





European Virus Archive goes Global: a growing resource for research*

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* Antiviral Res. 2018 Oct;158:127-134. doi: 10.1016/j.antiviral.2018.07.017. Epub 2018 Jul 29. Review. PMID:30059721

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The consortium



16 partners from Europe, and 9 partners from non-EU countries

15 Associated partners:
USA, Russia, Greece, Turkey, Jordan, Germany

Associated networks:
Gabriel Network, Pasteur Institute network

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Communication & Distribution



<http://global.european-virus-archive.com>



3

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European Virus Archive goes Global



- ▶ 40 partners
 - 16- EU-partners
 - 9 non EU-partners
 - 15 Associated partners
- under a French coordination

Non profit organization distributing viruses and viral associated resource to the scientific community, covering a full range of human and animal viruses from RG2 to RG4

All the members share the **same QMS** to deliver high quality products through a unique entry point: **The EVAg web-based catalogue**

4

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Veterinarian institutes (P and AP)



- ▶ **Animal and Plant Health Agency (APHA)**, (Prof Tony Fooks) Wheybridge, United Kingdom.
- ▶ **Friedrich Löffler Institute (FLI)**, (Prof Thomas Mettenleiter) Insel Riems, Germany.
- ▶ **The Pirbright Institute (TPI)**, (Dr Carrie Batten), Pirbright, United Kingdom.
- ▶ **Agricultural Research Council (ARC-OVI)**, (Dr Claude Sabeta), Pretoria, South Africa.
- ▶ **Commonwealth Scientific and Industrial Research Organisation (CSIRO)**, (Dr Trevor Drew) Geelong, Australia
- ▶ **Hacettepe University (HU)**, (Prof. Koray Ergunay), Ankara, Turkey
- ▶ **Jordan University of Science and Technology (JUST)**, (Prof. Nabil Hailat), Amman, Jordan
- ▶ **Istituto Zooprofilattico Sperimentale delle Venezie (IZSVe)**, (Maria Serena Beato, Legnaro), Italy

5

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13 Institutes including BSL4 facilities



- ▶ **Bernhard-Nocht-Institut für Tropenmedizin (BNI)**, Germany.
- ▶ **Institute of Virology**, Marburg, Germany.
- ▶ **Friedrich Löffler Institute (FLI)**, Insel Riems, Germany.
- ▶ **Robert Koch-Institut (RKI)**, Berlin, Germany.
- ▶ **Istituto nazionale malattie infettive Ispallanzani (INMI)**, Rome, Italy.
- ▶ **Institut national de la Santé et de la Recherche médicale (INSERM)**, Lyon, France.
- ▶ **University of Texas Medical Branch (UTMB)**, US-CDC, Galveston, Texas, USA.
- ▶ **National Health Laboratory Services (NICD-NHLS)**, Johannesburg, South Africa.
- ▶ **Swedish Public Health Agency**, Stockholm, Sweden.
- ▶ **Commonwealth Scientific and Industrial Research Organisation (CSIRO)**, Geelong, Australia.
- ▶ **Public Health England (DH PHE)**, Porton Down, United Kingdom.
- ▶ **Wuhan Institute of Virology, Chinese Academy of Sciences (WIV)**, Wuhan, China.
- ▶ **National Institute of Infectious Diseases (NIID)**, Tokyo, Japan.

Today among the largest BSL4 network worldwide

6

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Health Organization networks



▶ CDC's

- **E-CDC:** EVA has been the provider of reference material to the European Network for Diagnostics of "Imported" Viral Diseases (EVD Labnet). EVAg will continue this activity. European Centre for Disease Prevention and Control (E-CDC) representative is member of the EEAB.
- **China-CDC, Japan-CDC, Swedish Public Health Agency, Public Health England, National Health Laboratory Services (ZA),** : Resource exchange agreement has been signed. Those CDC's are members of EVAg.
- **Korea-CDC** : Exchange of resource already active, formal agreement is under discussion.

▶ WHO

- **GOARN:** (Global Outbreak Alert & Response Network): EVAg is an associated party. GOARN, Director is member of the EEAB.
- **EDPLN:** (Emerging and Dangerous Pathogens Laboratories Network):
 - A formal integration of EVAg partners in EDPLN has been accepted by WHO;
 - Publicity concerning this connection is made on the EVAg website.

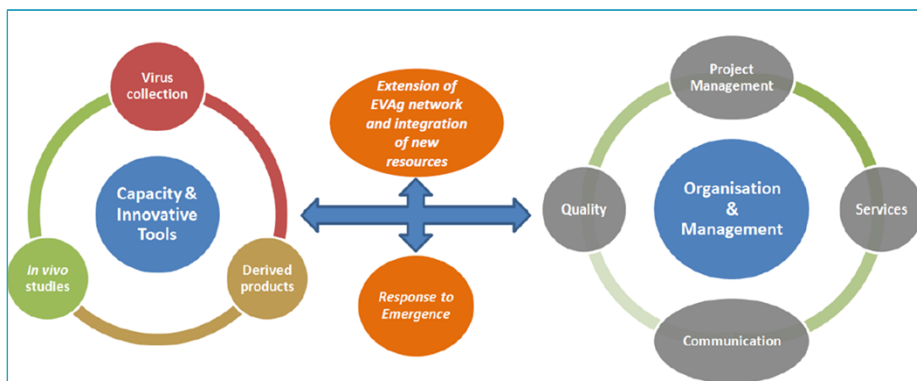
▶ OIE

- EVAg is an associated party, representative of the OIE scientific management is member of the EEAB.

7

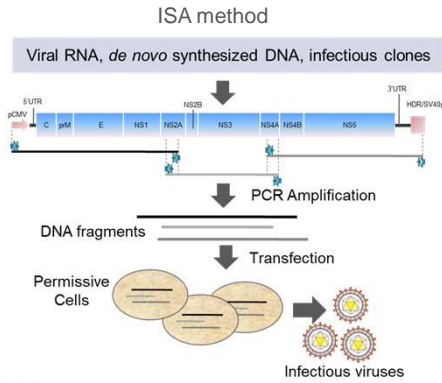
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Consortium Architecture



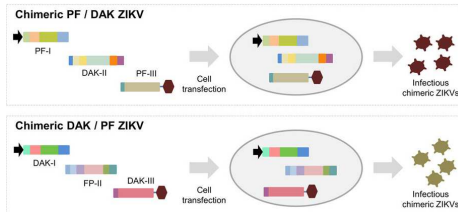
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Innovative Tool to facilitate exchange



Aubry et al, J Gen Virol 2014

Rapid generation of intra- and inter-lineage chimeras

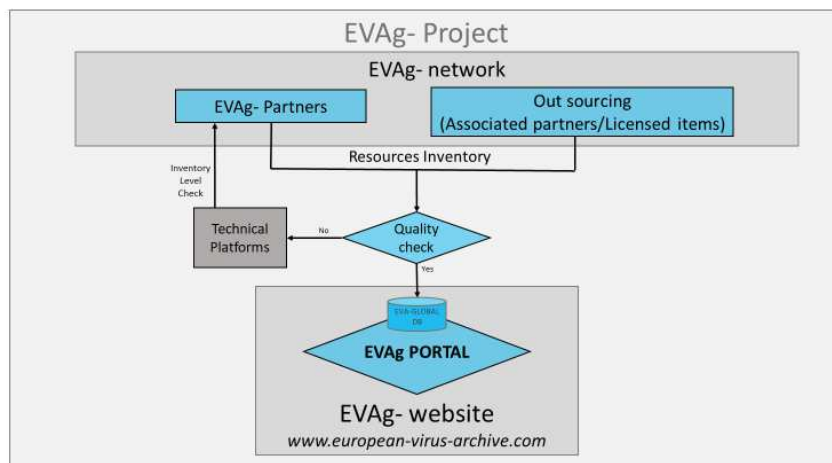


Atieh et al, Sci Rep, 2016

9

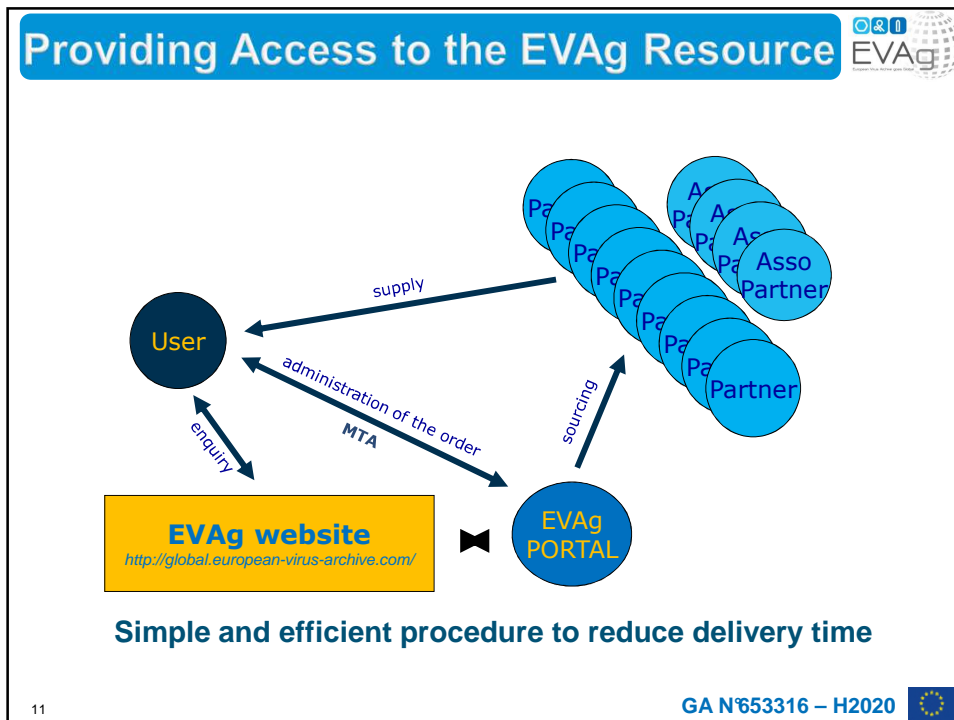
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Virtual Virus Collection and QMS



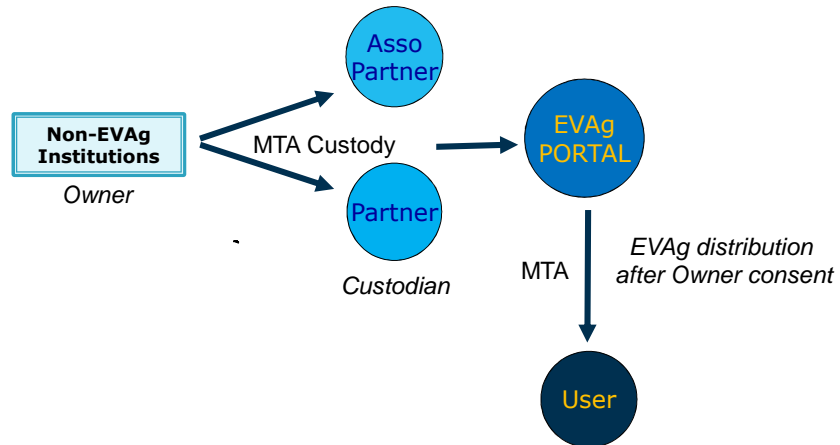
10

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- ## Types of access provision
- ▶ Free of charge access to the resource (40%)
 - An end-user can be granted for a free of charge access to the EVAg resource (virus, derived material or service)
 - The provider may provide this resource on its own budget
 - The provider may receive a compensation equivalent to production cost of the resource (EVAg budget). This type of provision is called Transnational Access, it is an incitement to supply material related to high quality research project. Eligibility of the recipient is evaluated by a selection panel. (20%)
 - ▶ Paying access to the resource (60%)
 - The end user will pay for the resource. The tag price corresponds to the production cost, without any gross margin
 - ▶ Shipment fees are paid by the recipient of the resource
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- 12

Extension of Access provision



To guaranty ownership rights

13

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Main achievements



- ▶ **Distribution of high quality products worldwide**
- ▶ **Active role in the management of viral outbreak in close association with Nations of emergence and WHO**
- ▶ **Interaction with industrial sector for the development of new diagnostic tools**

14

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An active organization



- ▶ 6 years of existence as a consortium
- ▶ An operational website (200 visits per day):
<http://global.european-virus-archive.com>
- ▶ A web-based catalogue including more than 1300 gold standard products (virus and derived materials) and more to come in the future
- ▶ More than 3600 products distributed worldwide
- ▶ 130 publications associated to EVAg impact

Today among the largest virtual virus collection worldwide

15

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16

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Major actor during viral outbreaks



- ▶ **MERS-CoV outbreak (2012)**
 - In December 2012, WHO, in its interim guidelines entitled "Laboratory testing for novel coronavirus", recommended PCR assays as the method to detect the virus in blood sample. The **European Virus Archive** was identified as a reliable source for the delivery of assay reagents (positive controls): up to date more than **300 kits** have been distributed to 155 laboratories in 58 countries.
- ▶ **EBOLA virus outbreak (2015)**
 - **Technical support** brought to Western Africa nations by EVAg partners: **BNI, UL, RKI, INMI, PHE, UKB, INSERM P4, UTMB, China-CDC, NICD**
- ▶ **ZIKA virus outbreak (2016)**
 - Because the response to this outbreak has been very slow to be initiated (first alert from PAHO in May 2015), the real increase of the number of inquiries has been delayed until February 2016 (WHO PHEIC). Up to date around **500 products** have been distributed to institutes in 30 countries, mainly live viruses for fundamental virology researches, new diagnostics, and vaccine developments
- ▶ **Re-emergence of yellow fever in South America (2017)**
 - In Brazil, 3240 suspected cases and 435 deaths were reported between December 2016 through May 2017.
 - EVAg partners identified a need to distinguish between the vaccine and the wild-type YFV-associated with disease. Consequently, **novel multiplex real-time reverse transcription PCRs** that differentiate between vaccine and American wild-type YFV isolates were developed by consortium partners in response to this outbreak. They were validated under field conditions and supplied as required.

17

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ZIKV PCR EQA in Brazil



18

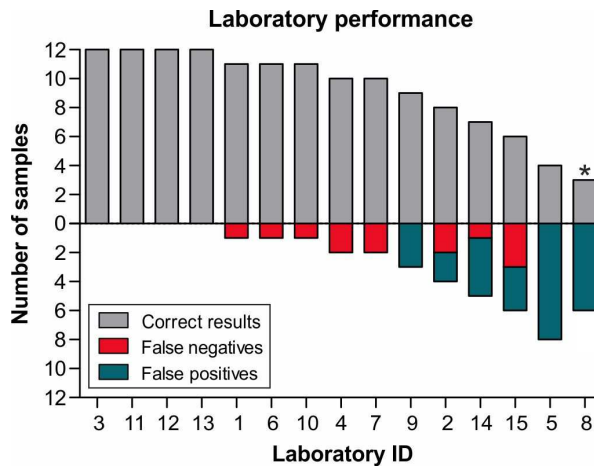
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EQA results



- Some labs excellent, some suboptimal – evidence for contamination



19

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Implications for public health



Research |

Risk of microcephaly after Zika virus infection in Brazil, 2015 to 2016

Thomas Jaenisch,^a Kerstin Daniela Rosenberger,^a Carlos Brito,^b Oliver Brady,^c Patrícia Brasil^d & Ernesto TA Marques^d

Risk estimates 0.5-40%

The NEW ENGLAND JOURNAL of MEDICINE

- Petersen LR, Jamieson LJ, Powers AM, Honein MA. Zika virus. *N Engl J Med* 2016;374:1552-63.
- Lanciotti RS, Kosoy OL, Laven JJ, et al. Genetic and serologic properties of Zika virus associated with an epidemic, Yap State, Micronesia, 2007. *Emerg Infect Dis* 2008;14:1232-9.
- Russell FK, Nisalak A. Dengue virus identification by the plaque reduction neutralization test. *J Immunol* 1967;99:291-6. DOI: 10.1056/NEJMc1603618
- Jabs DA, Nussenblatt RB, Rosenbaum JT. Standardization of Uveitis Nomenclature (SUN) Working Group. Standardization of uveitis nomenclature for reporting clinical data: results of the First International Workshop. *Am J Ophthalmol* 2005;140:509-16.

Requests for Abortion in Latin America Related to Concern about Zika Virus Exposure

Abortion requests: >100%

20

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21

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Interaction with Industry



The following list of products are part of licence agreements signed between EVAg partners and European industrial companies:

- ▶ Development of diagnostic assays for both molecular and serological detection of virus (filovirus and flavivirus)
- ▶ Preparation of panel of reference material for the validation of diagnostic tests (enterovirus and flavivirus)
- ▶ Supply of virus for the development of new vaccines (ZIKAV and EBOLAV)
- ▶ Production of serological microarray slides for discrimination of ZIKAVirus infection from other arbovirus infections
- ▶ Production of immunofluorescence slides carrying ZIKAVirus infected cells for detection of antibodies


22

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Towards EVA-GLOBAL

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EVA-GLOBAL composition 

- ▶ **50 partners**
 - 27 EU and 11 non EU-Partners
 - 6 Operating Associate Partners
 - 6 Associate Partners

under a French coordination

24 GA N°653316 – H2020 

Composition of EVA-GLOBAL



25

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Thank you for your attention



26

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