

**UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
Washington, D.C. 20549**

FORM 8-K

**CURRENT REPORT
Pursuant to Section 13 or 15(d)
of the Securities Exchange Act of 1934**

Date of Report (Date of earliest event reported): April 20, 2023

Sensei Biotherapeutics, Inc.
(Exact Name of Registrant as Specified in its Charter)

Delaware
(State or Other Jurisdiction
of Incorporation)

001-39980
(Commission
File Number)

83-1863385
(IRS Employer
Identification No.)

1405 Research Blvd, Suite 125
Rockville, MD
(Address of Principal Executive Offices)

20850
(Zip Code)

Registrant's telephone number, including area code: (240) 243-8000

Check the appropriate box below if the Form 8-K filing is intended to simultaneously satisfy the filing obligation of the registrant under any of the following provisions:

- Written communications pursuant to Rule 425 under the Securities Act (17 CFR 230.425)
- Soliciting material pursuant to Rule 14a-12 under the Exchange Act (17 CFR 240.14a-12)
- Pre-commencement communications pursuant to Rule 14d-2(b) under the Exchange Act (17 CFR 240.14d-2(b))
- Pre-commencement communications pursuant to Rule 13e-4(c) under the Exchange Act (17 CFR 240.13e-4(c))

Securities registered pursuant to Section 12(b) of the Securities Exchange Act of 1934:

Title of each class	Trading symbol	Name of each exchange on which registered
Common Stock	SNSE	The Nasdaq Stock Market LLC
Series A Preferred Stock Purchase Rights		The Nasdaq Stock Market LLC

Indicate by check mark whether the registrant is an emerging growth company as defined in Rule 405 of the Securities Act of 1933 (§230.405 of this chapter) or Rule 12b-2 of the Securities Exchange Act of 1934 (§240.12b-2 of this chapter).

Emerging growth company

If an emerging growth company, indicate by check mark if the registrant has elected not to use the extended transition period for complying with any new or revised financial accounting standards provided pursuant to Section 13(a) of the Exchange Act.

Item 7.01 Regulation FD Disclosure.

On April 20, 2023, Sensei Biotherapeutics, Inc. (the "Company") updated its corporate presentation for use in meetings with investors, analysts and others. A copy of the presentation is furnished as Exhibit 99.1 to this Current Report on Form 8-K.

The information in Item 7.01 and the exhibit attached hereto are being furnished and shall not be deemed "filed" for the purposes of Section 18 of the Securities Exchange Act of 1934, as amended (the "Exchange Act"), or otherwise subject to the liabilities of that section, nor shall they be deemed incorporated by reference into any filing under the Exchange Act or the Securities Act of 1933, as amended, whether filed before or after the date hereof and regardless of any general incorporation language in such filing.

Item 9.01 Financial Statements and Exhibits.

(d) Exhibits

<u>Exhibit Number</u>	<u>Exhibit Description</u>
99.1	Sensei Biotherapeutics, Inc. corporate presentation, dated April 2023
104	The cover page from this Current Report on Form 8-K, formatted in Inline XBRL.

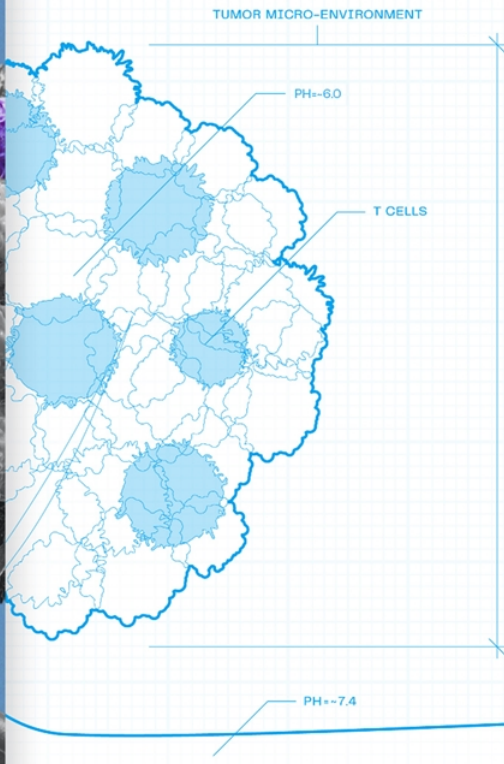
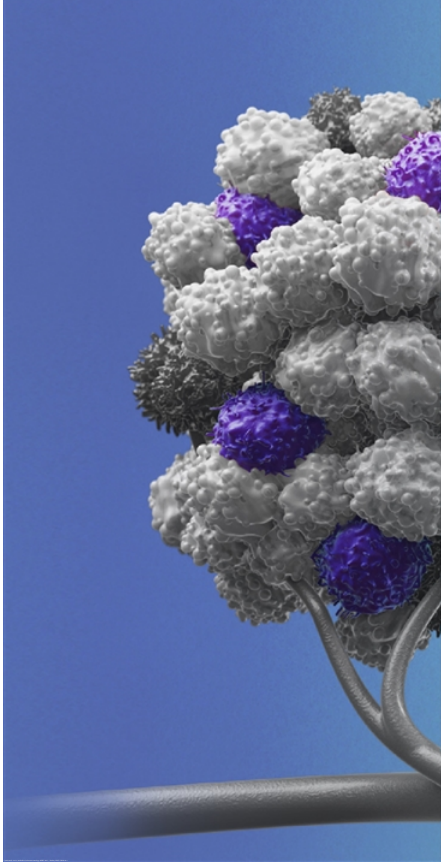
SIGNATURES

Pursuant to the requirements of the Securities Exchange Act of 1934, the registrant has duly caused this report to be signed on its behalf by the undersigned hereunto duly authorized.

Sensei Biotherapeutics, Inc.

Date: April 20, 2023

/s/ Christopher W. Gerry
Christopher W. Gerry
General Counsel and Secretary



Conditionally Active Antibodies for Immuno-oncology

APRIL 2023 | Nasdaq: SNSE

Disclaimer

This presentation has been prepared by Sensei Biotherapeutics, Inc. (the "Company," "we," "us") and is made for informational purposes only. The information set forth herein does not purport to be complete or to contain all of the information you may desire. Statements contained herein are made as of the date of this presentation unless stated otherwise, and neither the delivery of this presentation at any time, nor any sale of securities, shall under any circumstances create an implication that the information contained herein is correct as of any time after such date or that information will be updated or revised to reflect information that subsequently becomes available or changes occurring after the date hereof.

This presentation contains estimates and other statistical data made by independent parties and by us relating to market shares and other data about our industry. This presentation also contains "forward-looking" statements as that term is defined in the Private Securities Litigation Reform Act of 1995 that are based on our management's beliefs and assumptions and on information currently available to management. These forward-looking statements include, without limitation, expectations regarding the development and potential therapeutic benefits of our product candidates; the expected safety profile of our product candidates; the expected timing and design of our Phase 1/2 clinical trial of SNS-101; the availability of data from our preclinical studies; the timing of selection of product candidates; and our belief that our existing cash and cash equivalents will be sufficient to fund our operations at least into the second half of 2025.

When used in this presentation, the words and phrases "designed to," "may," "believes," "intends," "seeks," "anticipates," "plans," "estimates," "expects," "should," "assumes," "continues," "could," "will," "future" and the negative of these or similar terms and phrases are intended to identify forward-looking statements. Forward-looking statements involve known and unknown risks, uncertainties and other factors that may cause our actual results, performance or achievements to be materially different from any future results, performance or achievements expressed or implied by the forward-looking statements. Risks and uncertainties that may cause actual results to differ materially include uncertainties inherent in the development of therapeutic product candidates, such as preclinical discovery and development, conduct of clinical trials and related regulatory requirements, our reliance on third parties over which we may not always have full control, and other risk and uncertainties that are described in our Annual Report on Form 10-K filed with the SEC on March 29, 2023 and our other Periodic Reports filed with the SEC. Forward-looking statements represent our management's beliefs and assumptions only as of the date of this presentation and include all matters that are not historical facts. Our actual future results may be materially different from what we expect. Except as required by law, we assume no obligation to update these forward-looking statements publicly, or to update the reasons actual results could differ materially from those anticipated in the forward-looking statements, even if new information becomes available in the future.

Certain information contained in this presentation relates to, or is based on, studies, publications, surveys and other data obtained from third-party sources and the Company's own internal estimates and research. While the Company believes these third-party sources to be reliable as of the date of this presentation, it has not independently verified, and makes no representation as to the adequacy, fairness, accuracy or completeness of, any information obtained from third-party sources. In addition, all of the market data included in this presentation involves a number of assumptions and limitations, and there can be no guarantee as to the accuracy or reliability of such assumptions. Finally, while we believe our own internal research is reliable, such research has not been verified by any independent source.



Engineered Selectivity to Extend the Clinical Reach of Immuno-oncology Agents



Innovative Pipeline of IO Drugs with Broad Commercial Potential

Program (Target)	Indication	Discovery	IND-enabling	Phase 1 / 2 Clinical
SNS-101* (VISTA)	Solid Tumors			
SNS-102 (VSIG4)	Solid Tumors			
SNS-103 (ENTPDase1/CD39)	Solid Tumors			



*Sensei has entered into a Cooperative Research and Development Agreement (CRADA) with the National Cancer Institute. The goal of this collaborative effort is to further elucidate the role of VISTA in immune checkpoint resistance and expand the potential of SNS-101 as a combination therapy beyond anti-PD-1.

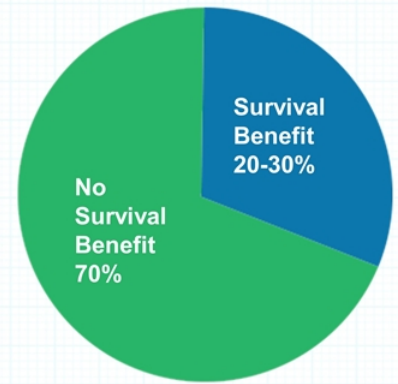
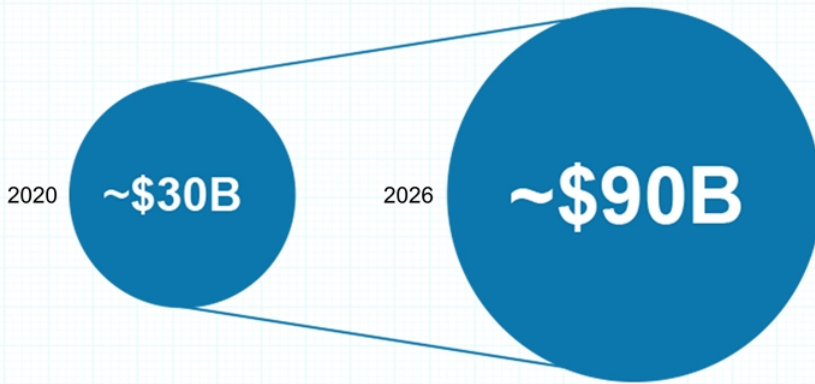


*Sensei has entered into a clinical supply agreement with Regeneron supporting the planned evaluation of SNS-101 in combination with Regeneron's anti-PD-1 therapy Libtayo® (cemiplimab) in a Phase 1/2 clinical trial in solid tumors.

The Modern-Day Challenge in Immuno-Oncology

The PD-1/PD-L1 market is big and growing fast¹

PD-1/PD-L1 monotherapy does not benefit 70% of patients²



Lack of Tumor Targeting is a Major Obstacle to CI Innovation

Industry Problem	Sensei's Solution
<p>Conventional antibodies target immune checkpoints that are highly expressed in normal tissues, resulting in:</p> <ul style="list-style-type: none">Dose-limiting toxicities due to on-target/off-tumor actionPharmacological sink effect requires higher and more frequent dosingSuboptimal activity due to poor PK and dose-limiting toxicities	<p>Conditionally active antibodies are selectively targeted to the tumor microenvironment, potentially providing:</p> <ul style="list-style-type: none">Little or no toxicity due to selective on-target/on-tumor actionLower and less frequent doses by avoiding normal tissue bindingPowerful activity selectively focused on the tumor microenvironment

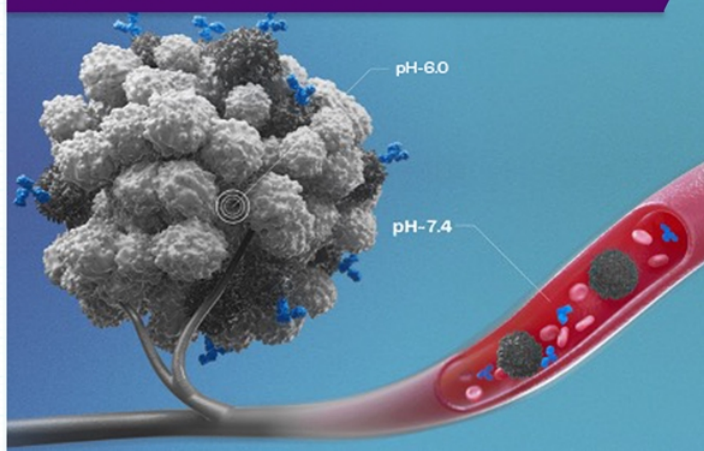
Only one new checkpoint inhibitor has been approved since the original CTLA-4 and PD-1/PD-L1 group



pH-sensitive Antibodies Have Potential to Selectively Bind Their Targets in the Low-pH Tumor Microenvironment

TMAb Platform

The tumor microenvironment of pH ~6 is lower than physiological pH of 7.4



Sensei's technology identifies pH-sensitive antibodies designed to bind only at the tumor

- Exploits the tumor microenvironment using pH-selective properties
- Intended to alleviate undesirable properties:
 - Dose-limiting toxicities due to on-target/off-tumor binding
 - Higher and more frequent dosing due to poor pharmacokinetics (Target-mediated Drug Disposition, or TMDD)
- Bolsters specific activities
- Goal is to unlock previously undruggable immune targets

Commercially Validated Precedent for pH-sensitive Approach

Solaris® (eculizumab), an anti-C5 monoclonal antibody (mAb), was considered standard of care for patients with paroxysmal nocturnal hemoglobinuria (PNH) and atypical hemolytic uremic syndrome, but had a short half-life as a result of extensive TMDD.

Engineering eculizumab using histidine substitutions resulted in a pH-sensitive mAb with markedly improved half-life.

Antibody Engineering of Solaris Led to pH Sensitivity and Half-Life Improvements

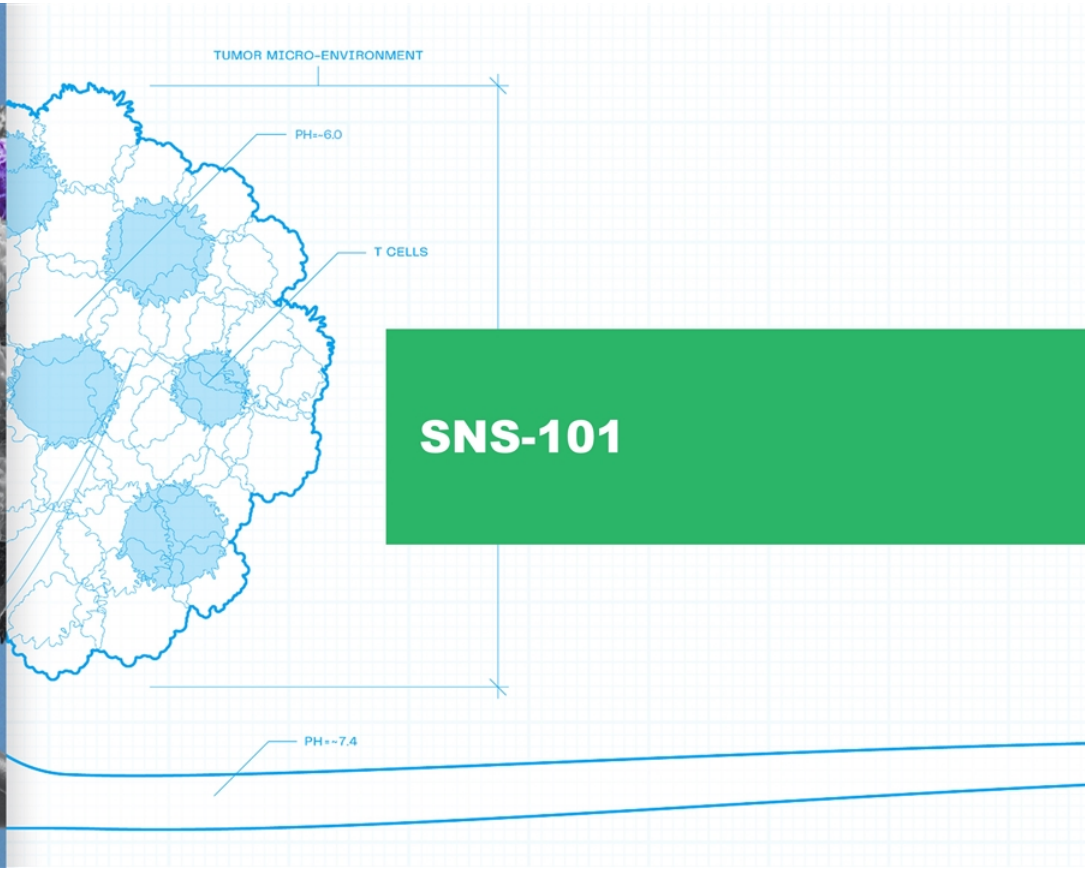
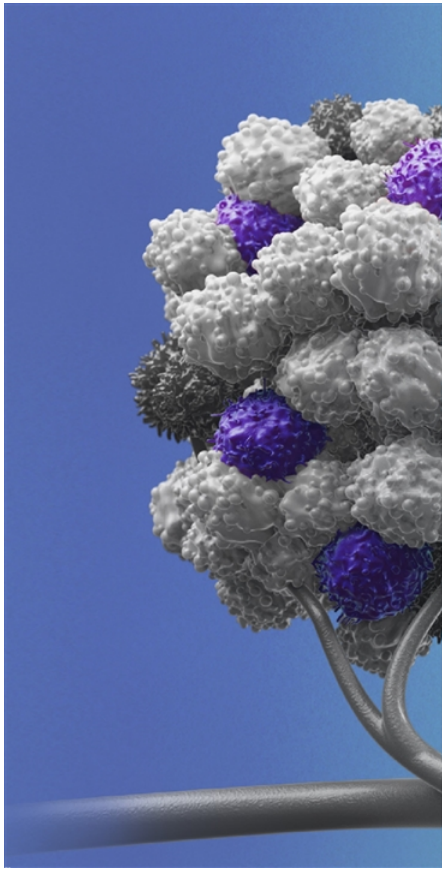
	Solaris (Eculizumab)	→	Ultomiris (Ravulizumab, ALXN1210)
K_D pH 7.4 (nM)	0.03		0.49
K_D pH 6.0 (nM)	0.6		22
$t_{1/2}$ (d)	3.9		13.4

Ravulizumab utilized histidine insertions into the CDR regions (VH_Y27H, VH_S57H) and Fc substitutions (M428L, N434S) of eculizumab

Due to its longer half-life (13.4 d vs 3.9 d), ravulizumab given every 8 weeks achieved noninferiority compared with eculizumab given every 2 weeks for all efficacy endpoints, while maintaining a similar safety profile.

2018: FDA approves Ultomiris® (ravulizumab, ALXN1210)

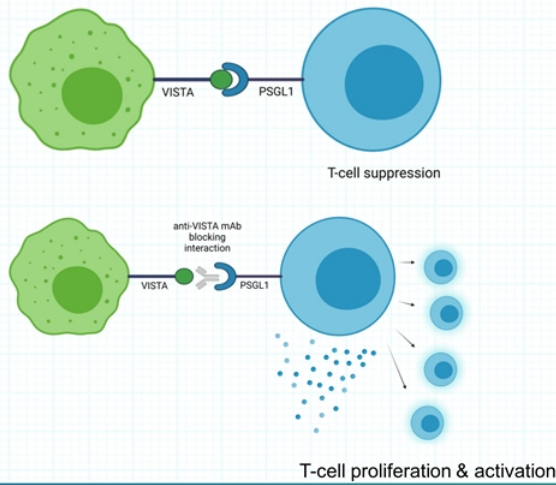
2020: Ultomiris sales = \$1.08 billion



VISTA is a Potent T cell Checkpoint Extensively Expressed on Myeloid Cells¹

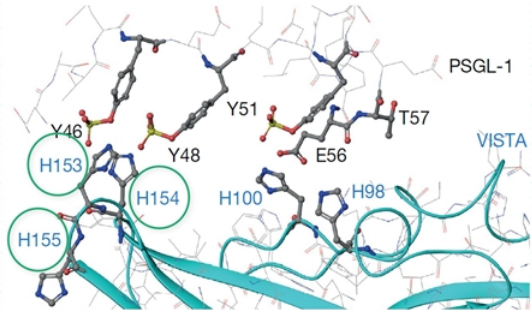
VISTA is a B7 family member that suppresses T cell function

Immunosuppressive function believed to be mediated by PSGL-1 receptor



Extensive VISTA expression on off-tumor myeloid cells demands a conditionally active antibody approach

VISTA has inherent pH sensitivity: its extracellular domain is uniquely rich in histidines²



SNS-101: Selectively Targeting VISTA with a pH-sensitive Antibody

SNS-101 is a differentiated, pH-sensitive antibody

Selectivity for Active VISTA^{pH6} over VISTA^{pH7.4}

Monovalent Affinity (K_D) [nM]

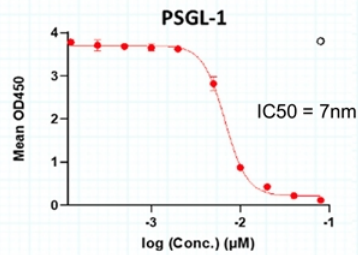
pH 6.0	pH 7.4
0.218	132 (~No binding)

Additional SNS-101 features

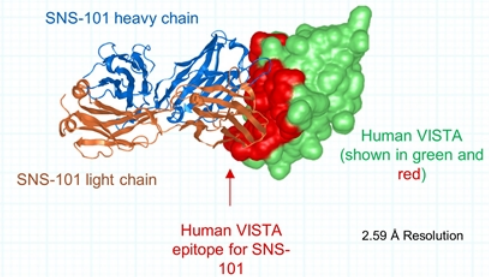
- IgG1 format
- Active Fc

SNS-101 blocks the key receptor regulating VISTA's immunosuppressive activity

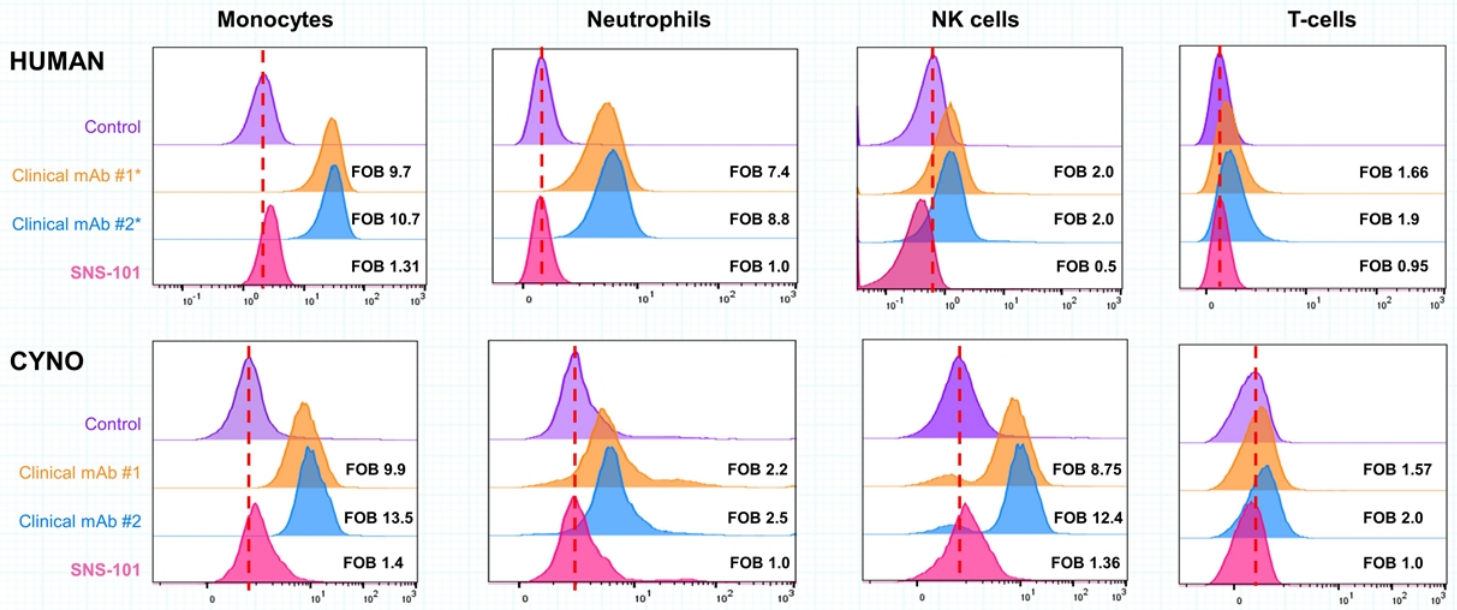
SNS-101 strongly inhibits the VISTA:PSGL-1 interaction and all other potential binding partners at pH 6.0 *in vitro*



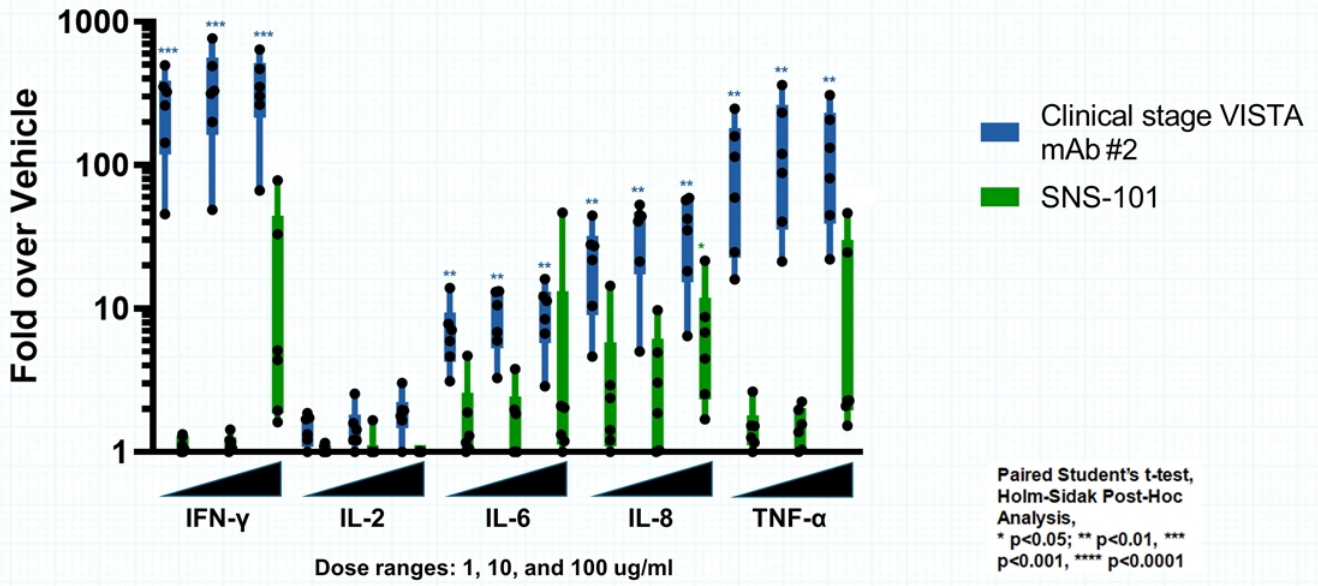
VISTA:SNS-101 co-crystal structure demonstrates epitope of SNS-101 encompasses VISTA's PSGL-1 epitope



No Significant Binding of SNS-101 to Monocytes, Neutrophils, NK Cells and T-cells in Whole blood at Physiological pH

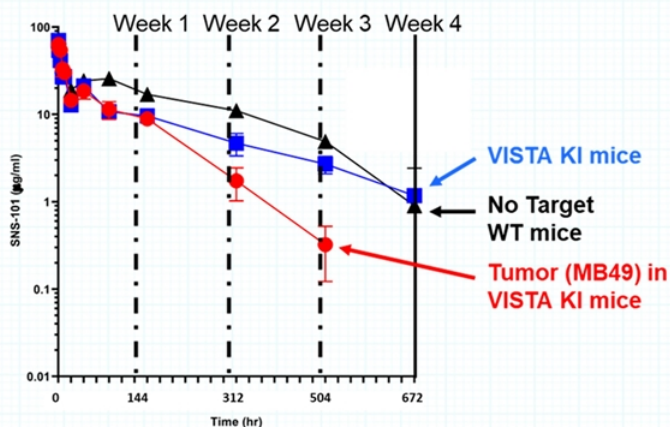


SNS-101 Induced Substantially Lower Cytokine Release in Whole-blood Assay at Neutral pH Compared to pH-independent VISTA Antibody



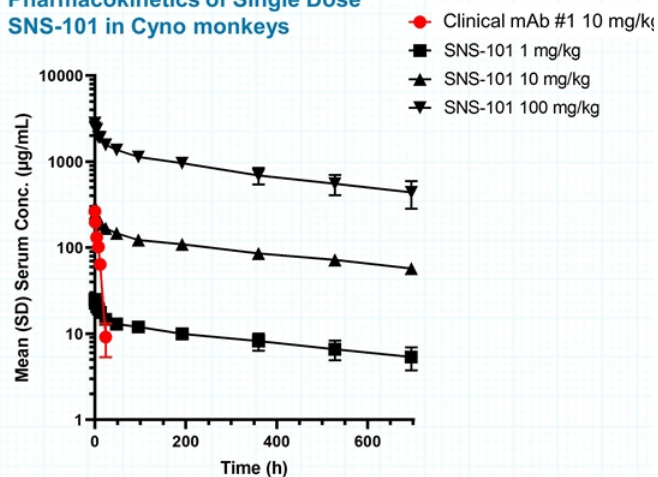
SNS-101 Has Displayed a Favorable Single-dose PK Profile in Preclinical Studies - No Significant TMDD in Human VISTA KI Mice or Non-human Primates

Pharmacokinetics of Single Dose 5 mg/kg SNS-101 in VISTA Knock-in Mice



Demonstrated a long mean residence time in the blood, indicating a lack of significant target-mediated drug disposition (TMDD) and clearance in non-malignant tissues

Pharmacokinetics of Single Dose SNS-101 in Cyno monkeys

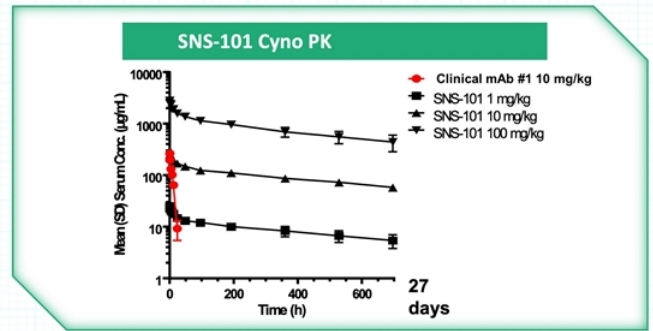


SNS-101 displayed linear elimination kinetics unlike a pH-independent anti-VISTA mAb, which demonstrated TMDD and rapid clearance

PK Sink Continues to be an Issue with Non-pH-Sensitive VISTA programs*

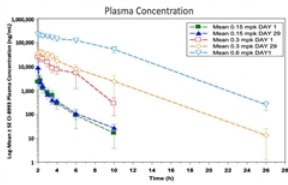
SNS-101 is designed to overcome elimination kinetics and half-life related to PK sink observed in non-pH-sensitive VISTA programs

Linear

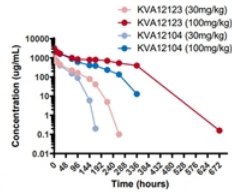


Non-linear

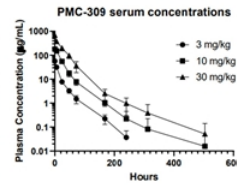
Curis CI-8993 Plasma Concentration



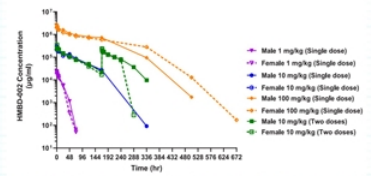
Kineta KVA12123 Cyno PK



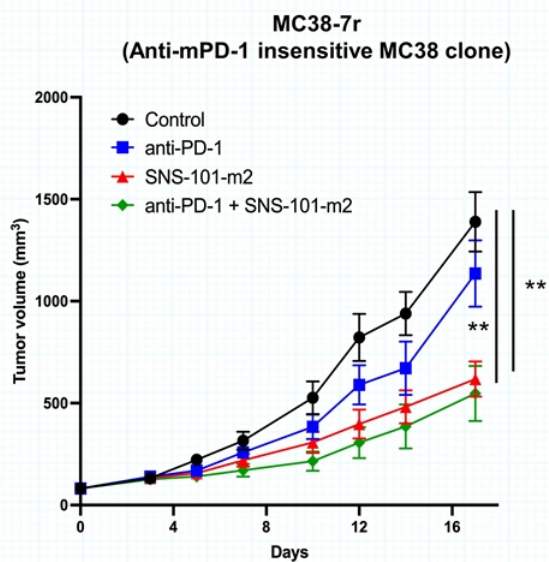
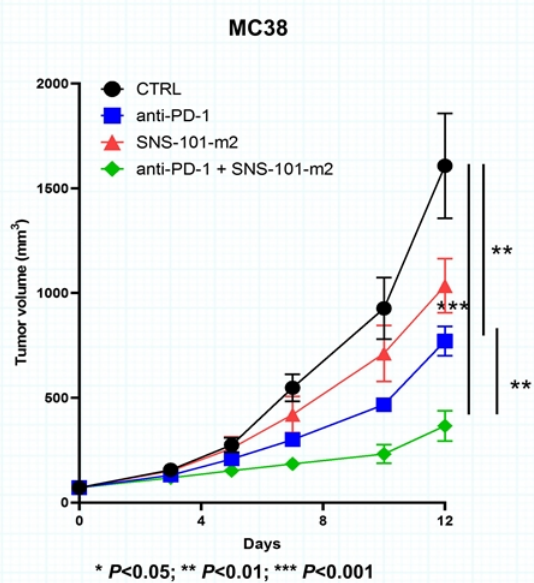
Abcine PMC-309 Serum Conc Cyno



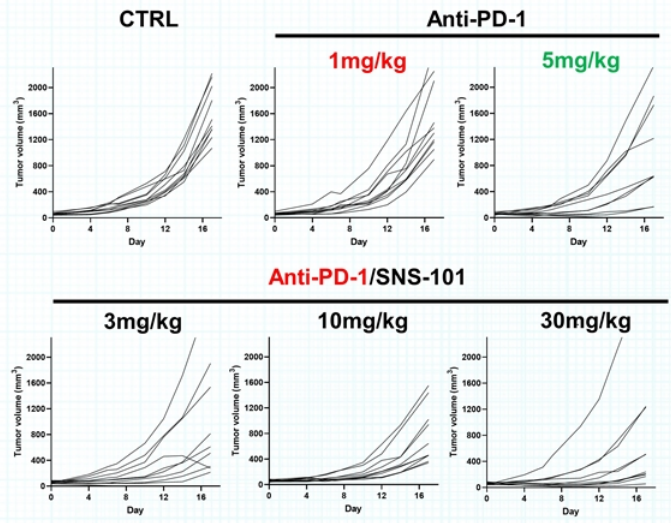
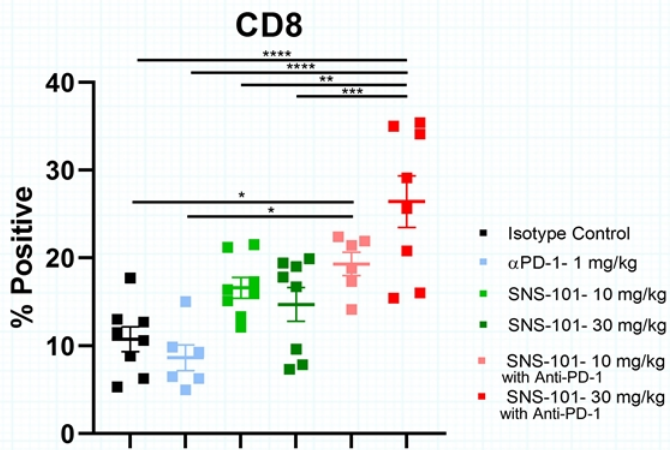
Hummingbird HMBD-002 Preclinical PK



SNS-101 Drove Single-agent Activity and Deepened Anti-tumor Responses to PD-1 in Human VISTA KI Mice



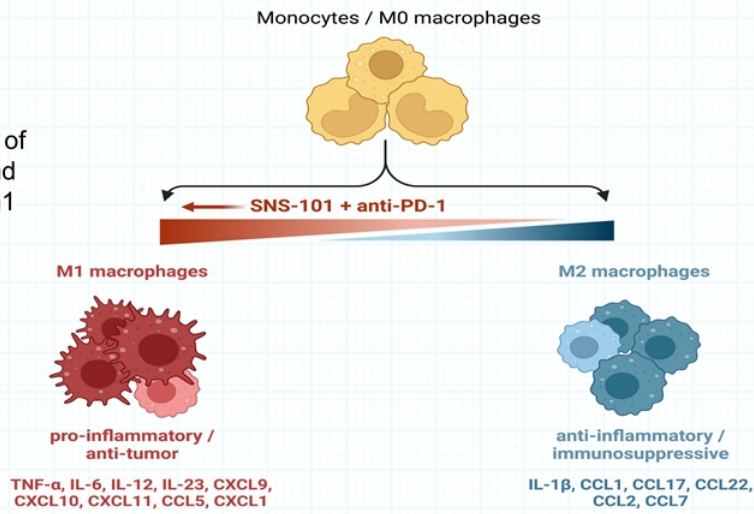
SNS-101 Increased CD8 T-cells in Combination With Anti-PD-1 in MC38 Tumors *In Vivo*



Targeting VISTA and PD-1 Checkpoints in the TME Promotes Anti-tumoral M1 Macrophage Polarization

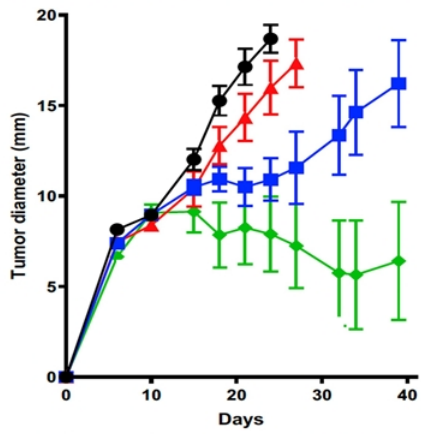
SNS-101 targets suppressive signaling in the myeloid compartment, and in combination with anti-PD-1 may help shift the balance of macrophage polarization toward an anti-tumor M1 phenotype

M1 macrophages are anti-tumorigenic through secretion of pro-inflammatory cytokines and chemokines, and driving of Th1 CD4+ T cell responses

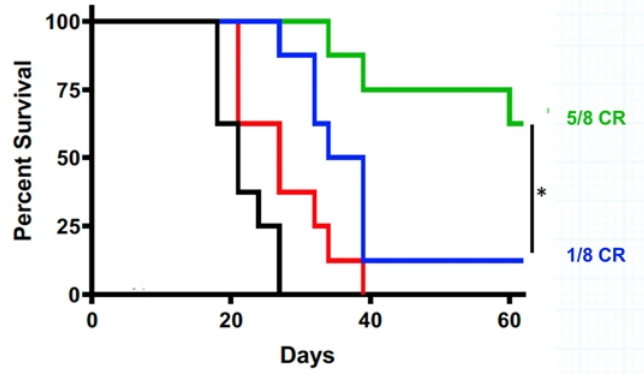


M2 macrophages are immunosuppressive; pro-tumor TAMs are a subset of M2-type cells

SNS-101 Re-sensitized Anti-PD-1 Insensitive Sarcoma Tumors in Human VISTA Knock-in Mice



- CTRL
- anti-PD-1
- ▲ SNS-101-m2
- ◆ anti-PD-1 + SNS-101-m2

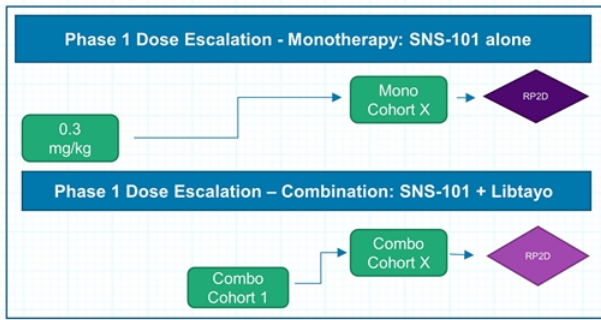


* p<0.05

SNS-101 Phase 1/2 Study

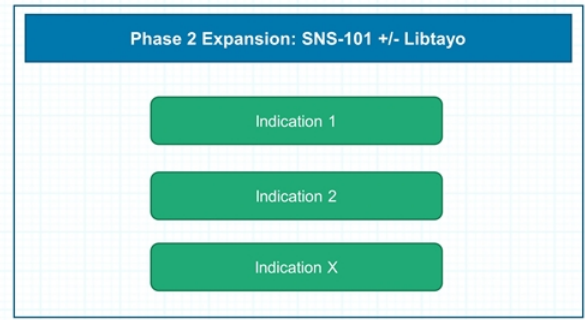
Phase 1 Study Design

Dose escalation using Bayesian Optimal Interval (BOIN) design; plan to initiate combo dosing prior to monotherapy RP2D*



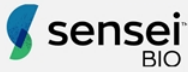
Anticipated Phase 2 Expansion Design

Single-arm, Simon two-stage minimax design incorporating an interim futility analysis



Patient Population	Study Objectives	Dosing
<ul style="list-style-type: none"> Advanced solid tumors 	<ul style="list-style-type: none"> Primary endpoint: safety, tolerability & RP2D Secondary endpoint: PK profile, immunogenicity & anti-tumor activity 	<ul style="list-style-type: none"> SNS-101 +/- Libtayo (350 mg/kg) dosed as an IV infusion once every 3 weeks SNS-101 starting dose = 0.3 mg/kg; Dose escalation/de-escalation will proceed following the BOIN design until the MTD/RP2D is determined




Patient Population	Study Objectives	Dosing
<ul style="list-style-type: none"> Advanced solid tumors Tumor types to be determined based on data from Phase 1 study and emerging results from preclinical studies 	<ul style="list-style-type: none"> Primary endpoint: Anti-tumor activity Secondary endpoint: Anti-tumor activity, safety, tolerability, PK profile & immunogenicity 	<ul style="list-style-type: none"> SNS-101 +/- Libtayo (350 mg/kg) dosed as an IV infusion once every 3 weeks Dose will be determined from the Phase 1 study




* Safety Monitoring Committee (SMC) to determine initiation of combination arm based on emerging clinical data
 RP2D = Recommended Phase 2 Dose
 MTD = Maximum Tolerated Dose

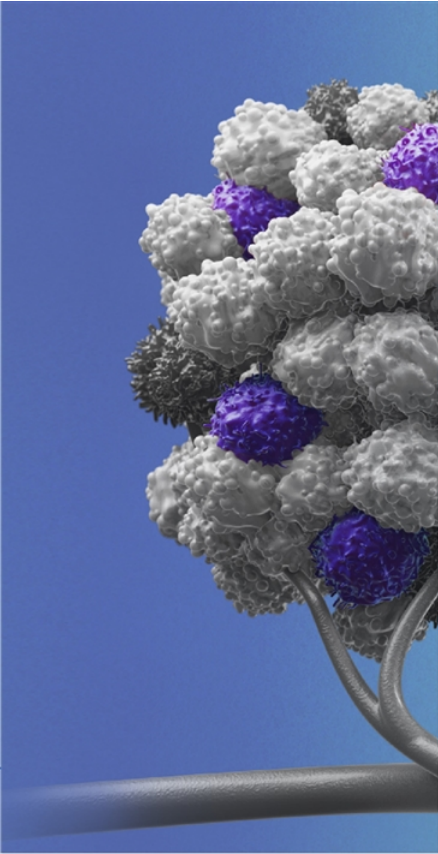
Key Partnerships Supporting SNS-101's Clinical Development

Potential opportunities for combination therapy and biomarker identification

Partner / Collaborator	Goal	Description
 <p>Clinical Supply Agreement</p>	Supports evaluation of SNS-101 in combination with Libtayo® (cemiplimab) in planned Phase 1/2 clinical trial	<ul style="list-style-type: none"> • Sensei to fund planned clinical trial • Regeneron to provide Libtayo® • Sensei maintains global development and commercial rights to SNS-101
 <p>Cooperative Research & Development Agreement</p>	Further elucidate role of VISTA in immune checkpoint resistance and expand potential of SNS-101 as a combination therapy beyond anti-PD-1	<ul style="list-style-type: none"> • Sensei collaborating with NCI Center for Immuno-Oncology Co-Directors, Jeffrey Schlom, Ph.D., and James Gulley, M.D., Ph.D. • Preclinical studies will assess SNS-101 mechanism of action in combination with therapies beyond anti-PD-1
 <p>Research Collaboration</p>	Further study the mechanism of SNS-101's anti-tumor activity	<ul style="list-style-type: none"> • Sensei collaborating with laboratory of immuno-oncology KOL, Robert Schreiber, Ph.D. • Preclinical studies will include identification of SNS-101 response biomarkers

SNS-101 Is a Fully Differentiated Anti-VISTA Antibody

	SNS-101 	CI-8993; JNJ-61610588 (J&J/Curis)	K01401-020; W0180 (Pierre Fabre)	HMBD-002 (Hummingbird)	KVA12.1 (Kineta)	VISTA.18 (BMS)	(PMC-309) Pharm Abcine
Inhibit PSGL-1 Binding	✓	✓	✓	✗	✓	✓	✓
pH Sensitive Binding	✓	✗	✗	✗	✗	✓	✗
Fc Active	✓ <small>(IgG1)</small>	✓ <small>(IgG1)</small>	N/A	✗	✓ <small>(IgG1)</small>	✗ <small>(IgG4)</small>	✓ <small>(IgG1)</small>
Stage	Phase 1	Phase 1	Phase 1	Phase 1	Phase 1	Preclinical	Preclinical



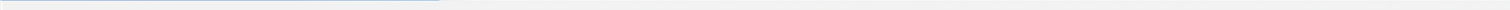
TUMOR MICRO-ENVIRONMENT

PH=6.0

T CELLS

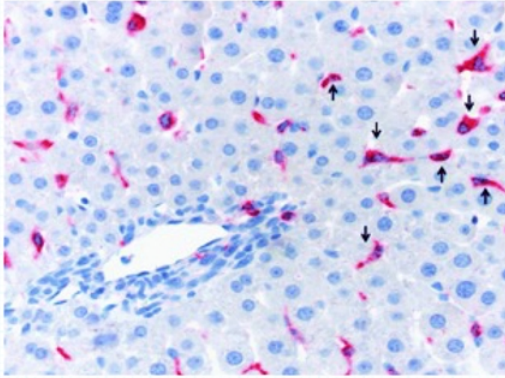
VSIG-4

PH=7.4



VSIG4 is an Immunosuppressive Receptor with On-Target, Off-Tumor Challenges

Tissue macrophages (Kupffer cells) in liver

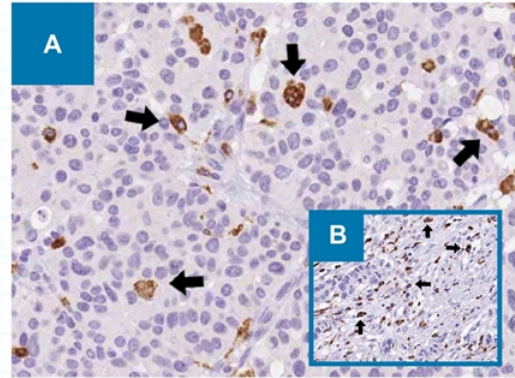


In the liver, VSIG-4 ...

Is expressed on Kupffer cells^{1,2}

Appears to drive significant target-mediated drug disposition (TMDD) and clearance

Tumor-associated macrophages in tumor and stroma (inset)



In the tumor microenvironment, VSIG-4 ...

Correlates with immunosuppressive "M2" macrophage infiltration³

Inhibits T cell activation⁴

Promotes tumor growth based on data from a syngeneic Lewis lung carcinoma model in knockout mice⁵

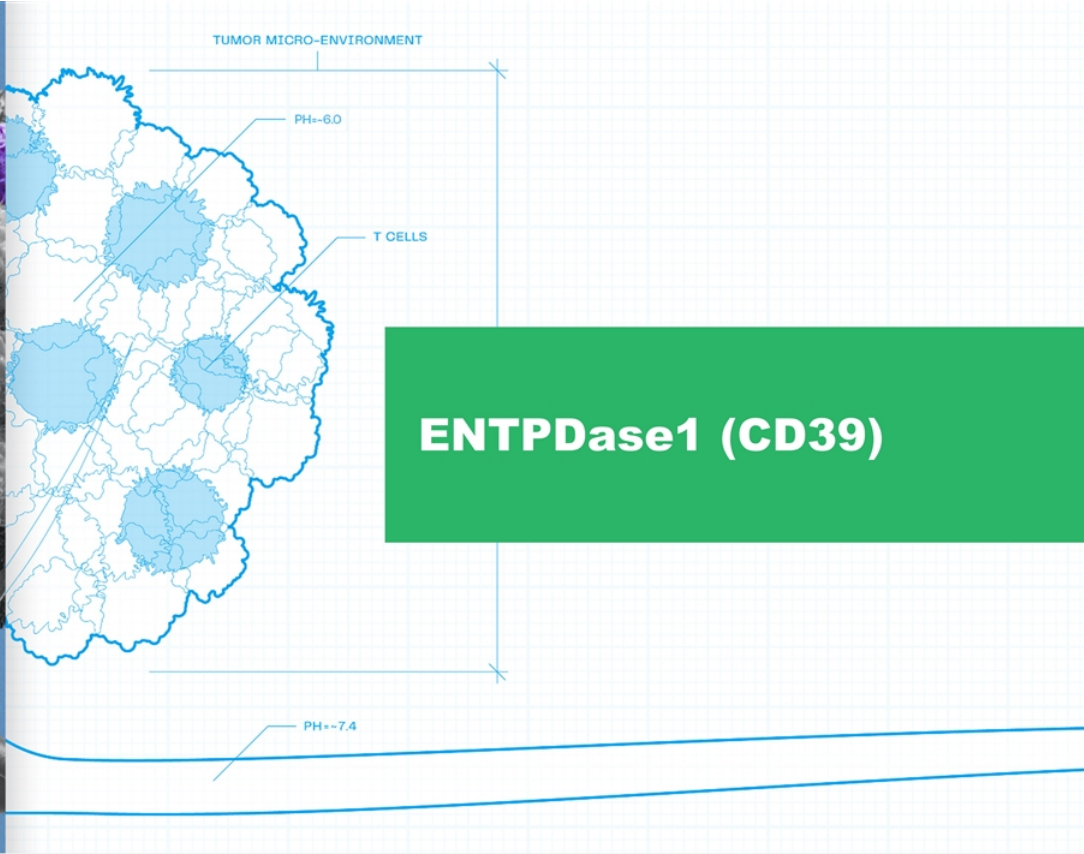
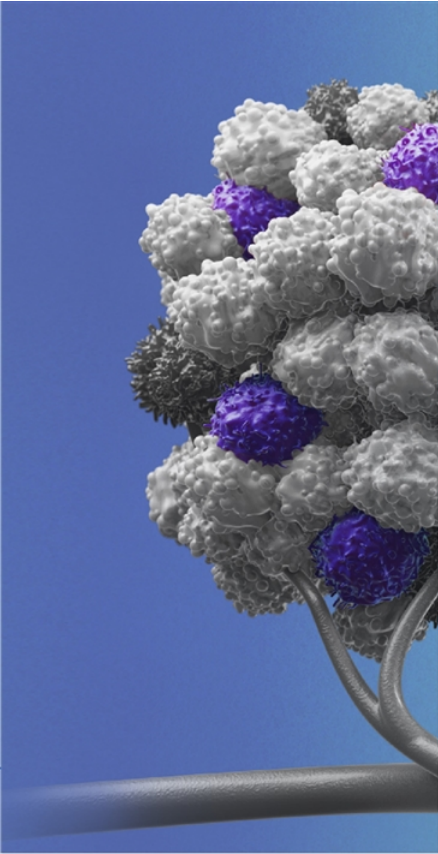
Sensei Has Identified pH-sensitive VSIG4 Antibodies

- Program milestones to date:
 - Identified 8 parental antibodies for optimization and are currently testing progeny antibodies;
 - Identified pH-sensitive antibodies highlighting the potential breadth of the TMAb platform;
 - Identified novel VSIG4 receptors on primary T-cells by Hi-Res proteomics, which are currently in verification stage.
- Plan to select product candidate in 2023

pH-Sensitive VSIG4 Parental Antibodies Selected for Further Optimization

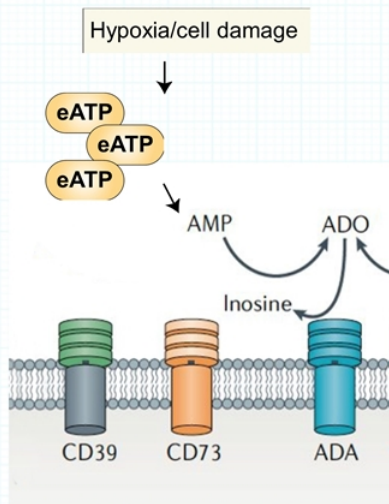
Antibody Reference #	Ratio of pH Selectivity (6.0 vs 7.4)	Blockage of Immobilized VSIG4-T-cell Inhibition	Blockage of Cellular VSIG4-T-cell Inhibition
1	1	+	+
2	7	+	+
3	1	+	+
4	3	+	+
5	3	+/-	+
6	25	+	+
7	1	+	+
8	2	-	+

* Ratio assessed by flow cytometry on VSIG4 overexpressing cells



ENTPDase1 (CD39)

ENTPDase1 (CD39) is the Rate Limiting Enzyme in the Production of Immunosuppressive Adenosine



- Primary function is conversion of extracellular ATP (eATP) to adenosine (ADO), which exerts immunosuppressive properties through binding to A2a/A2b receptors (ADA)
- Expressed on various immune cells in both tumors and normal tissues
- Development of a TMAb antibody has potential for improved safety and PK profile compared to competitor CD39 mAbs

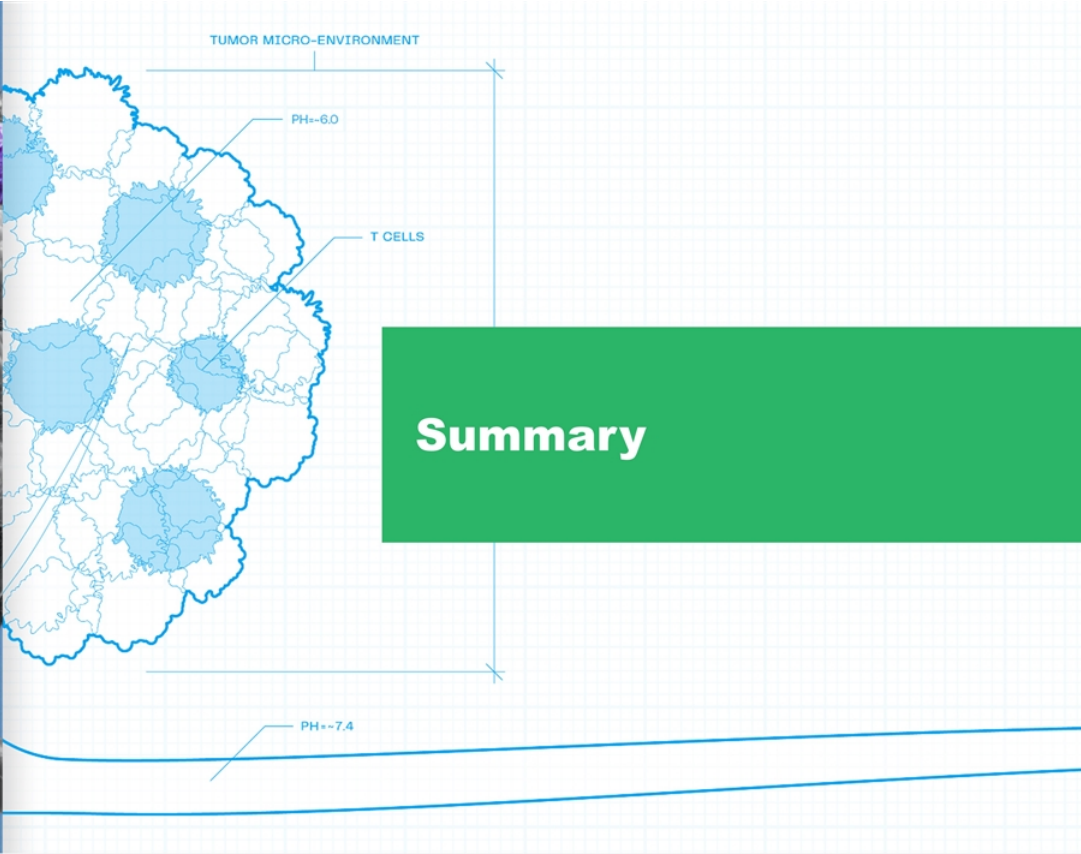
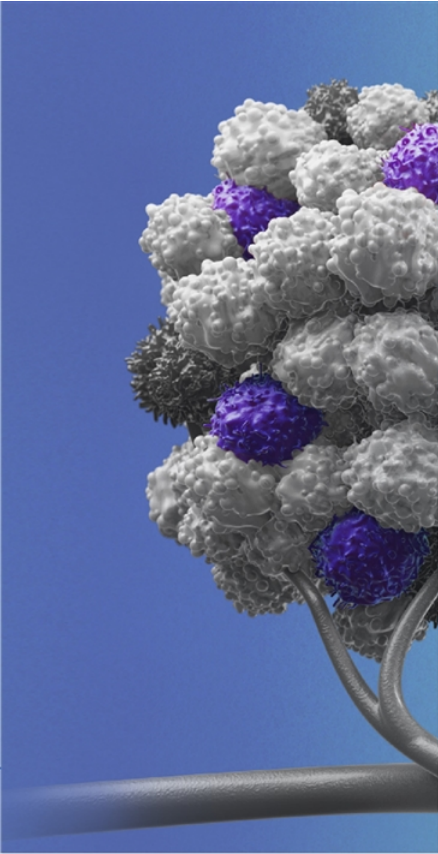


Sensei Has Identified pH-sensitive ENTPDase1 (CD39) Antibodies

pH-Sensitive CD39 Parental Antibodies Selected for Further Optimization

- Program milestones to date:
 - Identified 8 parental antibodies for further optimization
 - Identified pH-sensitive parental antibodies for lead optimization
- Plan to select lead product candidate in 2023

Antibody Reference #	Ratio of pH Selectivity (6.0 vs 7.4)
1	1
2	6
3	4
4	5
5	18
6	1
7	1
8	1



Expected Program Milestones



SNS-101 (anti-VISTA)

- **Mid-year 2023:** First patient first dose
- **2024:** Topline Phase 1 monotherapy data
- **2024:** Initial Phase 1 combination data



SNS-102 (anti-VSIG4)

- **2023:** Select product candidate



SNS-103 (anti-ENTPDase1/CD39)

- **2023:** Select product candidate



TMAb Platform

- Advance one program forward to IND-enabling studies following product candidate selection
- ✓ **2023:** Initiate fourth TMAb discovery program

Engineered Selectivity to Extend the Clinical Reach of Immuno-oncology Agents



Seasoned Leadership Team



John Celebi, MBA
President and CEO



Erin Colgan
Chief Financial Officer



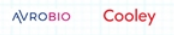
Patrick Gallagher
Chief Business Officer



Edward van der Horst, Ph.D.
Chief Scientific Officer



Christopher Gerry, J.D.
VP, General Counsel





HQ: 1405 Research Blvd, Suite 125, Rockville, MD 20850 / **MA:** 22 Boston Wharf Rd, 7th floor, Boston, MA 02210

senseibio.com

Appendix

References for Slide 24

1. Helmy KY, Katschke KJ Jr, Gorgani NN, Kljavin NM, Elliott JM, Diehl L, Scales SJ, Ghilardi N, van Lookeren Campagne M. CRIg: a macrophage complement receptor required for phagocytosis of circulating pathogens. *Cell*. 2006 Mar 10;124(5):915-27. doi: 10.1016/j.cell.2005.12.039. PMID: 16530040.
2. Voillet V, Berger TR, McKenna KM, Paulson KG, Tan WH, Smythe KS, Hunter DS, Valente WJ, Weaver S, Campbell JS, Kim TS, Byrd DR, Bielas JH, Pierce RH, Chapuis AG, Gottardo R, Rongvaux A. An In Vivo Model of Human Macrophages in Metastatic Melanoma. *J Immunol*. 2022 Aug 1;209(3):606-620. doi: 10.4049/jimmunol.2101109. Epub 2022 Jul 11. PMID: 35817516; PMCID: PMC9377377.
3. Reviewed in Small AG, Al-Baghdadi M, Quach A, Hii C, Ferrante A. Complement receptor immunoglobulin: a control point in infection and immunity, inflammation and cancer. *Swiss Med Wkly*. 2016 Apr 5;146:w14301. doi: 10.4414/smw.2016.14301. PMID: 27045607.
4. Vogt L, Schmitz N, Kurrer MO, Bauer M, Hinton HI, Behnke S, Gatto D, Sebbel P, Beerli RR, Sonderegger I, Kopf M, Saudan P, Bachmann MF. VSIG4, a B7 family-related protein, is a negative regulator of T cell activation. *J Clin Invest*. 2006 Oct;116(10):2817-26. doi: 10.1172/JCI25673. PMID: 17016562; PMCID: PMC1578631.
5. Liao Y, Guo S, Chen Y, Cao D, Xu H, Yang C, Fei L, Ni B, Ruan Z. VSIG4 expression on macrophages facilitates lung cancer development. *Lab Invest*. 2014 Jul;94(7):706-15. doi: 10.1038/labinvest.2014.73. Epub 2014 May 26. PMID: 24862966.