



## **Bureau of Public Health Laboratories (BPHL) Jacksonville - Miami - Tampa**

# **Testing for viruses**

The Bureau of Public Health Laboratories (BPHL) performs tests for the detection of respiratory viruses, such as influenza, mosquito-transmitted viruses, such as Zika, West Nile, and dengue viruses, for food-borne viruses, such as norovirus, emerging viruses, such as SARS-CoV-2 and for many other viruses of public health significance.

The BPHL Virology laboratories in Tampa, Jacksonville and Miami provide diagnostic testing, confirmatory testing, surveillance testing and have internal surge capacity for molecular and serological (antibody) testing in outbreak and pandemic events. Technologies used include the newest molecular assays as well as culture and serologic assays.

### **Virology Workload**

As a representation of a typical year, during 2019, the BPHL performed 38,022 clinical virology assays; 19,585 for influenza and other respiratory viruses; 5,355 for vaccine preventable diseases such as measles, mumps and chicken pox; 8,207 for mosquito transmitted viruses; 889 for enteric viruses and 3,986 for miscellaneous agents such as herpes, tick-borne diseases and toxoplasmosis. Additionally, in 2020 BPHL performed 398,988 molecular detection and 664 antibody detection assays for SARS-CoV-2. BPHL typically performs over 90,000 avian, mammal, and mosquito virology assays for the detection and surveillance of mosquito-transmitted viruses.

### **Testing for viral respiratory disease**

The BPHL participates in the World Health Organization (WHO) Collaborating Laboratories program for influenza virus strain surveillance; this program determines the types of viruses that will be used in the next influenza vaccine. While looking for influenza viruses, testing is also performed to detect other respiratory viruses that cause severe illnesses. One of these viruses, respiratory syncytial virus, or RSV, is a respiratory virus that infects the lungs and breathing passages, especially of babies. Testing of specimens from outbreaks in nursing homes and schools is also done to allow rapid intervention appropriate to the type of virus causing the illness to control the spread of disease.

The BPHL laboratories in Jacksonville, Tampa, and Miami perform influenza pyrosequencing to detect antiviral resistance in influenza A virus positive samples.

In 2020, BPHL implemented molecular and serological (antibody) assays for the detection of SARS-CoV-2. In response to the pandemic, BPHL implemented high throughput assays and shift staffing to perform up to 20,000 tests per day.

MERS, avian influenza, measles, and mumps virus testing is available for suspect cases.

### **Food-borne (enteric) illness**

Norovirus (also known as Norwalk-like virus or calicivirus) is the most frequent cause of viral gastroenteritis in the US. Food-borne outbreaks are common as are outbreaks in nursing homes. The BPHL performs molecular assays with for detection of this virus with rapid result reporting (24-36 hours) so that outbreaks may be better controlled. The BPHL in Tampa is a certified to participate

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in the CDC CaliciNet program, a national norovirus outbreak surveillance network. During 2017, the BPHL tested 261 samples from 85 outbreaks. Noroviruses were detected in 146 (56%) of these samples. 46 outbreaks were submitted to CaliciNet. Specimens have been submitted from County Health Departments (nursing/group homes, schools, restaurant/catered food outbreaks), hospitals, private laboratories and correctional facilities.

### **Mosquito-borne disease**

Dengue virus is the most important mosquito transmitted virus worldwide. There had been no endemic transmission in Florida since the 1930's, but in 2009 local transmission was detected in Key West and in 2013 in Martin County, leading to increased specimen submission to the BPHL. Chikungunya virus was first detected in travelers returning from endemic areas in 2014 and locally acquired cases were detected in 2015. Prior to the Zika virus outbreak in the Americas, BPHL added Zika virus testing to its test menu in 2015. Preparing for this virus allowed the BPHL to rapidly respond in 2016 to the testing needs in the state for pregnant women, travelers and potentially locally acquired cases by performing 23,654 Zika virus tests. The BPHL performs molecular assays that allows us to detect virus in the serum prior to the development of antibody. This allows us to detect additional local transmission and alert mosquito control agencies to act.

The BPHL has maintained an early warning system for the detection of locally circulating mosquito-borne viruses (West Nile, St. Louis and eastern equine encephalitis viruses) with sentinel chickens. Flocks of chickens are maintained by mosquito control districts or county health departments, bled once per week and submitted for antibody testing. The sentinel chicken surveillance program has been in place since 1978 following a St. Louis encephalitis outbreak in central Florida in 1977.

### **Vaccine preventable disease**

Measles, mumps and other vaccine preventable viral diseases can cause explosive outbreaks. The BPHL performs both molecular and serological assays for the identification of the associated viruses.

### **Tick-borne disease**

Ticks transmit many diseases in Florida. The BPHL in Jacksonville performs serological testing for Lyme Disease, Rocky Mountain Spotted Fever and Ehrlichiosis.

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