

## Modular Bench Top Automation

ELISA Workstation: Thermo Scientific Orbitor and BioTek Microplate Instrumentation

One of the most prevalent assay formats in biomedical research is ELISA, using the specificity of antibodies to identify a wide range of analytes from many different matrices. The general process of ELISA remains constant with most processes performed manually by the technician, from managing assay timing steps to physically moving the sample microplates between commonly used instrumentation like dispensers, washers and detection systems. When many samples need to be processed routinely, manual methods are impractical and inefficient.

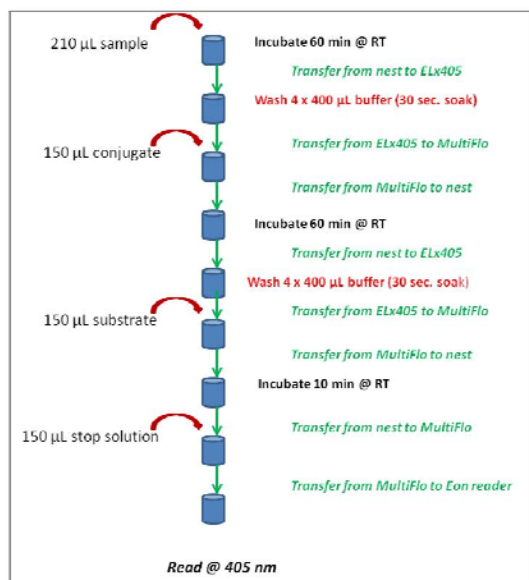
Thermo Scientific Laboratory Automation and BioTek have collaborated to define a modular bench top workstation to automate the ELISA process – to free up technician time, allow continuous processing of multiple plates and to provide excellent assay performance. The main component of this workstation is the Thermo Scientific Orbitor® RS plate mover, with a BioTek 405™ washer, MultiFlo™ dispenser and an Eon™ or Epoch™ microplate spectrophotometer around the periphery. Using a Thermo Scientific mezzanine to stack the washer and dispense, these four devices fit neatly into a compact 36" x 55" bench space, with plenty of room for device and plate stack access.



*Thermo Scientific Orbitor RS plate mover with BioTek's 405 washer, MultiFlo dispenser and Epoch reader makes a versatile bench top automated workstation.*

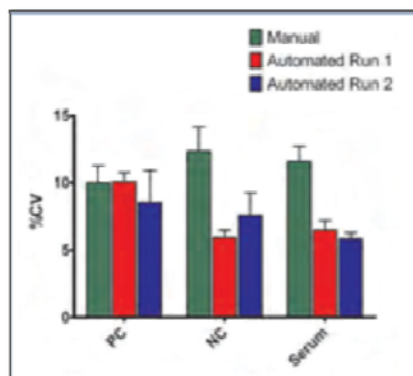
The Orbitor RS has a 360° rotating lift that moves a bidirectional telescoping arm up and down to the component instruments, quickly and efficiently. The BioTek 405, MultiFlo, Epoch or Eon instrument plate carriers are designed to easily receive plates from the Orbitor gripper without requiring tedious alignment procedures.

The assay procedure performed in the system described here is the HIV-1 micro ELISA (Avioq, RTP North Carolina). Dilutions of the positive control (PC) and the negative control (NC) along with pooled human serum and pooled human plasma were assayed in replicates eight on four separate microplates. The multiple steps of the assay procedure are shown in the figure below:



- Plate mover tasks are shown indicated in green
- Wash steps are in red
- Read step is last

The assay procedure was carried out manually and in the automated system for comparison, with the automated system providing equal or better results as shown in the graph, right:



This study concludes that through the use of a compact, simple and robust plate mover and appropriate microplate instrumentation, a routine ELISA assay can be automated, providing increased throughput, productivity and excellent performance. Many assay procedures can be similarly automated with the Orbitor RS plate mover and BioTek microplate instrumentation.

For more information about Modular Bench Top Automation, contact:



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