGENE S.A. (FR)
Abo Akademi University, laboratory of Aquatic Pathobiology (FI)
National Veterinary Institute of Norway (NO)
Center for Fish and Wildlife health, Institut of Animal Pathology, Vetsuisse fakulty (CH)
Istituto Zooprofilattico Sperimentale delle Venezie (IT)
National Veterinary Institute, Technical University of Denmark
Pharmaq AS (NO)

Coordinateur

Eric DUCHAUD (FR)

Aide de l'ANR

238 000 € (partenaires français)

Début et durée

mars 2011, 36 mois

Référence

ANR-10-EMIDA-006