



Huachenbio -- Your Professional Choice!

- ✦ High expansion fold: >100,000-fold expansion by Day 28
- ✦ High Yield: 100-150 Billion Cells by Day 21
- ✦ High purity: >98% CD3⁻CD56⁺ (High-Efficiency Version), >90% CD3⁻CD56⁺ (Enhanced Version), and >90% CD16⁺CD56⁺
- ✦ High cell viability: >90% viability
- ✦ Low cost: The production cost per NK cell preparation is 1/3 to 1/5 of the original cost
- ✦ Allogeneic use: CD3⁺ cells < 1%, meeting the requirement for allogeneic application
- ✦ Pure factor: feeder-free, GMP-manufactured, with DMF filing number



苏州华辰生物科技有限公司

Suzhou Huachen Biotechnology Co., Ltd

Tel: 400-965-9800

Website: www.huachenbiotech.com

Address: Unit A3-504-1, Creative Industry Park, No. 328 Xinghu Street, Suzhou Industrial Park



WeChat Official Account



WeChat Official Subscription Account



WeChat ID for Inquiries

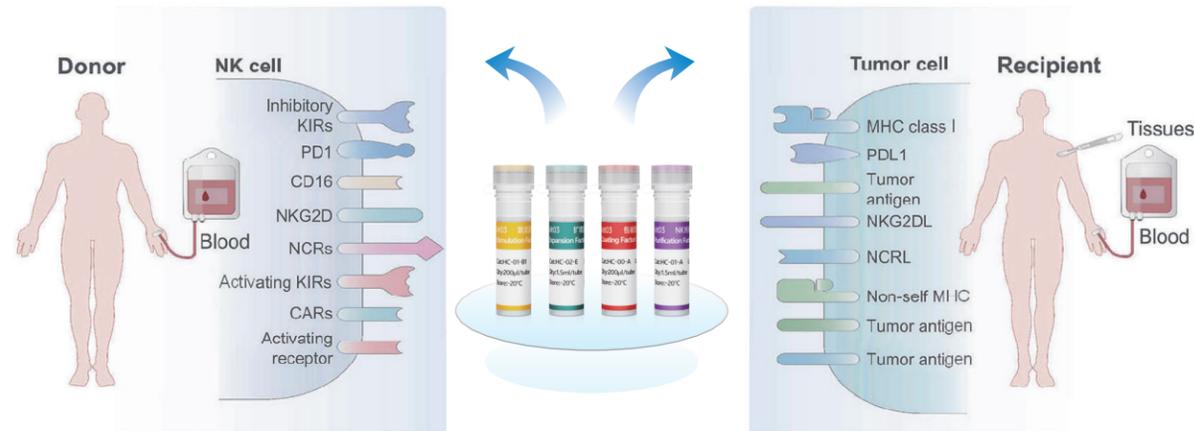
hyperClone[®] NK KIT

人NK细胞高效激活扩增试剂盒

hyperClone Human NK Activation/Expansion Cocktail

Brief Introduction to the Expansion Principle and Core Technology of hyperClone NK

HUACHEN hyperClone NK-kit integrates important signaling pathway factors essential for NK cell activation and expansion, as well as key cytokines that maintain and extend NK cell activity. Therefore, it can efficiently expand and activate high-purity NK cells, and serves as a powerful tool for large-scale preparation of NK cells with tumor-killing activity via the pure protein factor method.

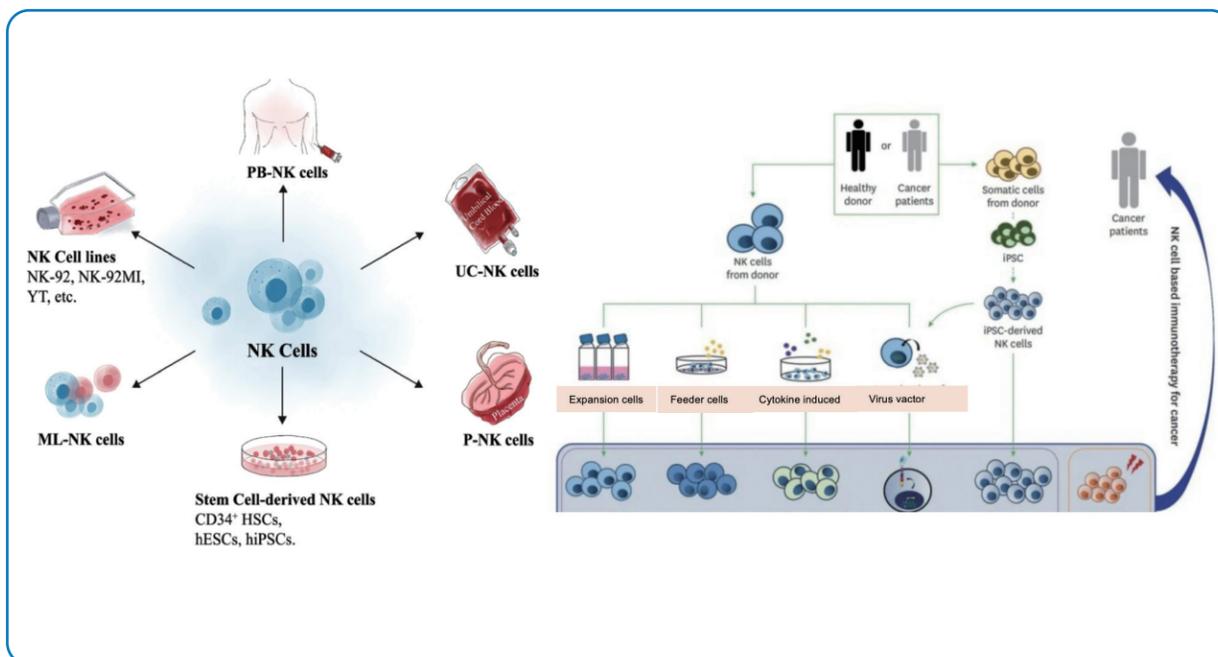


hyperClone NK Cell Pure Protein Factor In Vitro Expansion Kit

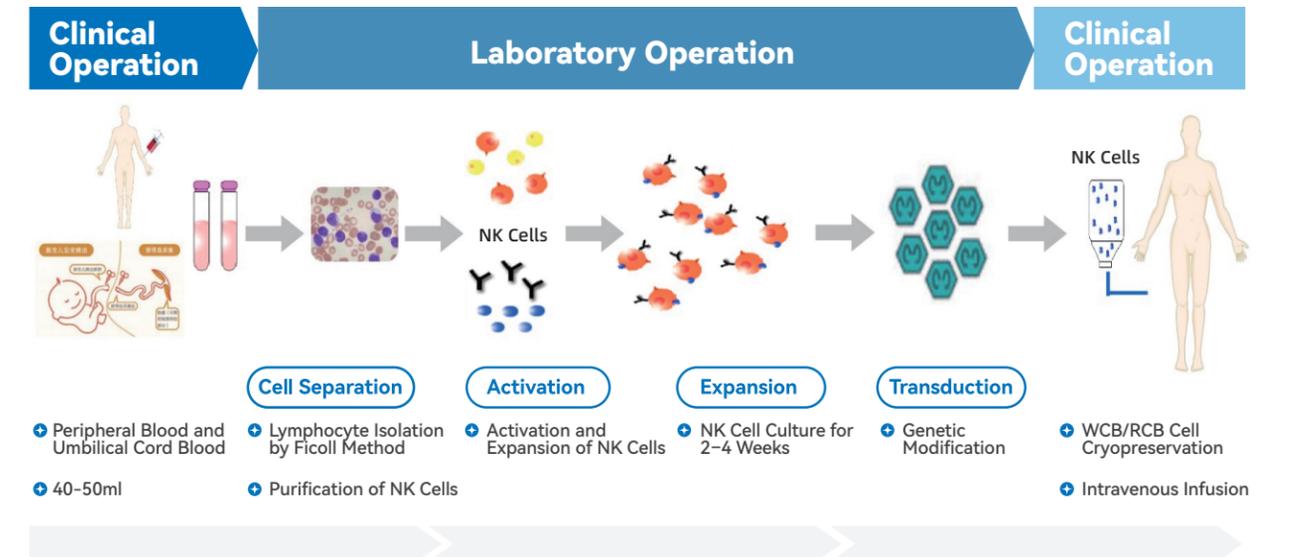
It requires no feeder cells, enabling efficient expansion of NK cells with high purity to meet the application needs of autologous or allogeneic NK cells. With a defined chemical composition and compliance with GMP standards, it can support the regulatory filing of NK cell-based pharmaceuticals.

Sources of NK Cells

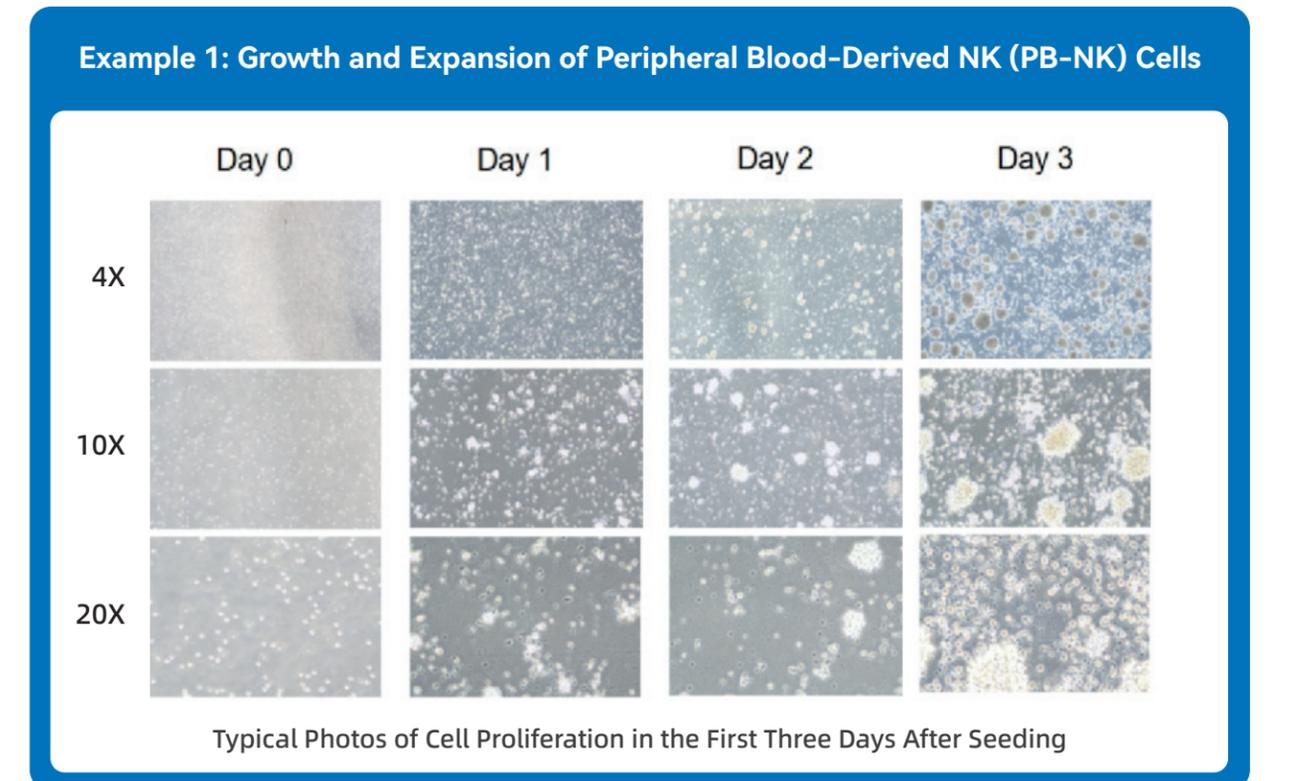
It is suitable for peripheral blood and umbilical cord blood, and compatible with both fresh blood samples and cryopreserved cells.

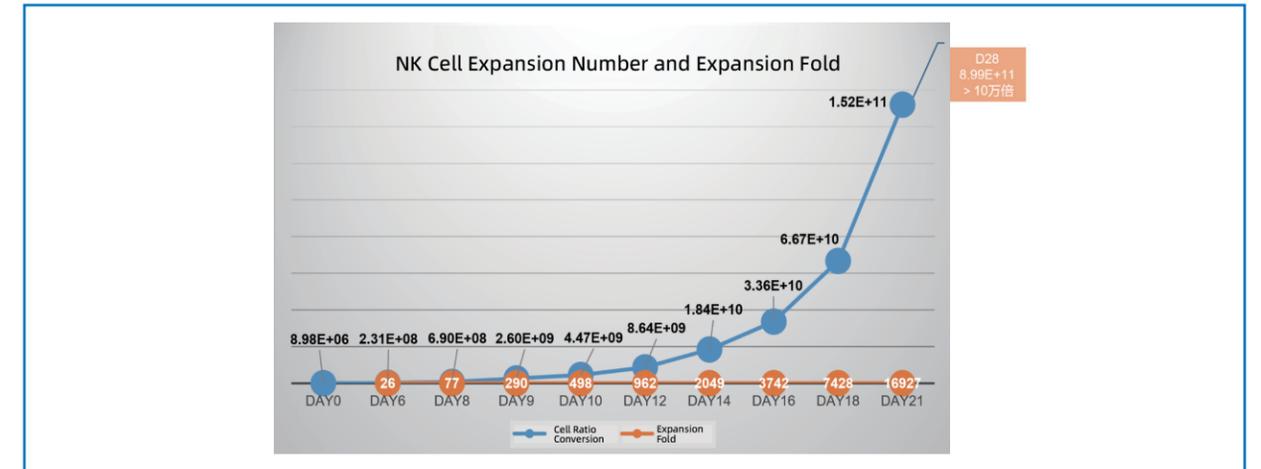
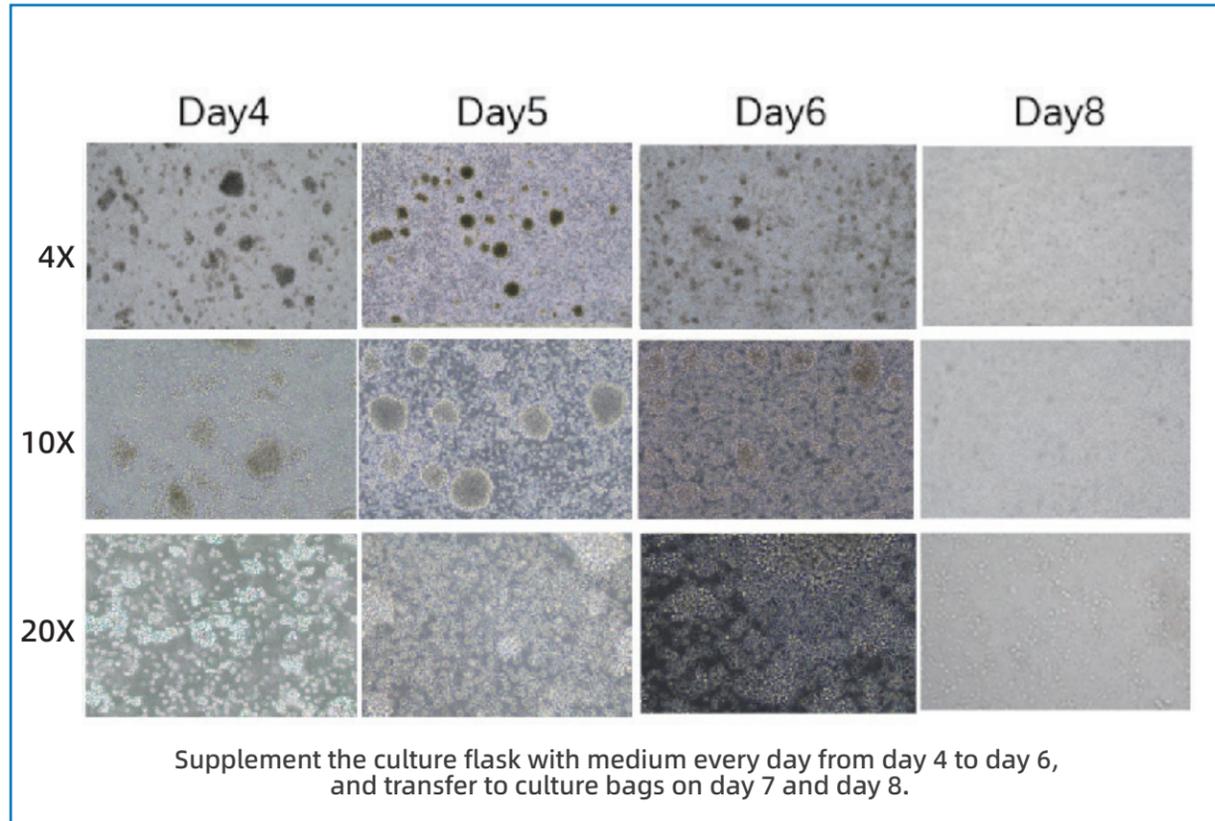


NK Cell Application and Operation Process



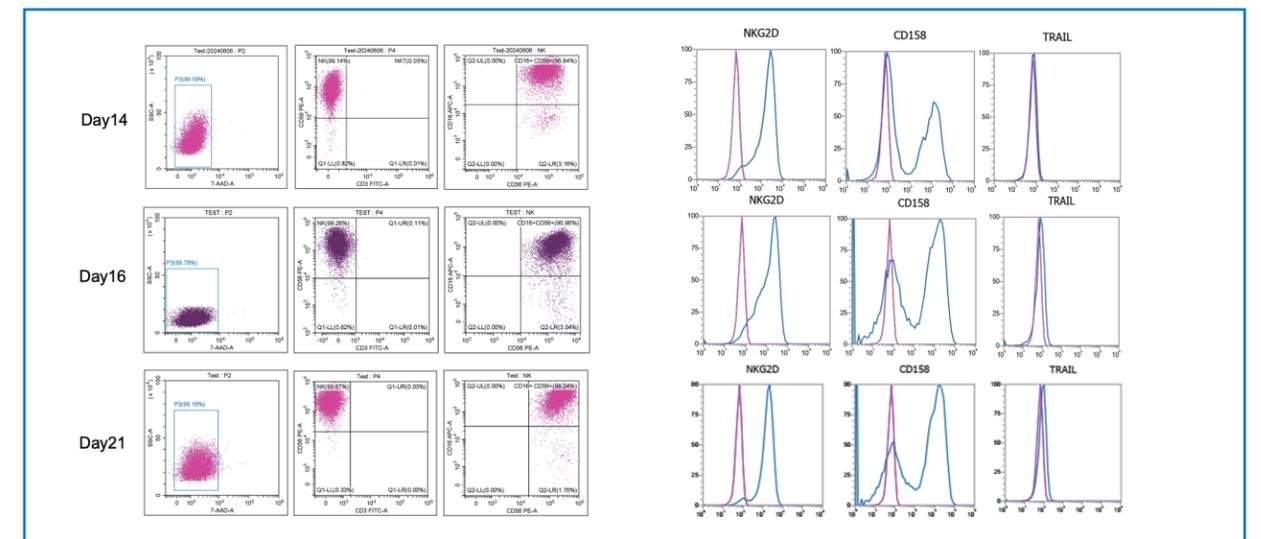
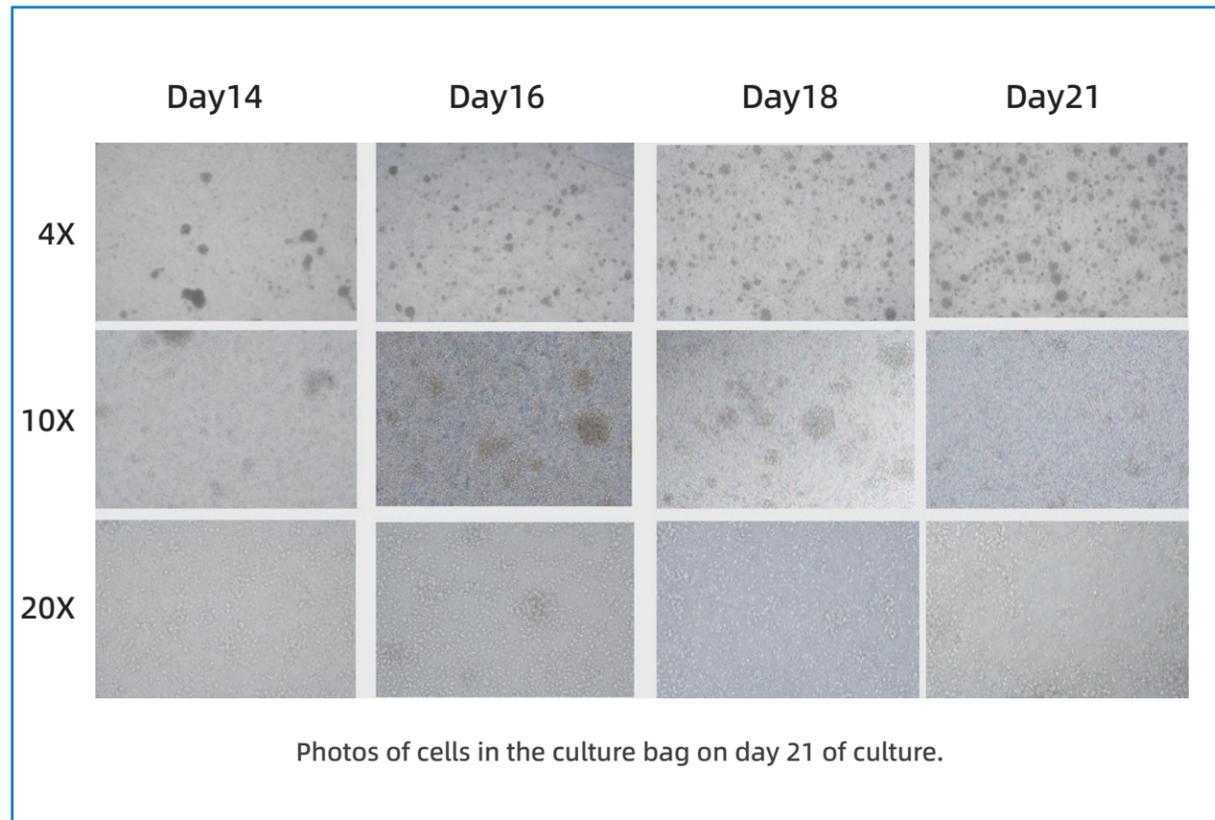
Data Presentation





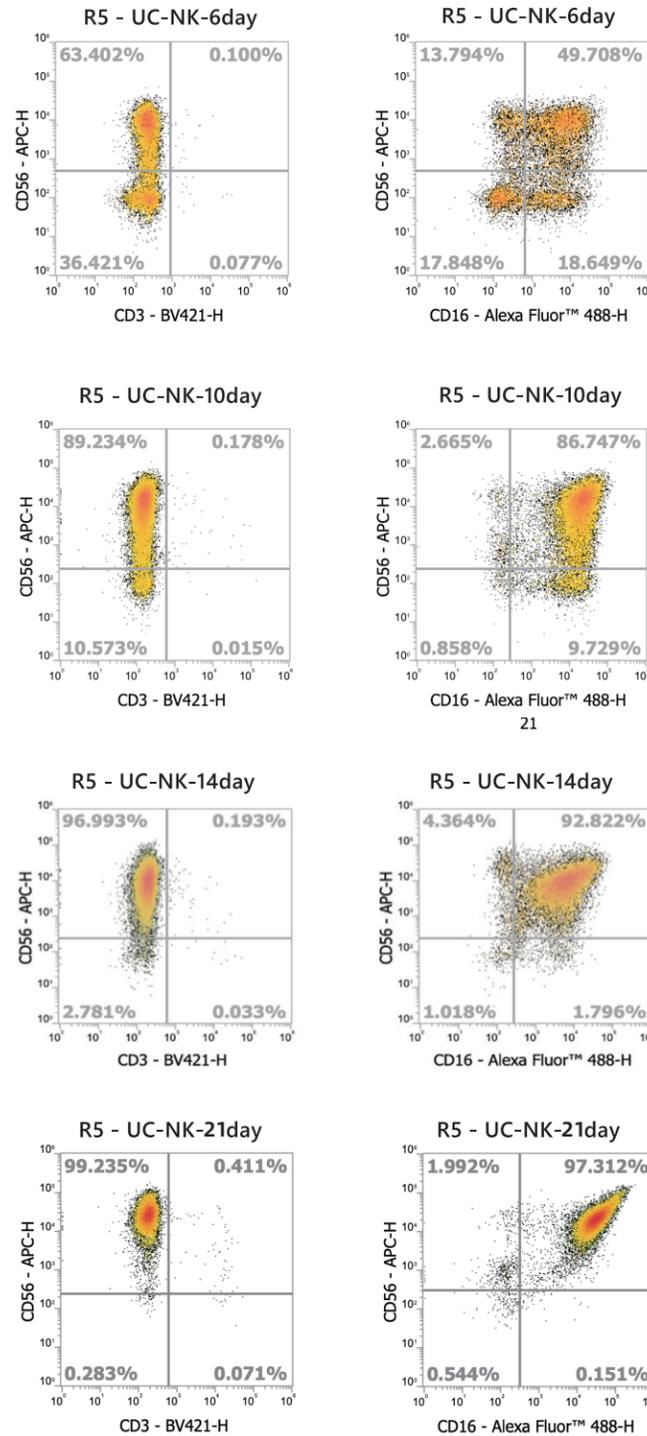
PBNK	DAY0	DAY6	DAY8	DAY9	DAY10	DAY12	DAY14	DAY16	DAY18	DAY20	DAY28
Calculate the total number of cells	8.98E+06	2.31E+08	6.90E+08	2.60E+09	4.47E+09	8.64E+09	1.84E+10	3.36E+10	6.67E+10	1.52E+11	8.99E+11
Expansion fold		26	77	290	498	962	2049	3742	7428	16927	100111
Volume after medium supplementation		450ml	900ml	1500ml	3L	6L	12L	24L	48L	96L	300L

Changes in Surface Marker Expression During PB-NK Cell Expansion



PBNK	7-AAD-(Viability)	CD45+	CD3-	CD3-CD56+	CD16+	CD56+CD16+	NKG2D	NKP44	NKP46	KIR	TRAIL
DAY6	98.86%	99.39%	97.99%	94.19%	46.51%	45.189%	45.86%	0.66%	51.29%	27.15%	1.370%
DAY8	98.17%	98.48%	99.68%	95.68%	64.75%	63.288%	90.26%	1.94%	54.18%	31.64%	0.347%
DAY10	93.69%	99.55%	98.53%	97.39%	87.82%	86.876%	91.13%	5.17%	68.99%	40.48%	1.917%
DAY14	99.59%	99.62%	99.96%	99.14%	96.84%	96.84%	90.88%	8.42%	72.95%	50.46%	0.200%
DAY16	99.78%	99.42%	99.88%	99.26%	96.96%	96.96%	90.53%	37.12%	77.26%	60.13%	2.265%
DAY21	99.16%	98.64%	99.99%	99.67%	98.24%	98.24%	93.15%	64.19%	79.78%	62.89%	1.275%

Example 2: Expansion Efficacy of CB-NK Cells



Cord Blood-Derived NK Cells (CB-NK Cells)

After 21 days of culture, the total number of CB-NK cells reached 3.2×10^{11} cells, with an expansion fold of 20,000x.

NK Cell Purity

CD3⁻CD56⁺ Cell Content



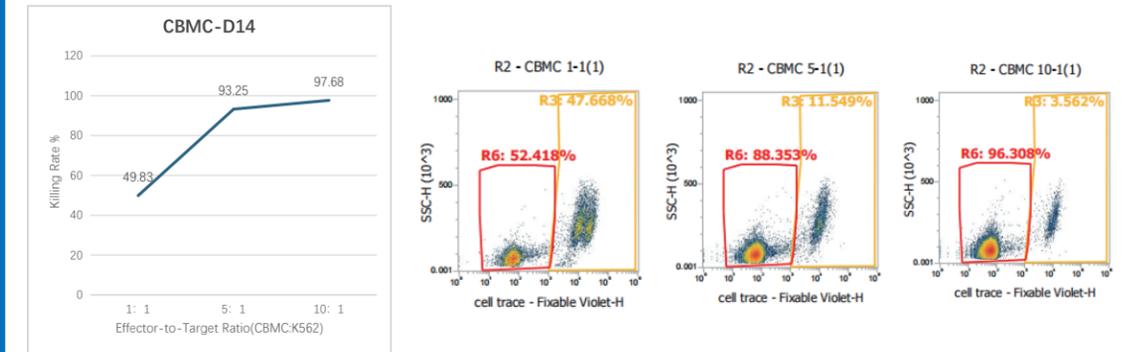
CD16⁺CD56⁺



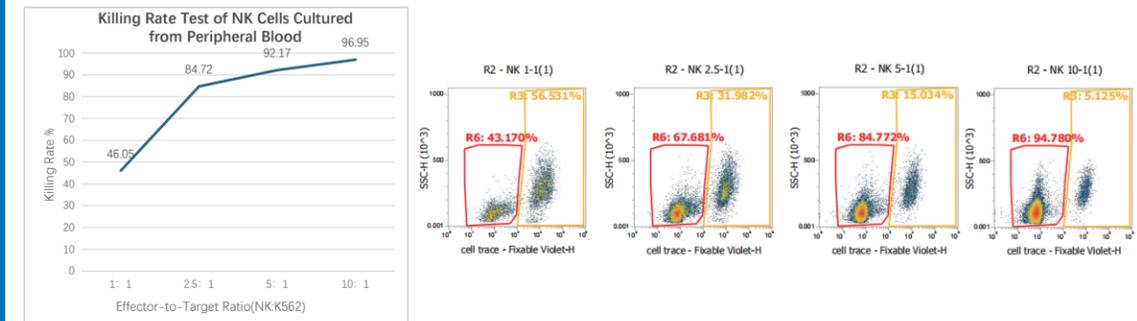
If the NK cell dose is set at 1×10^9 cells per dose, 320 doses of NK cells available for allogeneic use can be obtained.

Detection of NK Cell Cytotoxicity

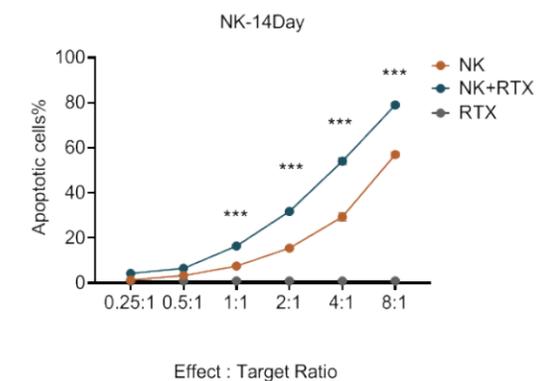
Tumor Killing Assay: Co-incubation of CBMCs with K562 Cells for 4 Hours After 14 Days of CBMC Culture



Tumor Killing Assay: Co-incubation of PBMCs with K562 Cells for 4 Hours After 14 Days of PBMC Culture

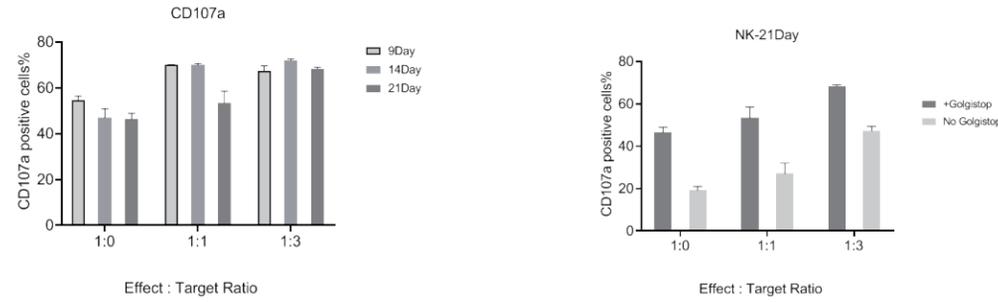


ADCC:RajiKilling ability Rituximab: 5 µg/mL, co-incubation for 4 hours

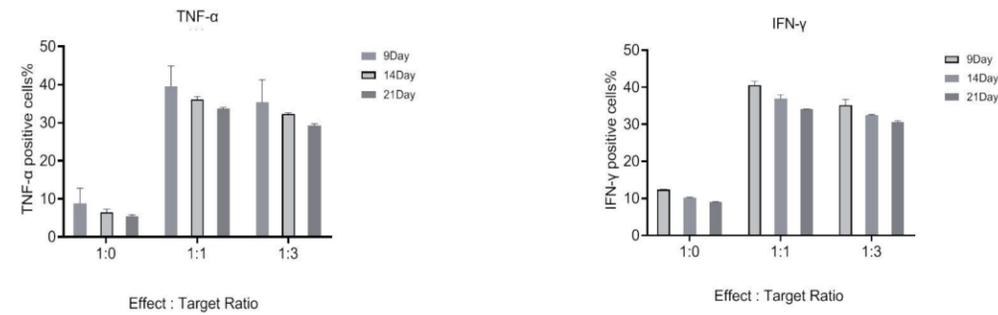


Data Presentation

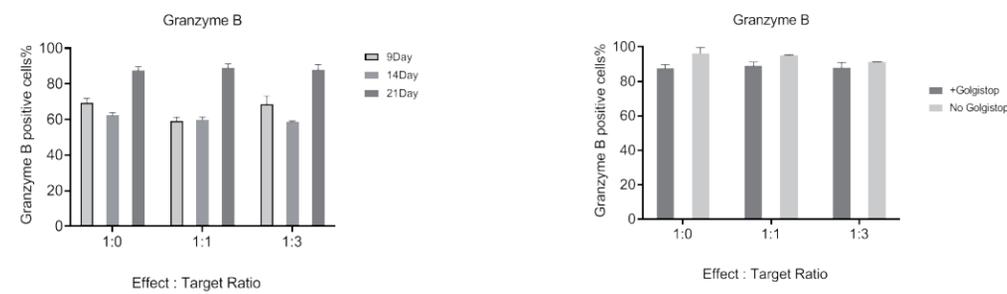
Cytokine and Cytotoxic Mediator Secretion: **CD107a**



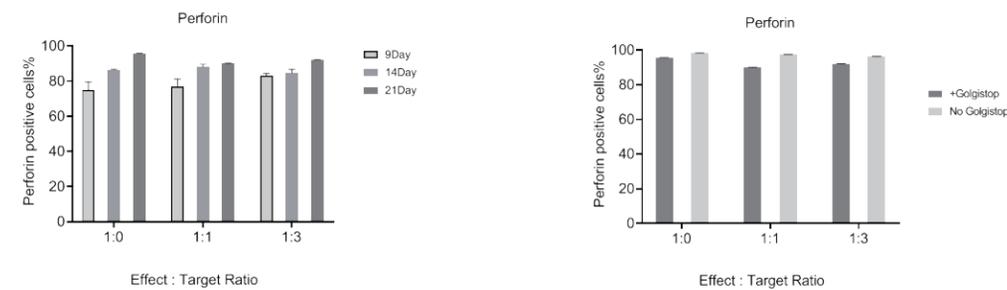
Cytokine and Cytotoxic Mediator Secretion: **TNF-α, IFN-γ**



Cytokine and Cytotoxic Mediator Secretion: **Granzyme B**



Cytokine and Cytotoxic Mediator Secretion: **Perforin**



Allogeneic NK Cell Application— Screening and Matching for Cord Blood NK Cell Bank Establishment

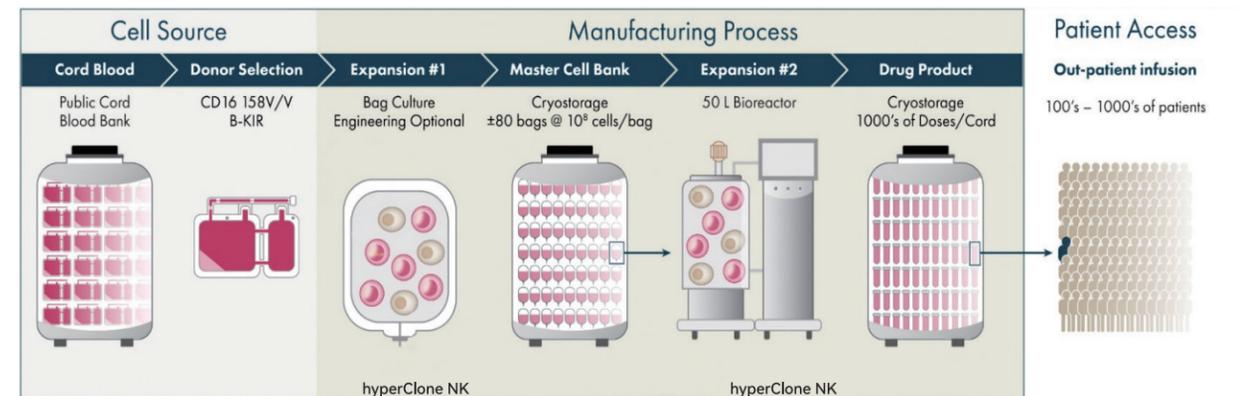
- ◆ CD16a 158V/V (The probability among East Asians is approximately 10%)
- ◆ HLA matching is not required
- ◆ Activating KIR, B-Type KIR, and Donor-Recipient KIR-HLA Mismatch

Donor selection

■ CMV⁻ ■ CMV⁺
■ CMV⁺ superdonor with single-KIR⁺ NKG2C⁺ adaptive NK cells



Allogeneic NK Cell Therapy — The Future of Cell Therapy Is Coming



The hyperClone NK Kit enables high-density, long-term culture and supports the acquisition of large quantities of allogeneic NK cell ready-to-use formulations with high purity and high activity.

Innovative Application Strategy Based on HUACHEN-NK Cells —Family NK Cell Healthcare



Family NK Cell Healthcare:

- ✦ A young member of the family donates a 50 mL blood sample;
- ✦ The laboratory performs expansion culture to establish 20-30 seed banks;
- ✦ Thawing one seed bank each time can support one NK cell healthcare session for a family member;
- ✦ Calculated based on two sessions per person per year, the seed banks can meet the family's needs for 15 years.
- ✦ Blood relatives who are young have cells with better activity, and these cells are more easily accepted (by the recipients' bodies).

Innovative Application Strategy Based on HUACHEN-NK Cells —NK Cell Healthcare for High-Net-Worth Individuals



NK Cell Healthcare for High-Net-Worth Individuals:

- ✦ First, adjust the body to an optimal state, then collect 50 mL of blood;
- ✦ Perform laboratory expansion and activation of the cells, followed by storage of 20-30 seed banks of cells;
- ✦ Retrieve one NK cell seed bank each time for two sessions annually, with two cell infusions per year;
- ✦ This setup can meet an individual's needs for 15 years.
- ✦ These are autologous cells, activated in vitro with high purity. In the future, they can support cell-based gene-modified therapy.

Top 10 Product Advantages

10

Top 10 Product Advantages

01

High Expansion Multiple

With the pure factor kit, after 14-28 days of culture, the number of NK cells can be expanded by more than 100,000 times

02

High Purity, Double 90%

Final Product: CD⁻CD56⁺>95%
CD16⁺CD56⁺>90%

03

High viability > 90%

04

Low CD3⁺ Ratio

In the final product, CD3⁺ cells account for less than 5%, with most cases below 2%, which can meet the requirements for allogeneic infusion

05

High Tumor-Killing Activity

The killing rate against target cells reaches over 90% within 4 hours

06

Long In Vivo Survival Time

Over 30 Days

07

Simple Operation

It can be completed without special equipment, is simple and easy to use, allowing researchers to easily obtain large quantities of high-purity NK cells after simple training

08

High Culture Success Rate

Over 90% of samples can easily yield high-purity, qualified NK cells

09

Localization, Stable Supply

Both cytokines and NK cell-specific culture media have achieved localization, enabling large-scale and stable supply

10

GMP - level, supporting the application for NK cell drugs

The NK cell culture kits and dedicated culture media are produced in compliance with GMP standards and can meet the requirements for pharmaceutical registration

Guide for Selecting NK Cell Culture-Related Products

Product Name	Cat#	Main Parameters	Application Scenarios	Advantages
hyperClone® Human Fresh Blood NK Activation/Expansion Kit	hyperCloneNK-Hckit03	① Pure cytokine kit, no feeder cells required; ② After 14-28 days of culture and expansion, the number of NK cells can be expanded by more than 100,000 times; ③ Purity can reach >98%, meeting the requirements for allogeneic infusion; ④ High CD16 ⁺ CD56 ⁺ expression: when combined with antibody therapy, it can give full play to the antibody-dependent cell-mediated cytotoxicity (ADCC) effect of NK cells; ⑤ The kit adopts a 2L system; if large-scale expansion is needed, only the expansion reagent set needs to be supplemented, which can meet the demand for large-scale culture of NK cells at the 100-billion level; ⑥ Suitable for both peripheral blood and umbilical cord blood.	1.Ultra-high purity NK cells, allogeneic NK cell infusion; 2.100-billion-level large-scale NK cell culture protocol using 50ml blood samples; 3.Meeting the requirements for NK cell drug IND filing.	Efficient and High-Purity Culture Restricted to Fresh Blood
hyperClone® Human Cryopreserved Mononuclear Cells NK Activation/Expansion Kit	hyperCloneNK-Hckit02	① Specifically optimized for cryopreserved cells, compatible with cryopreserved PBMCs or cryopreserved CBMCs; ② For autologous NK cell use, the final purity of cryopreserved PBMC-derived NK cells is approximately 80-90%; ③ The final purity of cryopreserved CBMC-derived NK cells is over 90%; ④ Culturing in a 2L system yields 6-8 billion cells; ⑤ High cost-effectiveness.	1.Preparing NK cells by resuscitating the client's cryopreserved peripheral blood PBMCs, suitable for autologous infusion; 2.Preparing NK cells by resuscitating cryopreserved CBMCs from umbilical cord blood banks (with the longest tested cryopreservation duration of 20 years for samples).	Efficient and cost-effective culture restricted to cryopreserved mononuclear cells
hyperClone® Human Fresh Blood NK Activation/Expansion Kit	hyperCloneNK-Hckit05	① Specifically optimized for the preparation of NK cells from peripheral blood and umbilical cord blood in the field of general health; ② Pursuing high cost-effectiveness; ③ The final purity of peripheral blood-derived NK cells is >90%, for autologous use; ④ The final purity of umbilical cord blood-derived NK cells is >90%, suitable for allogeneic use.	1.Fresh peripheral blood-derived NK cells for autologous use; 2.Preparation of fresh umbilical cord blood-derived NK cells;	1.Efficient and high-purity culture restricted to fresh blood; 2.Its purity is slightly lower than that of Kit 03, failing to meet the standard for allogeneic use of peripheral blood-derived NK cells, but its cost-effectiveness is significantly improved.
NK Cell Seed Bank Establishment, Resuscitation, and Recultivation Kit	Kit03+Kit09	① Seed Cell Bank Establishment Using Kit03, culture cells from 50 mL of fresh blood for approximately 8-10 days to establish a seed cell bank of approximately 20 vials at 1E8 cells/vial (using StarSeed-02 Cryopreservation Medium). ② Clinical-Grade NK Cell Preparation Thaw one vial of seed cells when needed, and culture for approximately 10 days to generate a fresh NK cell formulation ready for clinical use.	1.True NK cell storage with seed bank establishment; 2.Elimination of repeated blood collection; 3.Seed cells meeting the standards for allogeneic use; 4.Family-based NK cell health management program; 5.NK cell storage program for high-net-worth individuals.	One blood collection for multiple uses of fresh preparations
pureSep-NK NK Cell Purification Reagent	pureSep-01	It enables simple and rapid purification of NK cells from whole blood, reduces T cell interference, requires no special operations or equipment, and adopts a non-magnetic bead method. It features high NK cell recovery rate and high cell viability. It uses a negative selection method, which does not affect the performance of NK cells.	It enables the purification of NK cells from umbilical cord blood or peripheral blood, eliminating individual differences in blood sample sources and ensuring that the purity of cultured NK cells reaches over 99%.	It is simple, rapid and efficient. Negative selection does not affect NK cell quality, eliminates individual differences in blood sample sources, and improves the success rate of NK cell culture.
Cryopreservation Solution	StarSeed-01 StarSeed-02 HCCryo-GMP03 HCCryo-GMP04	① Seed Cell Cryopreservation Medium High freeze-thaw efficiency, protects against organelle damage, and ensures high cell culture success rate post-thaw. ② Drug Product Cryopreservation Medium Serum-free, animal-derived component-free, pharmaceutical-grade formulation. A ready-to-use, pre-mixed cell cryopreservation medium supporting a high cell density of up to 2E8/mL.	For PBMCs or CBMCs after Ficoll separation, StarSeed-01 Cryopreservation Solution shall be used; For cryopreservation of NK seed cells cultured until approximately Day 8, StarSeed-02 Cryopreservation Solution shall be used; For the final NK cell preparation, either GMP-03 Cryopreservation Solution (containing DMSO) or GMP-04 Cryopreservation Solution (DMSO-free) can be selected.	Select different cryopreservation solutions based on various cryopreservation purposes. These solutions are specially optimized and have clear functional divisions.
novaNK-20 Chemically Defined Serum-Free Medium For Culture of Human Natural Killer cells	HC-NK20R HC-NK20F	① Specifically developed for NK cell culture; ② Chemically defined; ③ Compared with similar products on the market, it enables faster cell proliferation, higher cell viability, and higher cell density; ④ The cell density in culture bags can reach 4-5×10 ⁶ cells/mL.	It is suitable for culturing NK cells in culture bags and for large-scale culturing of NK cells in Wave bioreactors.	Higher cell density, faster proliferation, and higher viability.

Huachen Bio: Core Technology Platforms



Independent Intellectual Property Rights Core Technology Platforms

Culture Medium Development Platform

- Component Screening Procedure for Chemically Defined (CD) Medium
- Optimization and Simulation Procedure for Stem Cell Culture on 3D Microcarriers
- Integrated Intelligent Manufacturing System Management Platform for Cells

Overall Solution

10 Billion-Scale Culture Process of Stem Cells Using 3D Microcarriers
 100 Billion-Scale Culture Process of NK Cells

Ordering Information

Product Name	Cat#	Specs
hyperClone® Human Fresh Blood NK Activation/Expansion Kit	hyperCloneNK-HCkit03	1Kit, 2L
hyperClone® Human Cryopreserved Mononuclear Cells NK Activation/Expansion Kit	hyperCloneNK-HCkit02	1Kit, 2L
hyperClone® Human Fresh Blood NK Activation/Expansion Kit	hyperCloneNK-HCkit05	1Kit, 2L
hyperClone® NK Cells Seed Bank Resuscitation/Activation Culture Kit	hyperCloneNK-HCkit09	1Kit, 2L
hyperclone® NK Cells Amplification Reagent Kit	NKkit-20SE	1L
pureSep-NK NK Cell Purification Reagent	pureSep-01	1.5mL/tube
Cryopreservation Solution	StarSeed-01 StarSeed-02 HCCryo-GMP03 HCCryo-GMP04	100mL/bottle
novaNK-20 Chemically Defined Serum-Free Medium For Culture of Human Natural Killer cells	HC-NK20R HC-NK20F	1L/bottle

- Suitable for Primary Cell Isolation and Subculture
- Compatible with a variety of mesenchymal stem cells, such as umbilical cord-, adipose-, bone marrow-, amniotic membrane-, hair follicle-, and dental pulp-derived mesenchymal stem cells
- Serum-free, free of any animal-derived components, antibiotic-free, stable in performance, and minimal batch-to-batch variation
- High cell expansion rate, with a single passage expansion fold of over 20x
- Cell yield per T175 flask: >2x10⁷ cells; Cell yield per 10-layer cell factory: 8-10x10⁸ cells
- Cell diameter: 14-15 μm, smaller than that of similar products on the market
- GMP level, prepared with water for injection (WFI), endotoxin < 0.1 EU/ml
- Independent R&D and production system, stable supply, and high cost-effectiveness
- Scalability proven for 3D microcarrier culture (10L/50L)



novastem-MSR®
 间充质干细胞无血清培养基
 Serum-Free Medium For Mesenchymal Stem Cell

- Serum-free, platelet lysate-free
- Animal-derived component-free
- Human-derived component-free, containing recombinant human serum albumin (rhSA)
- Chemically defined, with high batch-to-batch consistency
- High efficiency, supporting primary and subculture of MSCs
- Manufactured in compliance with GMP standards, supporting pharmaceutical registration
- Higher quality, with endotoxin < 0.1 EU/ml



StarMedium®
 新一代间充质干细胞化学成分限定培养基
 Chemically Defined Medium For Mesenchymal Stem cell



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- High cell viability: >90% viability
- High purity: >98% CD3⁺CD56⁺ (High-Efficiency Version), >90% CD3⁺CD56⁺ (Enhanced Version), and >90% CD16⁺CD56⁺
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hyperClone® NK KIT
 人NK细胞高效扩增试剂盒
 hyperClone Human NK Activation/Expansion Cocktail

- Engineered Flexible Porous Gelatin (Pharmaceutical Grade)
- Irradiated, Closed-Process, Ready-to-Use
- Spherical, Uniform in Size, Fragment-Free
- Gentle 20-Minute Dissociation with Specialized Formulation
- Achieves 10B Cells in 10L and 50B Cells in 50L Bioreactors With Lower Carrier Consumption
- Higher Seeding Density · Higher Yield per Carrier
- Smaller Cell Size than Comparable Products
- Larger Surface Area for Higher Fold Expansion
- Direct Seeding with DMSO-Preserved Cells



3D StarPore® Max
 第二代Max微载体
 3D StarPore gelatin dissolvable porous microcarrier for cell culture