

Short communication

# CD4<sup>+</sup> T cell enumeration in HIV infection with limited resources

G.G. Sherman<sup>a,b,\*</sup>, J.S. Galpin<sup>c</sup>, J.M. Patel<sup>a,b</sup>, B.V. Mendelow<sup>a,b</sup>, D.K. Glencross<sup>a,b</sup>

<sup>a</sup> Department of Haematology, School of Pathology, South African Institute for Medical Research, Johannesburg, South Africa

<sup>b</sup> University of the Witwatersrand, Johannesburg, South Africa

<sup>c</sup> Department of Statistics and Actuarial Science, University of the Witwatersrand, Johannesburg, South Africa

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## Abstract

The incidence of human immunodeficiency virus (HIV) infection continues to increase in South Africa. Limited resources are available for diagnosis and management of the disease and the development of affordable strategies is required. Absolute CD4 counts are used locally predominantly to monitor disease progression and institute prophylaxis against opportunistic infections. A dramatic increase in demand for CD4 counts prompted an investigation for a more cost-effective flow cytometry method than those currently recommended by the Centers for Disease Control (CDC). CD4 counts generated by two different single tube methods using CD3/CD4/CD8 [1(3)] and CD4 [1(1)] antibodies, respectively, were compared to the CDC recommended 6 tube 2 colour panel [6(2)]. Whole blood analysis using the Coulter Multi-Q-Prep system and an Epics XL Flow Cytometer (Coulter, Hialeah, FL) was performed for each of the three methods. Random samples from HIV positive adult patients were compared. A mean difference in the absolute CD4 counts of less than  $10 \times 10^6/l$  was generated by both of the alternative panels when compared with the 6(2) panel. The precision of the three methods is comparable. In reagents alone, the 1(3) and 1(1) methods represent a cost saving of 76% and 93%, respectively, over the 6(2) method. The 1(3) and 1(1) panels would permit more affordable CD4 counts to be determined by the gold standard methodology of flow cytometry with no clinically significant sacrifices in accuracy or precision. © 1999 Elsevier Science B.V. All rights reserved.

**Keywords:** CD4 T lymphocyte; Absolute CD4 count; Human immunodeficiency virus; Flow cytometry; Monoclonal antibody

## 1. Introduction

The incidence of human immunodeficiency virus (HIV) infection continues to increase in South Africa. According to antenatal surveys, the national average prevalence figure is estimated at 14%. Geographical variation is striking and ranges from 4–25% depending on the province. The estimated population from the 1996 preliminary census figures is 37 859 000 (Census, 1996). The health care system in South Africa, as elsewhere in the world, is under increasing pressure to operate cost-effectively. CD4 counts are important in our setting to monitor disease progres-

Abbreviations: AIDS, acquired immunodeficiency syndrome; CV, coefficient of variation; EDTA, ethylenediamine tetra-acetate; HIV, human immunodeficiency syndrome; FITC, fluorescein isothiocyanate; RD1 and PE, phycoerythrin; ECD, energy coupled dye (PE-Texas-Red)

\* Corresponding author. Department of Haematology, Johannesburg Hospital, Haematology laboratory, P.O. Box 1038, Johannesburg, 2000, South Africa. Tel.: +27-11-489-8584; Fax: +27-11-489-8589; E-mail: gayles@mail.saimr.wits.ac.za