Allegrow Biotech

AimGel

Artificial Cells for Immune Cell Activation

Animal free Chemically defined Self-degrading

T cells & NK cells ready

Stratech

version AB-BC-1.0.3

About Us

Allegrow Biotech is a biotech specialising in immunomodulation via biomimetic approaches, based in Hong Kong Science Park, and spun out from the Hong Kong University of Science and Technology with their investment. Our team consists of experts in biomaterials, immunology and bioengineering, with more than 85% holding postgraduate degrees. We endeavour to open a new chapter in cell signalling and modulation with our AimGel technology.

Our journey so far,

- Incubatee of Hong Kong Science and Technology Parks incubator programs: 2022 Ideation Program, 2024-2028 Incu-Bio Program
- Recipient of Research Talent Hub (RTH) and Technology Startup Support Scheme for Universities (TSSSU) support
- Winner, HKUST-Sino One Million Dollar Entrepreneurship Competition 2023
- Winner, JumpStarter Global Pitch Competition 2023
- Gold Medal, 48th Geneva International Exhibition of Inventions 2023
- Gold Medal, Silicon Valley International Invention Festival 2024

2022

Allegrow Biotech founded

2024

Established research HQ at Hong Kong Science Park

2025

Launched RUO products
Aim-Tconv
Aim-NK

2026

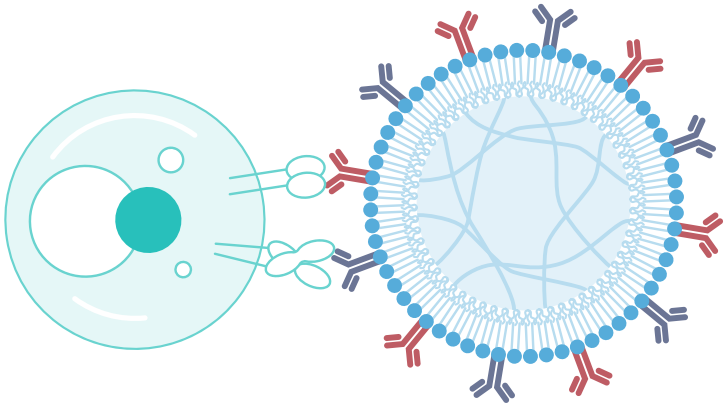
Expand sales to UK, North America, Japan, and other regions

AimGel™ A modular artificial cell platform

Biomimetic design

AimGel™ artificial cells are designed from the ground up to mimic natural antigen presenting cells (APCs). The soft hydrogel core replicates the mechanical stiffness and size (~10-15 µm) of real cells, while a mobile lipid bilayer coating allows activation signals to move freely across the surface — just as they would on a natural APC membrane.

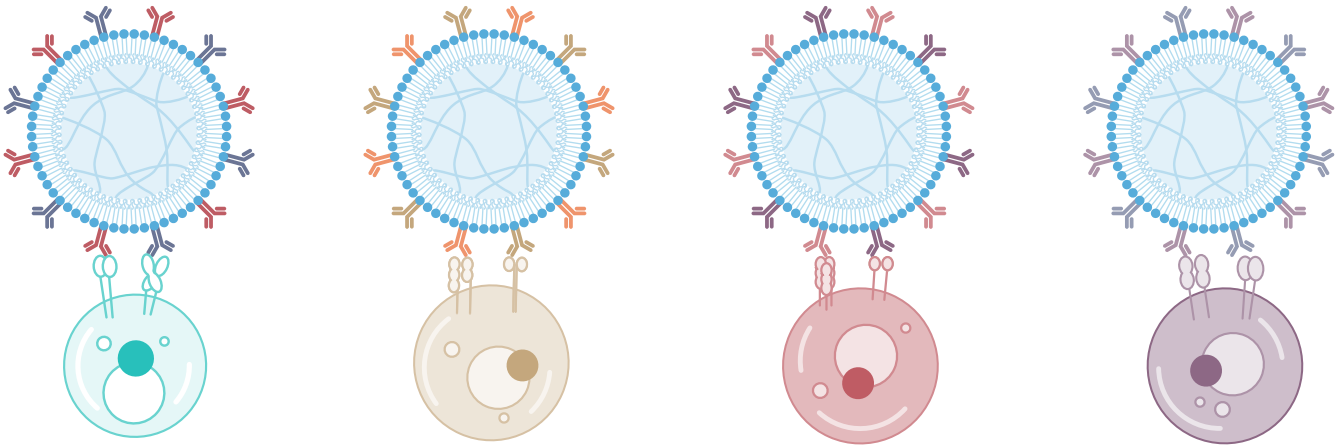
This biomimetic design delivers measurable advantages: AimGel™ requires significantly fewer activation signals than rigid magnetic microplastic beads while achieving more effective yet gentler activation. The result is higher cell expansion, better viability, and reduced exhaustion — cells remain responsive and can be re-stimulated.



One platform, unlimited applications

AimGel™'s core advantage is its modular design. Degradation kinetics, bead size, and signal loading capacity are all chemically tuneable, giving you precise control over activation parameters. Load different signals for different experimental needs — currently optimised for T cell and NK cell activation, with a Treg solution coming soon.

The platform adapts to your research: adjust activation duration, coordinate with lentiviral transduction timing, or engineer entirely new signal combinations. One flexible platform, configured for your specific application.



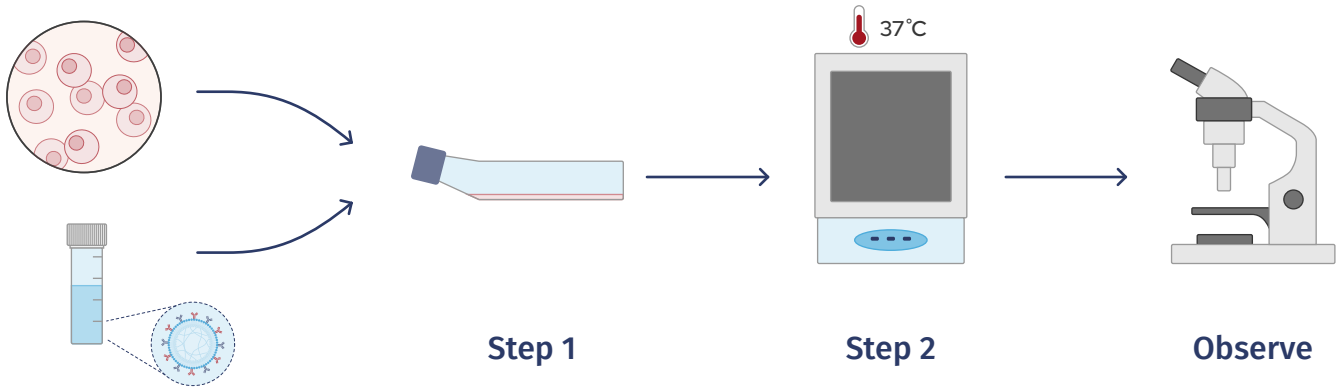
Fewer steps, focus on what matters

Skip isolation steps

Whether you're starting with PBMCs or isolated cells, AimGel™ activates both efficiently, achieving >90% activation in your target cell population.

Easy removal, on your terms

AimGel™ artificial cells self-degrade at a pre-programmed timepoint or degrade on-demand with enzyme treatment—maintaining full cell viability either way.

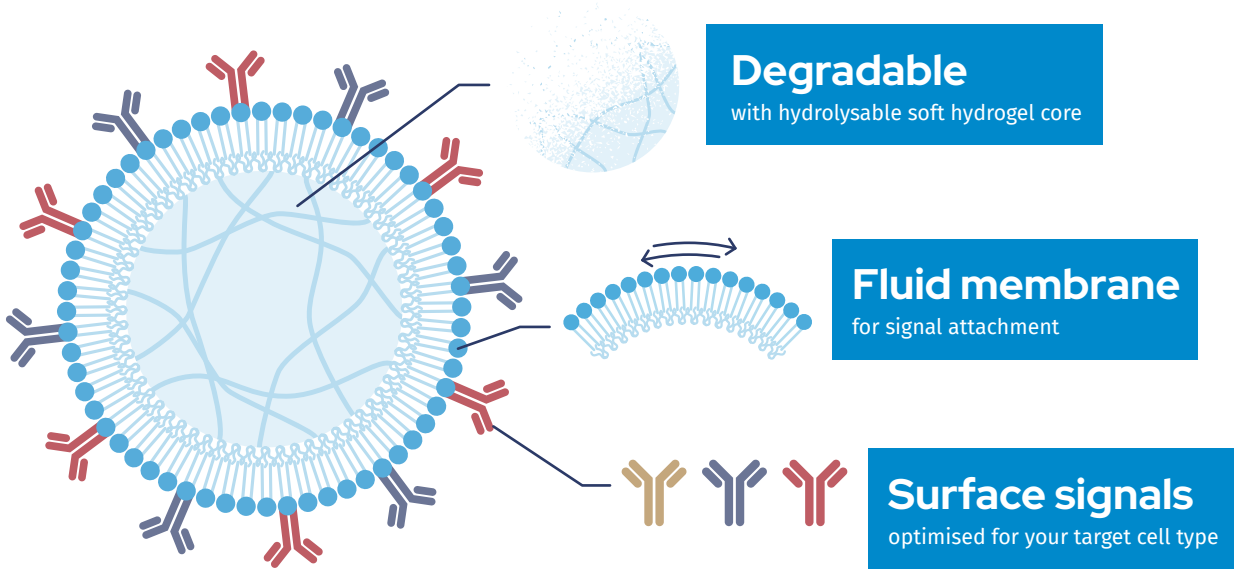


Step 1	Suspend AimGel™ with cells in culture vessel according to ratio
Step 2	Incubate in your incubator of choice
Observe	Cells enter log growth phase the next day

You could also re-stimulate the cells according to your needs

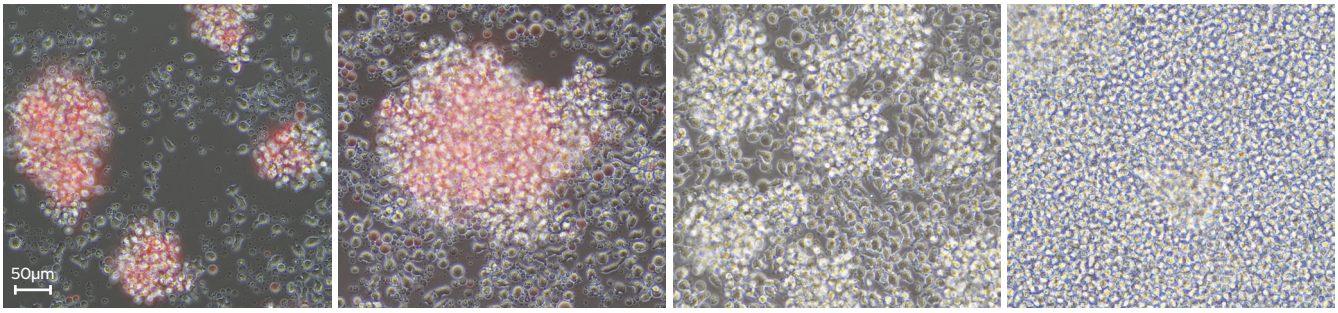
Defined, consistent, compliant

AimGel™ is 100% synthetically derived with fully defined structures and ratios. No animal components means no batch-to-batch variability — just consistent, reproducible activation you can rely on for every experiment.



AimTconv T cell activator

Catalogue No. ATC01-0050H



Day 2
T cells form clusters with Aim-Tconv (dyed in red)

Day 3
T cell/Aim-Tconv clusters grow

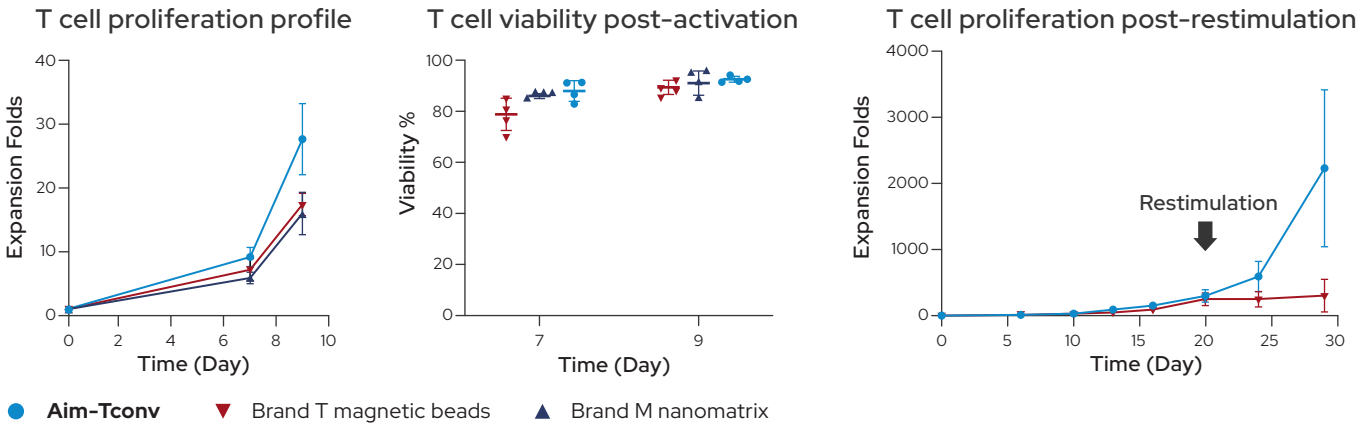
Day 5
Aim-Tconv self-degrade, T cell/Aim-Tconv clusters dissociate

Day 7
Aim-Tconv fully degraded, releasing T cells

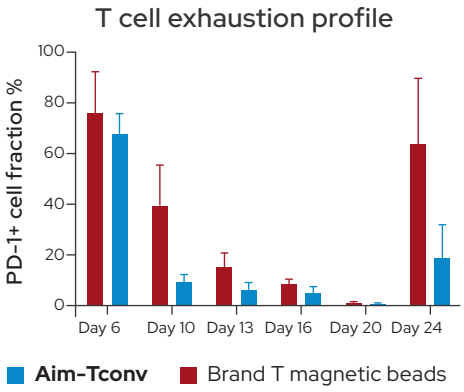
Aim-Tconv is an efficient T cell activation and expansion system built on AimGel™'s biomimetic lipid membrane and self-degrading hydrogel technology. Unlike traditional magnetic microplastic beads, Aim-Tconv eliminates the need for bead removal procedures and works directly with PBMCs — streamlining your workflow from sample to expansion.

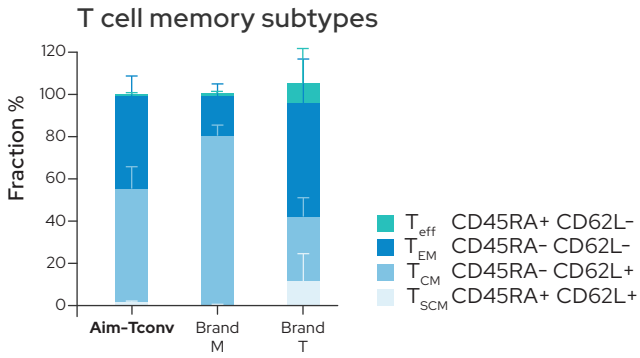
The formulation is 100% serum-free and chemically defined, with zero animal-derived components. The fluid lipid membrane structure dynamically mimics the natural immune synapse, delivering gentler yet highly potent activation signals.

Aim-Tconv outperforms conventional aCD3/aCD28 microbeads in activation efficiency while promoting central memory T cells (Tcm) and effector memory T cells (Tem) subtypes, enhancing T cell persistence and functional capacity.

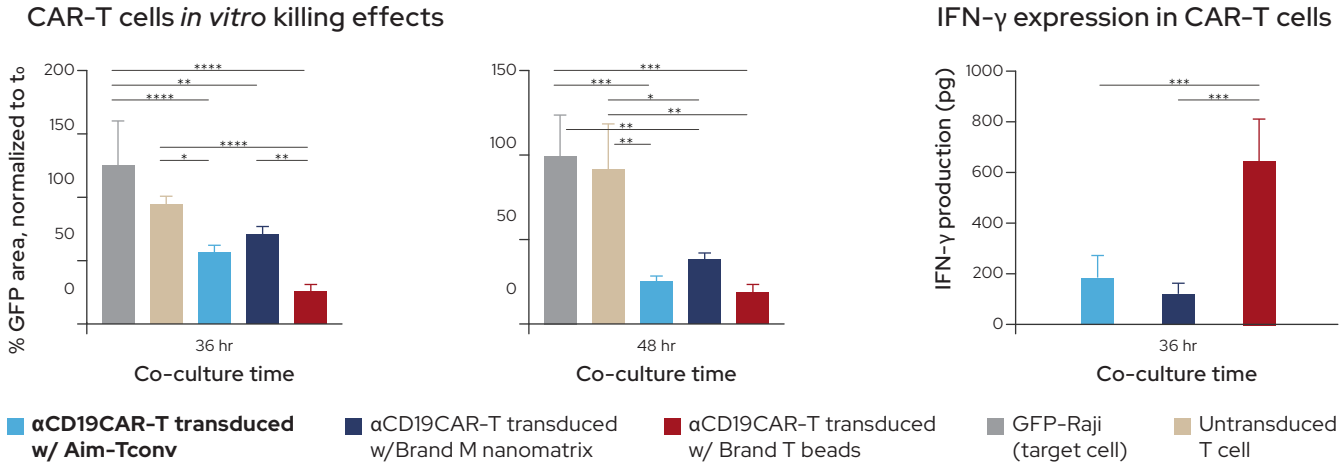


T cell expansion with Aim-Tconv compared to magnetic beads (Brand T) and nanomatrix (Brand M). Aim-Tconv delivers superior expansion and viability, with gentler activation that enables re-stimulation for extended culture.



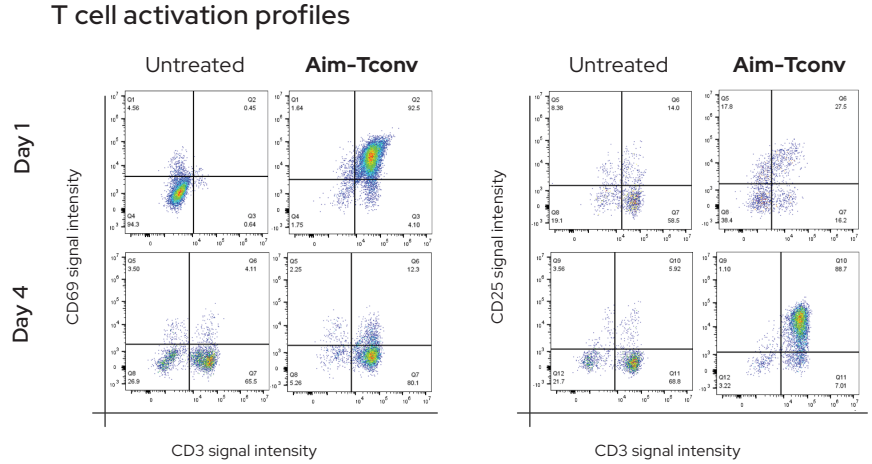


T cell exhaustion and memory subtype distribution following PBMC activation. Aim-Tconv enables faster recovery from exhaustion versus magnetic beads (Brand T) and produces balanced Tcm/Tem populations compared to both magnetic beads (Brand T) and nanomatrix (Brand M).



Left panels 1-2: CAR-T cell-mediated killing of GFP+ Raji cancer cells assessed by fluorescence microscopy during co-culture.
Left panel 3: IFN-γ secretion quantified by ELISA in supernatants from CAR-T and Raji co-cultures over 0-36 hours. Statistical analysis by one-way ANOVA.

CAR-T cells activated with Aim-Tconv show equivalent tumour killing to Brand T beads with reduced IFN-γ production, lowering cytokine storm risk.



T cell activation with Aim-Tconv. Expression of early-stage (CD69) and late-stage (CD25) activation markers on T cells from healthy donor PBMCs, gated against unstimulated T cells.

AimNK NK cell activator

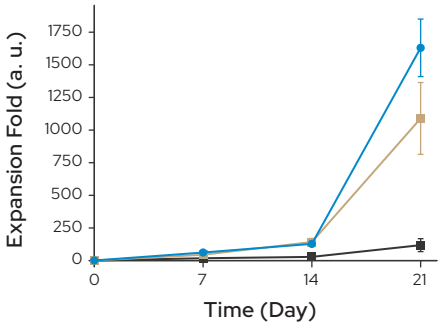
Catalogue No. ANK01-0050H

Aim-NK is a high-efficiency NK cell activation and expansion system built on AimGel™'s biomimetic lipid membrane and self-degrading hydrogel technology. Unlike microplastic beads that require removal steps or coated well-plates that need preparation, Aim-NK is simple: just add to your culture and expand—no prep, no cleanup, no debeading. Aim-NK works directly with PBMCs, eliminating time-consuming cell isolation steps.

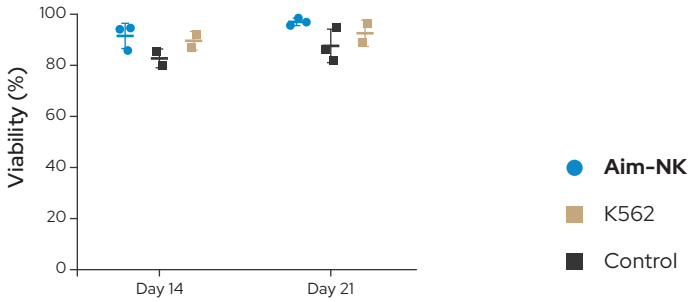
Aim-NK is media-agnostic, working seamlessly with standard RPMI or specialised NK media formulations. This flexibility lets you boost NK expansion performance by simply adding Aim-NK artificial cells with the medium of your choice.

The formulation is 100% serum-free and chemically defined, with zero animal-derived components. Aim-NK outperforms basic feeder cell systems in activation efficiency while maintaining viability and purity. The gentler activation also enables re-stimulation for extended expansion.

Total cell proliferation profile

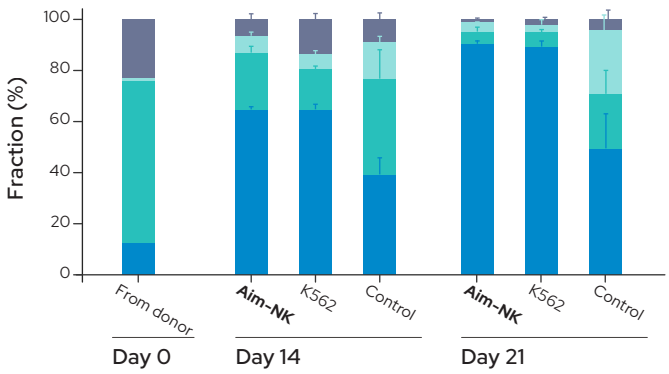


NK cell viability post-activation



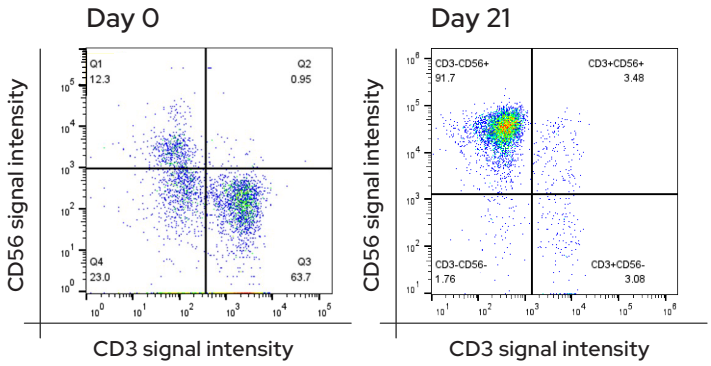
Unlike other synthetic NK activation solutions, Aim-NK outperforms K562 feeder cells in expansion efficiency, achieving 1,630-fold total cell growth with viability comparable to feeder cell-activated populations.

NK cell fraction

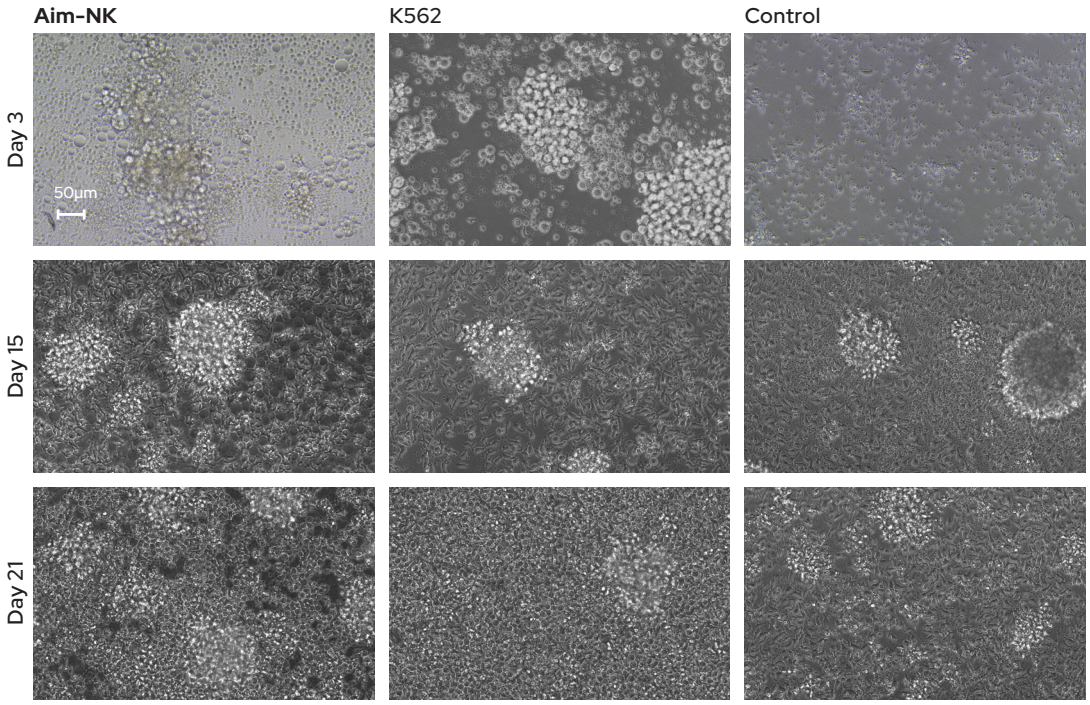


Starting from PBMCs, Aim-NK achieves 90% NK cell purity by Day 21—equivalent to 11,019-fold NK cell expansion.

NK cell activation profiles using Aim-NK

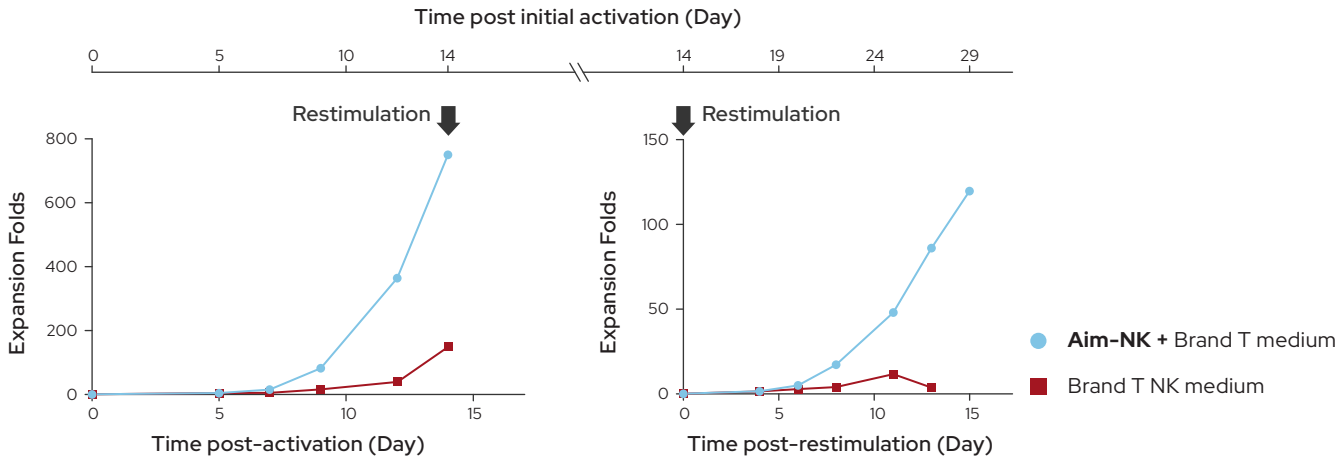


Flow cytometry showing enrichment of NK cells (CD3- CD56+) following Aim-NK activation from PBMCs.



NK cell growth over 21 days visualised by brightfield microscopy. In Aim-NK cultures, NK cells form clusters around the artificial cell beads (visible as regular spheres). Compared to K562 feeder cell activation and unstimulated controls.

NK expansion over initial activation and restimulation



Aim-NK's gentler activation allows NK cells to be re-stimulated for continued expansion. Data shown using Aim-NK with Brand T NK medium.

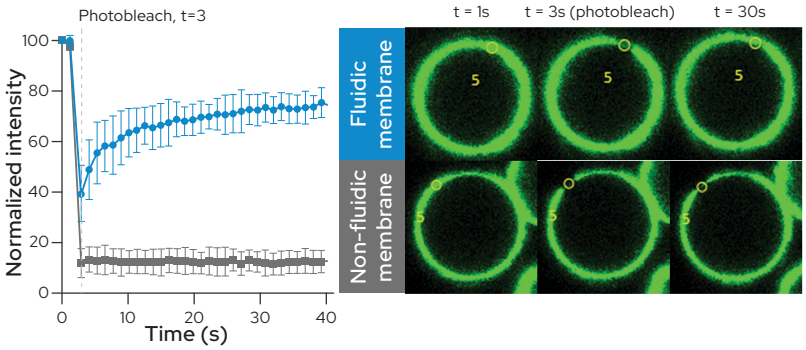
AimCore Blank Artificial Cells

Aim-Core is the essence of our technology, AimGel™ artificial cells with a blank canvas for you to dock any signals onto the surface for cell-like presentation. All signals are welcome as long as they are biotinylated, and attach to the artificial cells via simple mixing. This makes Aim-Core perfect for investigating niche cell subtypes, workflows or even species, where generic labels like T cells or NK cells do not suffice. We offer a selection of Aim-Core beads to give users choices in persistence in the culture media (degradability), signal loading capacity (avidin amount) and membrane fluidity. Aim-Core is the ultimate platform for users to explore cell-signalling interactions with unprecedented biomimicry while maintaining a simple mix-and-grow workflow.

Just like its signal-decorated brethren of Aim-Tconv and Aim-NK, the Aim-Core formulation is 100% serum-free and chemically defined, with zero animal-derived components.

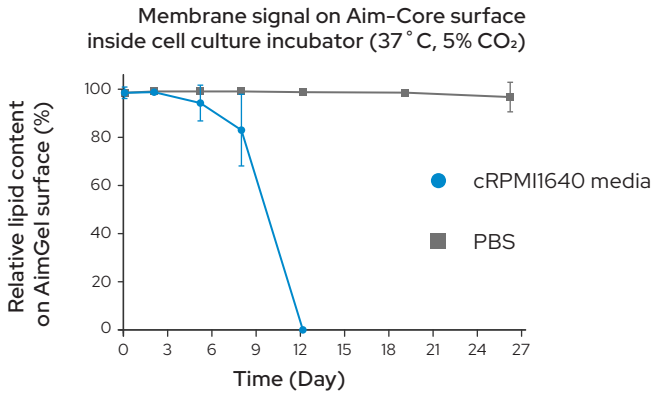
Degradability	Membrane Fluidity	Avidin Amount	Catalogue No.
Transient/Self-degrading 7-10 days in RMPI, 37˚C, 5% CO_2	Low fluidity	Low ~ 4000/μm²	AVI01-0100
		Medium ~ 14500/μm²	AVI02-0100
		High ~ 44000/μm²	AVI03-0100
	High fluidity	Low ~ 4000/μm²	AVI04-0100
		Medium ~ 14500/μm²	AVI05-0100
		High ~ 44000/μm²	AVI06-0100
Persistant >60 days in RMPI, 37˚C, 5% CO_2	Low fluidity	Low ~ 4000/μm²	AVI07-0100
		Medium ~ 14500/μm²	AVI08-0100
		High ~ 44000/μm²	AVI09-0100
	High fluidity	Low ~ 4000/μm²	AVI10-0100
		Medium ~ 14500/μm²	AVI11-0100
		High ~ 44000/μm²	AVI12-0100

Membrane fluidity



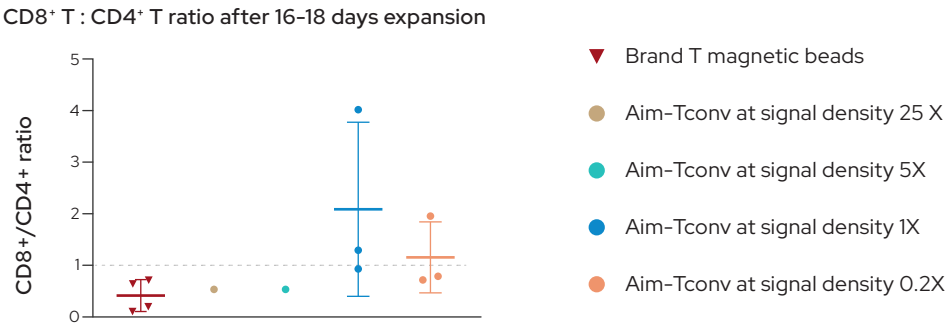
FRAP (fluorescence recovery after photobleaching) demonstrating membrane fluorescence signal recovery and hence mebrane fluidity of the AimGel artificial cell platform.

Degradability

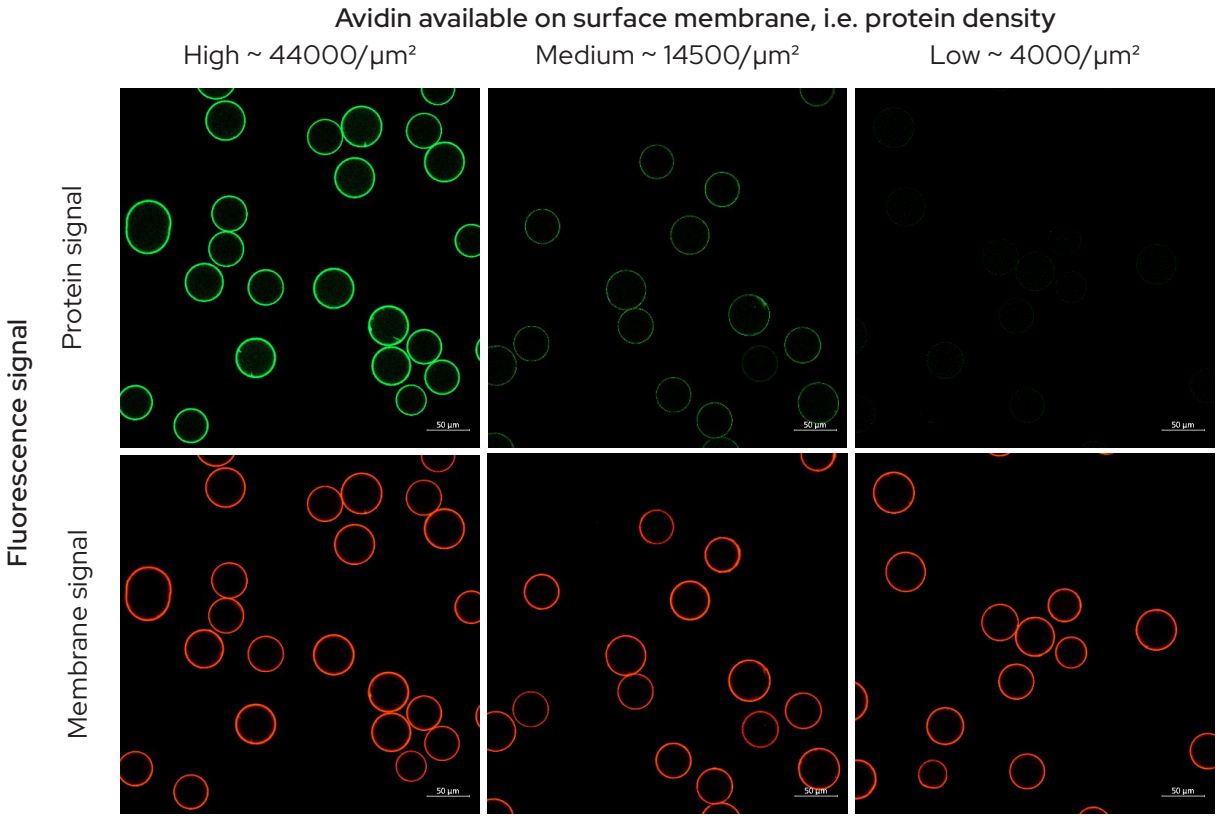


AimGel artificial cells hydrolyses in slightly acidic culture conditions, and the hydrolysis time is adjusted by our chemical formulation. Here, we showcase the formula for transient Aim-Core artificial cells, which maintain >80% integrity till Day 8, and are completely degraded by Day 12. All AimGel artificial cells could aso be removed by the addition of enzymes.

Signal loading capacity



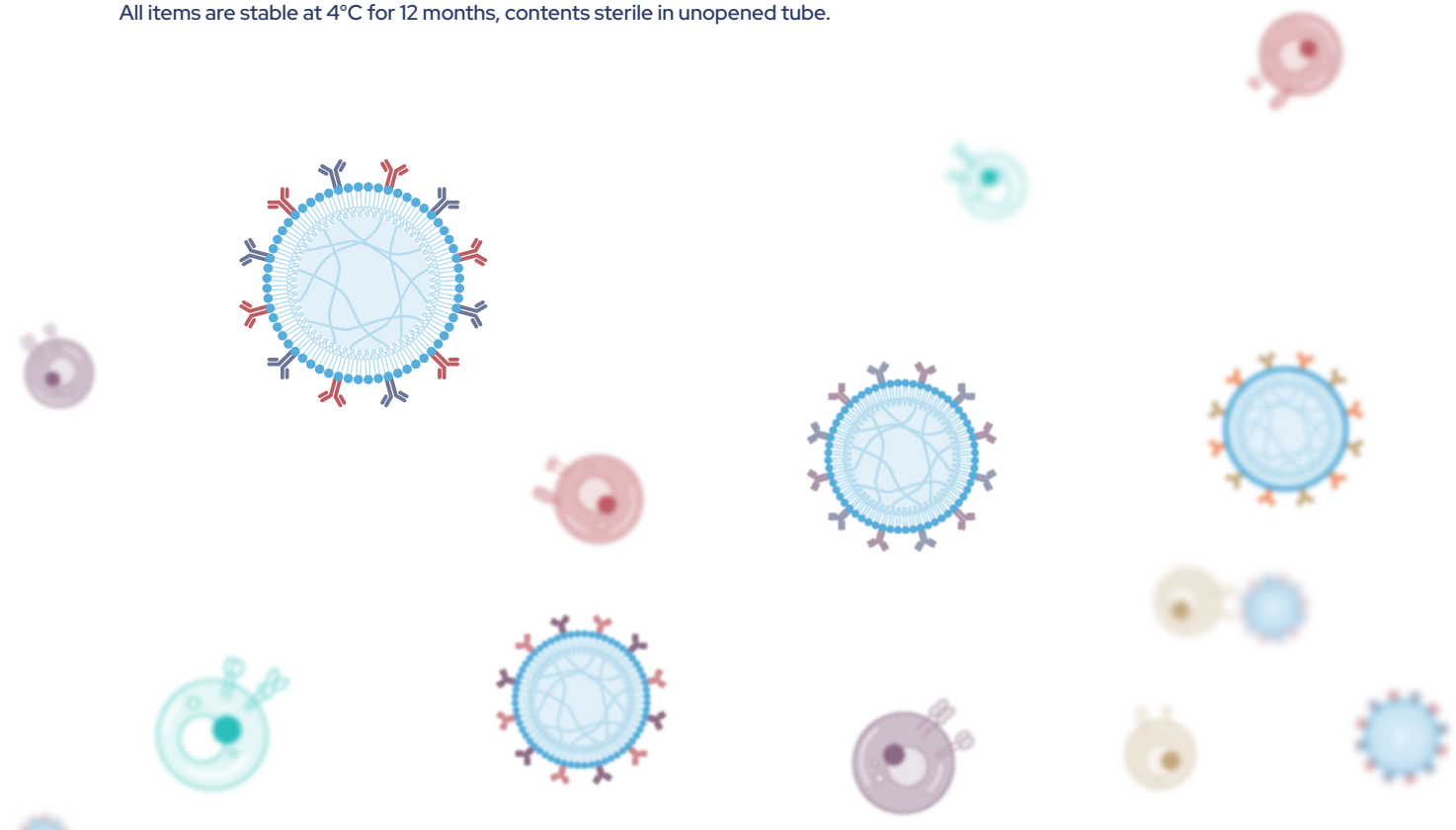
The signal loading capacity, defined by the amount of avidin on the surface membrane, controls the signal density of the attached surface signals. This is shown to have a direct effect on the phenotypic subtypes of the activated cells. Here, T cells are activated with the same base Aim-Tconv signal panel, but at different overall signal densities. Higher densities skew the population towards CD4⁺ helper T cells, while lower signal densities skew towards CD8⁺ cytotoxic T cells.



Allegrow Catalogue

Product	Category			Vol.	Catalogue No.
Aim-Tconv	Human T cell activator			0.5 mL	ATC01-0050H
Aim-NK	Human NK cell activator			0.5 mL	ANK01-0050H
Aim-Core	Transient/ Degradable	Low membrane fluidity	Low avidin	1.0 mL	AVI01-0100
			Medium avidin	1.0 mL	AVI02-0100
			High avidin	1.0 mL	AVI03-0100
		High membrane fluidity	Low avidin	1.0 mL	AVI04-0100
			Medium avidin	1.0 mL	AVI05-0100
			High avidin	1.0 mL	AVI06-0100
	Persistent	Low membrane fluidity	Low avidin	1.0 mL	AVI07-0100
			Medium avidin	1.0 mL	AVI08-0100
			High avidin	1.0 mL	AVI09-0100
		High membrane fluidity	Low avidin	1.0 mL	AVI10-0100
			Medium avidin	1.0 mL	AVI11-0100
			High avidin	1.0 mL	AVI12-0100

All items are stable at 4°C for 12 months, contents sterile in unopened tube.



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