



SWINOSTICS

Swine diseases field diagnostics toolbox

Newsletter N° 3 - October 2019

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SUSTAINABLE FOOD SECURITY – RESILIENT AND RESOURCE-EFFICIENT VALUE CHAINS
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SWINOSTICS news:

✧ MREs identification and characterization

During this period, commercial antibodies able to bind whole virions of the target viruses were selected (Table 1). The binding capability of the commercial antibodies was analysed through western blotting (WB) and ELISA assays in order to evaluate their specificity, affinity and selectivity. **Figure 1** shows the ELISA sandwich result for the African Swine Fever Virus (ASFV).

Virus	Monoclonal Ab			Recombinant protein			Polyclonal Ab		
	Specificity / Antigen	Company	Cat. number	Protein	Company	Cat. Number	Specificity / Antigen	Company	Cat. Number
Porcine Circovirus (PCV2)	VP2 (ORF2 or Capsid)	INOGENASA	VP2 PCV2 type 2 specific Monoclonal Antibody Cat#113-PCV20005 Clone 30A9	Recombinant Porcine Circovirus Type 2 capsid protein (PCV2-ORF2)	Alpha-Diagnostic	PCV2C20-R-10	Recombinant Fragment corresponding to amino acids 1-119 of Porcine circovirus type 2 Capsid	Cat#194-14500	Porcine Circovirus Type 2 capsid antibody
African Swine Fever Virus (ASFV)	VP12	INOGENASA	VP12 ASFV specific Monoclonal Ab No. 11-19A-SMB001 Clone 30B01	Recombinant ASFV attachment protein p12 (p12-110)	My Resource	SMB1100709	Recombinant purified ASFV proteins 2A-4 (2A-4 (110 kD)	ASFV12.5 Rabbit anti-Rp/Name Anti-African Swine fever virus (ASFV) IgG antibodies	
Classical Swine Fever Virus (CSFV or pestivirus)	E2	ADRIA SCIENTIFIC	Clone W1002 Monoclonal antibody to pestivirus Core Nucleocapsid	Recombinant Classical swine fever virus E2 protein (CSFV E2, envelope protein)	Alpha-Diagnostic	CSFV2-E-10	Recombinant purified CSFV E2 protein	CSFV2.5 Rabbit anti-Classical swine fever virus E2 protein (CSFV E2) IgG antibodies	
Porcine Reproductive and Respiratory Syndrome virus (PRRSV Type 1, European)	PRRSV NP	ADRIA SCIENTIFIC	Recombinant PRRSV NP	Recombinant PRRSV1 nuclear protein (NP)	Alpha-Diagnostic	PRRSP-12-R-10	Recombinant purified PRRSV1 NP	PRRSV1.5 Rabbit anti-Porcine reproductive and respiratory syndrome virus 1 nuclear protein antibodies	
Porcine Parvovirus	VP1	VIMMO	Clone SC0013011	Recombinant (E. coli) Swine/porcine Parvovirus (PPV) VP1 protein	Alpha-Diagnostic	PPVVP1-R-10	Recombinant purified PPV1 protein	PPVVP1.5 Rabbit Anti-Swine/porcine Parvovirus (PPV) VP1 IgG antibodies	

Table 1. List of monoclonal, polyclonal and recombinant protein identified and purchased.

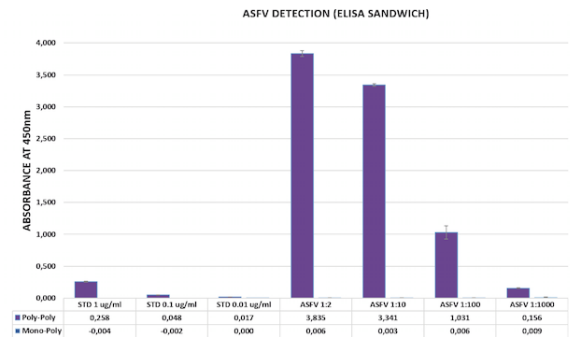


Fig.1 Sandwich ELISA test for ASFV virus.

✧ Nanoring sensor development

The design and fabrication of the first version of the SWINOSTICS photonic integrated circuit (PIC) was completed. **Figure 2** shows the photo of the PIC surface captured with an optical microscope (A) and a preliminary optical response experiment (B).

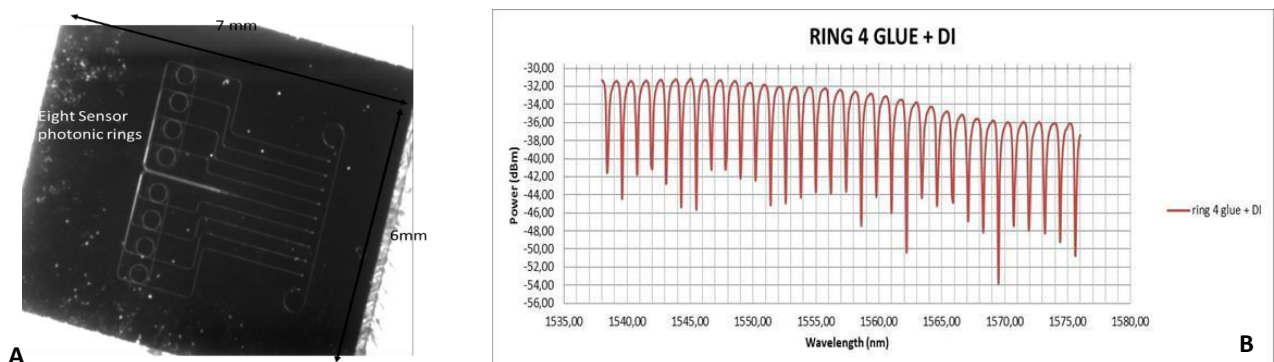


Fig. 2 PIC surface (A) and optical response of several ring resonator (B).

✓ Mid-project integration week:

Last September, two remote mid-project integration weeks were completed. Testing of the SWINOSTICS optical module and Cloud/App in combination with the main processing unit was performed by ISS, K46 and CyRIC.

✓ M18 Project meeting in Florence

On the 15th and 16th May 2019 the **SWINOSTICS 18M Meeting** was hosted by UNIFI in Florence (Italy). All partners attended the event. Focus of the discussion was on the delivery of all updated hardware modules and the forthcoming integrated testing. During the meeting, the following issues have been discussed:

- ✓ Identification of the best MREs against the target viruses
- ✓ Design and production of the chips for the mid-project integration
- ✓ Derivatization and functionalization protocol
- ✓ Optical and temperature control final configuration
- ✓ SWINOSTICS App and Cloud software
- ✓ Dissemination and communication activity



Main Technical Deliverables M18-M24

- D3.2** Biosensing surface prototypes
- D3.3** Biosensor preliminary prototypes testing report
- D3.4** PIC sensor version V1
- D3.5** PIC sensor version V2
- D4.1** Swinostics device hardware modules v1
- D4.2** Swinostics device hardware modules v2
- D4.3** Cloud-based software
- D4.4** Mobile App
- D5.1** Mid-project testing output report



Fig.3 M18 meeting

✓ Review Meeting in Brussels

The first SWINOSTICS Review Meeting took place in Brussels on the 17th of July 2019. The Project Officer and the Reviewers provided valuable comments for improving the system and keeping on track for a future Swinostics-based product.



Fig 4. Covent Garden in Brussels



Fig 5. Review meeting in Brussels

✓ Planned events:

The next SWINOSTICS Consortium Meeting (M24) will be hosted by UVMB in Budapest (Hungary)



✓ Conferences and Workshops



The SWINOSTICS project participated at the biggest Hungarian swine veterinarian conference (www.kovesnapok.hu).



The SWINOSTICS project was presented at the “X International Symposium of the Mediterranean Pig” in Florence

✓ SWINOSTICS Project Papers

The Consortium has published two peer-review papers on the Open Access Journal - Sensors



Concept Paper

A Diagnostic Device for In-Situ Detection of Swine Viral Diseases: The SWINOSTICS Project

Concetta Montagnese ¹, Paolo Barattini ², Alessandro Giusti ³, Gyula Balka ⁴, Ugo Bruno ¹, Ioannis Bossis ⁵, Athanasios Gelasakis ⁵, Matteo Bonasso ², Panayiotis Philimis ³, Lilla Dénes ⁴, Sergio Peransi ⁶, Manuel Rodrigo ⁶, Santiago Simón ⁶, Amadeu Griol ⁷, Grzegorz Wozniakowski ⁸, Katarzyna Podgórska ⁸, Carolina Pugliese ⁹, Lapo Nannucci ⁹, Sabato D'Auria ^{10,*} and Antonio Varriale ¹⁰



Article

Design and Development of Photonic Biosensors for Swine Viral Diseases Detection

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✓ Next events

SWINOSTICS will participate at North American PRRS/NC-229 Symposium on PRRS, Emerging and Foreign Diseases of Swine - 1st-2nd November 2019 Chicago (USA).

SWINOSTICS Consortium

