



## Product Sheet

# NK-92MI (ATCC® CRL-2408™)

### Please read this FIRST



Storage Temp.  
**liquid nitrogen**  
vapor phase

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Biosafety Level  
**2**

### Intended Use

This product is intended for research use only. It is not intended for any animal or human therapeutic or diagnostic use.

### Complete Growth Medium

The base medium for this cell line is Alpha Minimum Essential medium without ribonucleosides and deoxyribonucleosides but with 2 mM L-glutamine and 1.5 g/L sodium bicarbonate. To make the complete growth medium, add the following components to the base medium: 0.2 mM inositol; 0.1 mM 2-mercaptoethanol; 0.02 mM folic acid; horse serum to a final concentration of 12.5%; fetal bovine serum to a final concentration of 12.5%.

### Citation of Strain

If use of this culture results in a scientific publication, it should be cited in that manuscript in the following manner: NK-92MI (ATCC® CRL-2408™)

American Type Culture Collection  
PO Box 1549  
Manassas, VA 20108 USA  
[www.atcc.org](http://www.atcc.org)

800.638.6597 or 703.365.2700  
Fax: 703.365.2750  
Email: [Tech@atcc.org](mailto:Tech@atcc.org)

Or contact your local distributor

### Description

**Organism:** *Homo sapiens*, human

**Tissue:** peripheral blood, blood

**Disease:** malignant non-Hodgkin's lymphoma

**Cell Type:** natural killer cell; NK cell

**Age:** 50 years

**Gender:** male

**Morphology:** lymphoblast

**Growth Properties:** suspension, multicell aggregates

**Virus Susceptibility:**

**Viral Testing:** ATCC confirmed this cell line is positive for the presence of Epstein-Barr viral DNA sequences via PCR.

**DNA Profile:**

D5S818: 12, 13

D13S317: 9, 12

D7S820: 10, 11

D16S539: 11, 12

vWA: 16, 18

THO1: 6, 9.3

TPOX: 8

CSF1PO: 11, 12

Amelogenin: X, Y

### Batch-Specific Information

Refer to the Certificate of Analysis for batch-specific test results.

### SAFETY PRECAUTION

ATCC highly recommends that protective gloves and clothing always be used and a full face mask always be worn when handling frozen vials. It is important to note that some vials leak when submersed in liquid nitrogen and will slowly fill with liquid nitrogen. Upon thawing, the conversion of the liquid nitrogen back to its gas phase may result in the vessel exploding or blowing off its cap with dangerous force creating flying debris.

### Unpacking & Storage Instructions

1. Check all containers for leakage or breakage.
2. Remove the frozen cells from the dry ice packaging and immediately place the cells at a temperature below -130°C, preferably in liquid nitrogen vapor, until ready for use.

### Handling Procedure for Frozen Cells

To insure the highest level of viability, thaw the vial and initiate the culture as soon as possible upon receipt. If upon arrival, continued storage of the frozen culture is necessary, it should be stored in liquid nitrogen vapor phase and not at -70°C. Storage at -70°C will result in loss of viability.



1. Thaw the vial by gentle agitation in a 37°C water bath. To reduce the possibility of contamination, keep the O-ring and cap out of the water. Thawing should be rapid (approximately 2 minutes).
2. Remove the vial from the water bath as soon as the contents are thawed, and decontaminate by dipping in or spraying with 70% ethanol. All of the operations from this point on should be carried out under strict aseptic conditions.
3. Withdraw the cells from the ampoule and transfer thawed cells to empty 15 mL centrifuge tube. Add 9-11 mL 4°C culture medium slowly to the cell suspension.
4. Centrifuge the cell suspension at approximately 175 x g for 10 minutes at 4°C. Discard the supernatant.
5. Resuspend cell pellet with the recommended complete medium (see the specific batch information for the culture recommended dilution ratio) and dispense into a new culture flask. It is important to avoid excessive alkalinity of the medium during recovery of the cells. It is suggested that, prior to the addition of the vial contents, the culture vessel containing the complete growth medium be placed into the incubator for at least 15 minutes to allow the medium to reach its normal pH (7.0 to 7.6).
6. Incubate the culture at 37°C in a suitable incubator. A 5% CO<sub>2</sub> in air atmosphere is recommended if using the medium described on this product sheet.



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### Handling Procedure for Flask Cultures

The flask was seeded with cells (see specific batch information), grown, and completely filled with medium at ATCC to prevent loss of cells during shipping.

1. Upon receipt, visually examine the culture for macroscopic evidence of any microbial contamination. Using an inverted microscope (preferably equipped with phase-contrast optics), carefully check for any evidence of microbial contamination.
2. Incubate the flask in an upright position for several hours at 37°C. After the temperature has equilibrated, aseptically remove the entire contents of the flask and centrifuge at 125 x g for 5 to 10 minutes. Remove shipping medium and save for reuse. Resuspend the cell pellet in 10 mL of this medium.
3. From this cell suspension remove a sample for a cell count and viability. Adjust the cell density of the suspension to  $3 \times 10^5$  to  $4 \times 10^5$  viable cells/mL in the shipping medium.
4. Incubate the culture, horizontally, at 37°C in a 5% CO<sub>2</sub> in air atmosphere. Maintain the cell density of the culture as suggested under the subculture procedure.



### Subculturing Procedure

Cultures can be maintained by centrifuging cells and resuspending cell pellet in fresh medium at 2 - 3 x 10<sup>5</sup> viable cells/mL. Centrifugation and full replacement of culture medium may be performed for the first subcultures. Cultures can then be maintained by addition of fresh medium. These cells tend to grow in aggregates that may lose viability when they are dispersed. Accurate counts and viabilities may not be possible.

Maintain cell density between 2 x 10<sup>5</sup> and 1 x 10<sup>6</sup> viable cells/mL or use a 1:3 split ratio.



### Cryopreservation Medium

FBS, 90%; DMSO, 10%



### Comments

NK-92 and this derivative cell line NK-92MI have the following characteristics: surface marker positive for CD2, CD7, CD11a, CD28, CD45, CD54 and CD56 bright; surface marker negative for CD1, CD3, CD4, CD5, CD8, CD10, CD14, CD16, CD19, CD20, CD23, CD34 and HLA-DR.

The parental IL-2 dependent cell line is available as ATCC CRL-2407 (NK-92). NK-92MI was shown to contain, express, and synthesize the hIL-2.

A culture submitted to the ATCC in September of 1998 was found to be contaminated with mycoplasma. Progeny were cured by a 21-day treatment with BM Cycline. The cells were assayed for mycoplasma, by the Hoechst stain, PCR and the standard culture test, after a six-week period following treatment. All tests were negative.

ATCC confirmed this cell line is positive for the presence of Epstein-Barr viral DNA sequences via PCR.



### References

References and other information relating to this product are available online at [www.atcc.org](http://www.atcc.org).



### Biosafety Level: 2

Appropriate safety procedures should always be used with this material. Laboratory safety is discussed in the current publication of the *Biosafety in Microbiological and Biomedical Laboratories* from the U.S. Department of Health and Human Services Centers for Disease Control and Prevention and National Institutes for Health.

### ATCC Warranty

ATCC® products are warranted for 30 days from the date of shipment, and this warranty is valid only if the product is stored and handled according to the information included on this product information sheet. If the ATCC® product is a living cell or microorganism, ATCC lists the media formulation that has been found to be effective for this product. While other, unspecified media may also produce satisfactory results, a change in media or the absence of an additive from the ATCC recommended media may affect recovery, growth and/or function of this product. If an alternative medium formulation is used, the ATCC warranty for viability is no longer valid.



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### Disclaimers

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Please see the enclosed Material Transfer Agreement (MTA) for further details regarding the use of this product. The MTA is also available on our Web site at [www.atcc.org](http://www.atcc.org)

Additional information on this culture is available on the ATCC web site at [www.atcc.org](http://www.atcc.org).

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