



# Are the cell separators Spectra Optia and Amicus equally suitable for collection of MNCs and their subsets?

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## OBJECTIVES

The use of mononuclear cells (MNCs) as a therapy is well established and new therapeutic applications continue to emerge. Collection of CD3 subsets may be substantial for future immunotherapeutic approaches for treatment of different types of cancer. Dependent on the intended use different MNC subsets are favoured, CD34+ cells for stem cell collections CD14+ and CD33+ cells for the generation of dendritic cells. CD3+ cells for donor lymphocyte infusions (DLI). Alpha beta ( $\alpha\beta$ ) and gamma delta ( $\gamma\delta$ ) T-cell in battling cancer. In this investigation we analysed the collection properties concerning MNCs and subsets of Amicus™ (Fresenius) and Spectra Optia® (TerumoBCT).

## METHODS

Twelve healthy volunteers (3 females and 9 males, median 44yrs, 21-56) from our routine multikomponent donor pool were recruited for MNC donation on Amicus™ (Fresenius) and Spectra Optia® (Terumo BCT) in a cross over design. They all fulfilled the requirements for blood donation. MNC subsets CD3, CD19, CD33, CD3  $\alpha\beta$ , CD3  $\gamma\delta$  CD4  $\alpha\beta$ , CD8  $\alpha\beta$ , CD56 were analyzed using the FACSDiVa 6 software (BD Biosciences) for cell acquisition and data evaluation (Fig 1, 2). The collection was optimized by HOT System for Amicus and by adjusting the collection preference for Optia. Statistics were done using the non parametric Mann Whitney U Test

**Table 1** (data are given in mean and standarddeviation / SD)

	Amicus	Spectra Optia
PRBV (ml)	6068 (51)	5542 (273)
NC pre (G/L)	6.47 (0.81)	6.8 (1.68)
Hb pre (g/dL)	13.8 (1.5)	13.4 (1.4)
Plt pre (G/L)	277 (60)	297 (93)
NC post (G/L)	6.43 (1.09)	6.22 (1.8)
Hb post (g/dL)	12.3 (1.6)	12.5 (1.4)
Plt post (G/L)	246 (54)	237 (68)

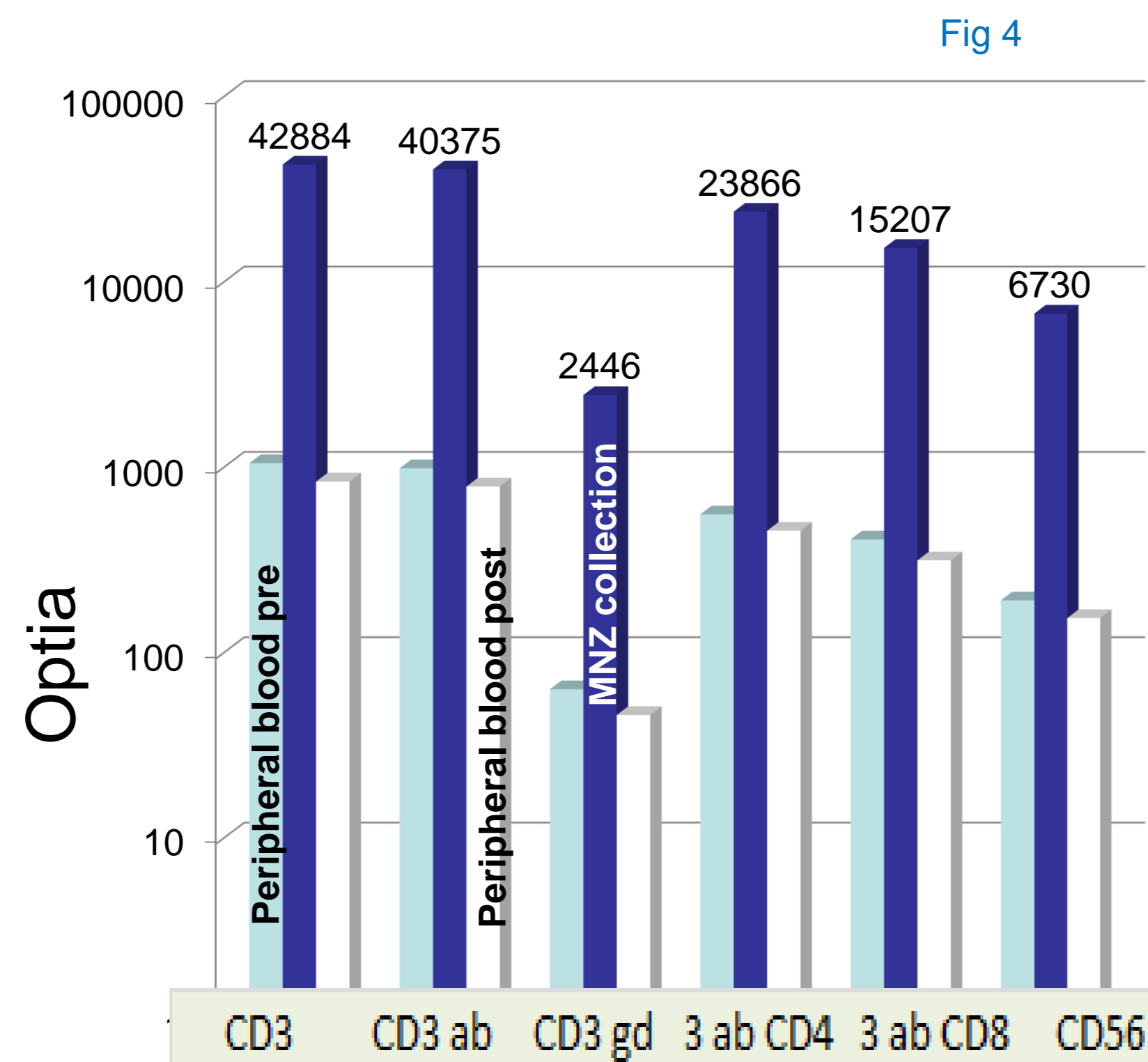
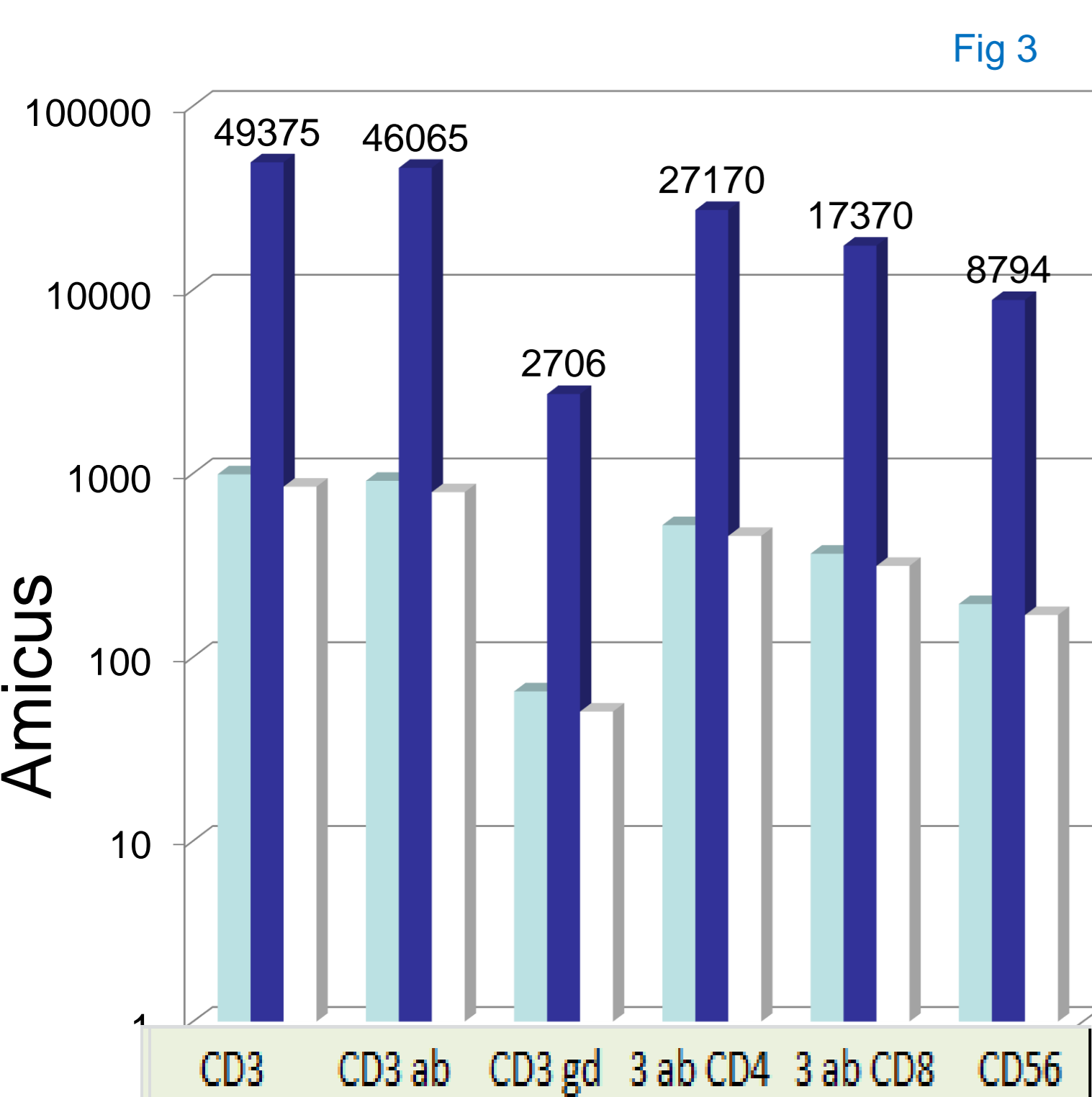
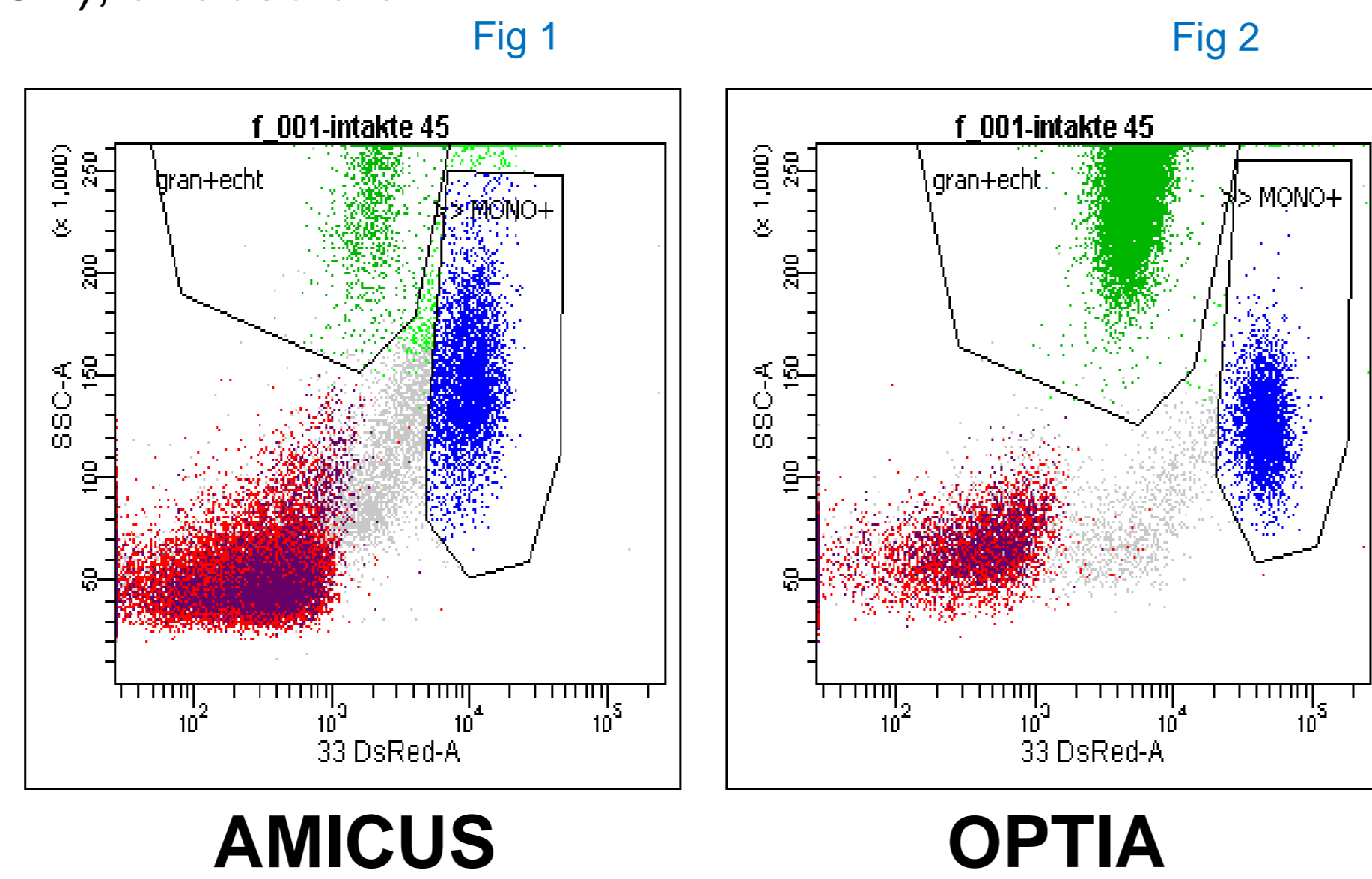
**Table 1, demographic and processing data** prevalues and procedure data were comparable between both groups

PRBV=processed blood volume  
 NC=nucleated cells  
 Hb=hemoglobin  
 Plt=platelets  
 Pre=predonation  
 Post=postdonation

**Table 2**, product characteristics, mean (SD), a=absolute

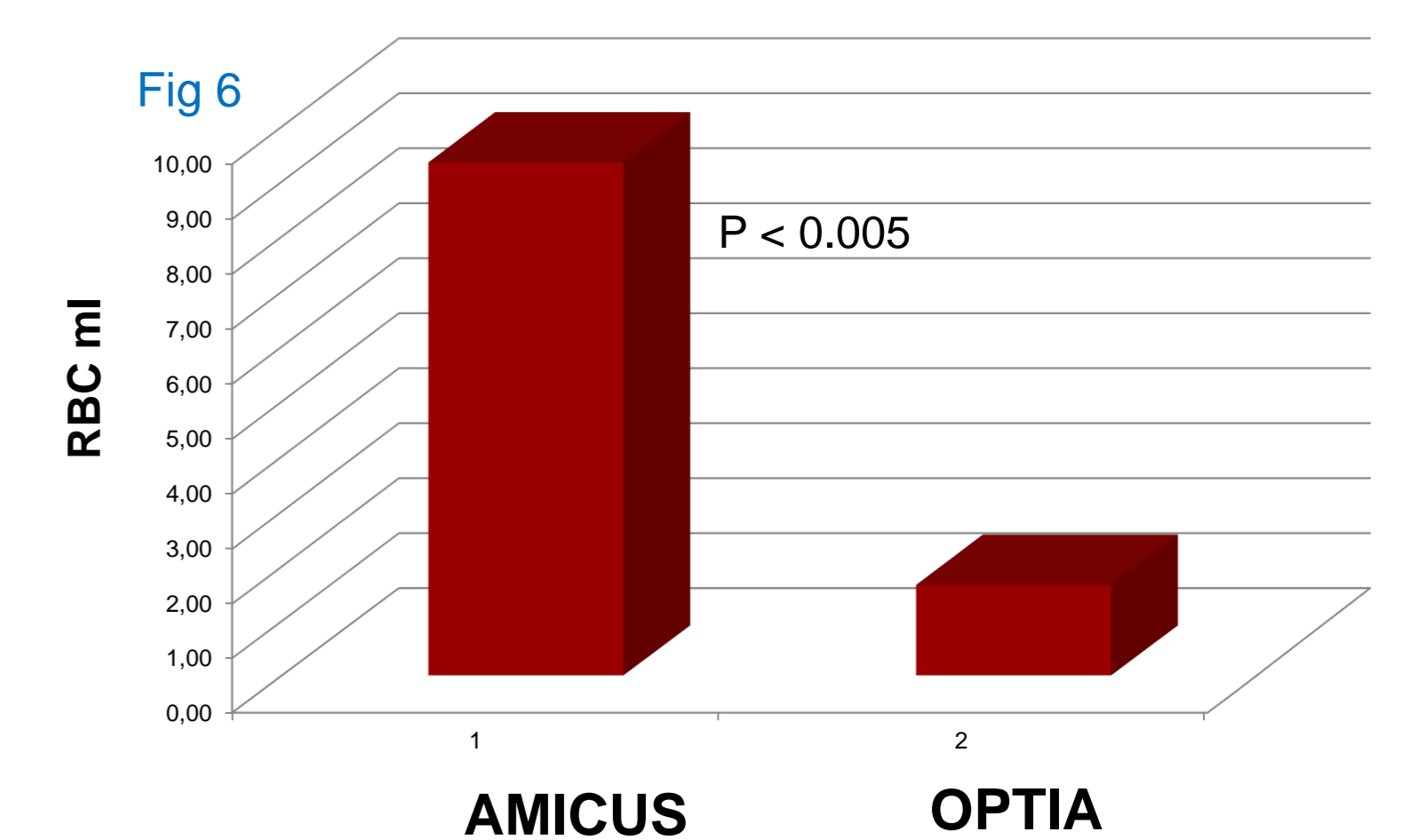
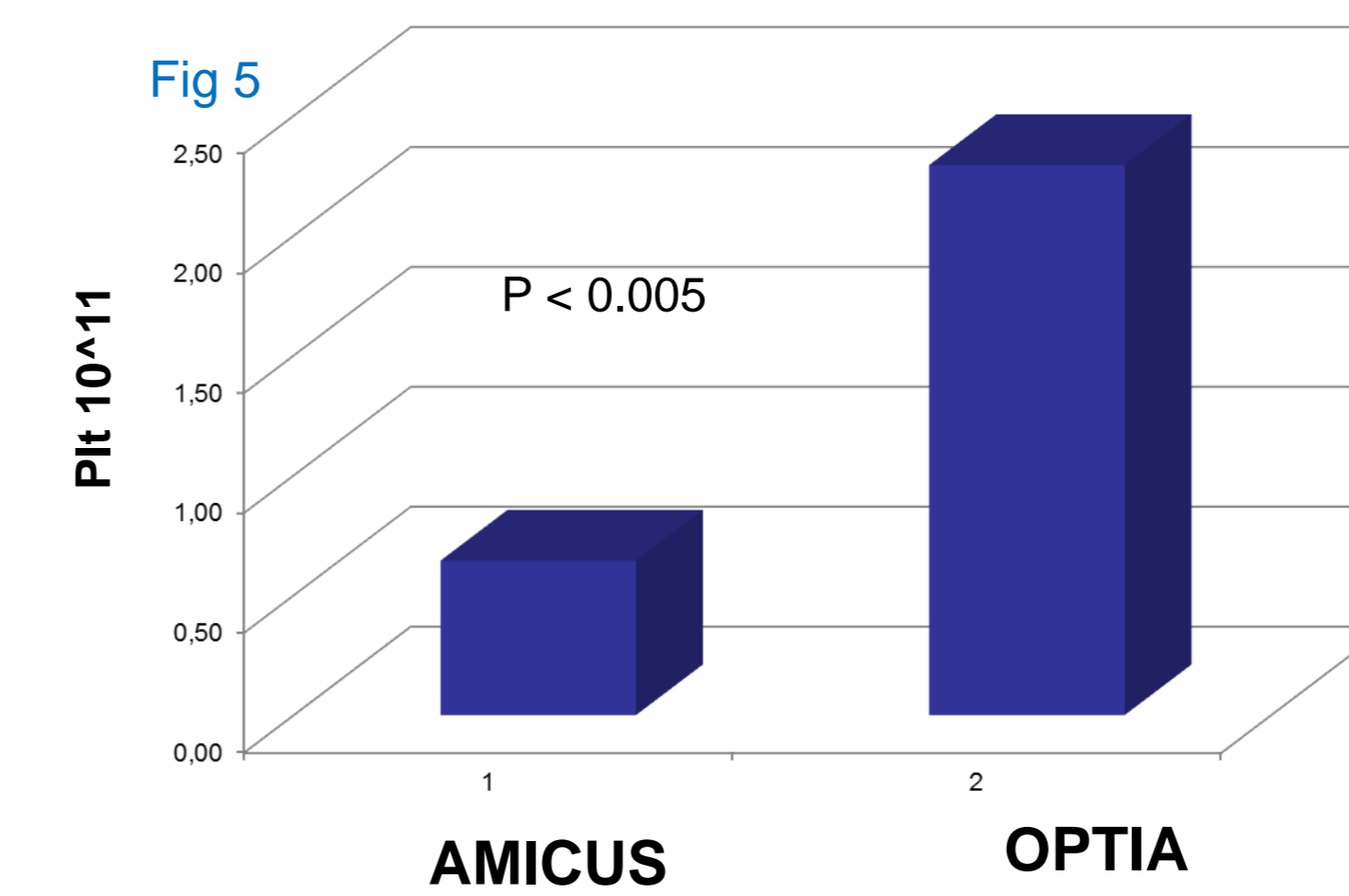
	Amicus	Optia
NC ( $10^9$ )	103 (33)	92 (29)
NCa ( $10^8$ )	74 (20)	83 (26)
Plt ( $10^9$ )	890 (349)*	2582 (885)*
Plta ( $10^{11}$ )	0.64 (0.24)*	2.29 (0.68)*
Hct (%)	13 (2)*	2 (0.1)*
RBC (ml)	9.35 (1.34)*	1.66 (0.47)*
Time (min)	110 (7)	108 (14)
Vol (ml)	74 (13)	92 (17)

\* Asterisks indicate p < 0.05



## RESULTS

The procedures were well tolerated by the donors. Except a mild citrate reaction in 1 donor no side effects were observed. We found no differences in pre and post values of the donors although Optia collected significantly more platelets than Amicus (mean  $2.29 \times 10^{11}$ /Optia vs  $0.64 \times 10^{11}$ /Amicus,  $p < 0.05$ , Fig 5). On the other side the concomitantly collected red cell fraction was significantly higher in Amicus than in Optia ( $9.35 \text{ ml}$ /Amicus vs  $1.66 \text{ ml}$ /Optia,  $p < 0.05$ , Fig 6). The number and purity of collected MNCs were almost equal in both devices ( $81.8\%$ /Amicus vs  $84.6\%$ /Optia), subsets were slightly higher in Amicus, although without significance (Fig 3, 4).



## CONCLUSIONS

Both devices are equally applicable for MNC collection in general and for all tested subsets. New therapeutic strategies in adoptive immunotherapy include the collection and in vitro expansion of gamma-delta ( $\gamma\delta$ ) cells as a novel immunotherapy in certain types of cancer. Although collected MNC subsets were slightly higher in Amicus MNCs there was no significant difference between both devices. Thus they are both applicable in this setting. How far the higher platelet numbers in Optia and the higher RBC volume in Amicus, respectively, may negatively influence in vitro expansion needs further investigation.

## References

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