



DEFEND NEWSLETTER # 2

AUGUST 2019

DEFEND is a consortium of 30 scientific partners from academia, industry and government working together to halt the emergence of two viral pathogens of livestock into Europe and neighbouring countries – **African swine fever virus (ASFV) and lumpy skin disease virus (LSDV)**.

The aim of DEFEND is 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.

DEFEND Key Facts

Start date: June 2018

Duration: 5 years

Budget: 5.6 million EUR

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Welcome to our second DEFEND newsletter!

It's hard to believe the DEFEND project is already one year into its five-year term. We are delighted with the progress so far - all 15 work packages are active, researchers have been recruited to undertake the research tasks, experiments are underway and DEFEND knowledge is being generated.

In this edition we have an update of progress so far, an interview with Dr Silvia Bellini discussing her recent trip to China and, in our partner focus, we have profiles from our consortium members in Russia, Serbia and Sweden.

We hope you enjoy this issue!

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NEWS

“DEFEND after one year”- commentary from Dr Pip Beard, the DEFEND consortium lead

After one year the overall assessment of DEFEND is “all systems go”! The planning and initiating stages of the project have been completed and execution of the research tasks is now underway in every work package. The central ethos of DEFEND is to foster effective collaboration between a diverse range of partners so the consortium achieves more as a whole than as individuals. This ethos is evident in the partnerships and co-operative activities undertaken by the partners and is already translating into practical outputs. These outputs include:

- A review and critical analysis of the existing literature on relationships between conflict, migration and spread of animal disease
- Development and optimisation of new immunodiagnostic tests for LSDV
- Transmission studies involving cattle and insects are underway in order to understand how LSDV is spread
- Pigs have been vaccinated with an attenuated strain of ASFV and their immune response examined in detail allowing researchers to identify T-cell antigens required for protection

The timeliness and importance of DEFEND research has been highlighted by the rapid spread of ASFV through Asia. ASF was first confirmed in China on 3 August 2018. Despite the actions taken by Chinese authorities, veterinarians and farmers outbreaks have now been reported across the country with 32 provinces currently affected. The disease has also spread to the neighbouring countries of Mongolia, Vietnam, Cambodia, Democratic People’s Republic of Korea and Lao People’s Democratic Republic. The situation is deeply worrying.

Visit to China

In March 2019 I was invited to China to speak at the ‘EU-China collaboration on pig disease research with a particular focus on African swine fever workshop’. The meeting was co-organised by the Delegation of the European Union to China, Beijing, the Chinese Academy of Agricultural Sciences (CAAS) and STAR-IDAZ International Research Consortium (STAR-IDAZ IRC). Latest developments were presented by research teams from China and Europe, knowledge gaps highlighted, and methods of sharing information between research laboratories discussed. The seriousness of the situation was acknowledged by all participants. The structure of the pig industry in Asia is such that control of ASFV is exceptionally challenging. As one researcher noted “ASFV has found its paradise in China”.



Dr Pip Beard speaking at the EU-China collaborative workshop on pig disease

The control of LSDV in Europe is different from ASFV but is reaching a key decision point. There have been no LSDV outbreaks reported in Europe or neighbouring Balkan countries in 2019 to date due primarily to the effectiveness of the regional vaccination campaign. However, cases of LSD have been reported in Russia and Turkey in 2019, highlighting the threat the disease still poses to the region. The current challenge for policy makers is to balance the desire for countries to cease vaccination and regain LSDV-free status with the threat that LSDV still poses to Europe.

The DEFEND consortium is focusing on ASF and LSD, interacting with policy makers in China, as described in the interview with Dr Silvia Bellini, and in Europe, providing scientific results to enable evidence-based decisions to be made, and developing new tools to help control these diseases.

Keep up to date

If you would like to keep up to date with our work on DEFEND, you can register as a **DEFEND Stakeholder**, by emailing the DEFEND mailbox (defend@pirbright.ac.uk).

You can also follow us on **Twitter and Facebook @defend2020**



DEFEND Integrated Knowledge Transfer Awards 2019

The DEFEND project held its first Integrated Knowledge Transfer (iKT) Awards competition in July 2019. The awards form part of the DEFEND iKT plan, which focuses on guaranteeing the impact of DEFEND by ensuring that the knowledge gained during the project is shared and utilised to its fullest extent.



'What is Integrated Knowledge Transfer?'

iKT is an ongoing, dynamic, two-way interaction between the DEFEND partners and knowledge users. iKT is often described as 'partnerships between those who produce research and those who use it'.

'Who is a knowledge user?'

Knowledge users are those who will be using DEFEND research outputs. They could be veterinarians, policy makers, farmers, governments or pharmaceutical companies to name but a few.

iKT Awards 2019

Partners involved with the DEFEND project were invited to apply for an iKT award of €1000 to undertake a knowledge transfer activity.

Applications were invited for activities that focused on one or more of the following criteria;

- Ensuring relevance of the DEFEND research
- Facilitating the use of DEFEND knowledge
- Assessing barriers to using DEFEND knowledge
- Monitoring DEFEND knowledge use

The DEFEND Project Support Team was delighted to receive several applications from partners for the awards. The applications were assessed by the DEFEND Steering Committee against a specific set of criteria and were ranked to give the overall winners.

Due to the high quality of the applications and their relevance to the DEFEND project, three of the applications were chosen to each receive €1000 towards their proposed activity.

Successful applications

- **Scientific Veterinary Institute Novi Sad (NIV-NS)**, Serbia - for attendance at the 13th annual conference of EPIZONE, Berlin, 26-28 August 2019
- **Veterinary Specialist Institute Kraljevo (VSI-Kraljevo)**, Serbia - for attendance at the 13th annual conference of EPIZONE, Berlin, 26-28 August 2019
- **Institutul de Diagnosti si Sanatate Animalia (IDAH)**, Romania - for attendance at the 13th Applied Biosafety Meeting, University of Berne, Switzerland, 22-23 August 2019

Many congratulations to the successful applicants. We wish them every success with their activities and we will be following up with them about their activities in future DEFEND newsletters.



INTERVIEW- Dr Silvia Bellini



Dr Silvia Bellini

Dr Silvia Bellini is the Staff Director of Istituto Zooprofilattico Sperimentale della Lombardia e dell'Emilia Romagna (in Italy) responsible for the Unit of Epidemiology, Surveillance and Control. She is a veterinarian with a background in

epidemiology, surveillance and prevention and control of animal diseases. She is a member of the Scientific Commission on Animal Diseases (SCAD) of The World Organisation for Animal Diseases (OIE), the Chair of the European Commission Task Force on ASF, an expert of CVET (Community Veterinary Emergency Team) and GF-TADs (Global Framework for Transboundary Animal Diseases).

'What is your role in the DEFEND project?'

'I am the lead scientist for work package 6. This work package focuses on the prevention, management and control of African swine fever in Europe and neighbouring countries. The disease is currently spreading in domestic pigs (a concern currently in Russia) and also in wild boar (in eastern parts of Europe). In terms of controlling the disease both pig and wild boar populations need to be managed.'

'You recently visited China. What was the reason / purpose for your visit?'

'I visited China earlier this year (8-12 April 2019) to present at a symposium and to attend several meetings in Beijing. My first presentation was on biosecurity in farming at the Beijing International Symposium on ASF. This was jointly organised by the Ministry of Agriculture and Rural Affairs in China (MARA), FAO (Food and Agriculture Organisation of the United Nations) and OIE. I then was lucky enough to be asked to attend the first meeting of the GF-TADs standing group of experts (SGE) on ASF for Asia. This was again hosted by MARA and was the first meeting of its kind in Asia. I gave a presentation on the management of ASF and the discussions following this proved to be very useful, so much so that a second meeting has already been proposed and will be held in Japan. I also attended a Better Training for Safer Food (BTSF) meeting, an EU training initiative designed to develop a strategy in areas of food and feed law, animal health and welfare. I gave three presentations, surveillance and the role of passive surveillance, ASF early detection and contingency planning and biosecurity in the pig farming system. I also chaired two working group meetings, which involved lots of fruitful discussions.'

'You sound like you had a busy trip! What did you learn about the ASF situation in China? What are the challenges they currently face?'

'Yes, it was a busy trip, but it was a great opportunity to learn about the ASF situation in China in more detail and to share my knowledge and experience.'

The disease is widespread. The first outbreak was in August 2018, and by the time I visited, it had spread across China and was in almost all provinces and had started to affect the neighbouring countries. The disease is reported in terms of outbreaks (136 at the time of my visit), but it is difficult for us to compare, as in Europe an outbreak is a holding, but in China it could be an entire village or area. The spread of the disease is linked to the movement of the animals and to swill feeding. It has also been detected in some slaughter houses, which means it had not been detected at the holding (origin of the animals). It is believed that over one million pigs have been slaughtered to date due to the disease - there are huge challenges to overcome.

'So, what does the future hold for China?'

'They believe that the best way to combat the problem is to start vaccinating, but there currently are no vaccines available that can be used in the field. However, they are testing a vaccine in wild boar. This vaccine is described in a paper by Barasona *et al.* (2019) in the journal *Frontiers in Veterinary Science*¹.

'Can the DEFEND Project help?'

'Yes, I believe the DEFEND project can have a huge impact on the ASF situation. The work being carried out in the project will give rise to improved strategies for control and eradication of the disease, which is an absolute necessity given the devastating effects that are being seen not only in China, but also in other parts of the world.'

'One last question, what was your overriding memory of your trip?'

'Everyone I met was willing to participate in discussions and knowledge sharing with their European colleagues. All of the meetings were very open, involving many fruitful discussions. It left me with a good impression and hope that the ASF situation will be managed.'

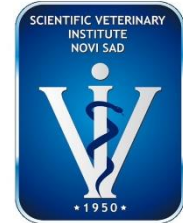
¹ 'First oral vaccination of Eurasian wild boar against African swine fever virus genotype II'
<https://www.frontiersin.org/articles/10.3389/fvets.2019.00137/full>

PARTNER FOCUS

In each newsletter we ask several of our partners to describe their organisation, research and role in DEFEND. In this edition we have focused on partners from **Serbia**, **Sweden** and the **Russian Federation**.

Partner: Scientific Veterinary Institute “Novi Sad” (NIV-NS)

Country: Serbia



Description of Organisation

Scientific Veterinary Institute "Novi Sad" (NIV-NS), established in 1950, is a leading public, official veterinary service and research institution under the supervision of Ministry of Agriculture and Ministry of science, with 11 departments and laboratories (<https://niv.ns.ac.rs/en/>). The Institute develops strategic and operative developmental programs for protection of animal health, food and feed safety and quality, welfare of animals and protection of the environment that are in accordance to international legislation and standards.

NIV-NS has more than 50 years of experience in Research & Development. The main activities in NIV-NS are diagnostic and research work in the field of veterinary medicine, biotechnology sciences and technologic development, food and feed safety, and multidisciplinary research in medicine, agriculture and protection of the environment.

Description of research / area of expertise

Laboratory diagnostics of animal infectious and zoonotic diseases, and animal health surveillance.

Role in DEFEND

- WP2: Phylogenetics of ASFV & LSDV
- WP4: Transmission of LSDV
- WP10: Host determinants of LSD resistance

Key people working on DEFEND

- Dr Tamaš Petrović
- Dr Sava Lazić



Members of the Virology Department at NIV-NS

Partner: The Swedish University of Agricultural Sciences

Country: Sweden



Description of Organisation

The Swedish University of Agricultural Sciences (SLU) develops the understanding and sustainable use and management of biological natural resources. This is achieved by research, education and environmental monitoring and assessment, in collaboration with the surrounding community.

The Department of Animal Breeding and Genetics performs research and education at all levels of animal genetics: molecular genetics, bioinformatics, quantitative genetics and applied genetics. We also host the Interbull Centre, which is responsible for worldwide genetic evaluation of dairy and beef bulls, the SLU Global Centre for Bioinformatics, and the Animal Genetics Laboratory.

Description of research / area of expertise

We specialise in quantitative genetics which involves genetic analysis and interpretation of data for complex traits. Most traits that are of importance in animals are complex traits, which are characterized by being influenced by a large number of genes and environmental factors that interact to create the phenotypes.

We study many different aspects of quantitative genetics. We study how complex traits are affected by genetic variants in the genome to predict the expression of particular trait, for example a disease. Other research areas include modelling of disease phenotypes to create new and more informative trait definitions, development of genomic selection and breeding methodologies, and analysis of Next Generation Sequencing Data. A large part of the work borders to other areas of genetics and biology, such as computational, population and molecular genetics, as well as bioinformatics, statistics and mathematical modelling.



Typical department lunch - summer crayfish party

Role in DEFEND

SLU is leading work package 10 on the host variation in susceptibility to LSD. The work package aims to pull together a large data set on animals that were infected with LSD and subsequently did, or did not, develop disease. This work package is highly collaborative and requires the input of many partners.

Key people working on DEFEND

- Prof DJ de Koning
- Dr Tomas Klingström

Partner: FGBI ARRIAH

Country: Russian Federation



Description of Organisation

FGBI ARRIAH is the leading research and diagnostics institute of the Ministry of Agriculture involved in controlling and preventing high consequence viral diseases of animals. Since the establishment from 1958 it has grown into the national interdisciplinary research centre with the focus on the interconnection between human and animal health.

Description of research / area of expertise

One of our research directions is to develop molecular tools for timely detection of important livestock pathogens, contributing to disease surveillance and emergency management programs. Our institute serves essential functions for disease control and eradication programs. We are also engaged in providing expert advice and recommendations on a range of issues, including diagnostics, veterinary care and vaccines.

Role in DEFEND

- WP1: Risk analysis framework
- WP2: Phylogenetics of ASFV & LSDV
- WP10: Host determinants of LSD resistance

Key people working on DEFEND

- Dr Aleksandr Kononov
- Dr Olga Byadovskaya
- Dr Alexander Sprygin
- Post graduate Yana Pestova



The team at FGBI ARRIAH