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

March 16, 2023
Date of Report (Date of earliest event reported)

CABALETTA BIO, INC.
(Exact name of Registrant as Specified in its Charter)

Delaware	**001-39103**	**82-1685768**
(State or other jurisdiction of incorporation)	**(Commission File Number)**	**(I.R.S. Employer Identification No.)**

2929 Arch Street, Suite 600, Philadelphia, PA	**19104**
(Address of principal executive offices)	**(Zip Code)**

(267) 759-3100
(Registrant's telephone number, including area code)

Not Applicable
(Former name or former address, if changed since last report)

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 Act:

Title of Each Class	**Trading Symbol(s)**	**Name of Each Exchange on Which Registered**
Common Stock, par value $0.00001 per share	CABA	The Nasdaq Global Select Market

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 2.02 Results of Operations and Financial Condition.

On March 16, 2023, Cabaletta Bio, Inc. (the "Company") announced its financial results for the fourth quarter and fiscal year ended December 31, 2022. A copy of the press release is being furnished as Exhibit 99.1 to this Report on Form 8-K.

Item 7.01 Regulation FD Disclosure

On March 16, 2023, the Company posted to the "Investors & Media" section of the Company's website at www.cabalettabio.com an updated corporate presentation providing a corporate overview and updated development plan (the "Corporate Presentation"). A copy of the Corporate Presentation is attached hereto as Exhibit 99.2 and is incorporated by reference into this Item 7.01 of this Current Report on Form 8-K.

The information contained in Items 2.01 and 7.01 of this Current Report on Form 8-K, including Exhibits 99.1 and 99.2 attached hereto, is being furnished and shall not be deemed to be "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 and shall not be incorporated by reference in any filing under the Securities Act of 1933, as amended, or the Exchange Act, except as shall be expressly set forth by specific reference in such filing.

Item 9.01 Financial Statements and Exhibits.

(d) Exhibits

99.1	Press Release issued by the registrant on March 16, 2023, furnished herewith.
99.2	Cabaletta Bio, Inc. Corporate Presentation, dated March 16, 2023, furnished herewith.
104	Cover Page Interactive Data File (embedded within the Inline XBRL Document).

SIGNATURE

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

CABALETTA BIO, INC.

Date: March 16, 2023

By: /s/ Steven Nichtberger
Steven Nichtberger, M.D.
President and Chief Executive Officer

Cabaletta Bio®

Cabaletta Bio Reports Fourth Quarter and Full Year 2022 Financial Results and Provides Business Update

– Company expecting Investigational New Drug (IND) clearance in the first half of 2023 for CABA-201, a 4-1BB-containing fully human CD19-CAR T cell therapy, with potential to generate initial clinical data by the first half of 2024 –

PHILADELPHIA, March 16, 2023 – Cabaletta Bio, Inc. (Nasdaq: CABA), a clinical-stage biotechnology company focused on developing and launching the first curative targeted cell therapies for patients with autoimmune diseases, today reported financial results for the fourth quarter and full year ended December 31, 2022, and provided a business update.

"As we seek FDA clearance for CABA-201 in the next few months, we believe that our specifically designed product candidate for autoimmune patients, our experience with efficient autoimmune cell therapy clinical trial design coupled with timely implementation of complicated autoimmune cell therapy trials and our exclusive translational research partnership with Georg Schett, M.D., which is currently delivering actionable clinical insights, provide us with the opportunity to deliver potentially transformative outcomes for patients with a broad range of autoimmune diseases," said Steven Nichtberger, M.D., Chief Executive Officer and Co-founder of Cabaletta. "In parallel, we continue to make progress on our pipeline of clinical-stage CAART legacy product candidates, with 1-month safety and persistence data for the combination sub-study in the DesCAARTes™ trial for DSG3-CAART anticipated in the first half of 2023 and recruitment in the MusCAARTes™ trial for MuSK-CAART ongoing. Looking ahead, we are confident in our ability to advance our autoimmune-focused pipeline for patients with serious unmet need and deliver on multiple upcoming value-creating milestones."

Recent Operational Highlights and Upcoming Milestones

Chimeric Antigen Receptor T cells for Autoimmunity (CARTA) Strategy

CABA-201: Autologous, engineered T cells with a chimeric antigen receptor containing a fully human CD19 binder and a 4-1BB co-stimulatory domain as a potential treatment for a broad range of autoimmune diseases where B cells contribute to the initiation and/or maintenance of disease.

- **Unveiled new development candidate, CABA-201, a 4-1BB containing CD19-CAR T cell therapy product candidate for autoimmune diseases:** On October 11, 2022, Cabaletta announced CABA-201, a newly designed cell therapy candidate that includes a fully human CD19 binder exclusively in-licensed from Nanjing IASO Biotherapeutics, Co., Ltd, or IASO. According to public communication by IASO, the binder has been clinically evaluated in approximately 20 cancer patients in a dual-CD19xCD22 CAR T candidate with a 4-1BB costimulatory domain in an investigator-initiated trial. We believe the tolerability data reported by IASO in these patients support clinical development in patients with autoimmune diseases.
- **Established exclusive translational research partnership with Georg Schett, M.D., a pioneer and global leader in the application of CD19-targeting cell therapies for autoimmune disease**: Dr. Schett is senior author of the landmark publications demonstrating the potential of CD19-targeting cell therapies in autoimmunity to reset the immune system, enabling long-term remission of disease off therapy. The September 2022 *Nature Medicine* publication reported complete responses in five out of five patients with moderate to severe, refractory, systemic lupus erythematosus, or SLE, durable to up to 17 months of follow-up off of SLE-related therapies. In February 2023, a report was published in the *Lancet Rheumatology* showing rapid and significant clinical responses following the same treatment regimen in a patient with refractory myositis (anti-synthetase syndrome subtype) within three months that was durable throughout the six month follow up period. In all patients, new, naïve B cells repopulated within 2 to 5 months of CAR T infusion, with no evidence of recurrence of disease or autoantibodies following repopulation.
- **Investigational New Drug application clearance expected in the first half of 2023 with initial clinical data anticipated in the first half of 2024, subject to timely clearance of our IND by the FDA:** Cabaletta expects to obtain clearance of its IND application from the U.S. Food and Drug Administration (FDA) for its lead product candidate, CABA-201, in the first half of 2023. Pending clearance by the FDA, Cabaletta plans to initiate clinical evaluation of CABA-201, and anticipates initial clinical data in the first half of 2024.

Chimeric AutoAntibody Receptor T (CAART) cells Strategy

DSG3-CAART: Desmoglein 3 chimeric autoantibody receptor T (DSG3-CAART) cells as a potential treatment for patients with mucosal pemphigus vulgaris (mPV).

- **Progressing in combination sub-study of DesCAARTes™ trial:** In September 2022 and October 2022, Cabaletta presented updated DSG3-CAART data which provided a rationale to prioritize the enrollment of the cohort in the combination sub-study (2.5 billion cells in combination with intravenous immunoglobulin [IVIg] and cyclophosphamide), with the goal of addressing possible cytokine and autoantibody effects on CAART activity. Cabaletta anticipates reporting 1-month safety and persistence data for the combination sub-study in the first half of 2023 and 6-month data for the combination sub-study in the second half of 2023.

MuSK-CAART: Muscle-specific kinase (MuSK) chimeric autoantibody receptor T (MuSK-CAART) cells as a potential treatment for patients with MuSK-associated myasthenia gravis.

- **Initiated first-in-human MusCAARTes™ trial:** In November 2022, Cabaletta initiated the MusCAARTes™ trial for MuSK-CAART in patients with MuSK autoantibody-positive MG. With insights generated from the DesCAARTes™ trial, the study design has been accelerated through (i) initiation at a dose of 500 million cells (versus 20 million cells in DesCAARTes™), (ii) use of a "2+4" dosing scheme, and (iii) early implementation of a combination approach. The trial is an open-label study consisting of an accelerated dose escalation phase, followed by a cohort expansion phase at the final selected dose. The Company expects to report 6-month data for the combination cohort of the MusCAARTes™ trial in the first half of 2024.
- **Preclinical data supporting IND application and MusCAARTes™ trial design published in *Nature Biotechnology*:** In January 2023, *Nature Biotechnology* published preclinical data demonstrating that MuSK-CAART had similar efficacy as CD19-CAR T cells for depletion of MuSK-specific B cells and retained cytolytic activity in the presence of soluble anti-MuSK antibodies. These data contributed to the Company's IND application for the recently initiated Phase 1 MusCAARTes™ clinical study of MuSK-CAART. These data were developed through a sponsored research agreement between Cabaletta Bio and University of Pennsylvania professor Aimee Payne, M.D., Ph.D., Cabaletta Bio co-founder and Scientific Advisory Board co-chair.

Corporate Highlights

- **Raised $32.6 million in net proceeds from oversubscribed offering:** In December 2022, Cabaletta closed a public offering of pre-funded warrants, in lieu of common stock, to purchase 6,213,776 shares of common stock at a price of $5.51999 per pre-funded warrant and 126,815 shares of its common stock at a price of $5.52 per share. Net proceeds from the offering were approximately $32.6 million, after deducting underwriting discounts, commissions and offering expenses payable by the Company.

Upcoming Events

Cabaletta will participate in the upcoming 22nd Annual Needham Virtual Healthcare Conference, which is being held from April 17 – 20, 2023.

Fourth Quarter and Full Year 2022 Financial Results

- Research and development expenses were $12.4 million and $39.3 million for the three months ended December 31, 2022, and the full year ended December 31, 2022, respectively, compared to $9.9 million and $32.5 million for the three months ended December 31, 2021, and the full year ended December 31, 2021, respectively.
- General and administrative expenses were $3.9 million and $14.8 million for the three months ended December 31, 2022, and the full year ended December 31, 2022, respectively, compared to $4.0 million and $13.8 million for the three months ended December 31, 2021, and the full year ended December 31, 2021, respectively.
- As of December 31, 2022, Cabaletta had cash, cash equivalents and investments of $106.5 million, compared to $122.2 million as of December 31, 2021.

The Company expects that its cash, cash equivalents and investments as of December 31, 2022, will enable it to fund its operating plan into the first quarter of 2025.

About Cabaletta Bio

Cabaletta Bio (Nasdaq: CABA) is a clinical-stage biotechnology company focused on the discovery and development of engineered T cell therapies that have the potential to provide a deep and durable, perhaps curative, treatment for patients with autoimmune diseases. The CABA™ platform encompasses two strategies: the CARTA (chimeric antigen receptor T cells for autoimmunity) strategy, with CABA-201, a 4-1BB-containing CD19-CAR T, as the lead product candidate, and the CAART (chimeric autoantibody receptor T cells) strategy, with multiple clinical-stage candidates, including DSG3-CAART for mucosal pemphigus vulgaris and MuSK-CAART for MuSK myasthenia gravis. The expanding CABA™ platform may offer potentially curative therapies for patients with a broad range of autoimmune diseases. Cabaletta Bio's headquarters are located in Philadelphia, PA.

Forward-Looking Statements

This press release contains "forward-looking statements" of Cabaletta Bio within the meaning of the Private Securities Litigation Reform Act of 1995, as amended, including without limitation, express or implied statements regarding expectations regarding: Cabaletta's ability to grow its autoimmune-focused pipeline; the ability to capitalize on and potential benefits resulting from the translational research partnership with Georg Schett, M.D., and the exclusive license agreement with IASO Bio; the company's business plans and objectives; the timing of its IND clearance for CABA-201, initiation of clinical evaluation of CABA-201 and generation of initial clinical data for CABA-201; statements regarding anticipated significance of, and timing of release of, safety and persistence data and combination cohort data; statements regarding regulatory filings for its development programs, including the planned timing of such regulatory filings and potential review by such regulatory authorities; the expectation that Cabaletta Bio may improve outcomes for patients suffering from mPV, MG, or other autoimmune diseases; the progress and results of its DesCAARTes™ Phase 1 trial and MusCAARTes™ Phase 1 trial, including Cabaletta's ability to enroll the requisite number of patients, dose each dosing cohort in the intended manner, and progress the trial; the ability to accelerate Cabaletta's pipeline and develop meaningful therapies for patients, including in collaboration with academic and industry partners and the ability to optimize such collaborations on its development programs; use of capital, expenses, future accumulated deficit and other financial results in the future; ability to fund operations into the first quarter of 2025; and the anticipated contribution of the members of Cabaletta's executives to the company's operations and progress.

Any forward-looking statements in this press release are based on management's current expectations and beliefs of future events, and are subject to a number of risks and uncertainties that could cause actual results to differ materially and adversely from those set forth in or implied by such forward-looking statements. These risks and uncertainties include, but are not limited to: risks related to regulatory filings and potential clearance; the risk that signs of biologic activity or persistence may not inform long-term results; Cabaletta's ability to demonstrate sufficient evidence of safety, efficacy and tolerability in its preclinical studies and clinical trials of DSG3-CAART, MuSK-CAART and CABA-201; the risk that the results observed with the similarly-designed construct employed in the recent *Nature Medicine* and *Lancet Rheumatology* publications are not indicative of the results we seek to achieve with CABA-201; risks related to clinical trial site activation or enrollment rates that are lower than expected; risks related to unexpected safety or efficacy data observed during clinical studies; risks related to volatile market and economic conditions; risks related to the impact of public health epidemics affecting countries or regions in which Cabaletta has operations or does business, such as COVID-19; Cabaletta's ability to retain and recognize the intended incentives conferred by Orphan Drug Designation and Fast Track Designation for its product candidates, as applicable; risks related to Cabaletta's ability to protect and maintain its intellectual property position; risks related to fostering and maintaining successful relationships with Cabaletta's collaboration and manufacturing partners; uncertainties related to the initiation and conduct of studies and other development requirements for its product candidates; the risk that any one or more of Cabaletta's product candidates will not be successfully developed and/or commercialized; and the risk that the initial or interim results of preclinical studies or clinical studies will not be predictive of future results in connection with future studies. For a discussion of these and other risks and uncertainties, and other important factors, any of which could cause Cabaletta's actual results to differ from those contained in the forward-looking statements, see the section entitled "Risk Factors" in Cabaletta's most recent annual report on Form 10-K as well as discussions of potential risks, uncertainties, and other important factors in Cabaletta's other filings with the Securities and Exchange Commission. All information in this press release is as of the date of the release, and Cabaletta undertakes no duty to update this information unless required by law.

CABALETTA BIO, INC.
SELECTED FINANCIAL DATA
(unaudited; in thousands, except share and per share data)

Statements of Operations

	Three months ended December 31,		Year Ended December 31,	
	2022	2021	2022	2021
	Unaudited			
Operating expenses:				
Research and development	12,400	9,919	39,300	32,494
General and administrative	3,902	3,974	14,839	13,819
Total operating expenses	16,302	13,893	54,139	46,313
Loss from operations	(16,302)	(13,893)	(54,139)	(46,313)
Other income				
Interest income	610	5	1,164	24
Net loss	(15,692)	(13,888)	(52,975)	(46,289)
Net loss per voting and non-voting share, basic and diluted	$ (0.52)	$ (0.49)	$ (1.81)	$ (1.80)

Selected Balance Sheet Data

	December 31,	
	2022	2021
	Unaudited	
Cash, cash equivalents and investments	$106,547	$122,222
Total assets	116,968	126,336
Total liabilities	12,448	8,380
Total stockholders' equity	104,520	117,956

Contacts:

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Chief Financial Officer
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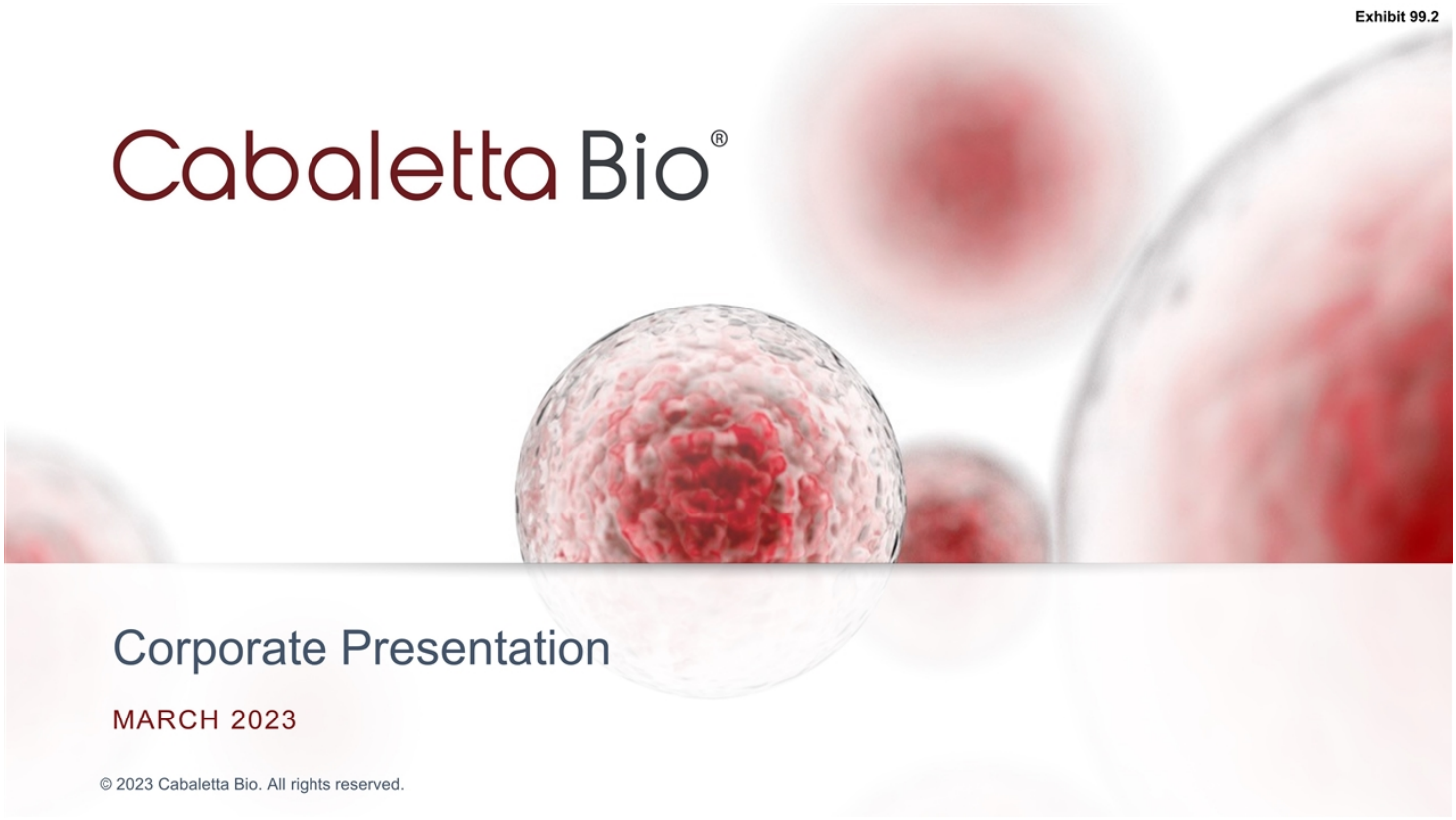
Sarah McCabe
Stern Investor Relations, Inc.
212-362-1200
sarah.mccabe@sternir.com

Exhibit 99.2

Cabaletta Bio®



Corporate Presentation

MARCH 2023

Disclaimer

The following presentation, including any printed or electronic copy of these slides, the talks given by the presenters, the information communicated during any delivery of the presentation and any question and answer session and any document or material distributed at or in connection with the presentation (collectively, the "Presentation") has been prepared by Cabaletta Bio, Inc. ("we," "us," "our," "Cabaletta" or the "Company") and is made for informational purposes only. This Presentation does not purport to be a prospectus, 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 this Presentation shall not 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 may contain "forward-looking statements" within the meaning of the Private Securities Litigation Reform Act of 1995 relating to our business, operations, and financial conditions, and include, but are not limited to, express or implied statements regarding our current beliefs, expectations and assumptions regarding: our business, future plans and strategies for our CAAR T and CARTA technologies and CABA™ platform; our ability to grow its autoimmune-focused pipeline; the ability to capitalize on and potential benefits resulting from the translational research partnership with Professor Georg Schett and the exclusive license agreement with IASO Bio; the timing of our expected clearance of an Investigational New Drug application (IND) for CABA-201 to the U.S. Food and Drug Administration as well as other planned regulatory filings for our development programs; the progress and results of our DesCAARTes™ Phase 1 trial, including the significance and impact around reported safety and clinical and translational data of cohorts from our DesCAARTes™ trial; the therapeutic potential and clinical benefits of our product candidates; the expectation that Cabaletta may improve outcomes for patients suffering from mucosal pemphigus vulgaris, myasthenia gravis, or other autoimmune diseases; our ability to escalate dosing as high as 10 to 15 billion cells in cohort A6m, initiate dosing in a combination cohort or otherwise; our ability to implement a pre-treatment regimen and the potential ability to enhance *in vivo* DSG3-CAART exposure; our ability to advance dose escalation in the DesCAARTes™ Phase 1 trial at the current dose ranges for the current cohorts and any projected potential dose ranges for future cohorts, and to optimize our targeted cell therapy; our ability to evaluate, and the potential significance of, the relationship between DSG3-CAART persistence and potential clinical responses in patients with mPV; our ability to safely retreat additional patients and whether we will continue to observe a lack of immune-mediated clearance of DSG3-CAART cells after retreatment and repeat dosing of patients; our ability to successfully complete our preclinical and clinical studies for our product candidates, including CABA-201, our ongoing Phase 1 DesCAARTes™ trial, and our ongoing Phase 1 MusCAARTes™ trial of MuSK-CAART, including our ability to enroll the requisite number of patients, dose each dosing cohort in the intended manner, and progress the trial; the ability of MuSK-CAART to target B cells that differentiate into antibody secreting cells, which produce autoantibodies against muscle-specific kinase; our ability to obtain and maintain regulatory approval of our product candidates, including our expectations regarding the intended incentives conferred by and ability to retain Orphan Drug Designation and Fast Track Designation for DSG3-CAART for the treatment of pemphigus vulgaris and Orphan Drug Designation and Fast Track Designation for MuSK-CAART to improve activities of daily living and muscle strength in patients with MuSK antibody-positive myasthenia gravis; the further expansion and development of our modular CABA™ platform across a range of autoimmune diseases; our ability to contract with third-party suppliers and manufacturers, implement an enhanced manufacturing process and further develop our internal manufacturing strategy, capabilities and facilities; our potential commercial opportunities, including value and addressable market, for our product candidates; our expectations regarding our use of capital and other financial results; and our ability to fund operations into the first quarter of 2025. Words such as, but not limited to, "look forward to," "believe," "expect," "anticipate," "estimate," "intend," "plan," "would," "should" and "could," and similar expressions or words, identify forward-looking statements.

Various risks, uncertainties and assumptions could cause actual results to differ materially from those anticipated or implied in our forward-looking statements. Such risks and uncertainties include, but are not limited to, risks related to the success, cost, and timing of our product candidate development activities and preclinical studies and clinical trials, risks related to our ability to demonstrate sufficient evidence of safety, efficacy and tolerability in our preclinical studies and clinical trials of CABA-201, DSG3-CAART and MuSK-CAART, the risk that the results observed with the similarly-designed construct employed in the recent *Nature Medicine* publication are not indicative of the results we seek to achieve with CABA-201, our plans to evaluate additional cohorts in the DesCAARTes™ trial, including a cohort implementing a pre-treatment regimen, the risk that signs of biologic activity or persistence may not inform long-term results, the risk that persistence observed with effective CART-19 oncology studies in combination with lymphodepletion is not indicative of, or applicable to, clinical responses in patients with mPV, risks related to clinical trial site activation or enrollment rates that are lower than expected, our ability to protect and maintain our intellectual property position, risks related to our relationship with third parties, uncertainties related to regulatory agencies' evaluation of regulatory filings and other information related to our product candidates, our ability to retain and recognize the intended incentives conferred by any Orphan Drug Designation and Fast Track Designations, the risk that any one or more of our product candidates will not be successfully developed and commercialized, the risk that the results of preclinical studies or clinical studies will not be predictive of future results in connection with future studies, the impact of COVID-19 on the timing, progress, interpretability of data, and results of ongoing or planned clinical trials and risks relating to as a result of extraordinary events or circumstances such as the COVID-19 pandemic, and any business interruptions to our operations or to those of our clinical sites, manufacturers, suppliers, or other vendors resulting from the COVID-19 pandemic or similar public health crisis. New risks and uncertainties may emerge from time to time, and it is not possible to predict all risks and uncertainties. Except as required by applicable law, we do not plan to publicly update or revise any forward-looking statements contained herein, whether as a result of any new information, future events, changed circumstances or otherwise. Although we believe the expectations reflected in such forward-looking statements are reasonable, we can give no assurance that such expectations will prove to be correct. Accordingly, you are cautioned not to place undue reliance on these forward-looking statements. No representations or warranties (expressed or implied) are made about the accuracy of any such forward-looking statements. For a discussion of these and other risks and uncertainties, and other important factors, any of which could cause our actual results to differ materially from those contained in the forward-looking statements, see the section entitled "Risk Factors" in our most recent annual report on Form 10-K, as well as discussions of potential risks, uncertainties, and other important factors in our other filings with the Securities and Exchange Commission. 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. The Company is the owner of various trademarks, trade names and service marks. Certain other trademarks, trade names and service marks appearing in this Presentation are the property of third parties. Solely for convenience, the trademarks and trade names in this Presentation are referred to without the ® and TM symbols, but such references should not be construed as any indicator that their respective owners will not assert, to the fullest extent under applicable law, their rights thereto.

Cabaletta Bio®

Cabaletta®: Pursuing cures for a broad range of autoimmune diseases

Experienced team uniquely positioned to efficiently advance CABA-201 in a range of autoimmune diseases

CARTA Strategy | CABA-201 (4-1BB CD19-CAR T) expecting 1H23 IND clearance[1]

- **Builds on academic clinical data[2,3] revealing potential for CD19-CAR T to reset immune system in refractory autoimmune patients**
  - *Exclusive translational research partnership with lead investigator[2,3] providing early & actionable insights for CABA-201*
- **CABA-201 has been specifically engineered for patients with autoimmune diseases**
  - *Including the same 4-1BB costimulatory domain and similar CD19 binder affinity[4] as used in the academic SLE[2] & myositis studies[3]*
  - *Fully human CD19 binder in CABA-201 with a favorable clinical tolerability profile in ~20 oncology patients*
- **Potential to cure a broad range of autoimmune diseases where B cells have a role initiating or maintaining disease**

CAART Strategy | DSG3-CAART & MuSK-CAART clinical studies evaluating combination regimens

- **DesCAARTes™ trial in mucosal pemphigus vulgaris – 1 month safety & persistence data anticipated 1H23[5]**
  - *Enrolling in combination sub-study using pre-treatment with IVIg & cyclophosphamide*
- **MusCAARTes™ trial in MuSK myasthenia gravis – leveraging insights from autoimmune experience with DSG3-CAART**
  - *Initiated in 4Q22; received FDA Fast Track Designation & Orphan Drug Designation*

Initial CABA-201 clinical data[1] and 6-month combination data from CAART trials expected by 1H24[5]

CAART – Chimeric AutoAntibody Receptor T cells; CARTA – Chimeric Antigen Receptor T cells for Autoimmunity; IND – Investigational New Drug; SLE – Systemic lupus erythematosus; RA – Rheumatoid arthritis

1. Subject to and pending clearance of CABA-201 IND by the FDA.
2. Mackensen, Andreas, et al. "Anti-CD19 CAR T cell therapy for refractory systemic lupus erythematosus." Nature Medicine (2022): 1-9.
3. Müller, Fabian, et al. "CD19-targeted CAR T cells in refractory antisynthetase syndrome." The Lancet (2023).
4. Dai, Zhenyu, et al. "Development and functional characterization of novel fully human anti-CD19 CARs for T-cell therapy." Journal of Cellular Physiology 236.8 (2021): 5832-5847.
5. Assumes no dose-limiting toxicities are observed in the cohort and uninterrupted enrollment occur in the trials.

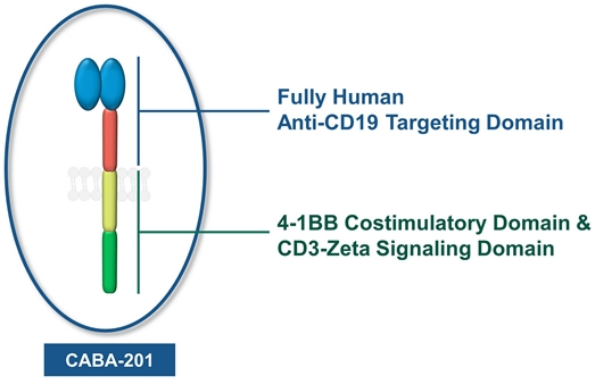
One CABA™ platform, two strategies to address autoimmune diseases

Complementary strategies to optimize clinical outcomes using cellular therapies in autoimmune diseases

CARTA

Chimeric **A**ntigen **R**eceptor **T** cells for **A**utoimmunity

*Potential to '**reset the immune system**' in patients with **autoimmune diseases driven by B cells**, through generalized transient B cell depletion and **repopulation of healthy B cells**[1]*

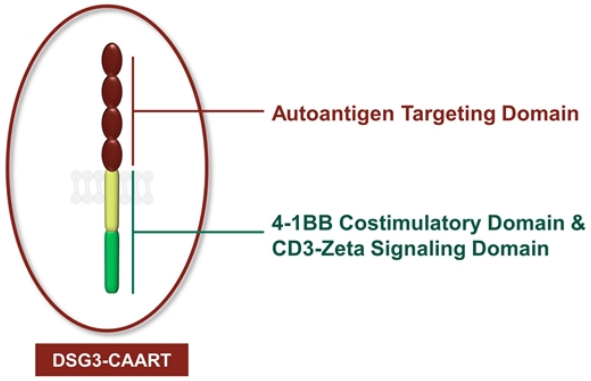


CABA-201

CAART

Chimeric **A**uto**A**ntibody **R**eceptor **T** cells

*In autoimmune diseases with a **limited number of well-defined pathogenic autoantibodies**, permanent **antigen-specific B cell depletion** may provide an **elegant biologic solution** to disease*[2]



DSG3-CAART

1. Mackensen, Andreas, et al. "Anti-CD19 CAR T cell therapy for refractory systemic lupus erythematosus." *Nature Medicine* (2022): 1-9.
2. Ellebrecht, Christoph T., et al. "Reengineering chimeric antigen receptor T cells for targeted therapy of autoimmune disease." *Science* 353.6295 (2016): 179-184.

CABA™ platform may apply across a range of autoimmune diseases

Biologic opportunity for cure or treatment may be possible in dozens of autoimmune diseases*

Neurology
- **Myasthenia Gravis**[1,2,3,5]
- Multiple Sclerosis[6]
- Neuromyelitis Optica[3]
- Chronic Inflammatory Demyelinating Polyneuropathy[1,2]
- Anti-NMDAR Encephalitis[3,6]
- Lambert-Eaton Syndrome[5]

Rheumatology
- **Systemic Lupus Erythematosus**[3,4,5,6]
- Rheumatoid Arthritis[2,3,4]
- **Myositis**[5]
- **Systemic sclerosis**[6]
- ANCA-Associated Vasculitis[3,4,5]

Dermatology
- **Pemphigus Vulgaris**[1,2,3]
- Pemphigus Foliaceus[1,2,3]
- Epidermolysis Bullosa Acquisita[3]
- Bullous Pemphigoid[1,2,3]

Hematology
- Immune Thrombocytopenic Purpura[3]
- Thrombotic Thrombocytopenic Purpura[1,2,3]
- Antiphospholipid Syndrome[4,5]
- Autoimmune Hemolytic Anemia[3]

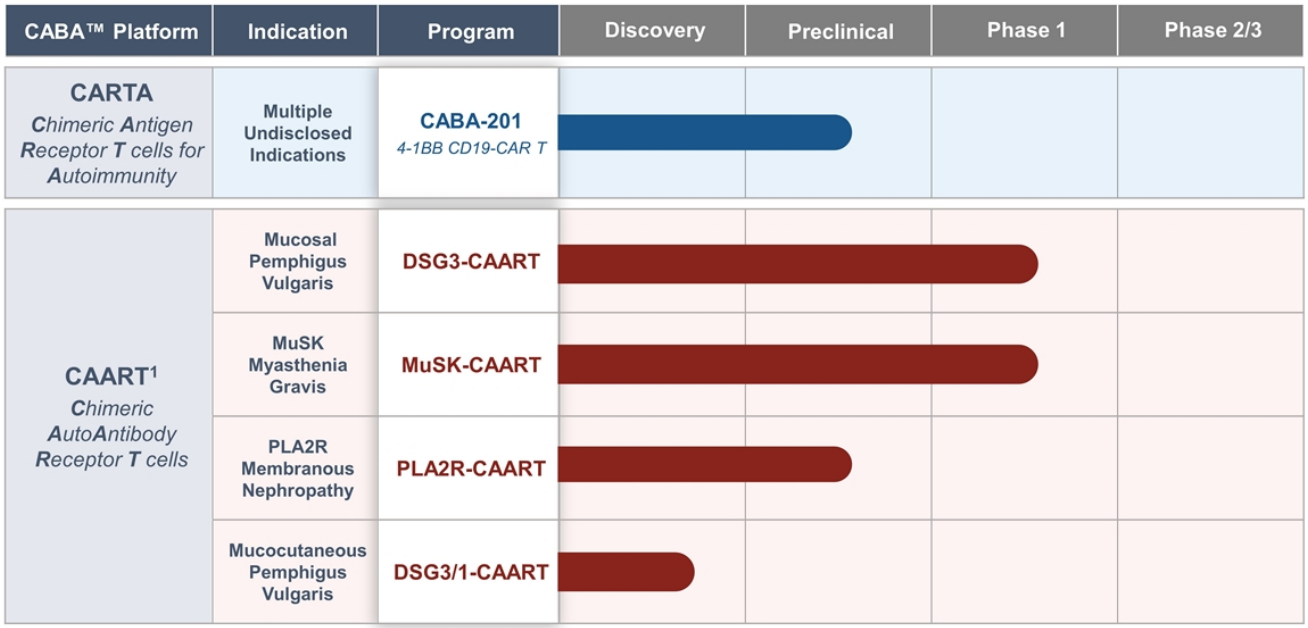
Nephrology
- **Lupus Nephritis**[3,4]
- Membranous Nephropathy[1,2,3]
- Goodpasture's Syndrome[1,2,3,4]

Endocrinology
- Type 1 Diabetes[3,6]
- Graves' Disease[3,5]
- Hashimoto's Disease[5]

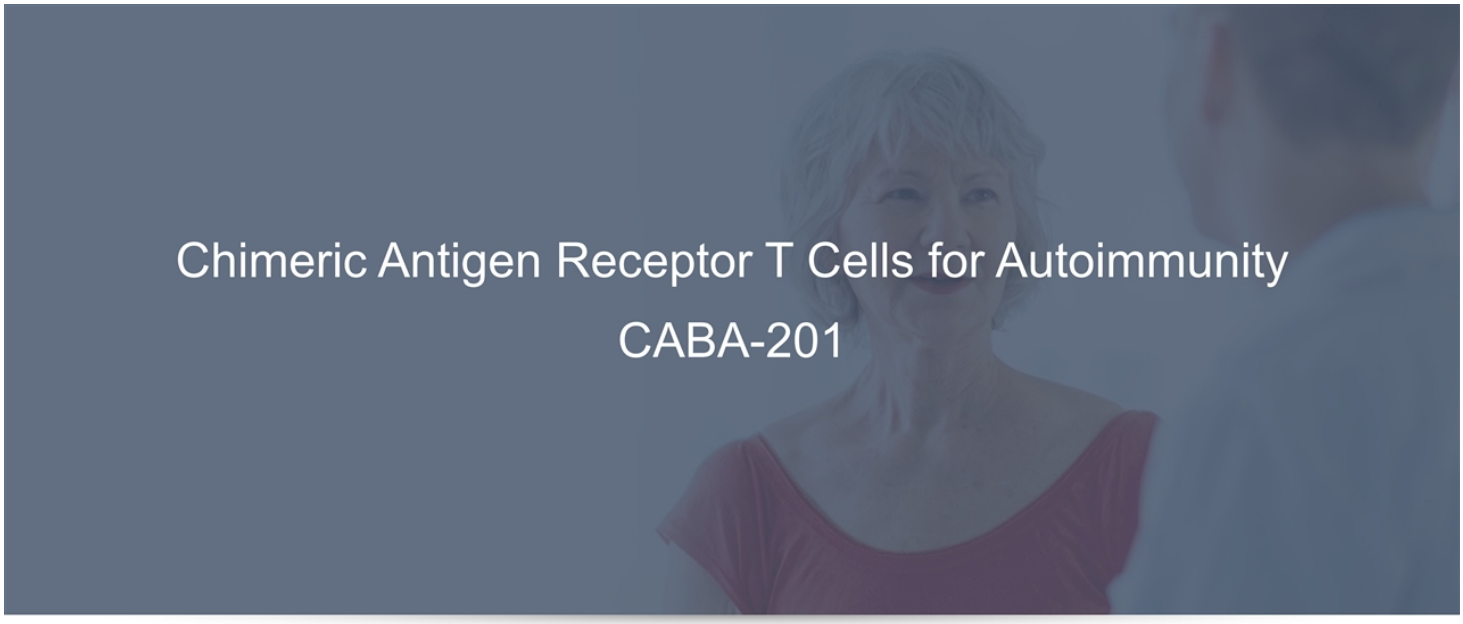
- *Illustrative list of autoimmune diseases where B cells may play a role in initiating or maintaining disease, and where biologic opportunity for cure or treatment with CAART or CARTA approach may be possible.*
- *Diseases **in bold** represent where clinical studies are underway or plan to be initiated by Cabaletta or by Professor Schett*

1. Koneczny, Inga. "Update on IgG4-mediated autoimmune diseases: new insights and new family members." Autoimmunity Reviews (2020): 102646.
2. Huijbers, Maartje G., et al. "IgG4-mediated autoimmune diseases: a niche of antibody-mediated disorders." Annals of the New York Academy of Sciences 1413.1 (2018): 92.
3. Ludwig, Ralf J., et al. "Mechanisms of autoantibody-induced pathology." Frontiers in immunology 8 (2017): 603.
4. Suurmond, Jolien, and Betty Diamond. "Autoantibodies in systemic autoimmune diseases: specificity and pathogenicity." The Journal of clinical investigation 125.6 (2015): 2194-2202.
5. Xiao, Ze Xiu, Joseph S. Miller, and Song Guo Zheng. "An updated advance of autoantibodies in autoimmune diseases." Autoimmunity Reviews (2020): 102743.
6. Hampe, Christiane S. "B cells in autoimmune diseases." Scientifica 2012 (2012).

Pipeline targeting autoimmune diseases where cure is possible



1. Additional CAART disease targets in discovery stage include two undisclosed indications. We have discontinued work on FVIII-CAART due to the prioritization of other product candidates.



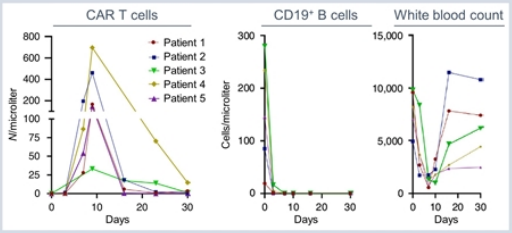
Cabaletta Bio®

Academic data: Immune system reset in SLE & myositis patients[1,2]

Exclusive translational research partnership with lead investigator informing our CD19 clinical strategy

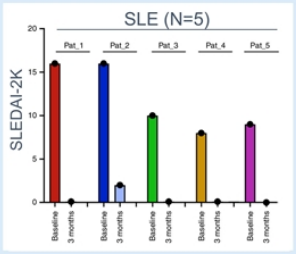
4-1BB CD19-CAR T[3] resulted in rapid, deep & transient CD19+ B cell depletion

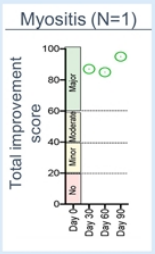
- 1x10^6 cells/kg preceded by standard Flu/Cy regimen
- CD19 binder (FMC63 scFv) & 4-1BB costim domain[3]



Clinical & serologic responses within 3 mo. of CD19-CAR T therapy in refractory patients with SLE[1] & patient with myositis[2]

Rapid & robust improvement in clinical disease activity





Normalization of serum markers of disease

5/5 SLE patients

- Anti-dsDNA Abs undetectable
- Complement levels normalized

Myositis patient (antisynthetase syndrome):

- Creatinine kinase dropped to normal

Promising safety data[1,2]

- Grade 1 CRS (fever) in 4/6 patients
- No ICANS of any grade

Repopulation of healthy B cells[1,2]

- New B cells in 6/6 patients in 2-5 months
- Limited decline in vaccination titers

Durable clinical responses[1,2]

- 5-17 months of follow up
- Off other immunosuppressive medications

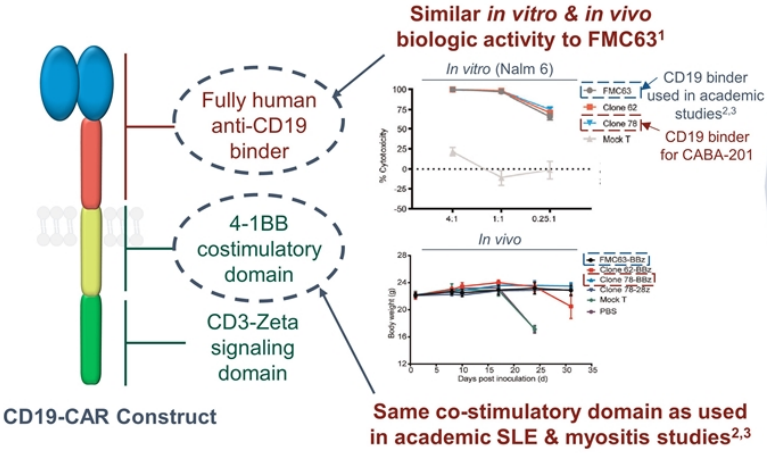
SLE – Systemic lupus erythematosus; ASyS – Anti-synthetase syndrome; scFv – Single chain variable fragment; SLEDAI-2K – Systemic Lupus Erythematosus Disease Activity Index 2000; CRS – Cytokine release syndrome; ICANS – Immune effector cell-associated neurotoxicity syndrome; Anti-dsDNA Abs – Anti-double-stranded deoxyribonucleic acid antibodies

1. Mackensen, Andreas, et al. "Anti-CD19 CAR T cell therapy for refractory systemic lupus erythematosus." Nature Medicine (2022): 1-9.
2. Müller, Fabian, et al. "CD19-targeted CAR T cells in refractory antisynthetase syndrome." The Lancet (2023).
3. The construct utilized in this study has a similar design to CABA-201, sharing the 4-1BB costimulatory domain, but is a different construct.

CABA-201: CD19-targeting CAR T therapy for autoimmune diseases

Cabaletta's CD19 binder with similar *in vitro* & *in vivo* activity to FMC63[1] (binder used in academic studies[2,3])

CABA-201



Similar *in vitro* & *in vivo* biologic activity to FMC63[1]

Same co-stimulatory domain as used in academic SLE & myositis studies[2,3]

Clinical data reported by Iaso using licensed CD19 binder[4]

Fully human binder
Evaluated within dual-CAR combined with CD22 binder with standard Flu/Cy preconditioning

Evaluated in ~20 patients to date[4]
Under evaluation in patients with B cell leukemia and lymphoma in IIT in China

Safety data supports autoimmune development[4]
Used in oncology patients with high target cell burden

SLE – Systemic lupus erythematosus; IIT – Investigator-initiated trial; Flu/Cy – Fludarabine/Cyclophosphamide; CRS – Cytokine release syndrome; ICANS – Immune effector cell-associated neurotoxicity syndrome

1. Dai, Zhenyu, et al. "Development and functional characterization of novel fully human anti-CD19 chimeric antigen receptors for T-cell therapy." Journal of Cellular Physiology 236.8 (2021): 5832-5847.
2. Mackensen, Andreas, et al. "Anti-CD19 CAR T cell therapy for refractory systemic lupus erythematosus." Nature Medicine (2022): 1-9.
3. Müller, Fabian, et al. "CD19-targeted CAR T cells in refractory antisynthetase syndrome." The Lancet (2023).
4. Evaluated as part of CT120, a dual-CD19xCD22 CAR T product candidate under development by Nanjing IASO Biotherapeutics, Co., Ltd. (IASO Bio).

CABA-201

Accelerating development of CABA-201 for autoimmune diseases

Differentiated asset, exclusive translational insights & track record of timely CAART clinical implementation

1 Cabaletta is uniquely positioned to efficiently advance CABA-201 in autoimmune diseases

- Expertise in conducting complex, interdisciplinary autoimmune-focused cell therapy clinical trials
- Track record of positive regulatory interactions to support cell therapy trials in autoimmune diseases since 2018
  - 2 INDs cleared within routine 30-day period; multiple clinical protocol modifications, Fast Track designations granted
- Successful track record of manufacturing novel cell therapy products with academic and industry partners
- Deep understanding of autoimmunity allows potential application across broad range of diseases

2 Clinically-evaluated binder & translational research partnership support CABA-201 development

- CABA-201 leverages similar design to 4-1BB-containing CD19-CAR T in seminal academic SLE & myositis studies[1,2]
- Exclusive research partnership with lead investigator for academic studies provides early and actionable insights

IND clearance for CABA-201 expected in first half of 2023

SLE – Systemic lupus erythematosus

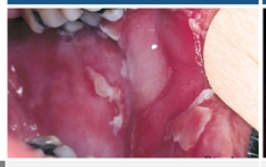
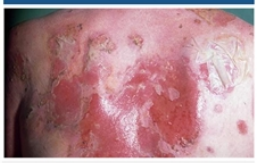
1. Mackensen, Andreas, et al. "Anti-CD19 CAR T cell therapy for refractory systemic lupus erythematosus." Nature Medicine (2022): 1-9.
2. Müller, Fabian, et al. "CD19-targeted CAR T cells in refractory antisynthetase syndrome." The Lancet (2023).

Cabaletta Bio®

DSG3-CAART

Overview of pemphigus vulgaris & current treatment landscape

Current treatments require broad immunosuppression associated with safety risks and transient efficacy

	Mucosal PV[1] (25%)	Mucocutaneous PV[2] (75%)
		
Associated Antibody	**Anti-DSG3**	**Anti-DSG3 + Anti-DSG1**
Clinical Signs	Painful blisters of the mucous membranes (mouth, nose, larynx, esophagus, eyes, genitalia, rectum)	Blisters on orifices and skin
U.S. Disease Prevalence	**3,250 to 4,750**	**9,750 to 14,250**

CROT = 8+ weeks without lesions while off systemic therapy

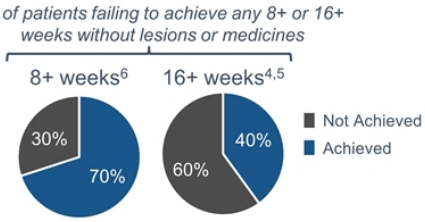
Broad immunosuppression[3,6]

Modestly effective & poorly tolerated

Rituximab plus steroids (~3,500 mg/yr)[4]

Transient remission

~30% relapse in 1 year & >50% relapse in 2 years[6]



Safety risks

- 22% annual serious adverse event (SAE) rate[4]
- 4-9%[3,4,5] annual risk of severe infection in PV
- ~1.9% lifetime risk of fatal infection[7]

1. Image credit: D@nderm.
2. http://www.vgrd.org/archive/cases/2004/pv/DSCN4996%20copy.JPG
3. Joly, Pascal, et al. "First-line rituximab combined with short-term prednisone versus prednisone alone for the treatment of pemphigus (Ritux 3): a prospective, multicentre, parallel-group, open-label randomised trial." The Lancet 389.10083 (2017): 2031-2040.
4. Werth, Victoria P., et al. "Rituximab versus Mycophenolate Mofetil in Patients with Pemphigus Vulgaris." New England Journal of Medicine (2021).
5. Rituximab label, 08/2020 revision.
6. Kushner, Carolyn J., et al. "Factors Associated With Complete Remission After Rituximab Therapy for Pemphigus." JAMA dermatology (2019).
7. Tony, Hans-Peter, et al. "Safety and clinical outcomes of rituximab therapy in patients with different autoimmune diseases: experience from a national registry (GRAID)." Arthritis research & therapy 13.3 (2011): 1-14.

DSG3-CAART

Ongoing DesCAARTes™ study in patients with mucosal PV

Orphan Drug Designation

Fast Track Designation

Monotherapy DSG3-CAART demonstrates favorable tolerability to date, but persistence plateaus

DesCAARTes™ study of DSG3-CAART

Ongoing open-label Phase 1 study[1] to determine the maximum tolerated dose & to evaluate safety of DSG3-CAART

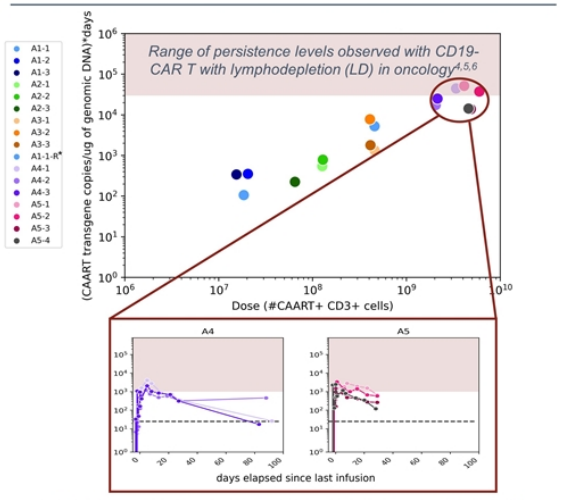
Part A Cohorts[1]	Subjects	Dose*
A1 – A6m[2,3]	3 (+3) per cohort	20M to 15B

Primary objective:
Determine the maximum tolerated dose of DSG3-CAART

Primary endpoint:
Adverse events, including dose-limiting toxicities (DLTs), related to DSG3-CAART within 3 months of infusion

Combination Sub-study	Subjects	Dose*
IVIG / Cyclophosphamide[3]	3 (+3) per cohort	2.5B

DSG3-CAART Persistence to 29d in Cohorts A1-A5



* *A1-1-R refers to a subject in cohort A1 who was retreated at the cohort A3 dose (500M).*

1. FDA has requested, and the Company has agreed, that we will share data from part A to inform a discussion on the optimal design of part C. According to FDA advice, the submission of part A data is not gating to planned enrollment in part B.
2. Cohort A6m reflects a two-dose regimen of 5.0 to 7.5 billion cells, 3 weeks apart, for a total of 10 to 15 billion cells, which is designed to prolong exposure time of DSG3-CAART *in vivo*.
3. Combination cohort has been prioritized relative to A6m based on emerging data in cohorts A4 and A5.
4. Mueller, Karen Thudium, et al. "Cellular kinetics of CTL019 in relapsed/refractory B-cell acute lymphoblastic leukemia and chronic lymphocytic leukemia." Blood. 130.21 (2017): 2317-2325.
5. Schuster SJ, Bishop MR, Tam CS, et al. Tisagenlecleucel in Adult Relapsed or Refractory Diffuse Large B-Cell Lymphoma. N Engl J Med. 2019;380(1):45-56. doi:10.1056/NEJMoa1804980.
6. The range of persistence observed with anti-CD19 CART therapy in oncology has not been confirmed to be necessary or sufficient for clinical responses in patients with mPV.

* *20M, 100M, 500M, 2.5B, 5.0B to 7.5B and 10B to 15B refers to the number of DSG3-CAART cells infused for patients in dosing cohorts A1 to A6m (M – millions; B – billions).*

Combination sub-study prioritized to increase CAART exposure

Combination strategy designed to enhance cytokine and/or diminish autoantibody effects on CAART activity

Combination sub-study cohort

A4 dose ($2.5x10^9$ cells) + cyclophosphamide (CY) & IVIg

- Dose-dependent increase in CAART persistence as monotherapy plateaued with Cohort A5
  - Through up to 6 months post-CAART infusion, no clear pattern in antibody levels and disease activity observed in first 3 subjects at cohort A5 dose
- CY may reduce 'cytokine sink,' potentially enhancing CAART activation & proliferation
- CY + IVIg may reduce anti-DSG3 autoantibodies, addressing a potential efficacy barrier
- CY & IVIg likely to provide transient improvement in first few months after infusion[1,2,3,4,5]
  - DSG3-CAART clinical effect may require follow-up for 6-9 months

Cohort A6m | *2x A5 dose ($1-1.5x10^{10}$ cells) – lower priority*

- Two infusions at the A5 dose level 3 weeks apart
  - To potentially increase the duration of maximal exposure to DSG3-CAART

1. Amagai, Masayuki, et al. "A randomized double-blind trial of intravenous immunoglobulin for pemphigus." Journal of the American Academy of Dermatology 60.4 (2009): 595-603.
2. Arnold, D. F., et al. "An 'n-of-1'placebo-controlled crossover trial of IVIg as adjuvant therapy in refractory pemphigus vulgaris." British Journal of Dermatology 160.5 (2009): 1098-1102.
3. Zhang, Wenjing, et al. "Short-Term Intravenous Infusion of Cyclophosphamide in the Treatment of Refractory Pemphigus Vulgaris: A Retrospective Study." Dermatology 237.2 (2021): 185-190.
4. Fleischli, Mary E., Rachel H. Valek, and Amit G. Pandya. "Pulse intravenous cyclophosphamide therapy in pemphigus." Archives of dermatology 135.1 (1999): 57-61.
5. Lolis, Margarita, et al. "Effect of IVIg with or without cytotoxic drugs on pemphigus intercellular antibodies." Journal of the American Academy of Dermatology 64.3 (2011): 484-489.

High unmet need in MuSK myasthenia gravis

Strategy for first-in-human trial informed by learnings from DesCAARTes™ study

Orphan Drug Designation

Fast Track Designation

1 Compelling biologic rationale, similar to PV

- IgG4-dominant disease
- Autoantibody titers drop after rituximab[1,2]
- Pathogenic B cells incompletely eliminated by rituximab and persist during relapse[3]
- Circulating anti-MuSK antibody titers may be ~90% lower than anti-DSG3 antibody in PV[4,5,6]

2 Differentiated market opportunity

- Total U.S. MG prevalence 50,000 to 80,000 patients
- MuSK+ MG comprises 6-7.5% of total MG population
- Compared to AChR+ MG, MuSK+ disease is typically more severe with limited treatment options
- MuSK+ disease has early onset, 7:1 females

MusCAARTes™ study of MuSK-CAART

Ongoing open-label study to determine the maximum tolerated dose & to evaluate safety of MuSK-CAART

Part	Cohort	Subjects
A – Monotherapy Dose Escalation[7] Dose increasing from 500M with 2 (+4) design	A1-A3	2 (+4) per cohort
A – Adaptive Combination Cohorts[7] Combination cohorts[8], starting at A2 dose	A4+	2 (+4) per cohort
B – Expansion Expanded subject enrollment at final selected dose	B	~12

Study Endpoint & Objectives

Primary Endpoint: Adverse Events, including DLT

Secondary & Tertiary Objectives: CAART expansion/persistence, effect on serum anti-MuSK antibody titer, use of concomitant systemic medications, effect on clinical symptoms, manufacturing success rate

* 500M refers to the number of MuSK-CAART cells infused for patients in dosing cohort A1 (M – millions).

1. Hain, Berit, et al. "Successful treatment of MuSK antibody–positive MG with rituximab." Muscle & Nerve. 33.4 (2006): 575-580.
2. Illa, Isabel, et al. "Sustained response to Rituximab in anti-AChR and anti-MuSK positive Myasthenia Gravis patients." Journal of neuroimmunology 201 (2008): 90-94.
3. Jiang, Ruoyi, et al. "Single-cell repertoire tracing identifies rituximab-resistant B cells during myasthenia gravis relapses." JCI insight 5.14 (2020).
4. Matthews, Ian, et al. "Muscle-specific receptor tyrosine kinase autoantibodies—a new immunoprecipitation assay." Clinica chimica acta 348.1-2 (2004): 95-99.
5. McConville, John, et al. "Detection and characterization of MuSK antibodies in seronegative myasthenia gravis." Annals of neurology 55.4 (2004): 580-584.
6. Marino, Mariapaola, et al. "Long-lasting rituximab-induced reduction of specific—but not total—IgG4 in MuSK-positive myasthenia gravis." *Frontiers in immunology* 11 (2020): 613.
7. A total of 6 subjects will need to have received the final selected dose in Part A of the study.
8. Cohorts A3 and A4 will be enrolled concurrently after cohort A2 is well-tolerated with a preference for enrollment into A4.

Cabaletta Bio®

Manufacturing strategy

Three-stage approach allows for efficient allocation of capital while leveraging experienced partners

Stage 1: Penn	**Stage 2:** CDMOs & CABA Process	**Stage 3:** Commercialization & Scale-Up
2019 –	2021 –	Data-gated, staged investment
• Cell processing capacity secured through Penn partnership • SOPs previously used to develop multiple clinical stage CAR T products • Clinical vector validated	• CDMOs for vector and cell processing with commercial support capabilities[1] OxfordBioMedica WuXi AppTec	• Leasing followed by engineering and build out of Cabaletta-owned manufacturing facility, and/or • Establishment of a strategic partnership to rapidly & reliably scale manufacturing, leveraging the partner's manufacturing expertise Cabaletta Bio®

1. CDMOs shown are currently contracted for select CAART product candidates.

Cabaletta Bio leadership

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tengion
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President, Science & Technology

Adaptimmune
Penn

David J. Chang, M.D., M.P.H., FACR
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Goldman Sachs
Children's Hospital of Philadelphia

Michael Gerard
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Spark
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Anup Marda
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Track record of operational success employing novel cell therapies in autoimmunity across preclinical, clinical, manufacturing & regulatory domains

Multiple potential clinical catalysts anticipated in next 12-18 months[1]

	Expected Timing	Expected Milestone
CABA-201 *4-1BB CD19-CAR T*	1H 2023	IND clearance[2]
	1H 2024	Initial clinical data[2]
DSG3-CAART *Mucosal-dominant pemphigus vulgaris*	1H 2023	1-month safety & persistence data for combination cohort in DesCAARTes™ trial
	2H 2023	6-month data for combination cohort
MuSK-CAART *MuSK-associated myasthenia gravis*	✓4Q 2022	Initiate first-in-human MusCAARTes™ trial
	1H 2024	6-month data for combination cohort

Cash runway into 1Q25

1. Assumes no dose-limiting toxicities are observed in any cohort and uninterrupted enrollment occur in the trials.
2. Subject to and pending clearance of CABA-201 IND by the FDA.

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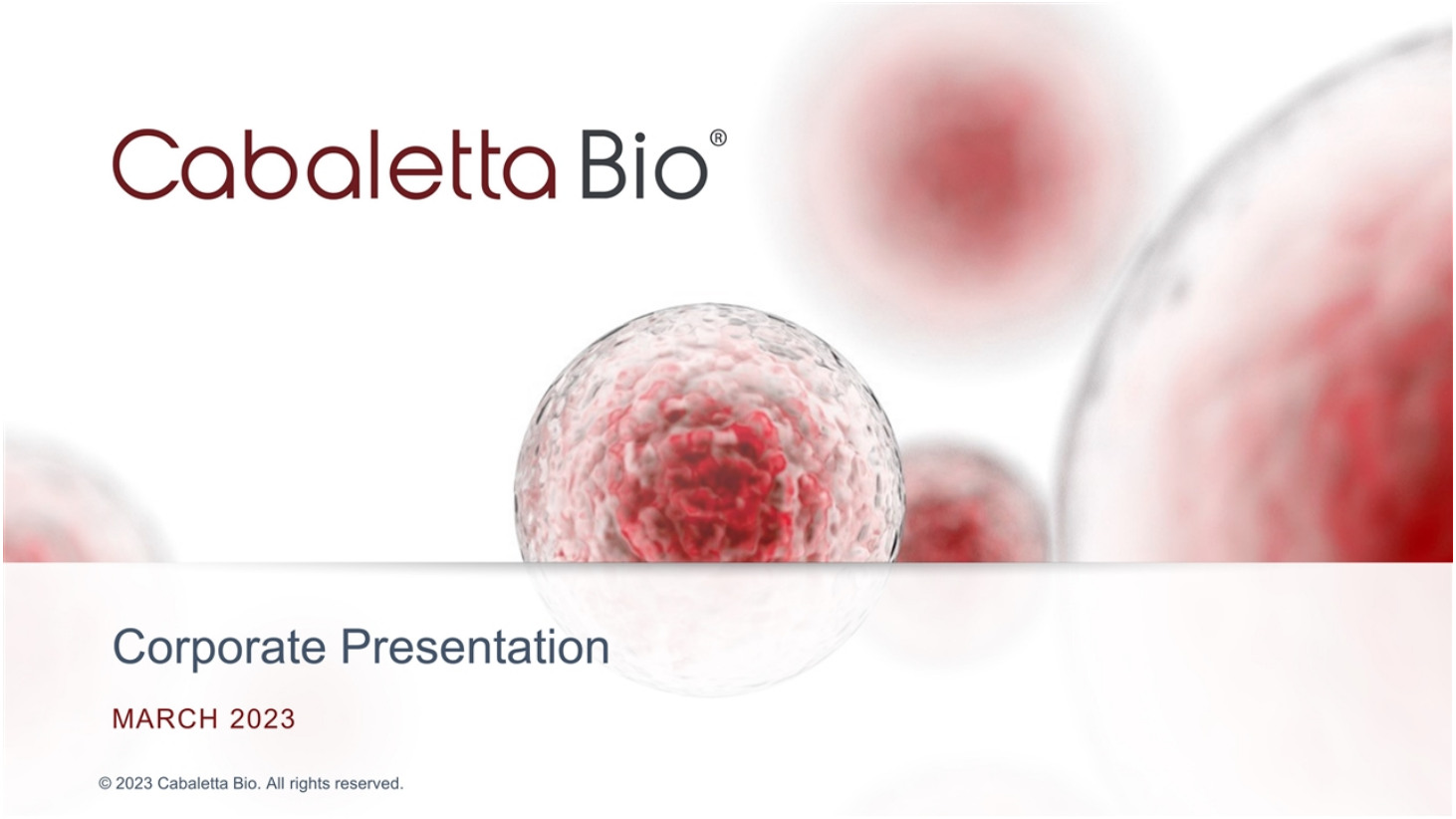

Corporate Presentation

MARCH 2023