

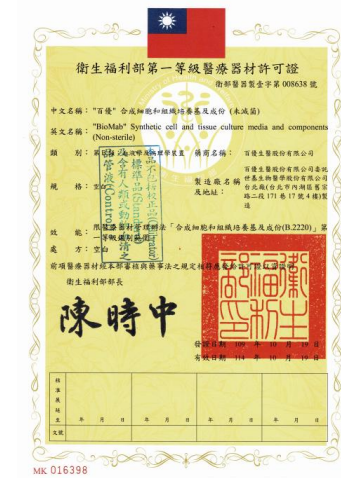
BioMab, Inc.

Improve Human Health Through Innovations

NK Cells Expansion Kit

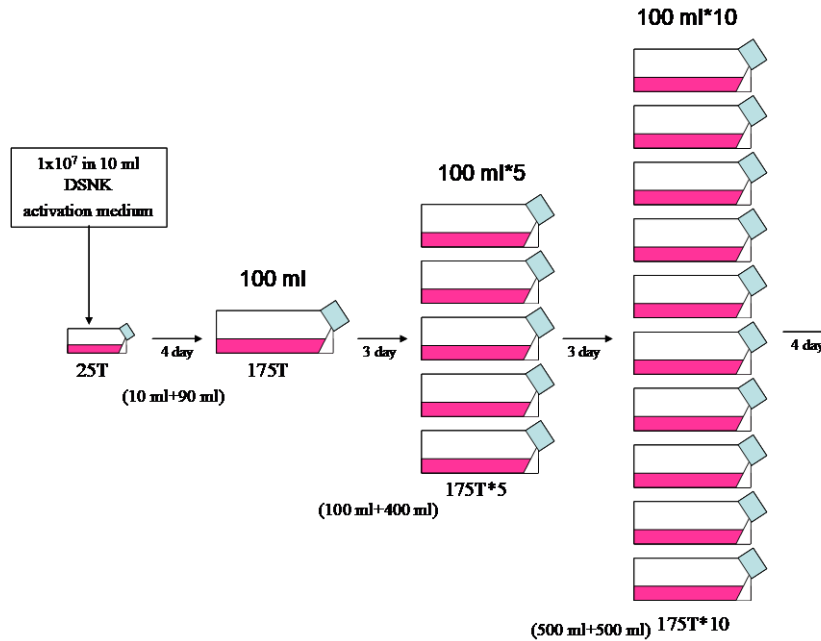
DSNK™ Product Overview

1. Chemically defined, contains no animal origin compounds
2. NK Cell Expansion Rate > 3000X
3. NK Cell Purity > 90%
4. Cancer Cell Line Killing Ability > 80%
5. Protocol is extremely easy to use
 - a) No need for antibodies coating before expansion
 - b) No need to purify NK cells before expansion (use PBMC directly)
 - c) No need for feeder cells
6. Available in both RUO and GMP grades
7. Obtained TFDA Medical Device Classification
8. 10mL peripheral blood can generates >> 1 Billion NK cells

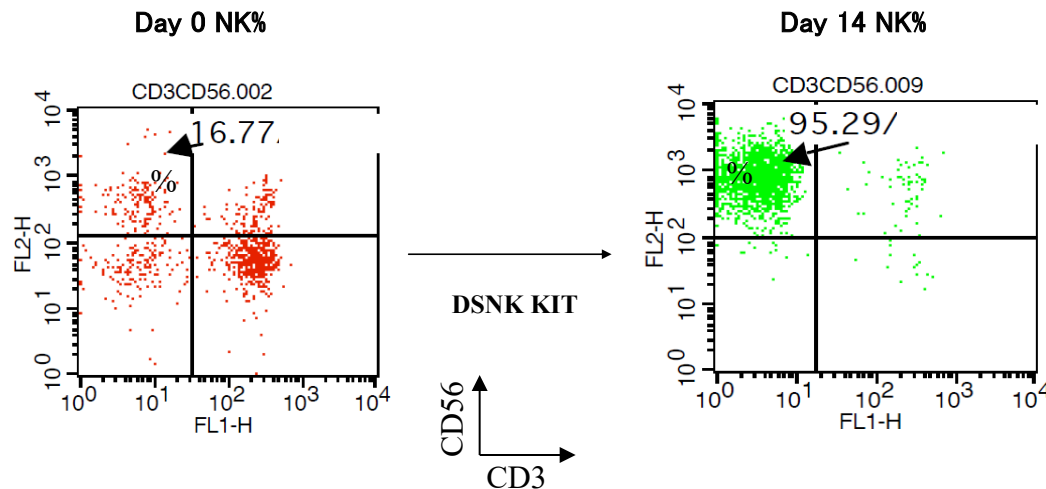


DSNK™ User Protocol & Performance

Protocol very easy to perform



High Purity



NK Cells Therapy Release Criteria

NK Cell Therapy Release Criteria

	NK cell therapy release specification	MASUYAMA	DSNK
CD56 ⁺ CD3 ⁻ (%)	>50%	40~70%	>90%
Viability(7-AAD)	>70%	>80%	>70%
Cytotoxicity to K562 at 20:1 of E:T	>20%	20~40% at 20:1 of E:T	>20% at 10:1 of E:T
(%CD56 ⁺ CD3 ⁻)NKG2D ⁺	n/a	++	>90%
(%CD56 ⁺ CD3 ⁻)NKp30 ⁺	n/a	+++	>90%
(%CD56 ⁺ CD3 ⁻)NKp44 ⁺	n/a	+	dim

Critical ReviewsTM in Oncogenesis, 19(1-2):121–132 (2014)

Competitive Analysis

DSNK Competitive Analysis

	Need to Purify NK Cells Prior to Culturing?	Need pre-coating with antibodies prior to culturing?	NK Cell Purity	NK Cell Expansion Rate	Need to purchase additional reagents?	GMP	TFDA Approval?
DSNK	No	No	>90%	>3000	No	Yes	Yes
KOHJINBIO	No	Yes	40-75%	NA	Yes	No	No
Masuyama	No	No	20-75%	100-500	Yes	No	No
Miltenyi System	Yes	NA	>90%	NA	Yes	Yes	Yes

Competitive Landscape

Manufacturer	Product	Total Cell Expansion folds	NK Cells Expansion fold	Purity
BioMab	DSNK	>300	>3000	>90%
Corning	Corning NK Expansion kit	100-290	--	>80%
Biotherapy Institute of Japan	BINKIT®(NK cell expansion kit)		600	88%
CellXVivo	Human NK Cell Expansion Kit	45	--	90%
CellGenix	CellGro SCGM	<60	--	<65%

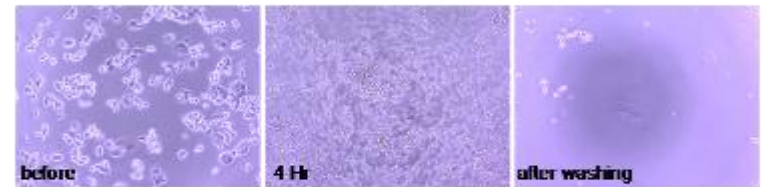
Expanded NK Cell Functional Analysis

Cancer Cell Lines Killing Abilities

Cytotoxicity(NK:MDA-MB-231=10:1)



Cytotoxicity(NK:HCT116=10:1)



Cytotoxicity(NK:H441=10:1)



Cytotoxicity(NK:MCF-7=10:1)



Cytotoxicity(NK:PA-1=10:1)



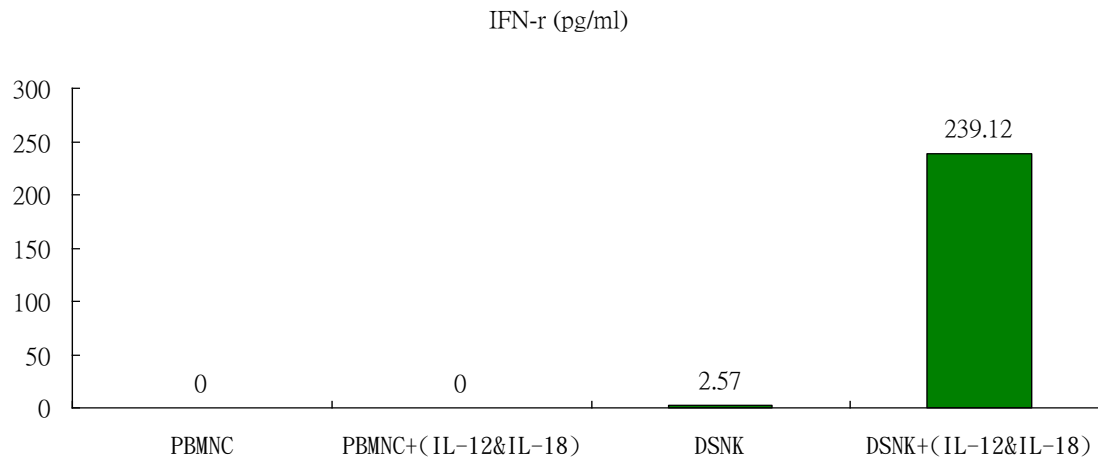
Cytotoxicity : 20~70% (E/T=10 ,K562)

cancer cell line >80% (E/T=10)

MCF-7(breast) 、 H441(lung) 、 PA-1(Ovarian) 、 HCT116(colon) & MDA-MB-231(breast)

DSNK™ Expansion Effects

- DSNK Cell : CD3⁻CD56⁺CD16⁺CD11b⁺NKG2D⁺NKp30⁺CXCR3⁺
- 1x10⁶ PBMNC(1x10⁵ NK)→ >1.4x10⁸ DSNK Cell
 - Using 10ml of blood, NK cells can be expand to 1 x 10⁹ cells (NK Cells expansion rate >1500X)
- Cytotoxicity : 20~50% (E/T=10 ,K562) · >80% (E/T=10 ,MCF-7 、H441 、PA-1 、HCT116 & MDA-MB-231)



Expanded NK Cells Surface Markers Analysis

(95%)

DSNK:CD3-CD56⁺CD16⁺NKG2D⁺CD69^{dim}NKp30⁺NKp44^{dim}NKp46^{dim}CD244^{dim}
CD11b⁺CXCR3⁺CD186⁻CD192^{dim}CD195⁺

(40-85%)

MASUYAMA:CD3-CD56⁺CD16⁺NKG2D⁺NKp30⁺NKp44^{dim}NKp46^{dim}CD244^{dim}

(75%)

Binkit:CD3-CD56⁺CD16⁺NKG2D⁺CD69^{dim}NKp30⁺NKp44^{dim}NKp46^{dim}

Ref: *Cytotherapy*, 2016; 18: 80–90
Int Immunopharmacol 14 (2012) 593-605

Thank You