

**REGIONAL SEMINAR ON THE OIE LABORATORY TWINNING
PROGRAMME CONCEPTS AND PERSPECTIVES**

**BENEFITS FOR CANDIDATE
LABORATORIES AND FUTURE OUTLOOK:
AFRICAN HORSE SICKNESS/BLUETONGUE
TWINNING EXPERIENCE LAB**

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Biopharma Lab Rabat Morocco

Johannesburg, South Africa, 9-10 October 2012

CREATION IN 1984

**CAPITAL ASSET :
3,2 M USD**

UNDER STATE CONTROL

**INVESTMENT :
100 M USD**

**HUMAN
RESOURCES : 66
(27 TECHNICIANS)**



BIOPHARMA

**SOCIETE DE PRODUCTIONS BIOLOGIQUES
ET PHARMACEUTIQUES VETERINAIRES**



Johannesburg, South Africa, 9-10 October 2012



CANDIDATE LAB: BIOPHARMA

- ▶ Biopharma laboratory was founded in June 1984, its mission was to contribute, to preserve and enhance animal health assuring laboratory diagnostic and veterinary vaccine production.
- ▶ Biopharma has taken on diverse research in the animal health sector for more than 25 years.
- ▶ On a national level, Biopharma is in charge of the diagnosis of contagious and exotic diseases as well as conducting epidemiological surveys, and research projects to identify the main problems affecting animal health in the country.



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CANDIDATE LAB: BIOPHARMA

VACCINE PRODUCTION TECHNOLOGY

1. BACTERIAL FERMENTATION PROCESS: ENTEROTOXEMIA VACCINE.....
2. PRODUCTION ON EGGS: NEWCASTLE DISEASE.....
3. PRODUCTION ON CELL CULTURE : SHEEP POX, BLUETONGUE, PESTE DES PETITS RUMINANTS
4. INDUSTRIAL CELL CULTURE ON BIOREACTORS: RABIES VACCINE AND CAMEL POX VACCINE

Vaccine production for prophylactic campaigns, covering 100% of local needs and export

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PARENT LAB: IAH PIRBRIGHT

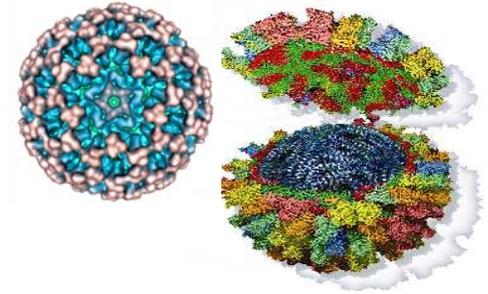


- ▶ IAH Pirbright is OIE reference laboratory for BT & AHS and has a proven expertise in auditing, training and collaborating with laboratories from other countries.
- ▶ BT and AHS research and diagnostics have been carried out at the Pirbright laboratory for over 30 years and the OIE Reference Laboratory holds one of the largest collections of BTV and ASHV strains in the world.
- ▶ The reference laboratory holds an annual 2 week training course specifically related to BTV diagnostics and molecular epidemiology in which up to 8 students participate. This is a practical course that involves both hands-on practical training in diagnostic methods as well as lectures given from the staff in their areas of expertise.

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TWINNING TOPIC



- ▶ During the last few years there have been widespread outbreaks of AHS in sub-Saharan countries in Africa reaching the south borders of Morocco (Mauritania, Senegal).
- ▶ From 1998 Bluetongue spreads in Europe and North Africa with many serotypes involved.
- ▶ Bluetongue (BT) and African Horse Sickness (AHS) are transmitted by mosquitoes and caused by viruses within the Orbivirus genus of the family Reoviridae.
- ▶ The project focused on training and transfer of technology for the control of Bluetongue and African Horse Sickness in the region.



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OBJECTIVES



- ▶ The main aim of the project is the establishment of an OIE Reference Laboratory in the North Africa region for early warning, emergency response and outbreak management of AHS and BT by improving laboratory diagnostic capacity, surveillance and technical expertise.
- ▶ The development of a centre of expertise for BT and AHS to assist countries in the North African region to combat these threatening diseases
- ▶ As an OIE Reference Laboratory, Biopharma will support regional detection, prevention and control of BT and AHS.



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TECHNICAL SUPPORT



- ▶ Detection and differentiation of AHS, BT and EHD viruses by applying conventional gel based RT-PCR technique, real time RT-PCR and nucleic acid sequencing
- ▶ Training program for Biopharma laboratory staff
 - Virus identification and characterization
 - Improvement of serological techniques to OIE standards
 - Molecular diagnostic techniques conforming to OIE guidelines
 - Vector identification and surveillance
 - Post training assessment
 - Final workshop for dissemination of the information within regional labs
- ▶ Establishment of a sample bank

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TWINNING PROJECT BENEFITS

1. **TECHNICAL BENEFITS (4)**
2. **SCIENTIFIC BENEFITS (2)**
3. **QUALITY ASSURANCE BENEFIT**

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FIRST TECHNICAL BENEFIT

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TRAINING COURSE



- ▶ Diagnostic techniques for 5 Biopharma technical staff, including:
 - Real time PCR
 - Virus isolation
 - Antibody detection by ELISA
 - Serotyping by viral neutralization test
 - Introduction to virus sequencing

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SECOND TECHNICAL BENEFIT



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TECHNOLOGY TRANSFER



1. Diagnostic by real time PCR using commercial or home made kit
2. Typing by real time PCR :
 Advantage: Fast and highly specific, results within hours instead of 7 days using serology
 Adoption of a disease surveillance program based on sentinel animals checked periodically by rtPCR
3. Virus isolation on insect cells
 Simple and sensitive technique compared to egg isolation



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THIRD TECHNICAL BENEFIT

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PROVIDING SPECIFIC REAGENTS

- Reference strains of BTV : 24 serotypes
- Reference sera of BTV : 24 serotypes
- Reference strains of AHSV : 09 serotypes
- Reference sera of AHSV : 09 serotypes
- BTV Detection kit by ELISA
- BTV Detection PCR kit



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FOURTH TECHNICAL BENEFIT

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DISSEMINATION OF SCIENTIFIC INFORMATION

SHARING SCIENTIFIC INFORMATION WITH MOROCCAN REGIONAL LABS BY :

- Workshop on BT, EHD and AHS (2 days) Rabat October 2010
 - 17 participants from regional labs, vet school and livestock Dept
 - Presentation of the OIE and the twinning project
 - World & regional situation of BT & AHS
 - Technical presentation: molecular, serological diagnostic, surveillance and early warning
 - Project perspectives



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TWINNING PROJECT BENEFITS

SCIENTIFIC BENEFITS

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FIRST SCIENTIFIC BENEFIT

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COURSES AND TRAINING



- ▶ 5 participants from Biopharma attended the annual course on BT in IAH Pirbright
 - The molecular epidemiology of BTV
 - RNA extraction systems for Orbiviruses
 - Molecular cloning
- ▶ Improving knowledge on concerned diseases: AHS, BT and EHD



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SECOND SCIENTIFIC BENEFIT



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PUBLICATION OF RESEARCH

THE SCIENTIFIC COLLABORATION HAS RESULTED IN PUBLICATION OF RESEARCH CARRIED DURING THE PERIOD OF THE TWINNING:

1. Experimental infection of camels with bluetongue virus

C.A. Batten a,1, B. Harif b,1, M.R. Henstock a, S. Ghizlane b, L. Edwards a, C. Loutfi b, C.A.L. Oura a, M. El Harrak. Research in Veterinary Science 2010

2. Midge-transmitted bluetongue in domestic dogs

C. Oura and M. Elharrak

Epidemiol. Infect., Page 1 of 5. f Cambridge University Press 2010

3. Development of RT-PCR assays for seven serotypes of epizootic haemorrhagic disease virus and their use to identify isolates from the Mediterranean region and North America

Narender S. Maan¹, Sushila Maan¹, Kyriaki Nomikou¹, Mehdi El Harrak², Hagai Yadin³, Hafsa Madani⁴, Donna Johnson⁵, Kadir Yesilbag⁶, Carrie Batten¹, Simon J. Anthony⁷ and Peter P.C. Mertens^{*1}. PLoS ONE 2011



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PUBLICATION OF RESEARCH

4. Experimental infection of Alpine goats with a moroccan strain of Peste des Petits Ruminant virus

M. Hammouchi, C.Loutfi, G.Sebbar, N.Touil, N.Chaffai, C.Batten, B.Harif, C.Oura, M.Elharrak.
Veterinary Microbiology 2012

5. A Reliable and Reproducible Experimental challenge Model for Peste des Petits Ruminants Virus

M.Elharrak, M. Hammouchi, C.Loutfi, G.Sebbar, N.Touil, N.Chaffai, C.Batten, B.Harif, C.Oura, Journal Of Clinical Microbiology (Under publication)

PUBLICATION ONGOING

1. Evidence for BTV virus replication in domestic dogs.
2. Do Sheep play a role in the spread of Peste des Petits Ruminants Virus during PPR epidemics?



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TWINNING PROJECT BENEFITS

QUALITY ASSURANCE BENEFIT

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ASSISTANCE TO IMPROVE “GOOD LABORATORY PRACTICE”



- Participation in the BTV proficiency testing
 - Genome detection by Real time PCR
 - Antibody detection by ELISA
 - Serotyping by viral neutralization test
- Assistance in diagnostic methods validation
- Strengthening quality insurance
- Auditing the diagnostic lab by the IAH staff



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CONCLUSION

The OIE twinning project between Biopharma and IAH Pirbright was conducted successfully on two emerging diseases of great importance for Morocco and the Mediterranean region: BT and AHS.

- This project has enabled the laboratory to improve the scientific level
 - This project also supplied Biopharma with required reagents: strains and reference serum .
 - Technician training and the parent lab assistance allowed technology transfer of diagnosis tests and monitoring.
 - Participation in the proficiency test organized by EC and the good results obtained provide evidence that Biopharma laboratory has a sufficient level to become an OIE regional Reference Lab
 - This collaboration was rewarded by scientific publications in research journals of high level.
1. As a result of this successful project, the candidature of Biopharma to be OIE reference lab was submitted and discussed this September 2012.
 2. Referring to the interesting results and the technical performance acquired with BT and AHS project, the extension of the twinning program for PPR was recently approved

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PERSPECTIVES



- ▶ **Twinning Sustainability:** continuing collaborations research projects for BT, AHS and other emerging diseases.
- ▶ **Extend the collaboration** to other important diseases in the region through a new twinning project on **Sheep pox and PPR.**
- ▶ Establishment of **laboratory network in Mediterranean region** for surveillance and early detection
- ▶ **Dissemination of knowledge** to Moroccan regional labs and national labs in neighboring countries

TECHNOLOGY TRANSFER



WORKSHOP ON BT, EHD AND AHS (2 DAYS)

RABAT OCTOBER 2010





THANK YOU FOR YOUR ATTENTION



ACKNOWLEDGEMENT :

- OIE
- SEMINAR ORGANIZATION COMITEE
- PIRBRIGHT IAH TEAM
- BIOPHARMA TEAM

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JOHANNESBURG, SOUTH AFRICA, 9-10 OCTOBER 2012**