

Partec - Mobile CyFlow® CD4 Laboratory



Mobile CyFlow® Laboratory for affordable CD4+ T-cell counting

This complete Flow Cytometry laboratory is installed in an off-road 4-wheel drive car.

The CyFlow® for affordable CD4+ T-cell counting (and CD8+ as well as any other immunolabelled cells) does not need any external regular electrical power. Solar panels guarantee energy supply using 12V DC car batteries.

All necessary services are built-in like water supply, waste water collection, safety containers for disposables, cool box sufficiently supplied with electrical power from the solar cells, etc.

The CyFlow® Flow Cytometer features network connection via Internet to central labs or small medical substations for communication and quality control as well as patient data transfer/exchange.

With this new CyFlow® concept you are in the situation to offer full high quality Flow Cytometry service to your AIDS patients in remote areas and resource-poor settings far away from centralized high level laboratory environment.

This project of patient-near HIV follow up was initiated by the University of Münster (Germany). It is jointly financed by Partec GmbH and CyTecs GmbH. The University of Münster is the scientific partner in this project.



The CyFlow® for CD4+/CD8+ cell counting is a fully equipped portable desktop Flow Cytometer. Its small size and robustness makes the CyFlow® the perfect device to take over the lymphocyte subset counting from more expensive and service demanding conventional Flow Cytometers; a dramatical cut down of the costs per sample is achieved.

The complete optical system of the CyFlow® is designed as one solid metal block. Time consuming installation and optical checks, realignments of lasers and readjustments are no longer required. High precision analysis is maintained by the extraordinary long life time of solid state lasers of the CyFlow®.

The CyFlow® supports all applications as known from traditional large Flow Cytometers at equipment costs roughly half the price of them. In addition, service and running costs as well as maintenance are reduced to a neglectible minimum.

The CyFlow® supports the same unique feature of true volumetric absolute counting as all other Partec Flow Cytometers. The CyFlow® is the perfect unbeatable device for precise and affordable counting of CD4+ and CD8+ cells. The low costs for absolute counting are achieved due to:

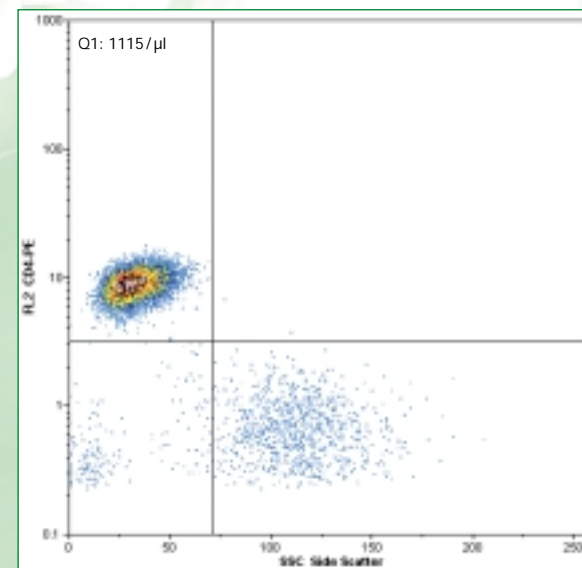
- No need for an independent haematology counter
- No need for expensive reference beads

CD4+ T-cell analysis using the Partec „no lyse no wash“ protocol. Absolute volumetric counting:

The cluster in quadrant Q1 represents the CD4+ cells.

The result of 1,115 CD4+ cells per μl blood is directly displayed.

On large numbers of blood samples it was found that the CD4+ cell count results from the Partec no lyse – CyFlow technique are identical to the results from the dual platform method.



The CyFlow (in its blue laser version) offers the complete range of lymphocyte subset analysis as known from conventional large Flow Cytometers:
5 parameter – 3 colour immunology.

Fig. 1 shows an example for conventional CD4 cell analysis employing a lyse – no wash protocol.
The result is 249 CD4 cells per μl .

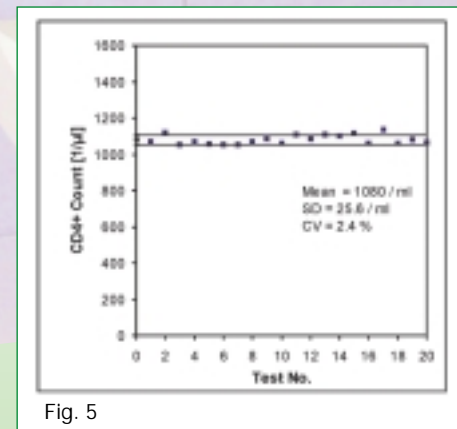
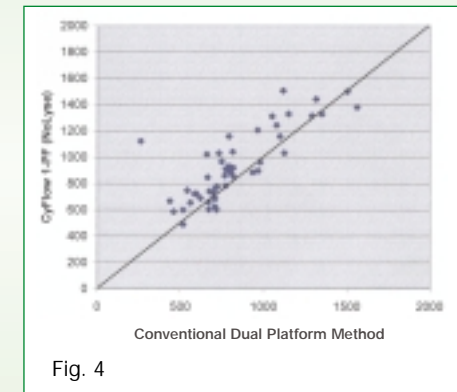
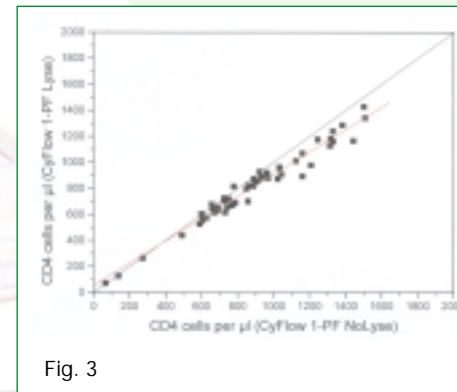
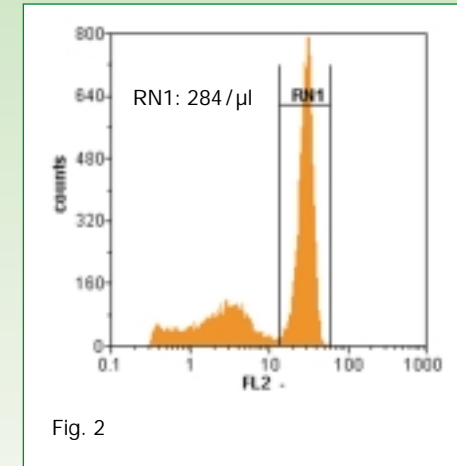
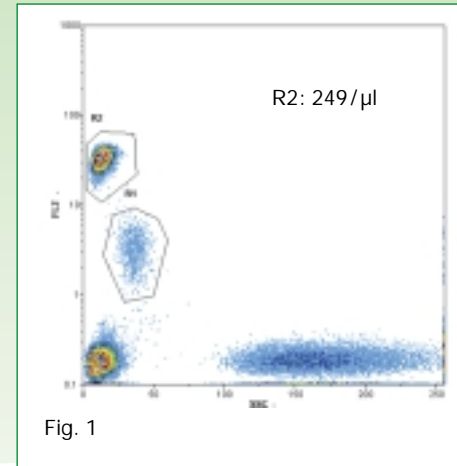
Fig. 2 shows the same blood sample analysed with the Partec **no lyse – no wash protocol**.
The result is 284 CD4 cells per μl . The difference to the result shown in Fig. 1 is due to the fact that all commercial lysing protocols destroy also a certain percentage of CD4 cells.

This effect has been investigated in large clinical studies. The comparison of lysing and no lysing data is shown in Fig. 3.

In Fig. 4 the comparison of data from the conventional dual platform method (FCM plus haematology counter) to the CyFlow absolute volumetric counting results using no lyse protocol is shown.

In average, the data fit to each other, but there is a large variance due to the fact that two independent devices (FCM and haematology counter) as well as a more complicated sample preparation contribute to the error of analysis if the dual platform method is used.

The Partec absolute volumetric counting has a high reproducibility as it is shown in Fig. 5. 20 CD4+ samples of the same blood were analysed independently. See also: Cassens et al., „A novel true volumetric method for the determination of residual leucocytes in blood components“, Vox Sanguinis (2002), 82, 198-206.



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