Expansion of CD16^{+} CD56^{+} NK cells in vericyte® NK cell growth medium

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Introduction

Natural Killer (NK) cells play a key role in host resistance to virus and tumour. These cells are potent killers of virus infected and tumour cells via a direct recognition of the target by activation receptor such as NKG2D or by inducing FcγIII receptor (CD16) mediated antibody dependent cellular cytotoxicity (ADCC). Current NK cell-based cancer immunotherapy aims to produce large amounts of functional NK cells, unfortunately most culture media used for NK cell expansion induced the downregulation of CD16 on NK cells. Here, we tested the impact of a new NK cell growth medium (Vericyte® from Medicyte) on NK cells sorted from blood

Results

1. Expanded NK cells maintain CD16 receptor expression in vericyte® medium

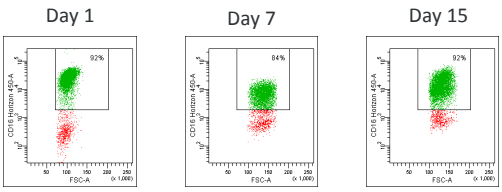

Figure 1 : **CD16 expression of cultivated NK cells**. NK cells cultivated in vericyte® medium were analysed for CD16 expression at different times by using flow cytometry. We have observed that NK cells conserved the expression of CD16 receptor during the culture.

2. Expanded NK cells are CD56^{bright} CD16^{+}

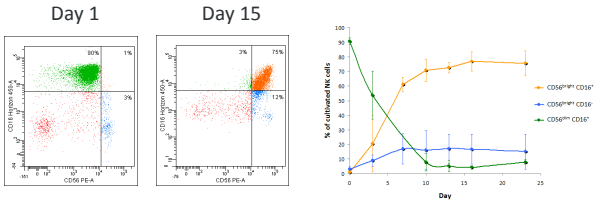

Figure 2 : **flow cytometry analysis of cultivated NK cells phenotype**. NK cells cultivated in vericyte® medium were analysed for CD16 and CD56 expression. During the culture, we observed a decrease proportion of CD56^{dim}CD16^{+} cells (green) and the majority the cells became CD56^{bright}CD16^{+} (orange).

3. Expanded NK cells have cytotoxic activity

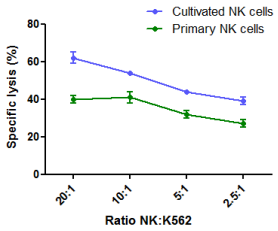

Figure 3 : **cytotoxic activity of NK cells against K562 cells**. Cytotoxic activity of vericyte® medium-cultivated NK cells and freshly isolated primary NK cells was analysed by Cr^{51} release assay against K562 cells. We observed that NK cells expanded in vericyte® medium killed K562 cells similarly to primary NK cells.

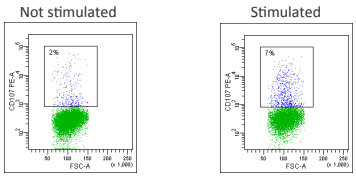

Figure 4 : **flow cytometry analysis of NK cells degranulation via CD16**. Degranulation activity of cultivated NK cells was analysed at day 23 by using CD107 staining, a marker of cytotoxic granule. We observed that cultivated NK cells were still able degranulate in response to anti-CD16 antibody.

Conclusion

Expansion of NK cells is not easy to achive and usually the expression of CD16, a key receptor of these cells, decreases in culture. Here, the number of cells NK is multiplied up to 70 times after 20 days in vericyte® medium (data not shown). Interestingly, NK cells express both CD16 and CD56 and are cytotoxic.
Thus, vericyte® medium could be useful to obtain large number of functional NK cells

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