

# EVA<sub>G</sub>

# EUROPEAN VIRUS

# ARCHIVE GOES GLOBAL

# (2015-2019)

Prof. Jean-Louis ROMETTE

Project coordinator

EPV/Aix-Marseille University, France

*jean-louis.romette@univ-amu.fr*

*www.european-virus-archive.com*

# Rational: to bring an appropriate answer to a critical situation in 2007

- A 40 year-old organization
  - A mosaic of independant collections
  - Most of the creators retired without successors to take over the activity
  - Most of the historical strains lost
  - Poor quality of the available resource in the existing collections in Europe
  - No viral stocks available
- Scarcity of the resource
  - The ATCC the only reliable supplier in USA ceased the external supply of viral strains outside of the country since «9/11»

# A well established organization

- 6 years of existence as a consortium
- An operational website (200 visits per day)
- A web-based catalogue including more than 1800 gold standard products (virus and derived materials) and more to come in the future
- More than 2000 products distributed worldwide
- Active actor, under the WHO umbrella, during the last virus outbreaks: MERS-CoV, Ebola

Today among the largest virtual virus collection worldwide

# EVAg consortium foundation

- **Non for profit organization**
- Each partner retains the ownership of its biological resource (section of the CA)
- Each partner is free to decide which part of its collection will be shared with the Scientific community via the Web-based catalogue (section of the CA)
- EVAg management has been mandated to represent EVAg partners for all actions aiming at
  - Developing networks with new associated partners
  - Promoting EVAg consortium activities and results
  - Giving access to EVAg biological resources
- All partners have signed a Grant Agreement and a Consortium Agreement (CA) defining rights and obligations

# EVAg missions: to deliver first quality products through a professional organization

- Define and establish a set of best practice quality guidelines for adoption by the consortium partner collections
- Improve **QMS** standards across the consortium partner collections
- Guarantee the supply of authenticated and quality controlled resource to users
- Harmonised service levels across the consortium

# Exemple of Achievement

## MERS-CoV outbreak

- Two cases of rapidly progressive acute respiratory infection in adults associated with a novel coronavirus have generated an international public health response. The two infections were acquired three months apart, probably in Saudi Arabia and Qatar. An interim case definition has been elaborated and was published on the **World Health Organization** website on 25 September 2012.
- In a collaborative activity co-ordinated by major European and national epidemic response networks **UKB** has developed diagnostic real-time reverse-transcription polymerase chain reaction (RT-PCR) assays suitable for qualitative and quantitative detection of the new agent
- 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 distributed worldwide

**Current situation (WHO report Oct 1st, 2015):** total of 824 confirmed cases (mainly in KSA), 286 related deaths

## Distribution of PCR controls (upE)



Source:  
[http://www.weltgebetstag.de/images/weltkarte\\_weltgebetstag.gif](http://www.weltgebetstag.de/images/weltkarte_weltgebetstag.gif)

**155 laboratories world-wide**  
**58 countries**



# THE CONSORTIUM

# 16 partners from Europe

- **EPV** (Prof Xavier de Lamballerie), Marseille, France
- **Animal and Plant Health Agency** (Prof Tony Fooks) Weybridge, United Kingdom
- **Bernard Nocht Institut für Tropenmedizin** (BSL4 lab) (Prof Stephan Günther) Hamburg, Germany
- **Universitätsklinikum of Bonn** (Prof Christian Drosten), Bonn, Germany
- **Public Health England**, (Prof Miles W Carroll), Porton Down, United Kingdom
- **The Pirbright Institute**, (Dr John Fazakerley), Pirbright, United Kingdom
- **IMI** (Prof Tatjana Avsic-Zupanc) Ljubljana, Slovenia
- **IVSAS** (Prof Boris Klempa), Bratislava, Slovakia
- **AFMB**, Protein production platform (Dr Bruno Coutard), Marseille, France
- **INMI** (BSL4 lab) (Dr Maria Capobianchi), Roma, Italy
- **Robert Koch Institut**, (Prof Andreas Nitsche), Berlin, Germany
- **ERASMUS Medical Center**, (Prof Marion Koopmans), Rotterdam, The Netherlands
- **LUMC**, ( Dr Alexander.E. Gorbalenya), Leiden, The Netherlands
- **INSERM** (BSL4) , (Dr Hervé Raoul), Lyon, France
- **Institut Pasteur**, (Dr Hervé Bourhy), Paris, France
- **Friedrich Loeffler Institute**, (BSL4) (Prof Thomas Mettenleiter) Insel Riems, Germany

## 9 non-European partners

- **ARC- Onderstepoort Veterinary Institute**, (Dr Claude Sabetta), Praetoria, South Africa
- **NICD** (BSL4),(Prof Janusz Paweska), Johannesburg, South Africa
- **Chumakov Institute**, (Dr Alexander Lukashev), Moscow, Russia
- **Research Institute of Influenza**, (Prof Mikhail Eropkin), St Petersburg, Russia
- **Mechnikov Institute**, (Prof Vitaly Zverev), Moscow, Russia
- **Institute of Virology** (BSL4 lab), (Prof Zhi-Hong Hu), CAS, Wuhan, China
- **Dpts of Virology of the China-CDC**,(Prof George Fu Gao),CAS and CAMS, Beijing, China
- **AAHL**, (BSL4 lab) CSIRO (Prof Prof Kurt Zuelke) Geelong, Australia
- **Department of Pathology and Immunology** (Prof Daniel Pinschewer) Basel, Switzerland

# 18 Associated partners

- **Center for Biodefense & Emerging Infectious Diseases (BSL4)**  
US-CDC, UTMB, (Prof Scott Weaver), Galveston, Texas, USA
- **NIID**, (BSL4 ) (Dr. Masayuki Saijo) Tokyo, Japan
- **Swedish Public Health Agency** (BSL4), (Dr Ali Mirazimi), Stockholm, Sweden
- **The Biomedical Center**, (Prof Alexander Koslov), St Petersburg, Russia
- **Pasteur Institute**, (Prof Anatoly Zhebrun), St Petersburg, Russia
- **CRI Epidemiology**, (Prof German Shipulin), Moscow, Russia
- **Hellenic Pasteur Institute**, (Dr.Urania Georgopoulou), Athens, Greece
- **Hacettepe University**, Biology Department, Virology unit (Prof Koray Ergunay) Ankara, Turkey
- **Jordan University of Science and Technology**, (Prof. Dr. Nabil Hailat), Amman, Jordan
- **Centro Nacional de Microbiología, Instituto de Salud Carlos III**, (Prof. Jose Manuel Echevarria), Madrid, Spain
- **Pasteur Institutes Network : 4 Institutes** in Cameroun, Senegal, Madagascar, Cambodia
- **GABRIEL Network : 5 Institutes** in Haiti, Mali, Cambodia, Guinea, and **IPB CAMS Beijing**

# 12 Institutes including BSL4 facilities

- **Bernard Nocht institut für Tropenmedizin** (Prof S Günther) Hamburg, Germany
- **INMI** (Dr M Capobianchi), Roma, Italy
- **INSERM** (Dr H Raoul), Lyon, France
- **Center for Biodefense & Emerging Infectious Diseases** UTMB, (Prof S Weaver), Galveston, Texas, USA
- **NICD** (Prof J Paweska), Johannesburg, South Africa
- **Frederic Loeffler Institute**, (Prof T Mettenleiter) Inlend Riems, Germany
- **Swedish Public Health Agency**, (Dr A Mirazimi), Stockholm, Sweden
- **AAHL**, CSIRO, (Prof K Zuelke) Geelong, Australia
- **Public Health England**,(Prof M W Carroll), Porton Down, United Kingdom
- **NIID**, (Dr. M Saijo) Tokyo, Japan
- **Robert Koch Institut**, (Prof A Nietzsche), Berlin, Germany (in process)
- **Institute of Virology**, (Prof Zhi-Hong Hu), CAS, Wuhan, China (in process)

# Extension of the consortium to other scientific networks

- **CDC's**

- E-CDC: EVA has been the provider of reference material to the European Network for Diagnostics of "Imported" Viral Diseases (ENIVD). EVAg will continue this activity. E-CDC representative is member of the EEAB
- China-CDC: Resource exchange agreement with the China-CDC has been agreed. China-CDC is member of EVAg, VP of C-CDC is member of the EEAB
- US-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**

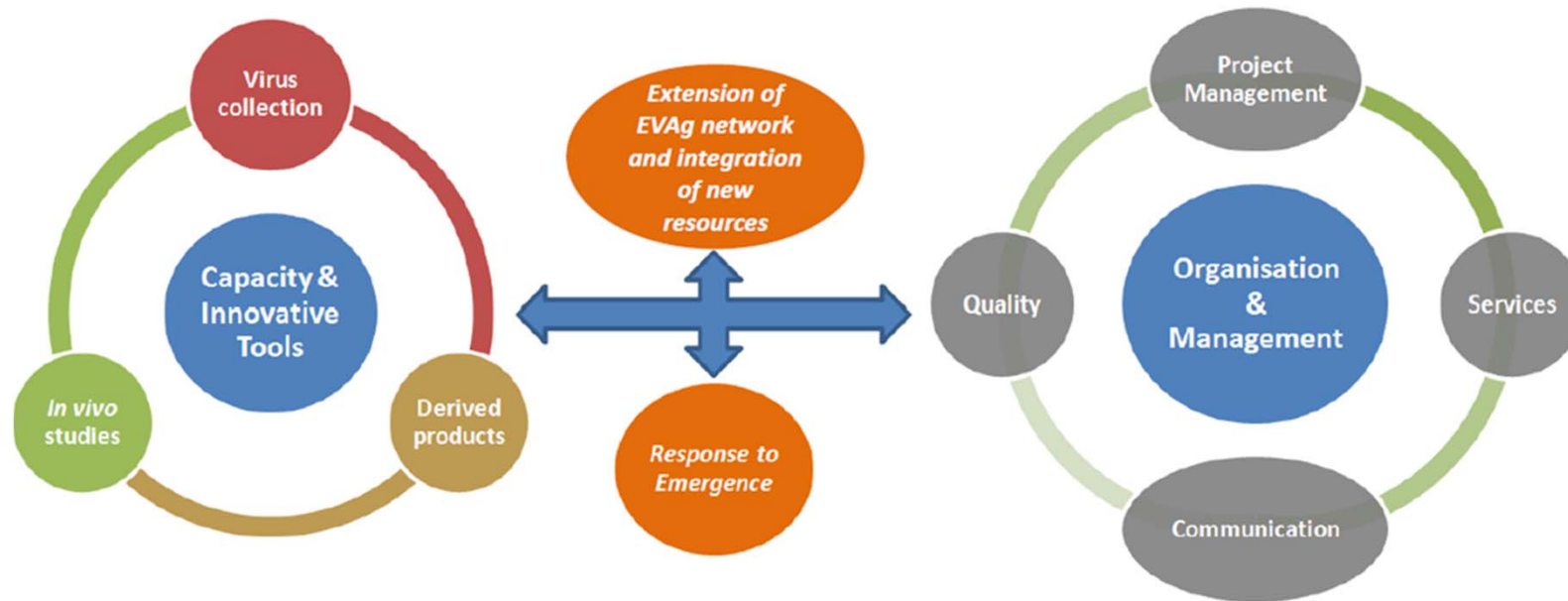
- OIE: EVAg is an associated party, the OIE scientific director is member of the EEAB

- **ESFRI**

- BBMRI: MoU signed, EVAg will integrate this ESFRI as a service unit
- ERINHA: EVAg is on the roadmap as material supplier, may integrate this ESFRI when its legal status will be implemented (still in preparation phase)
- MIRRI: EVAg is on the roadmap as microbial collection entity, may integrate this ESFRI when its legal status will be implemented (still in preparation phase)

# THE PROJECT

# Project Architecture





# EVAg main objectives (WPs)

- WP1: Developing a repository of quality controlled virus stocks and reference reagents and the **associated metadata including dedicated platforms**
- WP2: Developing a **derived materials platform**
- WP3: Developing an ***in vivo* studies platform**
- WP4: Implementation of a **Quality Management System**
- WP5: Extension of the EVAg network and **integration of new resources**
- WP6: **Support and Response to virus emergence**
- WP7: Providing Access to the EVAg resource
- WP8: Transfer of knowledge: dissemination and **communication** activities within & outside the consortium
- WP9: Optimizing the project management

# 1-Developing a repository of quality controlled virus stocks and the associated metadata

- Extension of the collection to **arthropods** and **fish** viruses
- Proposal of a methodology to reach the quality corresponding to the **gold standard**
- **Capacity building**: identification and design of technological platforms covering isolation , purification, sequencing, **metadata** production
- Management of **collections back up** in the event of disaster /emergency
- Conservation: short and **long term storage**
- Inactivation protocols
- Set up of technical protocols and guidelines to be used by partners but also by end-users (open access)

## 2-Derived material platform

- Recombinant virus generation platform (ISA)
- Recombinant proteins platform
- Molecular diagnostic platform
- Serological diagnostic platform
- Innovative tool for shipment

## 3-*In vivo* studies platform

- *in vivo* vertebrate hosts platform
  - Capacity: Platform to study virus infection in host open to EVAg partners
  - Innovative tools for studying virus infections in *vertebrates*
- *in vivo* invertebrate hosts platform
  - Platform to study virus infection in host open to EVAg partners
  - Innovative tools for studying virus infection in invertebrates
  - Isolation and passaging insect-borne viruses in mosquito models of infection

## 4-EVAg quality management systems

- Main objective : to define and establish a set of quality guidelines to be implemented by the biological and virological resource centres within EVAg.
  - Quality Grading Criteria for Viruses and Derived Materials in the EVA Product Range
  - Quality check / grading of new products and coordination of characterisation of new products
- Quality Work Group and Quality Survey
  - Internal Quality Audits

For practical purposes it will be for the management teams of the individual virus collections to decide and lay out what steps they will take towards achieving best practice.

## 5-Extension of EVAg network and integration of new resources

- Developing the access to new viral resource
  - Guidelines and standard agreements for co-operation
  - Contribution of EVAg partners for networking in Europe
  - Contribution of all EVAg partners for networking outside Europe
- Widening EVAg
  - Contribution of non-EU EVAg partners
  - EVAg institutional networking

## 6-Support to Response

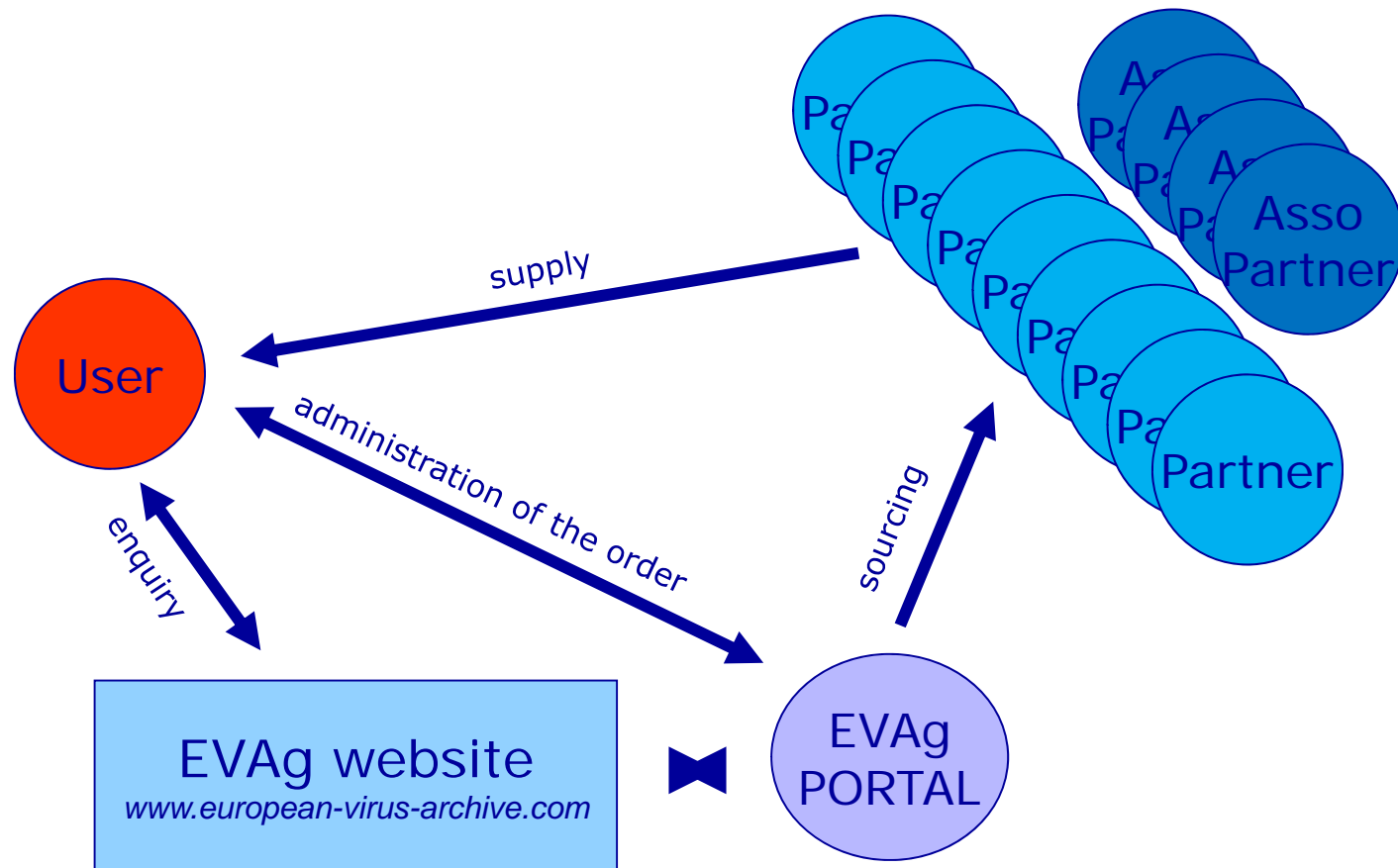
- **Mobilization of specific task force (WAVE) in case of emergence with the objective of:**
  - Development/production of reagents and protocols for molecular detection of emerging pathogens;
  - Development/production of reagents and protocols for serological detection of antibodies to emerging pathogens;
  - Validation of protocols using an established collection of viruses, genomes, antibodies, antigens and clinical samples within the EVAg network;
  - Clinical validation of protocols through the collaboration with network partners
  - Distribution of protocols and reagents.
- **Mobile laboratory capacity to assist in outbreak response**

## 7-Services currently offered by the infrastructure

- Access to virus and to derived products
- Access to high containment facilities for *in vivo* studies of infectious disease agents
- Access to high containment laboratories for *in vitro* studies of infectious disease agents
- Access to technological platforms
- Access to training with agents from RC2 to RC4

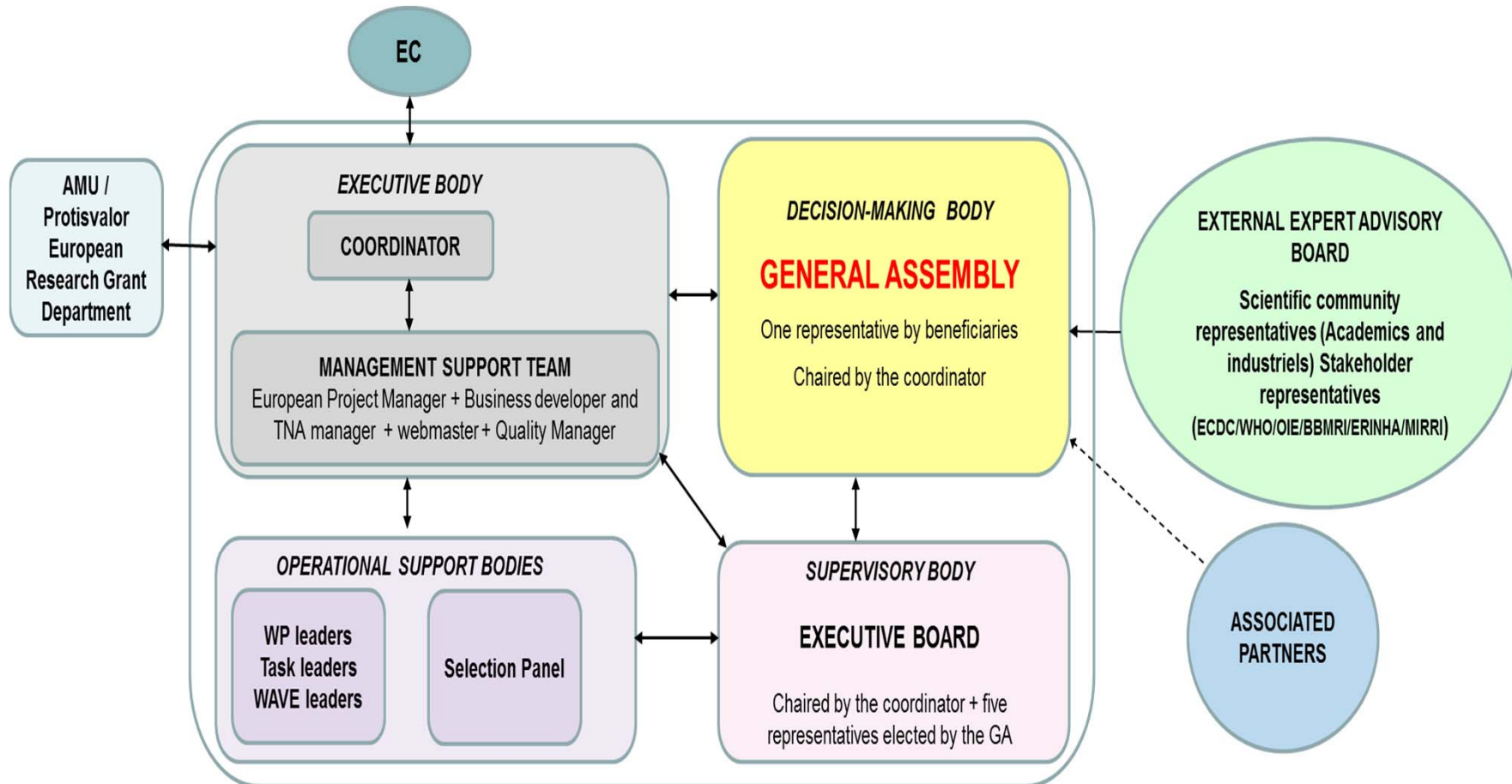


# Providing Access to the EVAg Resource



Simple and efficient procedure to reduce delivery time

# Management structure to prepare the set up of a legal status



# Thank you for your attention

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