

# THERAPEUTICS

# **Investor Presentation**

Virtual Healthcare Conference

March 2024

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### Arovella's strengths

### Off-the-shelf iNKT Cell Platform

Developing off-the-shelf iNKT cell therapies to target blood cancers and solid tumour cancers

### Lead Product Advancing to Clinic

ALA-101, a potential treatment for CD19-expressing blood cancers, is progressing to Phase 1 clinical trials, expected to commence in 2024

### Addressing Key Unmet Need

ial treatment Our iNKT cell platform is ng blood well positioned to solve ssing to key challenges that als, hamper the cell therapy ence in sector

#### Strategic Acquisitions

Focused on acquiring innovative technologies that strengthen the iNKT cell therapy platform and align with core focus areas

### Strong Leadership Group

Leadership team and Board have proven experience in drug development, particularly cell therapies

#### Unique Value Proposition

Arovella is among few companies globally developing an iNKT cell therapy platform

# Arovella's iNKT cell strategy

Incorporating world class IP to target a range of tumour types

Foundation IP Unique process to transduce iNKT cells with a CAR and expand CAR-iNKT cells (licenced from Imperial College London)

#### Armouring technology Complementary technologies that improve the activity or persistence of iNKT cells (eg cytokine technology from UNC)

#### Novel CARs Unique moieties for targeting different cancers (eg CLDN18.2 mAb licenced from Sparx)

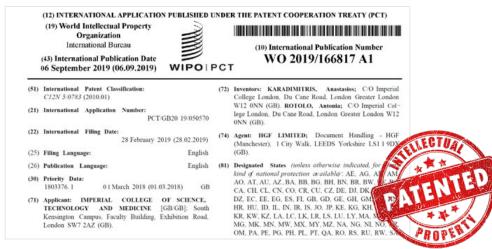
Regulatory strategy 12-year marketing exclusivity as a novel biologic drug, Orphan Drug Designation, Fast Track Designation, Paediatric Extension

#### **Know-How** Process-specific know-how and Trade Secrets



# Exclusive worldwide rights to granted patents

Further patent claims and applications actively being pursued



- Transduction and Expansion of Cells
- Patent life until 2038
- Method of manufacture, cell population claims
- Applicant: Imperial College of Science Technology and Medicine
- Granted in Europe, pending in Canada, Hong Kong, China and Australia
- Worldwide exclusive rights for human disease

	Paten Zhu et a	t Application Publicat	ion	<ul><li>(10) Pub. No</li><li>(43) Pub. Da</li></ul>		/0207857 Al Jul. 2, 2020
(54)	CLAUDIN METHOI	MOLECULES SPECIFIC FOR N 18.2, COMPOSITIONS AND IS THEREOF, FOR THE ENT OF CANCER AND OTHER S	(52)	CPC C (2013.0 2317/54 C07K	)1); C07K 2317/51 (2013.01); C07K 2317/622 (2013.0	13.01); <i>C12N 15/8</i> : 15 (2013.01); <i>C07R</i> 2317/51 (2013.01) 11); <i>C07K 2317/73</i> - 32 (2013.01); <i>C12N</i>
(71)	Applicant:	Sparx Therapeutics Inc., Mt. Prospect, IL (US)				<i>2317/55</i> (2013.01)
(72)	Inventors:	Guidong Zhu, Gurnee, IL (US); Jingdong Ye, Vernon Hills, IL (US); Jingdong Qin, Woodridge, IL (US); Jichun Ma, Germantown, MD (US)			ABSTRACT thods of making is bodies) or antiger	colated bindin as
(73)	Assignee:	Sparx Therapeutics Inc., Mt. Prospect, IL (US)	there disea	of useful as thera uses associated	apeutics for treating with cells expre	g and/or projection
(21)	Appl. No.:	16/727,554	esop	hageal cancer, pa	ted diseases such ancreatic cancer, lu	ung cancer at h
(22)	Filed:	Dec. 26, 2019			hepatic cancer, hea lder are described.	ad-neck can Also, described are
	Rel	ated U.S. Application Data			lations comprising	the described con

- Binding Molecules Specific for Claudin 18.2
- Patent life until 2038
- Composition of matter claims for a unique CLDN18.2 monoclonal antibody sequence
- Applicant: Sparx Therapeutics Inc.
- Granted in USA, pending in Europe, China, Japan and South Korea
- Worldwide exclusive rights for use in Cell Therapies

# **Financial overview**



ASX CODE	ALA
Market capitalisation <sup>1</sup>	\$143.4 million
Shares on issue	925.1 million
52-week low / high <sup>1</sup>	\$0.033 / \$0.185
Cash Balance (Dec 31 2023)	\$4.76 million
Major Shareholders Shareholder	Ownership (%) <sup>1</sup>
THE TRUST COMPANY (AUSTRALIA) LIMITED	56,186,926 (6.12%)
RICHARD JOHN MANN	50,905,657 (5.54%)
UBS NOMINEES PTY LTD	20,620,196 (2.25%)
BLACKBURNE CAPITAL PTY LTD	18,407,456 (2.00%)
DYLIDE PTY LTD	15,666,666 (1.71%)

1. As of 8 March 2024



ALA Price and Volume - 12 Months<sup>1</sup>



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# Recent cell therapy transactions<sup>1</sup>

Date	Type of deal	Acquirer/Licensee	Target/Licensor	Cell Type	Stage	Upfront (US\$M)	Milestones (US\$M)	Total deal value (US\$M)
Dec-23	Acquisition	AstraZeneca	GRACELL	T Cell	Phase 1b	\$1,000	\$200	\$1,200
Nov-23	Collaboration and investment <sup>2</sup>	AstraZeneca	celectis	Not specified	Platform	\$25	\$70-220 per product	
Aug-23	Licence <sup>3</sup>	IMUGENE Developing Cancer Immunotherapies		T Cell	Phase 1b	\$21	\$206	\$227
Aug-23	Strategic investment (ROFR) <sup>4</sup>	Astellas	THERAPEUTICS	T Cell	Phase 1	\$25	\$0	\$25
May-23	Licence	Janssen	Cellular Biomedicine Group	T Cell	Phase 1b	\$245	undisclosed	
Jan-23	Acquisition	AstraZeneca	neogene	T Cell	Phase 1	\$200	\$120	\$320
Oct-22	Development collaboration <sup>5</sup>	🚺 GILEAD	ARCELLX	T Cell	Phase 2	\$225	undisclosed	
Sep-22	Research collaboration	Genentech A Member of the Roche Group	-ArsenalBio	T Cell	Preclinical	\$70	undisclosed	
Aug-22	Licence & strategic collaboration	Roche	THERAPEUTICS	T Cell	Phase 1	\$110	\$110	\$220
Sep-21	Development collaboration	Genentech A Member of the Roche Group	<b>X</b> Adaptimmune	T Cell	Preclinical	\$150	\$150	\$300
Aug-21	Research collaboration	🚺 GILEAD		iNKT Cell	Preclinical	undisclosed	undisclosed	\$875
May-21	Acquisition	Athenex	<b>Kuur</b> THERAPEUTICS	iNKT Cell	Phase 1	\$70	\$115	\$185
Jun-21	Acquisition	eterna	X Novellus	Multiple	Preclinical	\$125	\$0	\$125

1. See the last slide for deal references

2. Cellectis will receive a US\$220m equity investment from Astra Zeneca plus tiered royalties. Milestones are payable for 10 products

3. Precision is eligible for double digit royalties on net sales and \$145 million in milestone payments and tiered royalties for additional programs

4. Poseida also received a US\$25m equity investment from Astellas

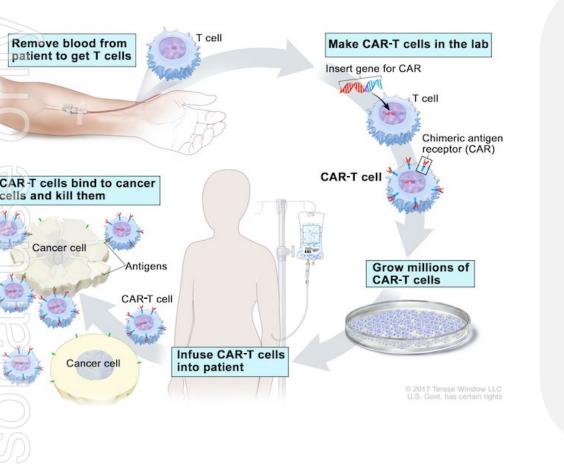
5. Arcellx also received a US\$100m equity investment from Gilead



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# How original CAR-T cell therapies work

CAR-T cell therapy is personalised medicine





### T cells = immune cell

T cells are a common type of immune cell that fight infections and can help fight cancer.

### T cells from patient 'reprogrammed'

To generate autologous CAR-T cells, T cells are taken from a patient with blood cancer and 'reprogrammed' to produce a Chimeric Antigen Receptor (CAR). The CAR can recognise cancer cells through a target antigen.



### CAR-T cells find & kill tumour cells

CAR-T cells are administered to the patient to find and kill the tumour cells. Once the CAR binds to a tumour cell, the CAR-T cell is activated to kill the tumour cell.



### Cell Therapy has revolutionised blood cancer treatment

CAR-T cells have demonstrated their curative potential in blood cancers



The Cell Therapy market is expected to reach \$61.2 billion by 2030<sup>1</sup>



### Cure

CAR-T cells have demonstrated ability to cure haematological cancers



### **Strong Sales**

**40-60%** Patients relapse post-CAR-T therapy<sup>2</sup>

Product	Approval Year	2023 Reveni
YESCARTA*     (axicabtagene ciloleucel)	2017	US\$1498m
(tisagenlecleucel)	union 2017	US\$509m
(idecabtagene vicleucel)	2021	US\$472m

- 1. https://www.businesswire.com/news/home/20230529005130/e n/Global-Cell-Therapy-Market-Report-2023-Advancements-in-Biotechnology-Drives-Growth----ResearchAndMarkets.com
- 2. Zinzi et al., 2023 Pharmacological Research 10.1016/j.phrs.2023.106742
- https://www.gilead.com/news-and-press/press-room/pressreleases/2024/2/gilead-sciences-announces-fourth-quarterand-full-year-2023-financialresults#:~:text=Yescarta%C2%AE%20(axicabtagene%20cilole ucel)%20sales,%E2%80%9D)%20outside%20the%20United% 20States.
- https://www.novartis.com/sites/novartis\_com/files/2024-01interim-financial-report-en.pdf
- https://news.bms.com/news/details/2024/Bristol-Myers-Squibb-Reports-Fourth-Quarter-and-Full-Year-Financial-Results-for-2023/default.aspx



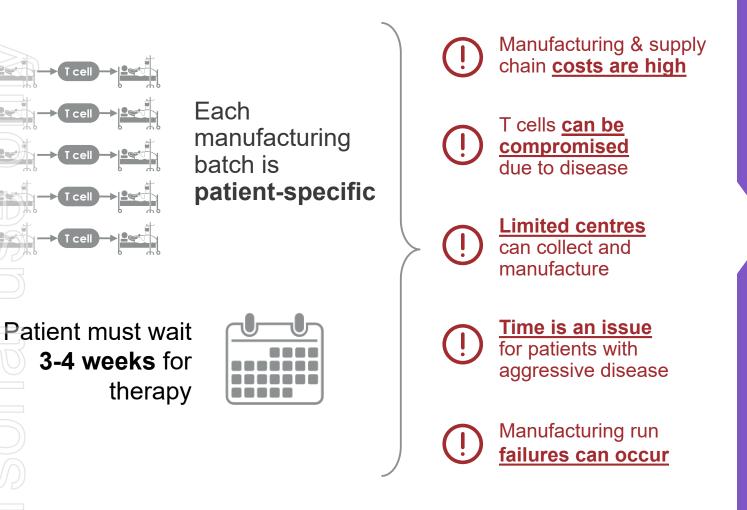


### Emily Whitehead - Celebrating 10 years of CAR-T cell therapy

https://emilywhiteheadfoundation.org/10-years-of-car-t/

# Autologous CAR-T pose challenges

The current manufacturing costs and time are limiting



# Allogeneic

**iNKT** 

cell

week

Patients ready to

dose within 1 week

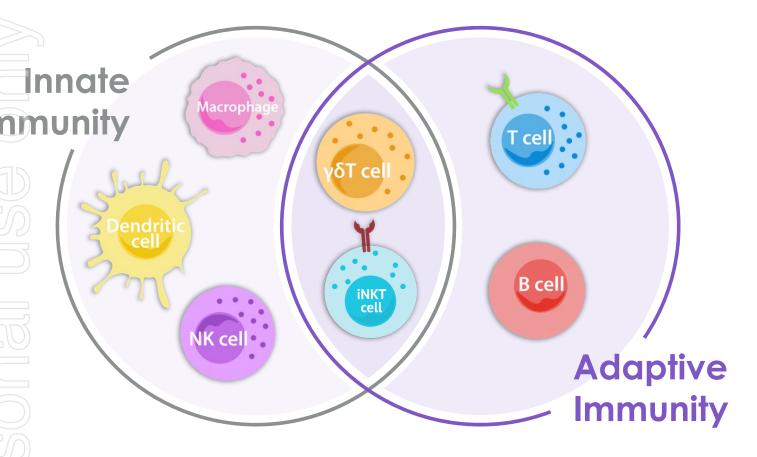
A single healthy donor batch = treatment for multiple patients

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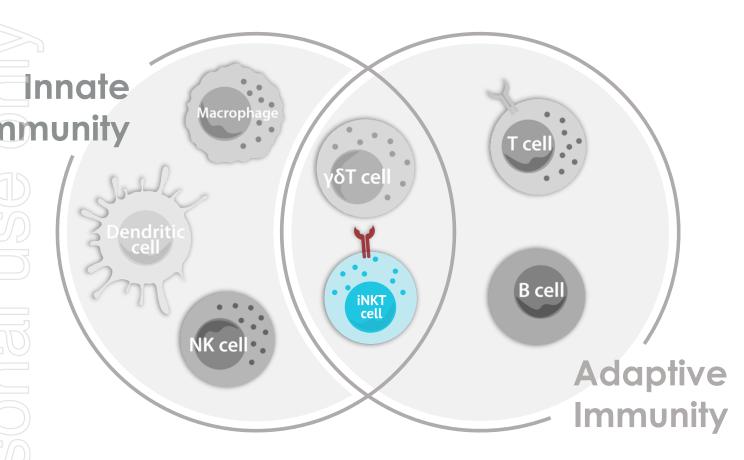
# Introducing invariant Natural Killer T (iNKT) cells

Bridging the innate and adaptive immune system



## iNKT cells represent a next-generation cell therapy

Properties make them ideal for use in cell therapy



### Strong safety profile

 Don't cause graft versus host disease (GvHD)

# Front line of the human immune system

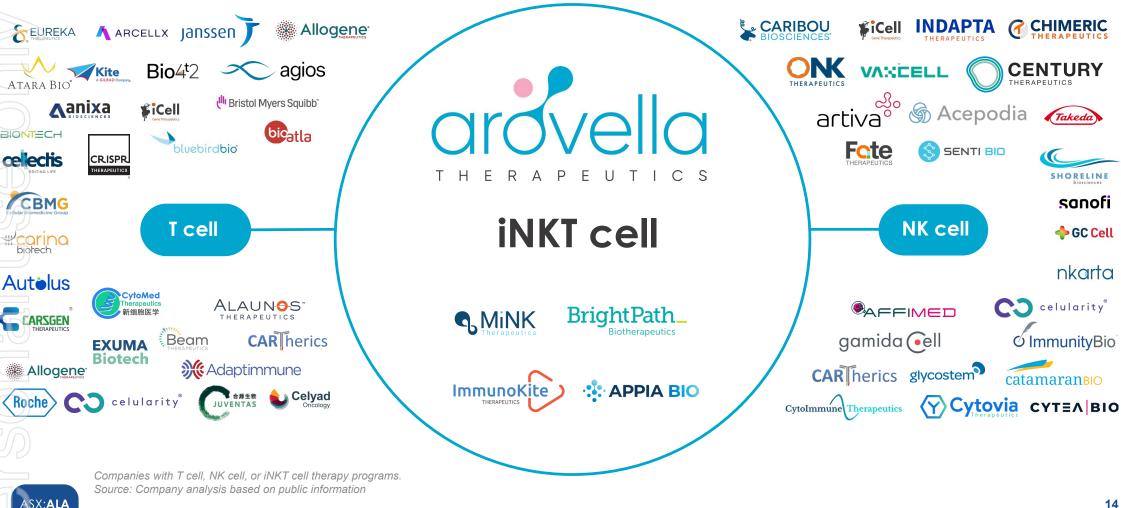
- Bridge innate & adaptive immune responses
- Contain both T cell & NK cell killing mechanisms
- Naturally target & kill cancers that express CD1d

# Multiple anti-cancer properties

- Shape the tumour microenvironment by blocking/killing pro tumour cells (TAMs/MDSCs)
- Infiltrate tumours & secrete signaling molecules to activate other immune cells to kill tumour cells

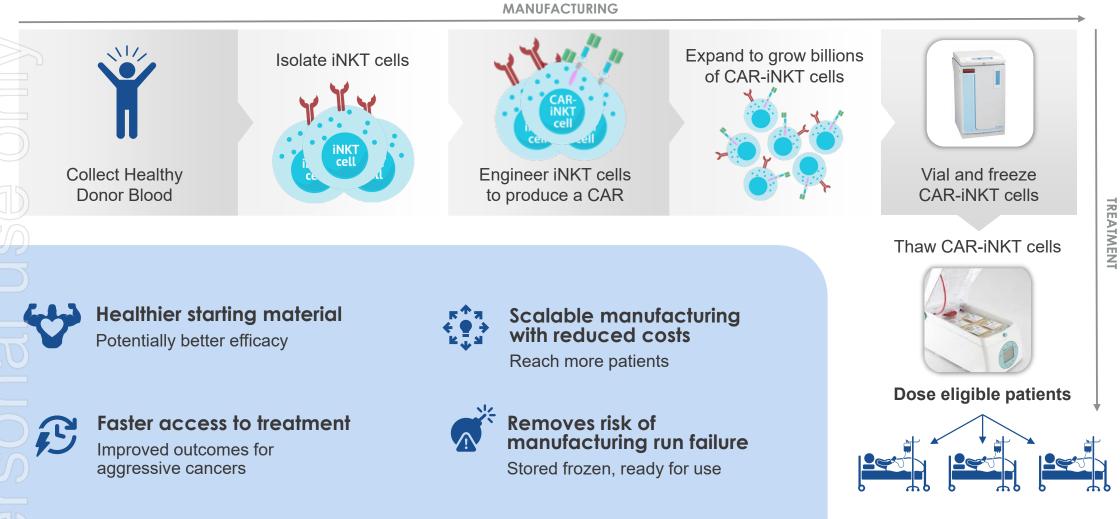
# A differentiated position

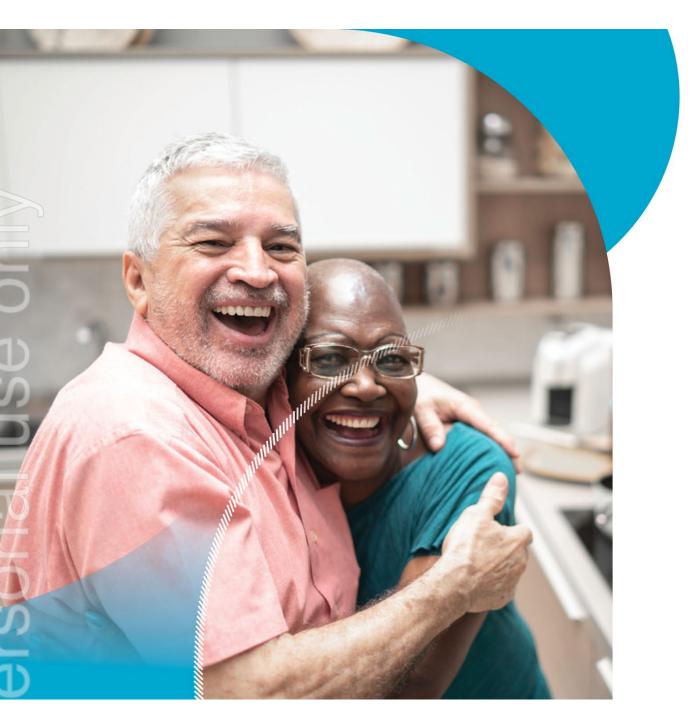
T cell and NK cell sectors are competitive



# CAR-iNKT cell therapy production advantages

Off-the-shelf manufacturing advantages





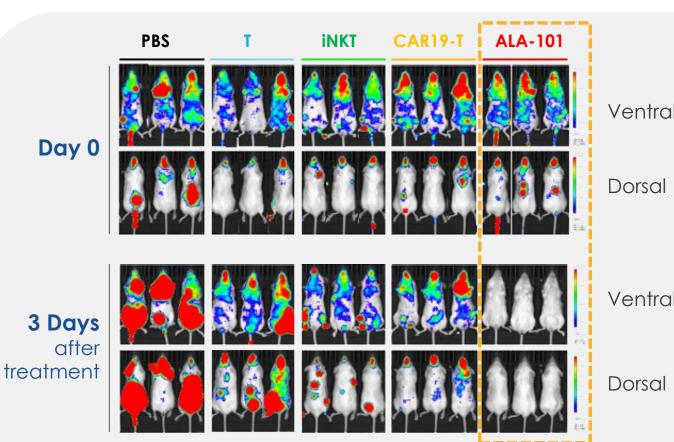
# ALA-101 (CAR19-iNKT cells)

A next generation **off-the-shelf** cell therapy for CD19 expressing cancers

# ALA-101: enhanced tumour killing in vivo

ALA-101 rapidly eradicates tumour cells in mice

- - Tumour cells expressing **CD19** and **CD1d** were intravenously delivered into mice
  - Mice were treated with:
    - PBS (saline)
    - Unmodified T cells (T)
    - Unmodified iNKT cells (iNKT)
    - CAR19-T cells
    - ALA-101 (CAR19-iNKT cells)
    - After three days, ALA-101 resulted in significant regression of tumour cells
    - In all other treatments, there was strong tumour cell persistence
    - ALA-101 displays swift action



Rotolo et al., Cancer Cell (20

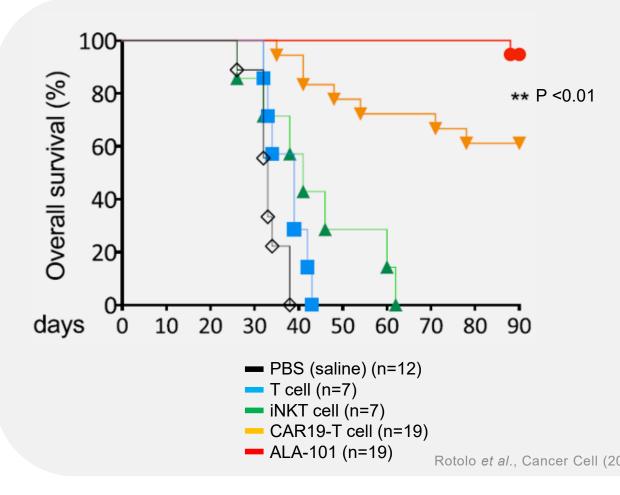
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# ALA-101: next generation cell therapy

ALA-101 significantly increased survival in mice versus treatment with CAR19-T cells

- Tumour cells expressing **CD19** and **CD1d** were intravenously delivered into mice
- Mice were treated with:
  - PBS (saline)
  - Unmodified T cells (T)
  - Unmodified iNKT cells (iNKT)
  - CAR19-T cells
  - ALA-101 (CAR19-iNKT cells)
  - After 90 days, only mice treated with CAR19-T cells or ALA-101 remained alive
  - 1.5x more mice treated with ALA-101 remained alive after 90 days relative to CAR19-T cells
  - ALA-101 has the potential to be an effective, off-the-shelf cell therapy for the treatment of CD19-expressing cancers



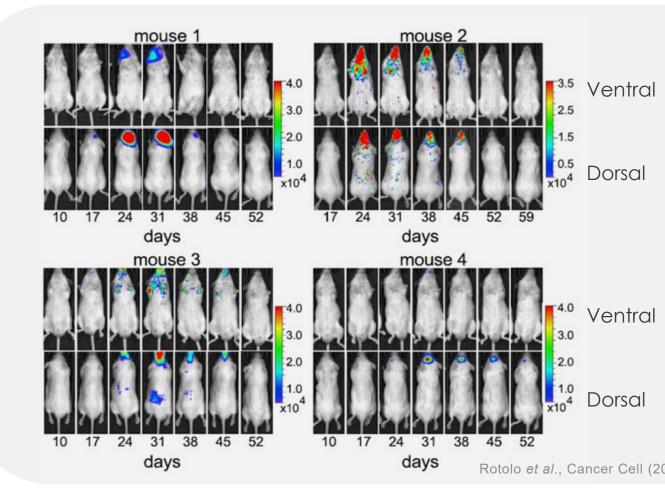




# ALA-101: spontaneous secondary remission

ALA-101 activity may persist to eradicate tumour cells following relapse

- Four mice treated with ALA-101
   had the cancer return to the brain
   In all four mice, the cancer was
  - In all four mice, the cancer was eliminated a second time with no additional dosing
  - This provides evidence that CAR19-iNKT cells can survive and continue to protect against cancer cells in vivo
  - Potential to use ALA-101 to treat central nervous system lymphoma or brain metastases



# Progress towards first-in-human clinical trials

ALA-101 data confirms activity and off-the-shelf capability

### Potent antitumour activity

Demonstrated efficacy of ALA-101 against CD19+ ymphomas and leukemias. Proof-of-concept data with clinical-designed lentiviral vector in animal models sing thawed, "off-the-shelf" ALA-101.

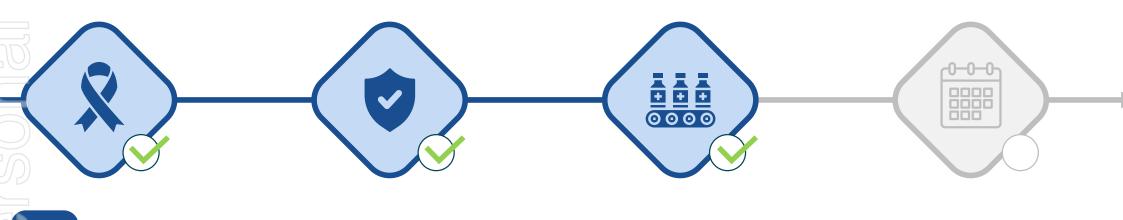
# Expected to be safe

iNKT cells have been shown in clinical trials not to cause graft versus host disease (GvHD) and the CD19 targeting CAR (FMC63) is a validated targeting agent in approved cell therapies.

# Multiple dose manufacturing

ALA has demonstrated that its manufacturing process can produce a high number of CAR+ cells with potent cell killing properties and has completed production of GMP-grade lentivirus for CD19 CAR expression. Phase 1 clinical trial anticipated CY 2024





# iNKT cells to target solid tumours

Arovella is implementing its strategy to target and kill solid tumours – 90% of newly diagnosed cancer cases<sup>1</sup>

https://www.cancer.gov/types/common-cancers



## Solid tumours pose challenges to cell therapies



Solid tumours are more difficult to treat with cell therapies



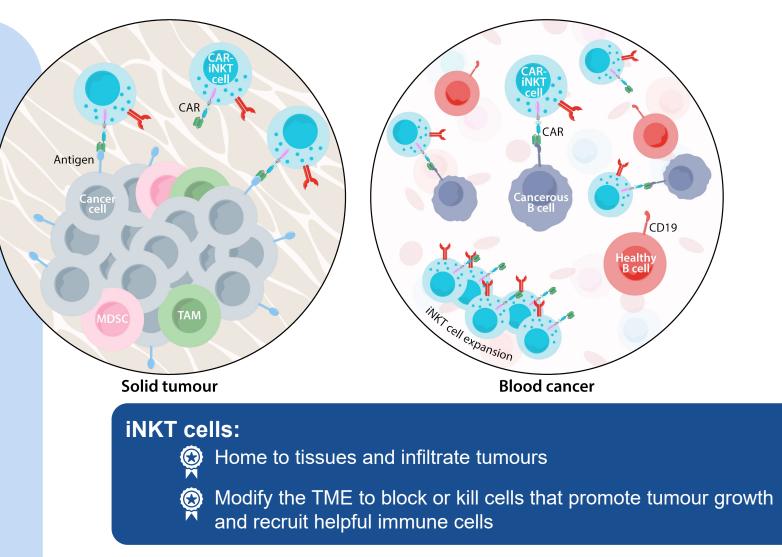
Access to tumour



Antigen specificity and uniformity

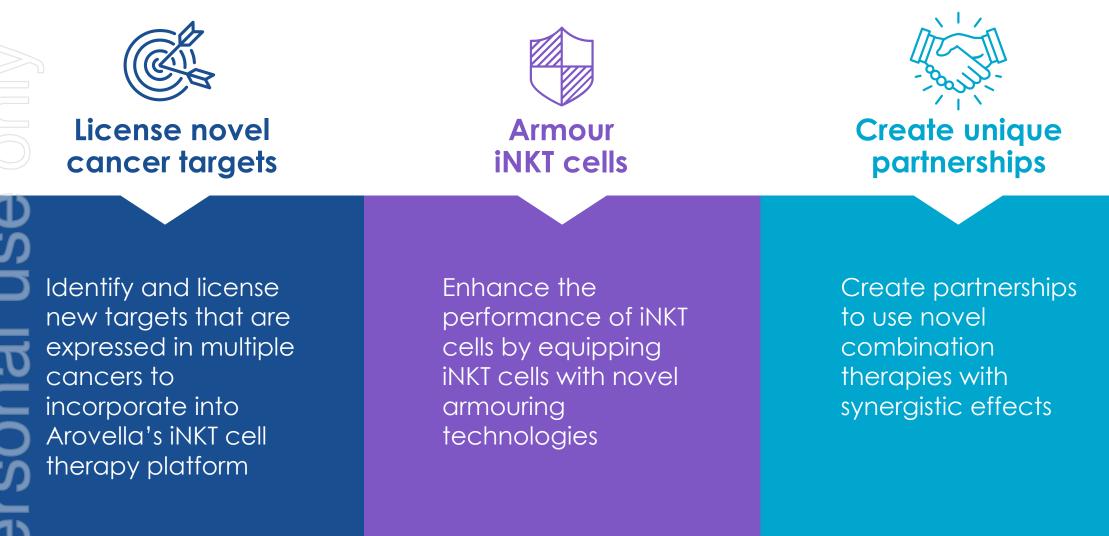


Tumour microenvironment (TME) contains cells that support cancer cell growth



# Arovella's strategies to combat solid tumours

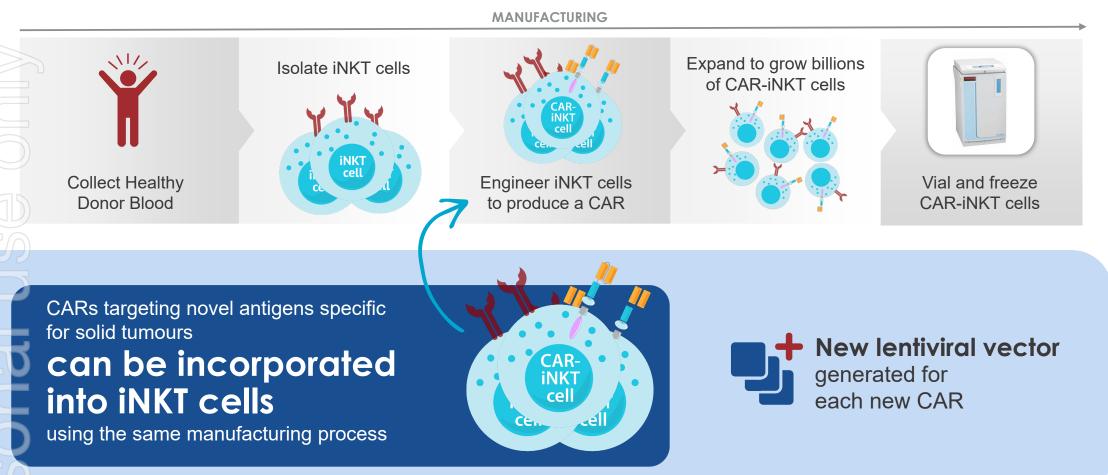
Arovella is using three approaches to expand the iNKT cell platform into solid tumours



# Add additional CARs for novel targets



Arovella's manufacturing process can be leveraged for multiple cancer types

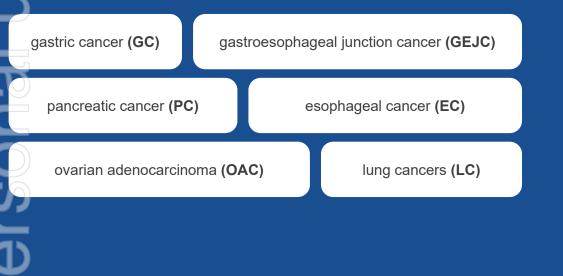




# Introducing Claudin 18.2 (CLDN18.2)

A promising solid tumour target

# CLDN18.2 overexpression has been identified in several types of cancers





### Validated target

with first monoclonal antibody expected to be **approved in 2024** 



### Gastric cancer market alone expected to reach \$10.7 billion by 2031<sup>1</sup>

1. https://www.alliedmarketresearch.com/gastric-cancer-market-A74458#:~:text=The%20global%20gastric%20cancer%20market,cells%20lining%20of%20the %20stomach

# "Armouring" CAR-iNKT cells

IL-12-TM (cytokine technology) enhances CAR-iNKT cell activity in solid tumours

CARiNKT cell IL-12-TM

# **IL-12-TM**

# IL-12-TM is a modified version of IL-12

with a membrane anchor that links it to the surface of CAR-iNKT cells. By linking it to the surface of iNKT cells, it can enhance CAR-iNKT cells without being released into the blood stream making it safer.

The IL-12-TM is incorporated into the lentiviral vector system and

does not require changes to the manufacturing process

### iNKT cells 🕂 IL-12-TM

Expand more and survive for longer than CAR-iNKT cells lacking the cytokine

### 10x more circulating CAR-iNKT cells

**CAR-INKT cel** 4 weeks after treatment in a mouse model

#### Superior anti-tumour activity

compared to CAR-iNKT cells lacking the cytoking

The technology has been published in the prestigious, peer reviewed journal, **Nature Communications** 

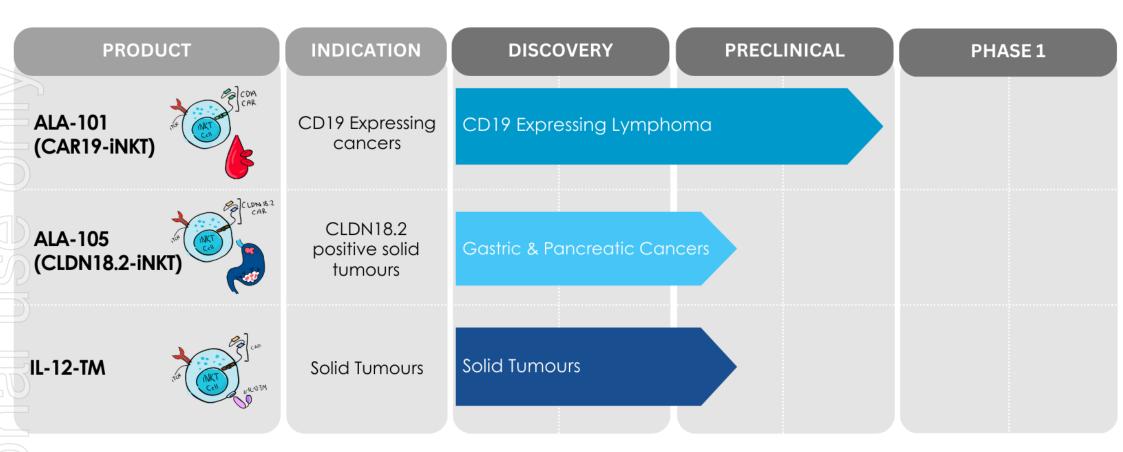
nature > nature communications > articles > article

Article | Open access | Published: 02 January 2024

IL-12 reprograms CAR-expressing natural killer T cells to long-lived Th1-polarized cells with potent antitumor activity



# Arovella's expanding pipeline



1024		July 024	Decer 202
ALA-101 (CD19)	<ul> <li>Complete cGMP manufacture for Phase 1 clinical trials</li> <li>Complete preparatory activities for Phase 1 study, including preparation of regulatory dossier, engagement with clinical sites and KOLs</li> </ul>		Commence Phase 1 for ALA-101 targeting CD19+ lymphoma and leukemia
ALA-105 CLDN18.2)	<ul> <li>Initiate proof-of-concept testing for CLDN18.2-iNKT cells to expand iNKT platform for treatment of solid tumours</li> <li>Optimise the CAR construct for robust efficacy</li> </ul>	•	Generate animal data for CLDN18.2 targeting CAR-iNKT cells against gastric cancer and/or pancreatic cancer Commence activities to manufacture ALA-105 for clinic (e.g. lentiviral vector)
IL-12-TM ntegration	<ul> <li>Integrate IL-12-TM into solid tumour programs and test its e</li> <li>Enter into a Sponsored Research Agreement (SRA) with Programs and test its experiment (SRA) with Programs and test its</li></ul>	-	



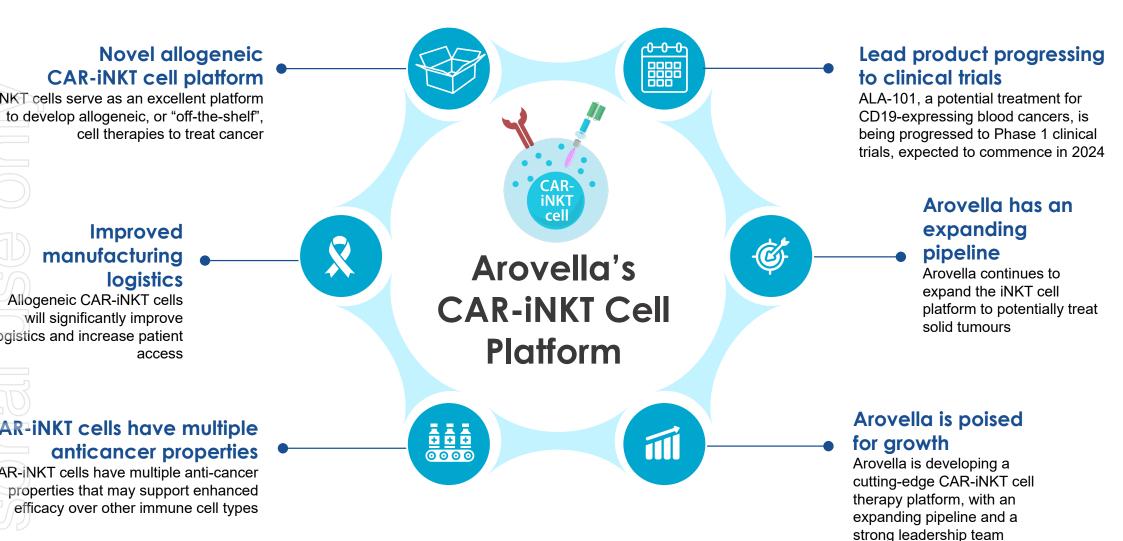
Expect to advance ALA-101 to Phase 1 first-in-human clinical trial during 2024

Dose escalation Phase 1 study in patients with CD19+ blood cancers

cGMP – Current Good Manufacturing Practice; KOLs – key opinion leaders



## Summary



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# THERAPEUTICS

# Thank You

### Dr. Michael Baker CEO & Managing Director

Email: investor@arovella.com Mobile: +61 403 468 187



# **Cell therapy deal references**

- https://www.astrazeneca.com/media-centre/press-releases/2023/astrazeneca-to-acquire-gracell-furthering-cell-therapy-ambition-across-oncology-and-autoimmune-diseases.html
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