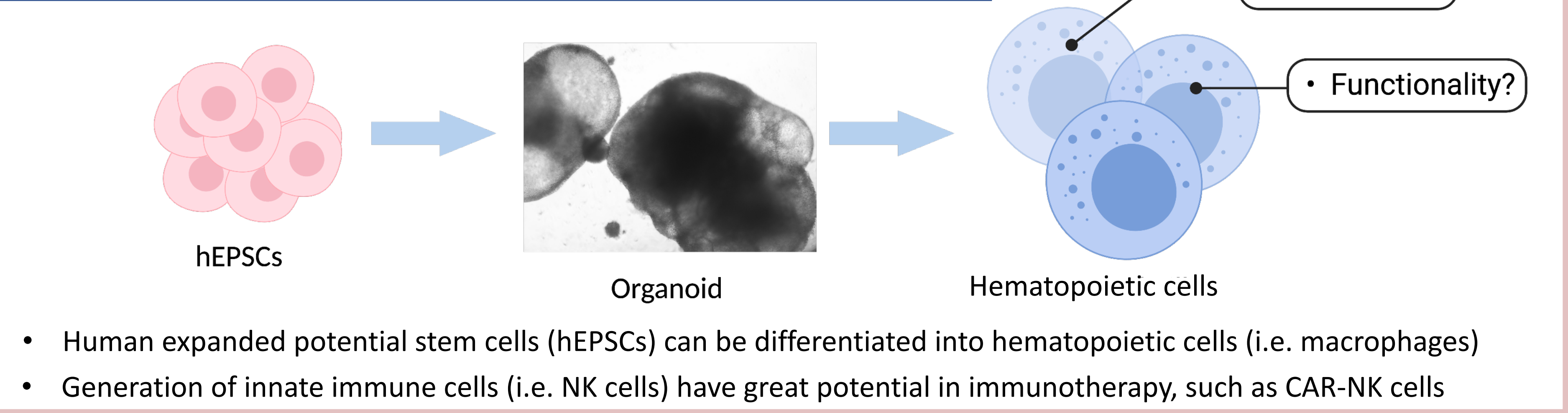


Defining the development path of innate Immune cells from human pluripotent stem cells

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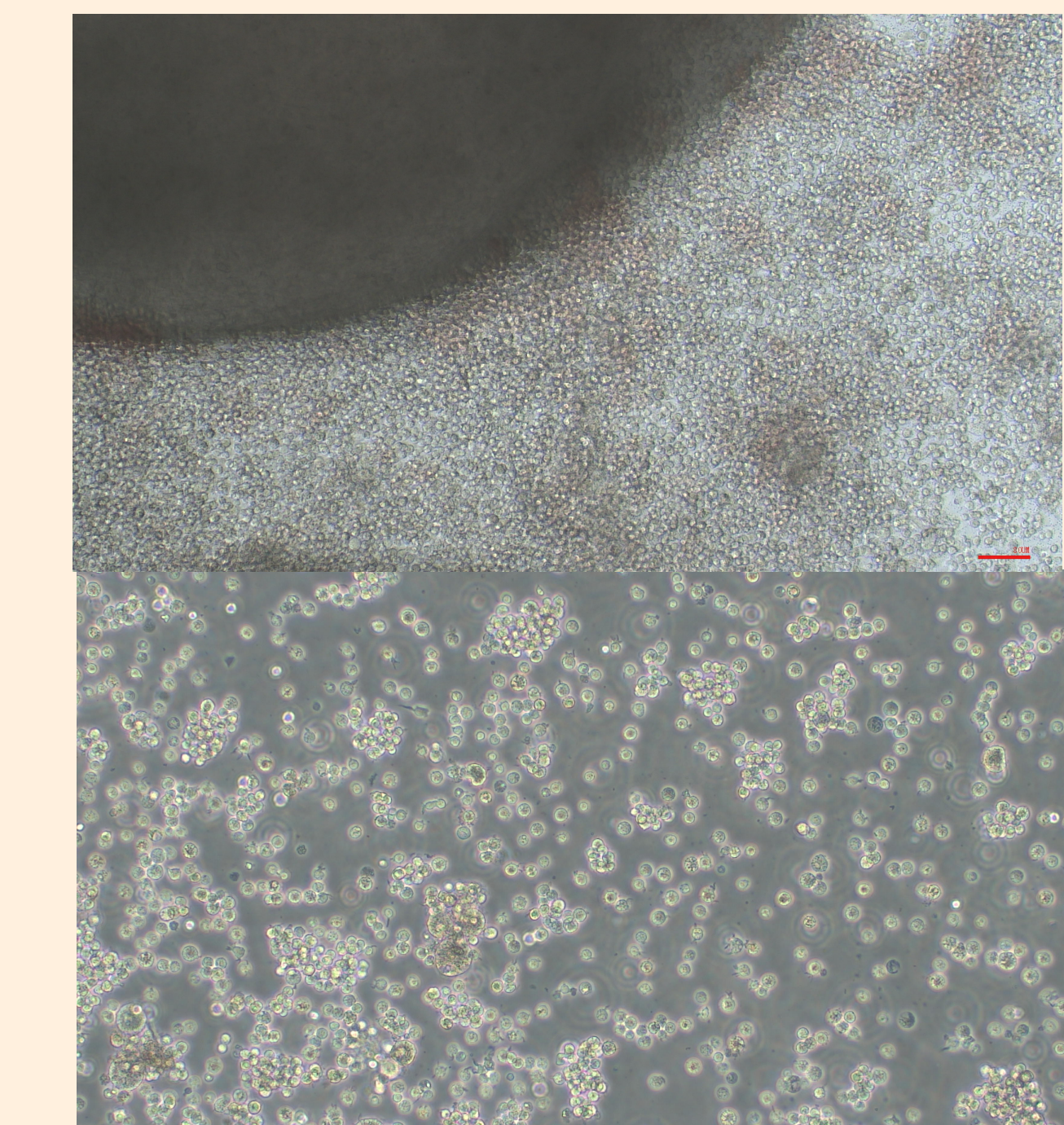
Introduction



Objectives

- Derive functional NK cells from hEPSCs
- Define its development pathway

Results



Morphology
Microscopic photos of VIOs under NK induction medium. (4X up; 10X below) Cells are released from organoid, and have a circular shape.

Acknowledgements

Thanks for the support!

Hypothesis

hEPSC-NK should phenotypically and functionally resembles human NK cells

Results

Phenotypes

Surface markers (FACS) transcriptome(RNA-seq)

Functionality
Degranulation (FACS)
Tumor killing (FACS)

Tumour killing

FACS plots of selected, NK-defining markers.
Unstained samples are used for negative gratings.

CD16 vs CD56

Quadrant	Percentage
Q5	88.5
Q6	3.68
Q7	0.38
Q8	7.35

CD159a vs CD94

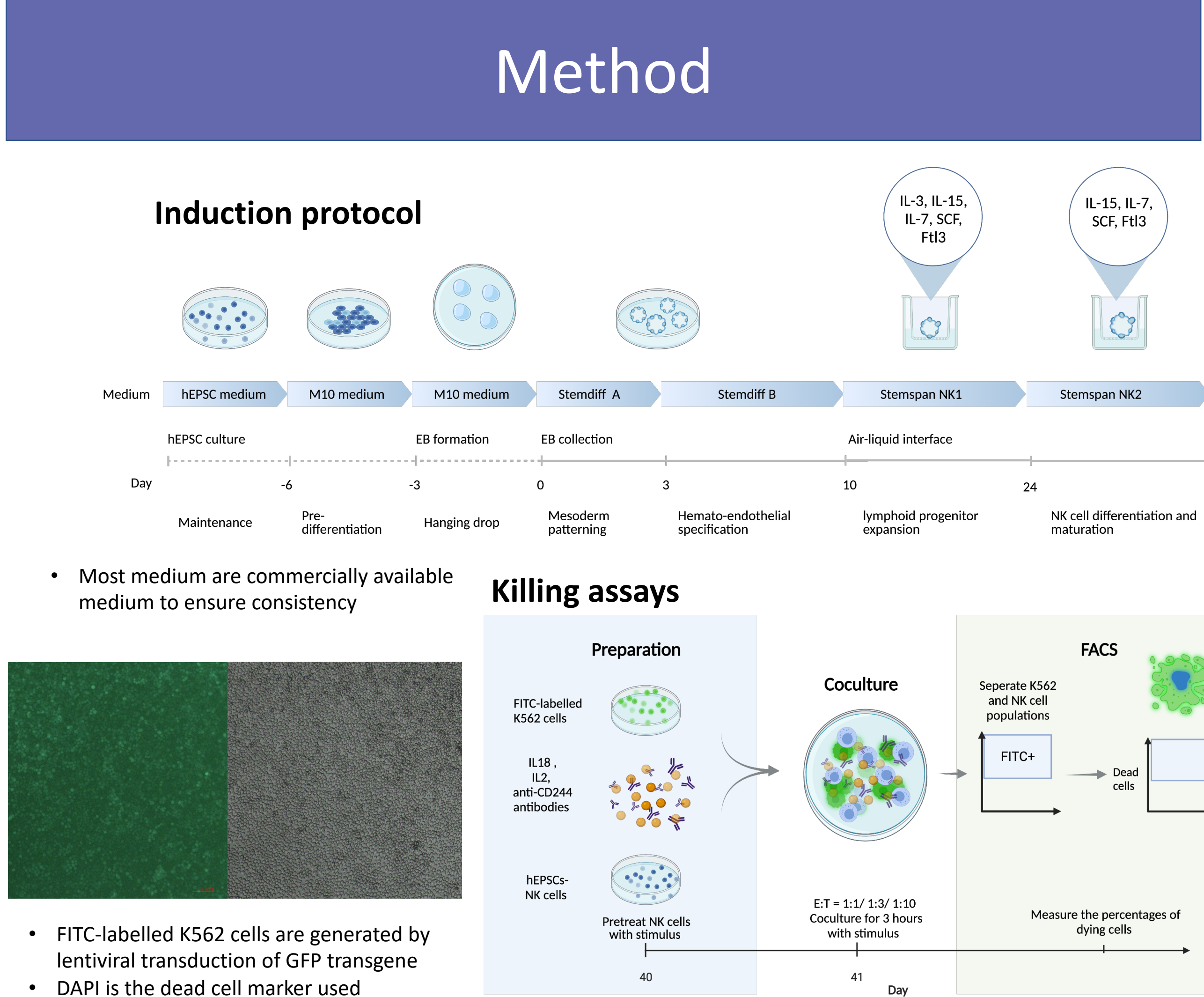
Quadrant	Percentage
Q1	4.26
Q2	24.7
Q3	3.67
Q4	67.4

CD3 vs CD56

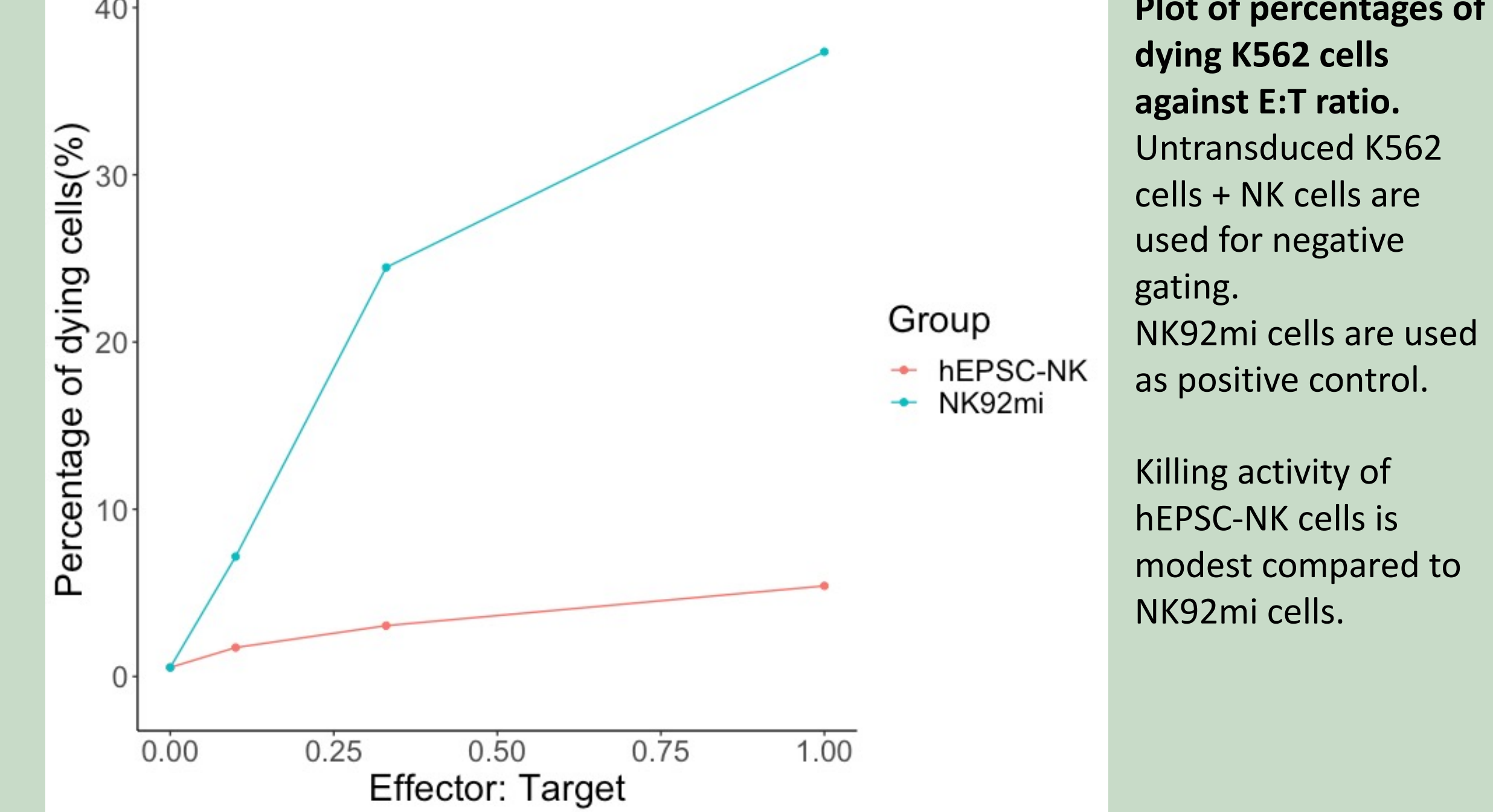
Quadrant	Percentage
Q2	0.27
Q3	0.22
Q4	86.1
Q1	13.4

CD56 vs CD107a

Quadrant	Percentage
Q1	26.0
Q2	13.5
Q3	34.2
Q4	26.3



- ### Discussion
- Develop an expansion method
 - Dox-inducible membrane-bound IL-15
 - Antibody-conjugated beads
 - DEG analysis of bulk RNA-seq data
 - hEPSC-NK vs hEPSC (day0 from established transcriptome)
 - trajectory analysis
 - Detect IFN γ production with ELISA-like methods
 - Test killing activity at earlier time points (i.e. 14 days)
 - primary NK cells as positive control



Summary

- The efficiency of induction ~15%
- Upon cytokine and antibodies priming, hEPSC-NK cells shows degranulation and modest killing activity

References

Zhu, H., and D. S. Kaufman. "An Improved Method to Produce Clinical-Scale Natural Killer Cells from Human Pluripotent Stem Cells." [In eng]. *Methods Mol Biol* 2048 (2019): 107-19. https://doi.org/10.1007/978-1-4939-9728-2_12.

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