

# Unique features of the muse auto cd4/cd4% system

Volume 4 Issue 4 - 2016

**Keywords:** muse auto cd4/cd4% system, viral patients, art, ce-ivdl, t cells, cd4 count

## Opinion

### New for laboratory use

The new exciting Muse Auto CD4/CD4% system is intended to monitor T cells in viral patients located in developing countries where self-declared CE-IVD mark is accepted. EMD Millipore, a division of Merck, KGaA, of Darmstadt, Germany, released the product in October of 2015. The University of Yaounde' in Cameroon contributed to the clinical testing and development of the Muse Auto CD4/CD4% system. Please take a closer look at the unique features of the Muse Auto CD4/CD4% system.

### Better counting

The Muse Auto CD4/CD4% system aspirates a measured 10 $\mu$ L of pre-diluted sample. Thus, the volume for precise counting is measured. The sample is pulled into a capillary by a pump measuring the volume. The cells are counted and measured one cell at a time using forward scatter and two color fluorescence. The Muse Auto CD4/CD4% system also measures the time taken to conduct the count. The formula for counting is  $C=V/T$  (Count Equals Volume divided by Time). Quality of the count is ensured by all three measurements including the count, the volume and time.

The count is initiated automatically when the sample is introduced into the Muse Auto CD4/CD4% system. Other flow cytometers require technologists to visually estimate the start and the end of the counting cycle. With use of the Muse Auto CD4/CD4% system, run to run precision is enhanced due to the elimination of human error. An empirical evaluation in your laboratory will reveal the performance of the Muse Auto CD4/CD4% system.

To improve counting resolution, design engineers at EMD Millipore mounted a lens near the point of interrogation where the cells are counted by the green laser. The positive T cells are fluoresced using the CD4 marker included in the cocktail of the prepared sample. Resolution for counting T cells is vastly improved because the lens is closer to the cells. Thus, this provides the Muse Auto CD4/CD4% system with a powerful counting system that has improved linearity over many other methods. The benefit is that the Muse Auto CD4/CD4% system can count and measure T cells in cytopenic specimen. The recovery of the T cell population can be identified by the Muse Auto CD4/CD4% system at lower levels.

### Quality control

The count is backed up by quality control. The Muse Auto CD4/CD4% offers a QC product called Systems Check. Systems Check contains counting beads that are coated with the Nile red stain. The operator prepares the sample of Systems Check and loads it onto the system. The Systems Check is measured the same as a patient sample. The beads in System Check are measured to verify the count. The Nile Red fluoresces in both red and yellow channels. Thus, after three

**Jim Mulry**  
Manager of Clinical Development, USA

**Correspondence:** Jim Mulry\*, Manager of Clinical Development, EMD Millipore, 1518W Bramble Berry Lane Phoenix, AZ 85085, USA, Tel (510)427-4641, Email jim.mulry@emdmillipore.com

**Received:** November 22, 2016 | **Published:** November 28, 2016

System Check runs both the count and the fluorescence is validated. The Muse Auto CD4/CD4% system will not allow patient samples to be run without passing Systems Check. Should Systems Check fail, the operator is alerted immediately and potential problems are displayed. Once System Check is passed, the operator can then run CD4/CD4% tests.

### Pediatric use

The Muse Auto CD4/CD4% system provides both a CD4 count and a CD4% measurement for every sample. The 10 $\mu$ L blood sample requirement makes drawing of the sample from pediatric and tertiary patients less discomforting. Accurate baseline T cell measurements can easily be established using the Muse Auto CD4/CD4% system before and after anti-retroviral therapy (ART) according to WHO protocol.

Those following WHO protocol know the patients should be monitored using a viral load technology during anti-viral therapy. Many of the technologies used for viral load assay, require serum or plasma samples from the patient. Often the blood sample needed is 1–2 mL because it must be spun down to get the required serum or plasma. It is often difficult to draw this much blood sample from a sick child or infant. Monitoring T cells for these patients using the Muse Auto CD4/CD4% system may have an advantage with an easier to obtain 10 $\mu$ L blood sample requirement.

Many competitive technologies ignore the needs of pediatric patients and fail to provide CD4% measurements. Laboratorians will like the fact that both CD4 count and CD4% measurement are provided with every sample result. This eliminates the need to change to a separate CD4% assay like some other vendors require.

### Improved productivity

The Muse Auto CD4/CD4% reagent kit protocol is very easy to use. Anyone who can pipette, can easily accomplish the sample preparation. 10 $\mu$ L of blood sample is inserted into the counting tube. 10 $\mu$ L of the reagent cocktail is added and mixed. The sample is then incubated in darkness for 15 minutes. 180 $\mu$ L of the lyse reagent is then added. The sample is again incubated for 15 minutes. Samples should be prepared in batch. After the second incubation is completed, the samples may be run one at a time. Results appear within 2–3 minutes.

The Muse Auto CD4/CD4% system offers a push button screen that makes operation quite easy! There are five USB portals available on the Muse Auto CD4/CD4% system. Customers can easily attach a bar code reader to improve order entry. The instrument is very easy to interface into a lab information system. The customer may also choose to add a keyboard or a mouse or a printer to enhance operation. Any of those devices that are compatible to Windows 7 operating system will work on the Muse Auto CD4/CD4% system.



The Muse Auto CD4/CD4% system is ready for the sub Saharan market. Product brochures, package inserts, and user's guides are available in English, French, and Portuguese. Application specialists are available to conduct customer training and installation. Service technicians are prepared to repair the instrument should problems arise. This is just a small example of Merck's commitment to the sub Saharan African market.

### Economic and sustainable

The Muse AutoCD4/CD4% reagent is among the lowest cost-per-test to operate with a list price under €4.00. The carbon footprint

is minimal because the sample size is so small. All disposables can be easily decontaminated using the manufacturer's protocol in the user's guide. Other flow cytometry instruments use a focused flow technology requiring liters of diluent producing liters of contaminated waste. The Muse Auto CD4/CD4% system decontaminates the waste automatically for simple disposal.

Many CD4/CD4% technologies utilize a cassette based technology. These cassettes are usually made from plastic and contain the bio-contamination from the sample. Customers using this technology must handle the additional cost and procedure of disposing of these biohazard cassettes.

### Summary

Please make a further investigation of the Muse Auto CD4/CD4% system for your clinical laboratory. An evaluation in your laboratory will reveal the accurate and precise counting, the ability to monitor T cells in both adults and children, the ease of use and the enhance productivity of the Muse Auto CD4/CD4% system. To arrange for your very own empirical evaluation of the Muse Auto CD4/CD4% system, please contact your local Merck Millipore representative or distributor. The empirical test is the best!

### Acknowledgments

None.

### Conflicts of Interest

None.

### Funding

None.