

## **ANNUAL GENERAL MEETING**

Lindy Durrant, CEO Sally Adams, CDO

November 22

LSE: SCLP.L



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## Harnessing immunology to fight disease



## **USP: Targeting modified neo-antigens**

# Innovators in antibodies and vaccines

- Clinical stage company with two vaccine technology platforms and three vaccine products in clinical development
- Two antibody technology platforms with a deep preclinical pipeline
- Licensing deal with Genmab for one of our five mAbs – milestones of up to \$624m and single digit royalties

# Specialist investor backing and strong financial position

- Supported by specialist biotech investors (Redmile Group, Vulpes)
- £82m raised to date, £33m in the last 2 years
- Cash runway to Q1 2024

## **Experienced team**

- Experienced C-suite and board
- Expanding clinical development capability in-house to drive products forward
- Highly skilled team >50
   employees headquartered in
   Oxford with research labs in
   Nottingham have delivered
   four platforms creating multiple
   opportunities for proprietary
   projects and revenue generating deals

# Leveraging unique platforms to develop cutting edge products targeting modified neo-antigens



### Four platforms delivering differentiated products for large unmet markets

#### **ANTIBODIES**

Targeting glycans preferentially expressed on tumours

GlyMab<sup>®</sup> AvidiMab<sup>®</sup>

### Anti-glycan mAb x 4

Targeting pancreatic, colorectal, small cell lung (SCLC) and ovarian cancer

### Anti-glycan mAb x 1

Stimulating tumour infiltrating T cells

### **Antibody AvidiMab®**

Broad potential for enhancing potency of any monoclonal antibody (mAb)

#### Vaccine AvidiMab®

Broad potential for enhancing potency of vaccines

#### **VACCINES**

Stimulating potent killer T cells

### Moditope®

#### Modi-1

#### **Citrullination**

Phase 1/2 trial in triple negative breast (TNBC), ovarian, renal, head & neck cancer

#### Modi-2

#### Homocitrullination

Targeting breast, colorectal, non-small cell lung (NSCLC), prostate cancer

## ImmunoBody®

### SCIB1/iSCIB1+

Phase 2 trial in melanoma patients with immune checkpoint inhibitors

iSCIB1+ AvidiMab® modified multi-epitope vaccine

#### **COVIDITY**

Adapted for COVID-19 trial

## Validation of the GlyMab® platform by leading antibody Biotech



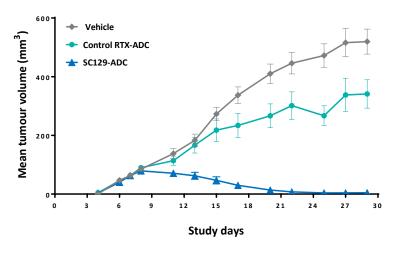
- ► SC129 mAb licensed to Genmab for antibody drug conjugates (ADC), T cell bispecifics (TCB) and radioimmunotherapy
- Upfront and milestone payments
- ► Milestones totalling up to \$624m, plus single digit royalties on sales
- ► Rights to SC129 for cell therapy products retained by Scancell



#### SC129 potential exemplified by internal and external preclinical studies

- ► SC129 binds strongly to pancreatic and colorectal tumours and has low expression on normal tissues
- ▶ Strong ADC activity demonstrated in vivo
- ▶ Direct and bystander killing demonstrated
- Activities confirmed during assessment by Genmab

#### ADC activity in colorectal tumour model



Tivadar et al., Mol Cancer Ther., 2020 Mar;19(3):790-801

# **Key clinical outcomes with current funding**



	Product	Indication	Research	Preclinical	Phase 1	Phase 2	Key outcomes
Vaccines	Modi-1	TNBC, ovarian, renal, head & neck					Safety & immunological data H2 2022 Efficacy data 2023/24
	Modi-2	Multiple, solid tumours					Enter the clinic H1 2024
	SCIB1/iSCIB1+	Late-stage melanoma					Completion of SCOPE trial H2 2024
	COVIDITY	Covid-19					Completion of the COVIDITY trial H1 2023
Antibodies	SC134 T cell bispecific	Small cell lung cancer					Enter clinic H1 2024
	SC2811 Stimulatory mAb	Any solid tumour					Lead candidate H1 2023
	GlyMab <sup>®</sup> Current & new	Multiple tumours					Validation and deals on current and new targets
<b>d</b>	AvidiMab®	Any mAb target					Licensing deals

# Clinically and commercially validated vaccine and antibody technology platforms with multiple value drivers



Four proprietary technology platforms delivering highly promising vaccine and antibody products: clinically validated by three vaccines in Phase 1/2 and a further oncology vaccine to enter Phase 1 in 2024

Vaccine portfolio has multiple near-term value inflection points, with **initial efficacy data** for Phase 2 oncology asset **expected in 2023** and a Phase 1 oncology asset with **early efficacy data expected in 2023** 

Deep pre-clinical pipeline of anti-cancer antibodies leveraged from two differentiated antibody platforms with broad commercial potential

Deep scientific and strategic validation of monoclonal antibody portfolio and Glymab® platform through \$624m¹ license agreement with leader in the field of antibody therapies for cancer, Genmab

Antibody discovery engine to fuel the future pipeline to be developed either internally or through codevelopment/licensing deals to drive further future value

Experienced leadership and skilled scientific teams with a **track record of delivering multiple 'in-house' and clinically and commercially validated assets** which are backed by blue chip healthcare specialist investors

(1) Potential milestone payments of up to \$208 million for each product developed and commercialised with up to a maximum of \$624 million if Genmab develops and commercialises products across all defined modalities

Vaccines targeting stress induced post translational modifications



# Vaccines: targeting modified neo-antigens to drive tumour-killing T cell responses



- ► Challenge with current cancer vaccines is that they stimulate low avidity T cells that fail to kill cancer cells
- ► Scancell's solutions are Moditope® which stimulates potent killer CD4 T cells against modified tumour neoepitopes and ImmunoBody® that stimulates potent (high avidity) killer CD8 responses in melanoma

### **Moditope® vaccines**

• Significant increase in survival seen after vaccination in preclinical models

#### Modi-1

- Citrullinated peptides for TNBC, head and neck, ovarian, renal cancers
- Phase 1/2 study actively recruiting in UK

#### Modi-2

- Homocitrullinated peptides for multiple solid cancers
- Preclinical development underway

## ImmunoBody® vaccines

 Cancer associated T cell epitopes engineered into a human antibody framework to make genetic antigen/antibody complex

#### SCIB1/iSCIB1+

- SCIB1 Phase 2 clinical trial with immune checkpoint inhibitor ongoing in melanoma
- iSCIB1+ enhanced with AvidiMab® technology plus additional epitopes to broaden response and extend patent protection

#### **COVIDITY**

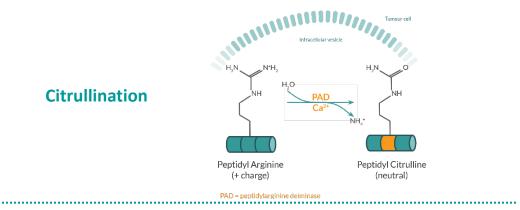
- Differentiated COVID-19 vaccine with needle-free delivery
- Phase 1 trial recruitment completed in South Africa

# **Moditope® targeting stress-induced citrullinated neo-antigens**

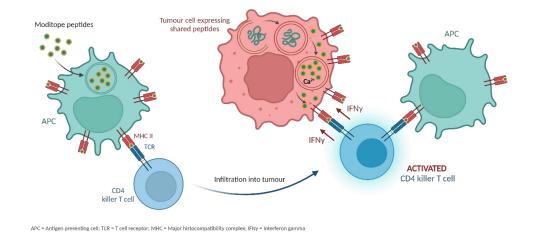


## Vaccines targeting citrullination in cancer unique to Scancell (strong patent position)

- ► The alteration of proteins due to enzymatic (PAD) conversion of arginine residues to citrulline
- ► Citrullination occurs as a result of autophagy induced in stressed cells, including cancer cells
- Citrullination protects from proteolytic cleavage and creates neo-epitopes
- ► Inflammation induces MHC class II expression and presentation of the citrullinated epitopes
- Modi-1 product consists of:
  - ► Two citrullinated vimentin peptides
  - One citrullinated enolase peptide
  - Conjugated to Amplivant® adjuvant to boost immune response



#### Mode of action



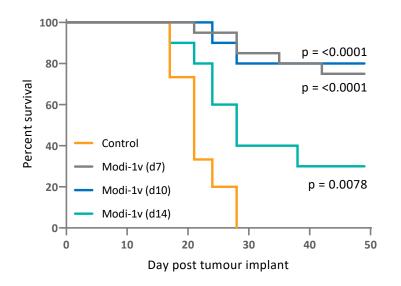
Brentville et al., J Immunother Cancer 2020, 8(1):e000560

## Modi-1 vaccine is effective against advanced tumours



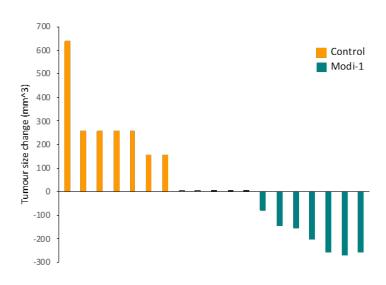
- ▶ B16cDR4 tumours established in HLA-DR4 transgenic mice (d1)
- ► Modi-1v (two vimentin peptides) plus adjuvant administered on d7, d10 or d14
- ▶ 30-80% of animals treated survived
- Survival in treated groups statistically significant

A single dose of Modi-1 results in significant survival response even against d14 tumours



- ▶ B16iDP4 tumours established in DP4 transgenic mice (d1)
- ► Modi-1 peptides plus adjuvant administered when tumours reach more than 5 x 5 mm in size
- Tumour regression seen within 4 days of Modi-1 vaccination
- ► Correlates with rapid & potent immune responses

Modi-1 causes regression of established tumours within 4 days of immunisation

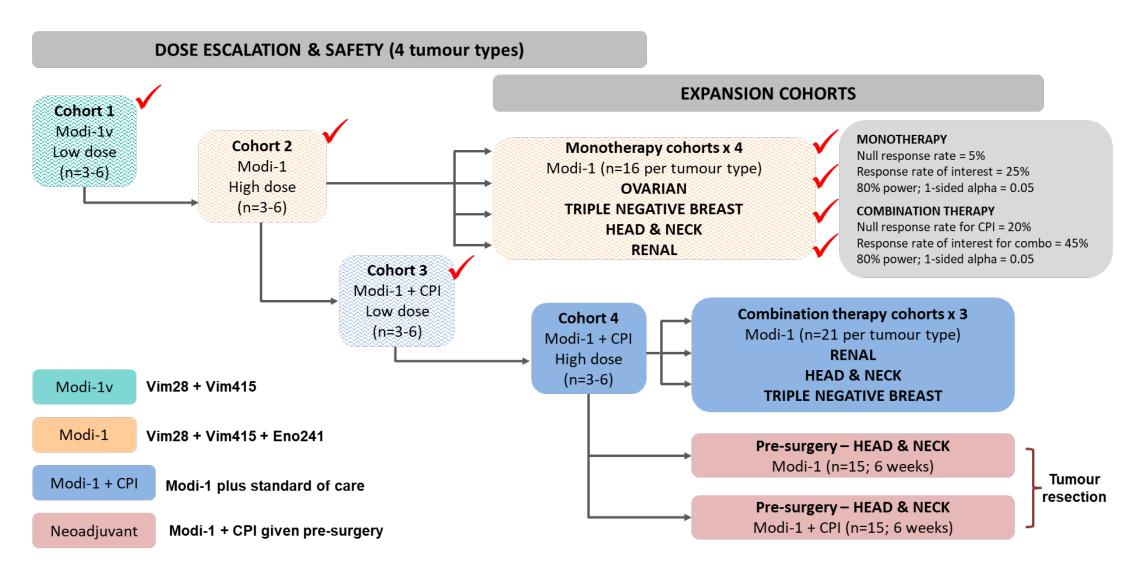


Brentville et al., Cancer Research 2016, 76(3):548-60

Brentville et al., J Immunother Cancer 2020, 8(1):e000560

# ModiFY Phase 1/2 trial actively recruiting patients in four tumour indications in the UK





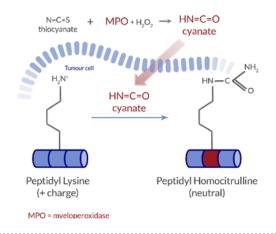
# Moditope® targeting stress-induced homocitrullinated modified neo-antigens-Modi-2



Vaccines targeting homocitrullination in cancer unique to Scancell (strong patent position)

#### **Homocitrullination**

- ► Alteration of proteins via carbamylation which converts lysine residues into homocitrulline
- Carbamylation is mediated by myeloperoxidase which is produced by immune cells, including myeloid-derived suppressor cells found in the tumour microenvironment
- Homocitrullination results in a change in charge, ultimately generating unique T cell epitopes
- Modi-2 targeting breast, colorectal, non-small cell lung and prostate cancer



#### Modi-2

- ► Four homocitrullinated peptides from:
  - Aldolase A
  - ► Immunoglobulin binding protein (BiP)
  - Cytokeratin 8
  - Vimentin

Modi-2
Formulation Development



## In-house formulation works speeds development timelines



- ▶ Outsourcing of all drug manufacturing process development is time-limiting and expensive
  - ► Contract negotiations time-consuming
  - ► Slot availability for small-scale and large-scale batches restrictive
  - ► Lack of flexibility particularly for challenging products
  - ► Potential to reduce timelines and costs



HLPC – peptide purification; DNA analysis





Peptide synthesizer

Rotary evaporator – solvent removal

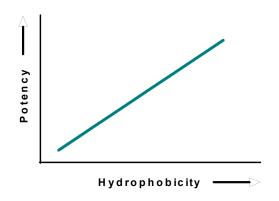
## **Modi-2 formulation development**



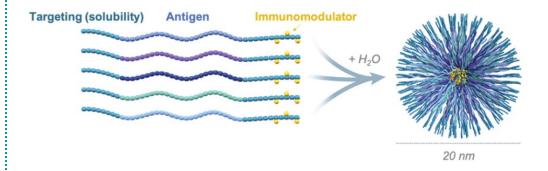
## SNAPvax<sup>™</sup> technology licensed from Vaccitech plc

### **Challenges**

- ► Strong bias toward hydrophobic amino acids at T-cell receptor contact residues within immunogenic epitopes (Chowell et al., 2015)
- Hydrophobic peptides have challenging synthetic properties



#### **Nanoparticle formation**



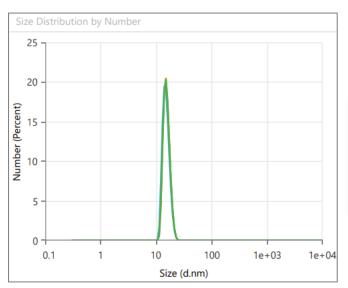
- Four homocitrullinated peptides
  - Each individual peptide conjugate synthesized
  - ► Mixed together
  - Diluted in different buffers
  - Assessed for particle formation and filterability

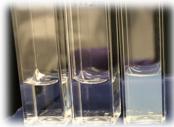
## **Modi-2 nanoparticles**



#### SNAPvax™ formulation

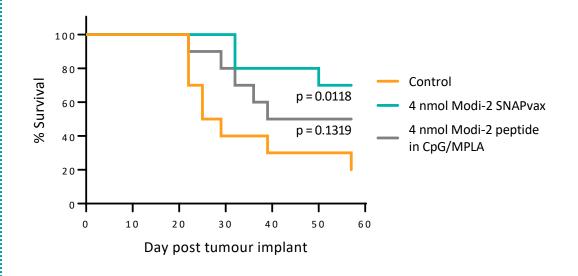
- ► Four peptide conjugates combined to produce mosaic particles
- ▶ Nanoparticles formed with consistent 17 nm diameter
- Buffer formulation identified for clear solution





#### Modi-2 SNAPvax™ particles mediate tumour therapy

- Balb/c mice injected with 4T1 tumour cells
- ► Tumours allowed to develop for 4 days
- ► Treated with Modi-2 SNAPvax<sup>™</sup> mosaic particles or Modi-2 peptides mixed with CpG/MPLA adjuvant
- ▶ 70% of animals treated with Modi-2 SNAPvax<sup>™</sup> particles survived



# ImmunoBody®



# SCIB1 – Phase 1/2 reduced recurrence and turned cancer into a chronic disease

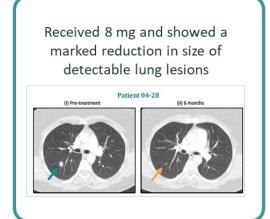


### 88% of patients remained disease-free for 5+ years

Two stage III/IV patients (of 15) had a measurable reduction in tumour size following treatment

Seven had stable disease for 16+ weeks

#### PATIENT #1



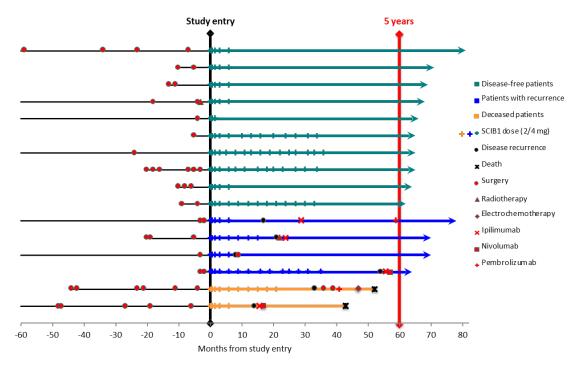
#### PATIENT #2



Patients with tumour present at study entry

#### 14/16 patients with resected tumours were disease free after 5 years

#### Only four had additional treatments following recurrence



Patients without tumour present at study entry

Patel et al., Oncoimmunology, 2018 7(6):e1433516

## Transition from SCIB1 to iSCIB1+ to increase potency



## Needle-free delivery, improved vaccine without HLA restriction

- ▶ Phase 2 SCOPE trial actively recruiting patients with metastatic melanoma receiving checkpoint inhibitor
- Transitioned from electroporation to PharmaJet needle-free delivery
- ► Recruitment remains challenged by HLA-A2 restriction (40% of patients)

- ▶ iSCIB1+ increases the potency of SCIB1
- ▶ iSCIB1+ includes multiple epitopes so it can be used to treat all patients
- ► Has AvidiMab® modification to enhance efficacy and extend patent life
- ► Aim to include in SCOPE trial in 2023



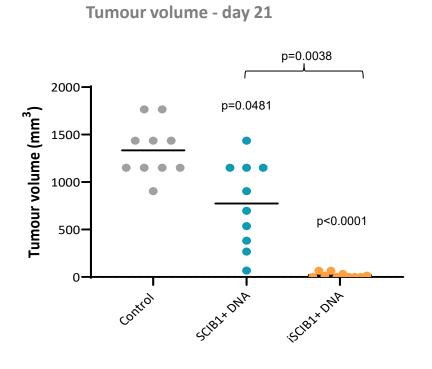


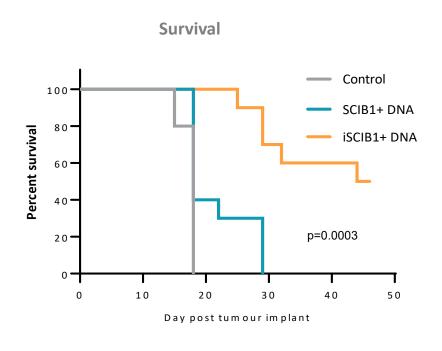


# iSCIB1+ reduces tumour volume and increases survival compared to SCIB1+ in preclinical model



- ▶ B16 tumours established in C57Bl mice (day 1)
- ▶ iSCIB1+ or SCIB1+ (no AvidiMab®) administered on d3, d11 and d18
- ▶ 50% of iSCIB1+ animals treated survived
- Survival in treated groups statistically significant compared to control





Unique antibodies targeting glycan modifications



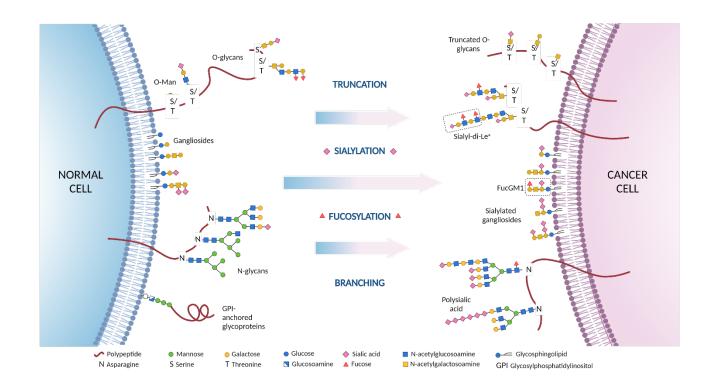
# **GlyMab®** – unlocking the value of tumour glycans



- ► Scancell is one of a few companies in the world able to make high affinity, humanised/human IgG anti-glycan antibodies
- ► Portfolio of patent protected anti-glycan antibodies with excellent specificity, binding strongly to tumours and showing restricted normal tissue expression

#### **Current GlyMab® assets**

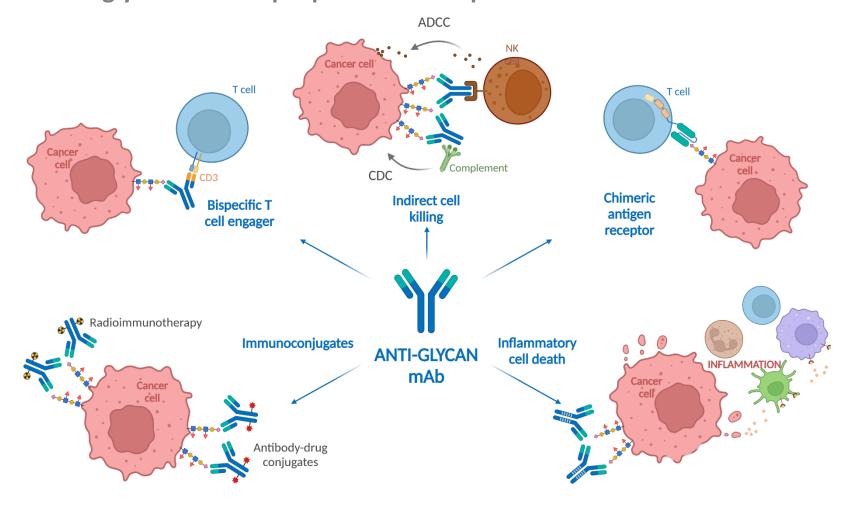
SC129	<ul> <li>Genmab licensed asset</li> <li>Sialyl-di-Lewis<sup>a</sup></li> <li>Pancreatic cancer</li> </ul>
SC134	<ul><li>TCB lead target</li><li>Fucosyl GM1</li><li>Small cell lung cancer</li></ul>
SC2811	<ul><li>Stimulatory mAb target</li><li>SSEA4</li><li>Any solid tumour</li></ul>
SC88	<ul> <li>Lewis<sup>acx</sup></li> <li>Colorectal cancer</li> </ul>
SC27	<ul> <li>Lewis<sup>y</sup></li> <li>Ovarian cancer</li> </ul>



## Each antibody can be developed into multiple products



## Expression of same glycan on multiple proteins and lipids

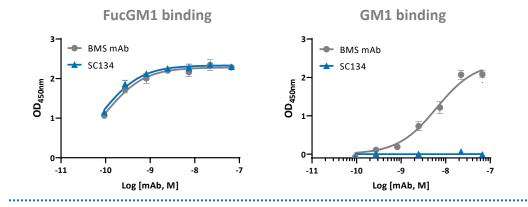


NK cell = natural killer cell; ADCC = antibody-dependent cellular cytotoxicity; CDC = complement-dependent cytotoxicity

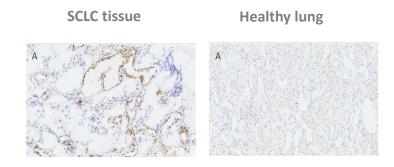
## SC134 – a highly specific antibody targeting small cell lung cancer



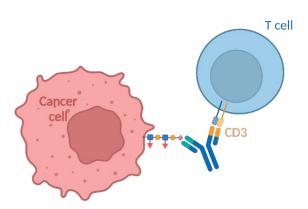
# No cross reactivity with GM1 expressed on neuronal cells SC134 compares favourably to BMS mAb



#### Excellent specificity – binds to SCLC but not any healthy tissue Immunohistochemistry on frozen tissue

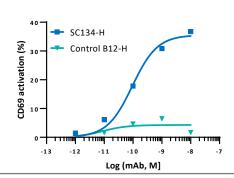


#### SC134 linked with scFv fragment of CD3 mAb – lead clinical candidate

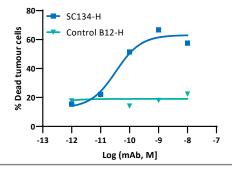


#### SC134-H activates T cells and kills tumour cells

Picomolar activation of T cells



SC134-H mediates T cell tumour killing

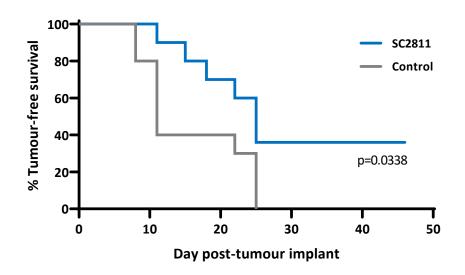


# iSC2811 – costimulates TILs resulting in anti-tumour immunity and enhances T cell engraftment for CAR-T development

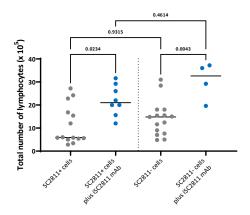


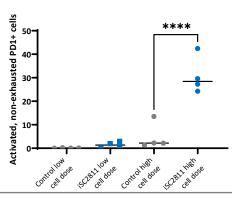
Ultraspecific SSEA4 mAb – lead AvidiMab® modified clinical candidate

SC2811 mediates tumour-free survival in preclinical models



iSC2811 enhances T cell engraftment and prevents exhaustion Potential for improving CAR-T approaches



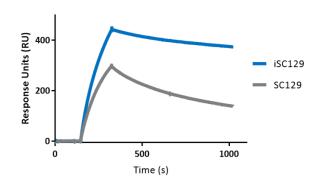


# AvidiMab® – a proprietary platform for enhancing the avidity of any antibody

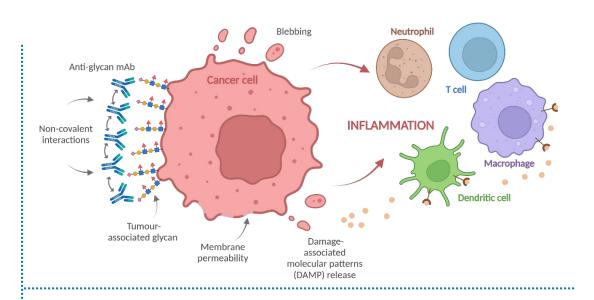


- Enhances avidity by promoting Fc-Fc interactions
- ▶ Reduces off-rate → increased affinity
- ► Increases direct cell-killing
- ► Potential to improve the therapeutic index of any monoclonal antibody
- Patent protected

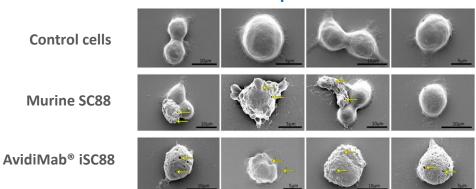
AvidiMab® modification of SC129 reduces the off-rate



Vankemmelbeke et al., Cancer Res., 2020 Aug 15;80(16):3399-3412



#### **SC88** induces pore formation



## **Summary**



# Current

 Delivered three vaccines into the clinic and an antibody deal in last 12 months

# **Future**

- Clinical validation of vaccine assets
- Require further funding to clinically validate antibody assets

# Prospects

 Multiple opportunities for further deals and products from our four platforms

# Thank you

www.scancell.co.uk

