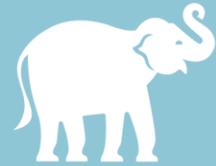




THE EEHV CONSORTIUM  
PO BOX 37012, MRC 5508, WASHINGTON, DC 20013-7012  
[Nationalzoo.si.edu/SCBI/AnimalCare/EEHV/](http://Nationalzoo.si.edu/SCBI/AnimalCare/EEHV/)  
2014, Vol. 1, #1

## The EEHV Consortium at the National Elephant Herpesvirus Laboratory **Update**



### A SNEAK PEAK AT NEXT QUARTER

**+** IMLS GRANT

**+** EEHV ADVISORY  
GROUP FORMATION

**+** TRUNK WASH  
SCREENING

**+** COLLABORATION:  
PAUL LING

## NEHL RECEIVES GIFT FROM INTERNATIONAL ELEPHANT FOUNDATION (IEF)

**A generous donation of a new StepOnePlus qPCR enhances NEHL research equipment**

A generous donation by the International Elephant Foundation has provided a StepOnePlus qPCR system to enhance the National Elephant Herpesvirus Laboratory's diagnostic capabilities. The qPCR system represents one of the most powerful and sensitive gene analysis tools in the field and will be an invaluable asset to our laboratory.

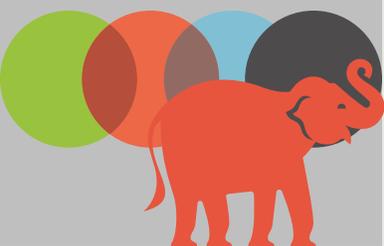
NEHL uses the qPCR system to perform vital Elephant Endotheliotropic Herpesvirus (EEHV) diagnostic testing and analysis. The speed and power of this new system will enable the turn-around of samples in a shorter time, test for multiple pathogens at once, as well as garner

additional information to support research.

The Smithsonian's National Zoo gives great thanks to the International Elephant Foundation (IEF) for making possible this significant enhancement in our diagnostic and research capabilities. IEF's support of NEHL has been a vital resource which has aided the laboratory in becoming the prime world-wide resource of herpesvirus information, testing and research.

This gift means the lab is better equipped to serve those affected by EEHV within the global elephant community.

*Continued on page 2*



**DID YOU KNOW?**

The NEHL Lab, along with Dr Gary Hayward's lab at Johns Hopkins, discovered all eight of the known types of EEHV, as well as three elephant gammaherpesviruses. The Lab also performed the first EEHV serology study of captive North American elephants.

**SPOTLIGHT ON EEHV STUDIES****NEHL receives gift**

*Continued from page 2*

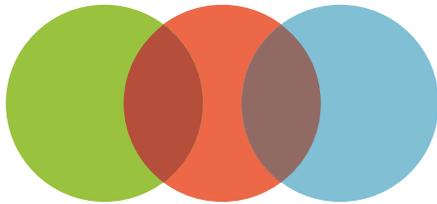
IEF, through their commitment to advancing research and global collaboration, is a vital partner to all the scientists tackling the deadly virus.

Thanks to a generous grant from the Smithsonian Women's Committee, a collaborative study is being conducted by several departments at the Smithsonian's National Zoo, to examine the behavioral and physiological impacts of the translocation of an Asian elephant into the National Zoo's herd. The act of translocation may be stressful to the animal(s) being moved and also to the existing herd; we are looking at the impact on an individual female elephant (Bozie) being moved from one institution to another as well as the impact of adding a translocated individual into an already established herd. The Zoo's established herd is comprised of Ambika (65 year old female), Shanthi (38 year old female) and Kandula (11 year old male).

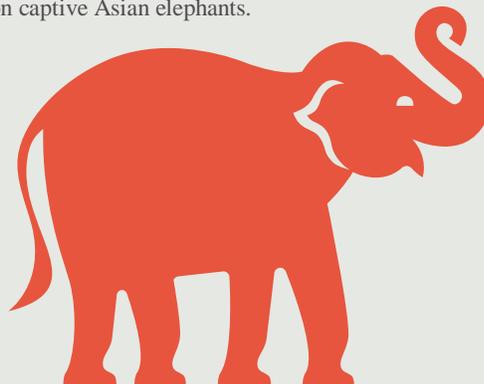
Although zoo professionals (and critics) talk generally about the stress of elephant translocations, very little research has been done on the behavioral and physiological effects of such transfers. Our study has been looking at the impact of translocation on captive Asian elephants.

We examined behavioral and physiological indicators of stress. Behavioral indicators included an increase in stereotypies and aggression as well as a change or decrease in cooperative management behaviors. Physiological indicators included corticosteroids, herpes virus shedding, blood chemistry, and medical notes.

We examined these values before, during, and after transfer, quarantine, and introductions. We followed the elephants for nine months after the arrival of the new elephant and then will recalculate values after one year. This study is being conducted through the collaboration of several departments at the zoo, including Animal Programs (Dr. Brandie Smith, Tony Barthel and the rest of the Elephant team), Wildlife Health Sciences (Dr. Suzan Murray, Dr. Jessica Siegal-Willott, and the rest of the veterinary team), the National Elephant Herpesvirus Laboratory (Erin Latimer) and Smithsonian Conservation Biology Institute (Dr. Janine Brown and her team).

**CHECK OUT OUR NEW qPCR!**

The StepOnePlus qPCR helps our laboratory diagnose EEHV more effectively. Learn more about qPCR and how it differs from cPCR on p. 3.



*Continued on page 3*

## SENDING YOUR SAMPLE TO NEHL

### PCR Sample requirements for EEHV diagnostics

For a case of suspected EEHV in a living elephant, please send EDTA whole blood and serum. For determination of a cause of death, please send 2cm<sup>2</sup> pieces of liver, heart, tongue, and any hemorrhagic tissue, along with blood and serum. More details and shipping information can be found at

[http://www.elephanttag.org/Professional/Request\\_Form\\_EEHV\\_testing\\_Sep2011.pdf](http://www.elephanttag.org/Professional/Request_Form_EEHV_testing_Sep2011.pdf)

A great resource for elephant veterinary information is the AZA SSP/TAG page at

[http://www.elephanttag.org/Professional/professional\\_Medical\\_Health\\_Care.html](http://www.elephanttag.org/Professional/professional_Medical_Health_Care.html)

## THANK YOU: MEMBERSHIP HELPS TO PREVENT ELEPHANT DEATHS

Ringling Bros. and Barnum & Bailey  
The Oregon Zoo  
Oklahoma City Zoo and Botanical Garden  
The Saint Louis Zoological Park  
Columbus Zoo and Aquarium  
The Houston Zoo  
The International Elephant Foundation  
Have Trunk Will Travel, Inc.  
Woodland Park Zoo  
The Buffalo Zoo  
The Cleveland Metroparks Zoo  
The Dallas Zoo  
Jacksonville Zoo & Gardens  
The Rosamond Gifford Zoo at Burnet Park  
The Tulsa Zoo



## EXPLANATION OF TESTS: cPCR vs. qPCR

Polymerase chain reaction (PCR) is used to amplify, examine, and quantify a particular segment of genetic material. This tool allows scientists to diagnose and study different diseases.

Conventional PCR (cPCR) and quantitative PCR (qPCR) are two versions of this method. These different protocols have different aspects to their uses and benefits.

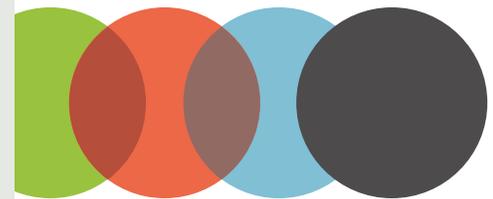
	cPCR	qPCR
<b>SPEED</b>	One round: 2.5 hrs. Two rounds may be needed.	After reaction set-up, as fast as 75 min
<b>SENSITIVITY – FIRST ROUND</b>	Not as sensitive as qPCR.	Can detect as little as 200vg/ml in blood
<b>SENSITIVITY – SECOND ROUND</b>	Slightly more sensitive than qPCR	
<b>SPECIFICITY</b>	Good	Good
<b>QUANTITATION</b>	Semi-quantitative	Yes
<b>COST</b>	\$	\$\$
<b>SEQUENCE DIRECTLY FROM REACTION?</b>	Yes	No
<b>DETECT ALL TYPES OF EEHV?</b>	Yes	Except EEHV7



*Continued from page 3*

The objective of this study is to help ensure the optimal health and welfare of all translocated elephants. We will provide data that will help guide behavioral and medical management during risky transfer events that will impact not only animals at the Smithsonian's National Zoo, but also at zoos across the country as more animals are moved in efforts to improve population sustainability. In addition, this study may inform translocations of elephants in range countries.

As part of our regular management and in preparation for this study, we collected behavioral data, blood, and fecal samples. We processed the samples to obtain the information on hormone (corticosteroid analysis), herpes, and blood chemistry. Data analysis is being performed now and is already helping to inform management decisions for the upcoming exciting arrival of three new Asian elephants from the Calgary Zoo!



### DID YOU KNOW?

*The NEHL Lab helped set up the first EEHV research and diagnostic lab in India and has continued to provide supplies, technical training, and collaboration on research.*

The EEHV Consortium Update 