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

August 11, 2022
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 August 11, 2022, Cabaletta Bio, Inc. (the "Company") announced its financial results for the second quarter ended June 30, 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 August 11, 2022, 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 2.02 and 7.01 of this Current Report on Form 8-K 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 August 11, 2022, furnished herewith.
99.2	Cabaletta Bio, Inc. Corporate Presentation, dated August 11, 2022, 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: August 11, 2022

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

Cabaletta Bio®

Cabaletta Bio Reports Second Quarter 2022 Financial Results and Provides Business Update

PHILADELPHIA, Aug. 11, 2022 – Cabaletta Bio, Inc. (Nasdaq: CABA), a clinical-stage biotechnology company focused on the discovery and development of targeted cell therapies for patients with autoimmune diseases, today reported financial results for the second quarter ended June 30, 2022, and provided a business update.

"The DesCAARTes™ trial is continuing to advance through additional cohorts including higher doses as well as a planned combination cohort with intravenous immunoglobulin and cyclophosphamide administered prior to DSG3-CAART infusion, which are expected to start dosing following cohort A5. We also expect to present 6 month clinical and translational data from cohort A4 as well as 28-day safety data from cohort A5 at the upcoming European Association of Dermatology and Venereology Congress next month," said Steven Nichtberger, M.D., Chief Executive Officer and Co-founder of Cabaletta. "With cash on hand to fund operations through the first quarter of 2024, the goal of our autoimmune-focused pipeline is to achieve deep, durable and perhaps curative outcomes for patients. We are confident that we are well-positioned to build on our progress to date and deliver long-term value to patients and our other key stakeholders."

Pipeline Highlights and Anticipated Upcoming Milestones

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

- **Presented updated interim clinical data from the ongoing DesCAARTes™ trial at ASGCT and SID Annual Meetings:** In May 2022, Cabaletta presented updated clinical and translational data through 6 months of follow-up in cohorts A1 through A3, safety data through 3 months and persistence data through 1 month of follow-up in cohorts A1 through A4 from the DesCAARTes™ trial at the American Society of Gene & Cell Therapy (ASGCT) 25th Annual Meeting and Society For Investigative Dermatology (SID) 2022 Annual Meeting. The updated interim data demonstrated that DSG3-CAART had a favorable safety profile with no dose limiting toxicities or cytokine release syndrome of any grade through cohort A4 and that a dose dependent increase in DSG3-CAART persistence was observed through day 29 in cohorts A1 through A4.
- **Additional data from the DesCAARTes™ trial anticipated at the 31st European Dermatology and Venereology (EADV) Congress:** Cabaletta plans to disclose 6 month clinical and translational data for cohort A4 and 28-day safety data for cohort A5 at the 31st EADV Congress, which is being held in Milan, Italy from September 7-10, 2022.

- **Upcoming cohorts designed to maximize DSG3-CAART exposure in vivo.** Two additional dose cohorts are planned after cohort A5: A6m (multi-dose regimen at 10 to 15 billion cells) and a combination cohort (2.5 billion cells in addition to patient pre- treatment with intravenous immunoglobulin [IVIg] and cyclophosphamide). The prioritization of cohorts following cohort A5 (e.g. A6m or combination) is subject to evaluation of emerging data and finalization of our protocol, as applicable. Cohort A5e (enhanced manufacturing process at 5.0 to 7.5 billion cells) is no longer planned to occur immediately after cohort A5.

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

- **Presented preclinical data supporting planned clinical development:** In May 2022, Cabaletta presented preclinical safety and activity studies supporting precision engineered T-cell therapy for MuSK myasthenia gravis at American Association of Immunologists IMMUNOLOGY2022™, 14th MGFA International Conference On Myasthenia And Related Disorders and American Society of Gene & Cell Therapy 25th Annual Meeting. The preclinical data demonstrated that MuSK-CAART eliminated anti-MuSK target cells in an animal model where CART19 cells were a positive control. The preclinical data suggest that MuSK-CAART demonstrated specific *in vivo* target engagement and support its progression into clinical evaluation.
- **Clinical Trial Application for MusCAARTes™ trial accepted by Health Canada:** In June 2022, Health Canada issued a No Objection Letter (NOL) in response to a Clinical Trial Application for the MusCAARTes™ trial submitted by Cabaletta. The NOL allows for Cabaletta to activate clinical trial sites and pursue patient enrollment for the MusCAARTes™ trial in Canada. The receipt of the NOL from Health Canada follows the clearance of an Investigational New Drug (IND) application submitted by Cabaletta to the FDA for the MusCAARTes™ trial, which was cleared within the routine 30-day review period. MuSK-CAART was granted Fast Track Designation in March 2022.
- **First-in-human trial planned to initiate in 2022:** The trial will be an open-label study consisting of two parts: (i) an accelerated dose escalation phase with a "2+4" dosing scheme designed to determine the maximum tolerated dose, with four additional patients added at the highest selected dose and (ii) a cohort expansion phase at the final selected dose. The trial will incorporate insights and enhancements supported by data from the DesCAARTes™ trial, including the ability to start at a higher initial dose. The trial is expected to enroll approximately 24 patients across multiple clinical sites throughout the United States and Canada.

Upcoming Events

Cabaletta will participate in the following upcoming investor conferences:

- Morgan Stanley 20th Annual Global Healthcare Conference, which is being held in New York, NY from September12-14, 2022.
- H.C. Wainwright 24th Annual Global Investment Conference, which is being held virtually and in person in New York, NY from September 12-14, 2022.

Second Quarter 2022 Financial Results

- Research and development expenses were $9.5 million for the three months ended June 30, 2022, compared to $7.9 million for the same period in 2021.
- General and administrative expenses were $3.5 million for the three months ended June 30, 2022, compared to $3.3 million for the same period in 2021.
- As of June 30, 2022, Cabaletta had cash, cash equivalents and investments of $96.8 million, compared to $122.2 million as of December 31, 2021.

Based on updated forecasting, the Company expects that its cash, cash equivalents and investments as of June 30, 2022 will enable it to fund its operating plan through the first quarter of 2024.

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, in combination with Cabaletta Bio's proprietary technology, has advanced a growing pipeline that currently includes potential treatments for patients with mucosal pemphigus vulgaris, MuSK-associated myasthenia gravis, PLA2R-associated membranous nephropathy, mucocutaneous pemphigus vulgaris and hemophilia A with FVIII alloantibodies. Cabaletta Bio's headquarters are located in Philadelphia, PA. For more information, visit www.cabalettabio.com and follow us on LinkedIn.

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 and advance its autoimmune-focused and preclinical pipeline; the progress and results of its DesCAARTes™ Phase 1 trial and planned MusCAARTes™ trial, including its ability to enroll the requisite number of patients, dose each dosing cohort in the intended manner, and progress the trial; the significance and impact around the clinical and translational data updates from cohorts A1 through A3 of the DesCAARTes™ trial; the expected timing and significance of the announcement of 28-day safety for cohort A5 and clinical and translational data for cohort A4 at the 31st EADV Congress in September 2022; the expectation that Cabaletta may improve outcomes for patients suffering from mPV; Cabaletta's ability to escalate dosing as high as 10 to 15 billion cells in a planned future cohort, initiate dosing in a combination cohort or otherwise; Cabaletta's plans to implement a pre-treatment regimen; Cabaletta's 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 its targeted cell therapy; Cabaletta's ability to evaluate, and the potential significance of, the relationship between DSG3-CAART persistence and potential clinical responses in patients with mPV; the expectation that Cabaletta Bio may improve outcomes for patients suffering from MuSK MG; plans to initiate patient dosing in an open-label Phase 1 clinical trial to evaluate MuSK-CAART safety and tolerability in MuSK MG patients in 2022; the effectiveness and timing of product candidates that Cabaletta may develop, including in collaboration with academic partners; presentation of additional data at upcoming scientific conferences, and other preclinical data; expectations regarding the design, implementation, timing and success of its current and

planned clinical trials and the successful completion of nonclinical studies; planned potential timing and advancement of its preclinical studies and clinical trials and related regulatory submissions; ability to optimize the impact of its collaborations on its development programs; use of capital, expenses, future accumulated deficit and other financial results in the future; and ability to fund operations through the first quarter of 2024.

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: 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 and clinical trials of DSG3-CAART and MuSK-CAART; 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; risks related to unexpected safety or efficacy data observed during clinical studies; risks related to the impact of public health epidemics, such as the ongoing COVID-19 pandemic, affecting countries or regions in which we have operations or do business; Cabaletta's ability to retain and recognize the intended incentives conferred by Orphan Drug Designation and Fast Track Designation for DSG3-CAART for improving healing of mucosal blisters in patients with mucosal pemphigus vulgaris; Cabaletta's ability to demonstrate sufficient evidence of safety, efficacy and tolerability in its preclinical and clinical trials of DSG3-CAART and MuSK-CAART; risks related to fostering and maintaining successful relationships with Cabaletta's manufacturing partners; risks related to Cabaletta's ability to protect and maintain its intellectual property position; 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 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 June 30,		Six Months Ended June 30,	
	2022	2021	2022	2021
	unaudited		unaudited	
Operating expenses:				
Research and development	$ 9,514	$ 7,850	$ 18,684	$ 14,406
General and administrative	3,546	3,295	7,375	6,451
Total operating expenses	13,060	11,145	26,059	20,857
Loss from operations	(13,060)	(11,145)	(26,059)	(20,857)
Other income:				
Interest income	150	6	203	16
Net loss	(12,910)	(11,139)	(25,856)	(20,841)
Net loss per share of voting and non-voting common stock, basic and diluted	$ (0.45)	$ (0.45)	$ (0.89)	$ (0.86)

Selected Balance Sheet Data

	June 30, 2022	December 31, 2021
	(unaudited)	
Cash, cash equivalents and investments	$ 96,806	$ 122,222
Total assets	102,016	126,336
Total liabilities	6,486	8,380
Total stockholders' equity	95,530	117,956

Contacts:

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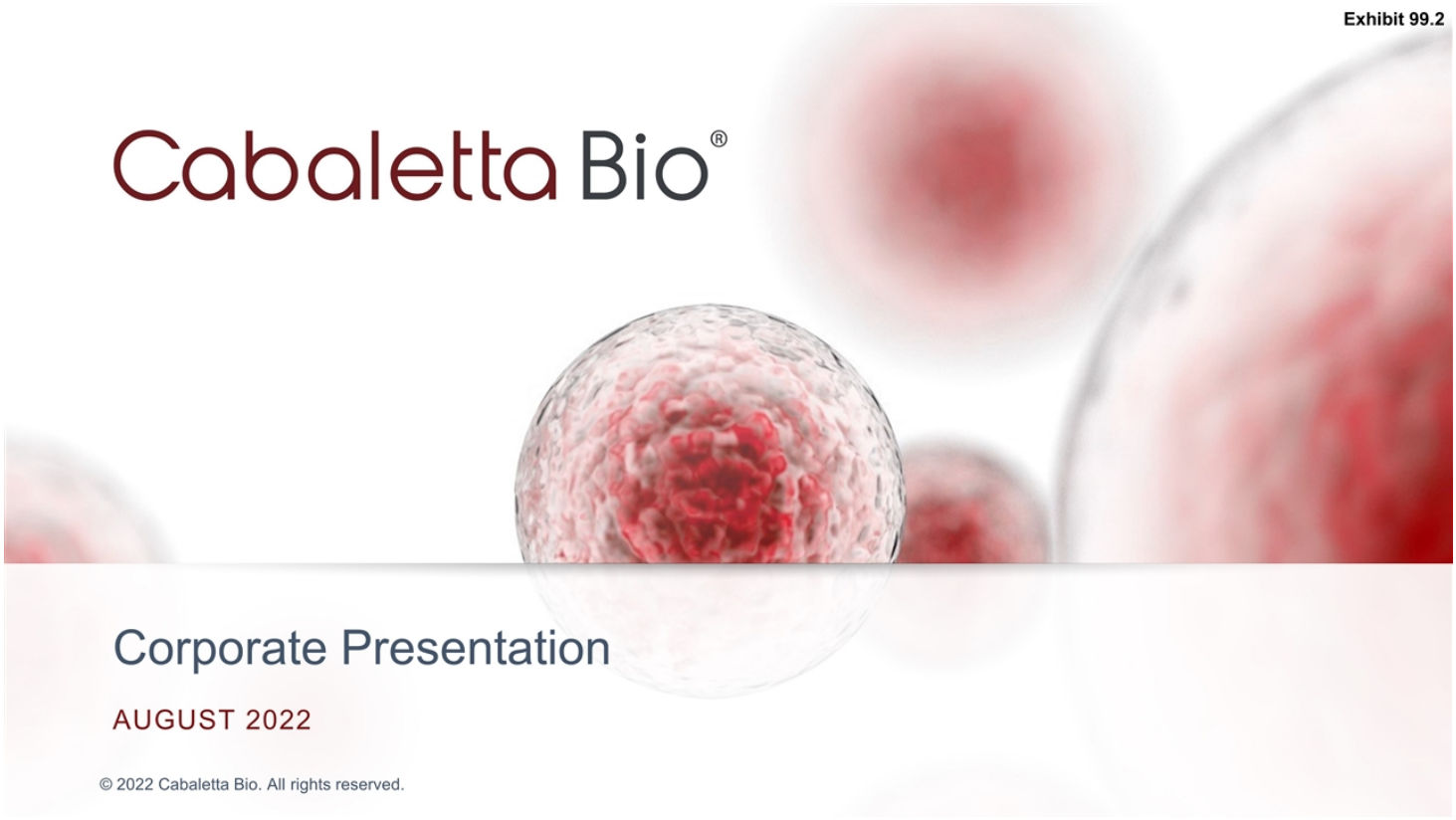
Chief Financial Officer
investors@cabalettabio.com

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

Exhibit 99.2

Cabaletta Bio®



Corporate Presentation

AUGUST 2022

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 technology and CABA™ platform; the progress and results of our DesCAARTes™ Phase 1 trial, including the significance and impact around the clinical and translational data updates from cohorts A1 through A4 of our DesCAARTes™ Phase 1 trial; the expected timing and significance of the announcement of 28-day safety for cohort A5 and clinical and translational data for cohort A4 at the 31st European Association of Dermatology and Venereology Congress; the therapeutic potential and clinical benefits of our product candidates; the expectation that Cabaletta Bio may improve outcomes for patients suffering from mucosal pemphigus vulgaris; our ability to continue progressing in cohort A5; our ability to escalate dosing as high as 10 to 15 billion cells in cohort A6m, initiate dosing in a combination cohort or otherwise; Cabaletta's plans to implement a pre-treatment regiment; 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 our ongoing Phase 1 DesCAARTes™ trial, our planned clinical 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 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 through the first quarter of 2024. 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 and clinical trials of DSG3-CAART and MuSK-CAART, 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® overview

Developing highly specific CAAR T products to treat B cell-mediated autoimmune diseases

DesCAARTes™ trial in patients with mucosal pemphigus vulgaris (mPV) ongoing

- Favorable safety profile for DSG3-CAART demonstrated in cohorts A1 through A4 at doses up to 2.5 billion cells
  - No CRS, ICANS, dose-limiting toxicities or related SAEs observed in any patient in cohorts A1 to A4
- Dose-dependent increase in DSG3-CAART persistence observed in cohorts A1 to A4, as presented at 25th Annual ASGCT Conference
  - Cohort A4 persistence approached the lower end of the range seen with anti-CD19 CART with lymphodepletion in oncology[1,2,3]
- Cohort A5 dosing up to 7.5 billion cells ongoing with multiple additional cohorts possible to enhance in vivo DSG3-CAART exposure

MusCAARTes™ trial in patients with MuSK myasthenia gravis on track to initiate in 2022

Cell therapy pipeline[4] targeting diseases that affect over 80,000 U.S. patients

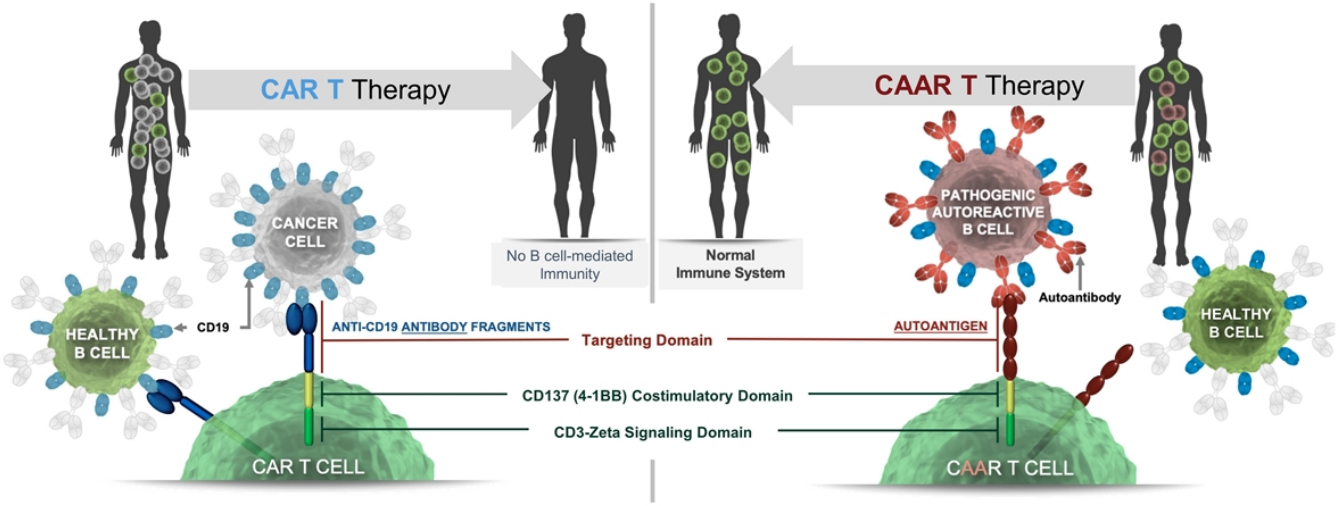
Cash runway through 1Q24 with $96.8M in cash and investments at the end of 2Q22

CRS – Cytokine release syndrome; ICANS – Immune effector cell-associated neurotoxicity syndrome; SAEs – Serious adverse events

1. Mueller, Karen Thudium, et al. "Cellular kinetics of CTL019 in relapsed/refractory B-cell acute lymphoblastic leukemia and chronic lymphocytic leukemia." Blood, The Journal of the American Society of Hematology 130.21 (2017): 2317-2325.
2. 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
3. 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.
4. Includes five disclosed product candidates and two undisclosed pipeline disease targets in our pipeline.

Our scientific platform leverages clinically validated CAR T technology

CAAR T product candidates are designed for selective and specific elimination of the pathogenic B cells



Chimeric **A**ntigen **R**eceptor **T** cell

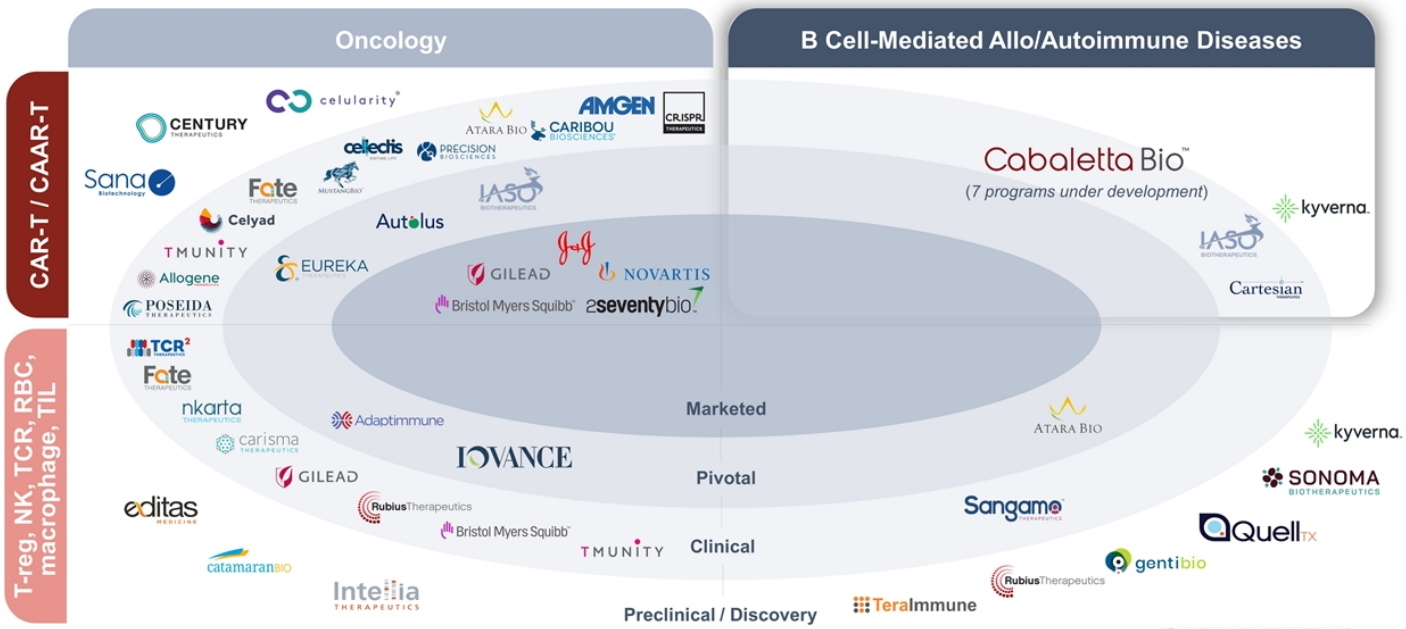
Kymriah

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

CABA CAAR T

Cabaletta: Advancing targeted cell therapy to autoimmunity

Foundational CAR T technology clinically validated in treating B cell-mediated cancers

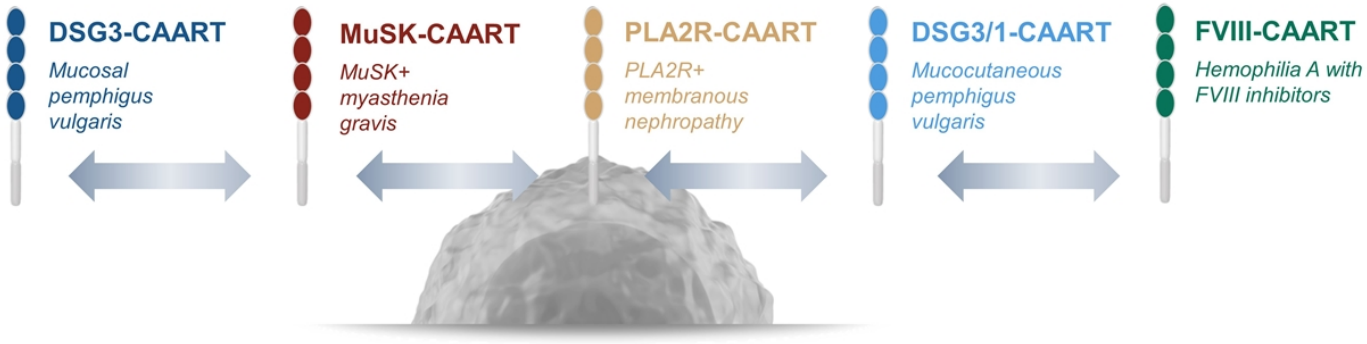


***Note**: Landscape for illustrative purposes only.*

Modular platform with “plug-and-play” architecture

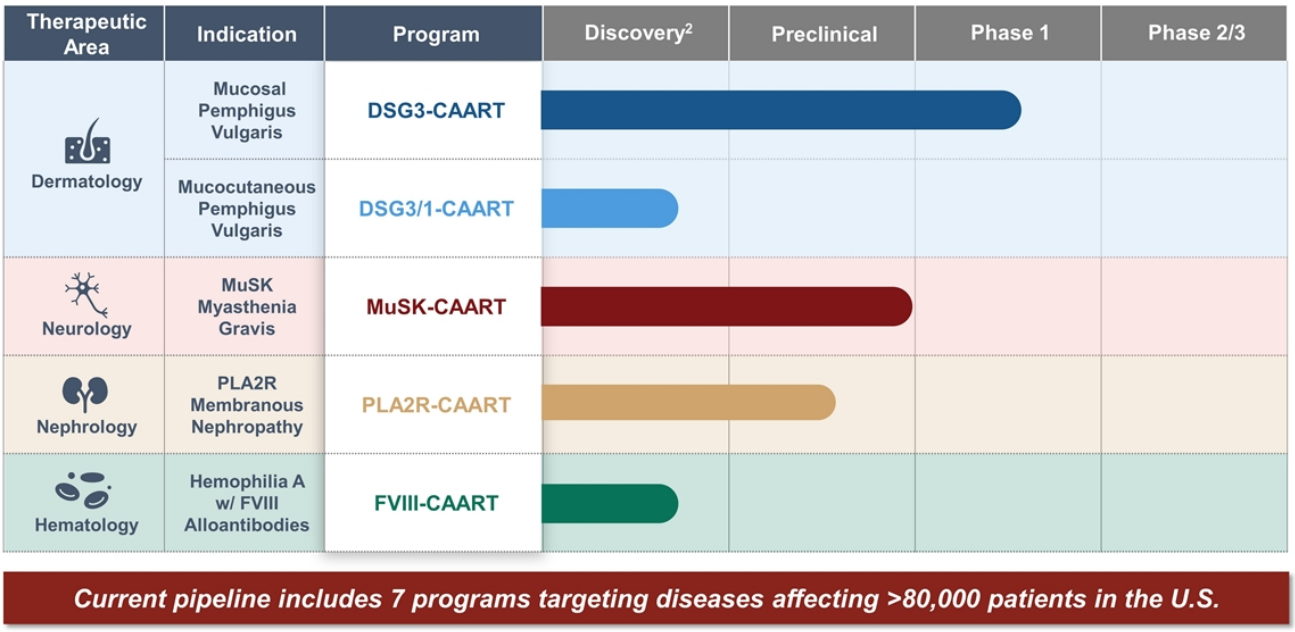
CABA™ platform designed to enable a portfolio of programs targeting B cell-mediated diseases

Swapping the extracellular domain, or autoantigen, creates **new product candidates**



Clinically validated engineered T cell platform is the foundational technology

Pipeline[1] includes multiple disease targets where cure is possible



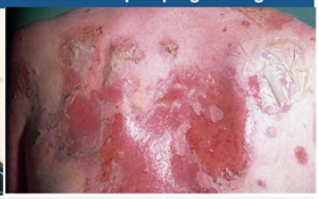
Current pipeline includes 7 programs targeting diseases affecting >80,000 patients in the U.S.

1. Two additional undisclosed disease targets currently in discovery stage are not shown in our pipeline portfolio.
2. In our discovery stage, we perform epitope mapping and optimize CAAR construct and design.

Cabaletta Bio®

Overview of pemphigus vulgaris

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

	Mucosal PV[1] 25% of U.S. pemphigus vulgaris	Mucocutaneous PV[2] 75% of U.S. pemphigus vulgaris
		
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
US Disease Prevalence	**3,250 to 4,750**	**9,750 to 14,250**

Current Treatment Landscape

Broad immunosuppression[3,6]

- Modestly effective
- Poorly tolerated

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

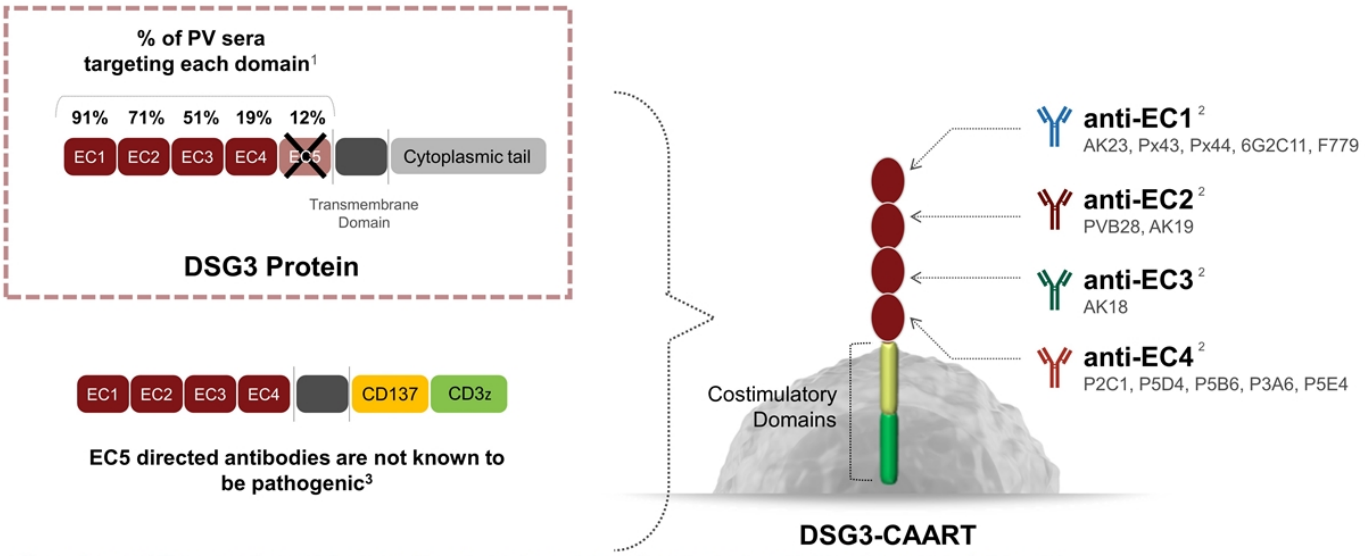
- Response: ~40% of patients achieved a 16-week period with no lesions or medicines during 1 yr[4,5]
- 22% annual serious adverse event (SAE) rate[4]
  - 4-9%[3,4,5] annual risk of severe infection in PV
- Real world data indicate:
  - *Transient* remission ~ 70% CROT[6]:
    - ~30% relapse in 1 year[6]
    - >50% relapse within 2 years[6]
  - ~30% never achieve CROT[6]
  - ~1.9% lifetime risk of fatal infection[7]

CROT = 8+ weeks without lesions while off systemic therapy

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 is designed to bind all known pathogenic autoantibodies

Inclusion of all disease-relevant epitopes enables a ‘one-size-fits-all’ approach for patients with mPV



1. Ohyama, Bungo, et al. "Epitope spreading is rarely found in pemphigus vulgaris by large-scale longitudinal study using desmoglein 2–based swapped molecules." Journal of investigative dermatology 132.4 (2012): 1158-1168.
2. Antibodies that target the specific extracellular domain are shown below each extracellular domain.
3. Amagai, Masayuki, et al. "Autoantibodies against the amino-terminal cadherin-like binding domain of pemphigus vulgaris antigen are pathogenic." The Journal of clinical investigation 90.3 (1992): 919-926.

DesCAARTes™ Phase 1 study of DSG3-CAART[1]

Fast Track Designation

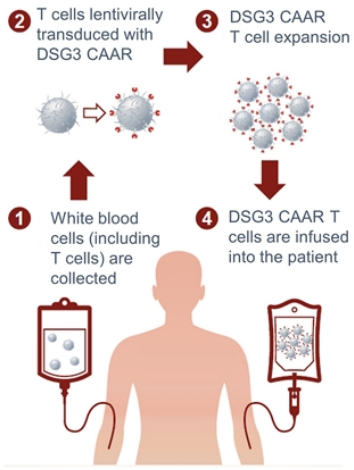
Trial in patients with mPV evaluating up to 750x dose range (20M up to 10-15B cells)

Major Inclusion Criteria

- Age: ≥18, confirmed diagnosis
- Inadequately managed by standard immunosuppressive therapies
- Active disease
- Anti-DSG3 antibody positive

Major Exclusion Criteria

- Recent rituximab
- Prednisone > 0.25 mg/kg/day
- Other autoimmune disorder requiring immunosuppressive therapies
- Recent investigational treatment
- ALC < 1,000 at screening



Adjunctive immunosuppressants are stopped; prednisone tapered to low dose prior to infusion

Part A Cohorts[1]	Subjects	Dose*
A1	3 (+3)	20M
A2	3 (+3)	100M
A3	3 (+3)	500M
A4	3 (+3)	2.5B
A5	3 (+3)	5.0B to 7.5B
A6m[2,3]	*3 (+3)*	*10B to 15B*
Combo[3,4]	*3 (+3)*	*2.5B*

Up to 750-fold dose escalation

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

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 multi-dose regimen where patients will receive a total of 10 to 15 billion cells.
3. Cohort progression following A5 (e.g. A6m or combination cohort) is to be prioritized according to emerging data and finalization of the protocol, as applicable.
4. Combination cohort reflects a cell dose of 2.5 billion cells in addition to pre-treatment with Intravenous Immunoglobulin (IVIg) and cyclophosphamide prior to DSG3-CAART infusion.

* *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 A (M – millions; B – billions).*

DesCAARTes™ clinical trial assessments & current timeframes

Safety assessed acutely, at 28 days & at 3 months, with data on biologic activity within 6 months**

Day 28 safety data

Infusion of DSG3-CAART in context of circulating soluble DSG3 antibody

Other safety measures

- CRS / neurotoxicity
- Other adverse events

Primary safety endpoint at 3 months

Potential for disease flare during planned steroid taper +/- discontinuation of immuno-suppressive medications for mPV

Early evaluations of efficacy include[1]:

- Persistence of DSG3-CAART detected via qPCR
- DSG3 antibody titer changes (targeting sustained reduction)[2]
- Change in mPV therapy and/or new systemic rescue therapy
- Disease activity changes based on clinically validated scales
  - e.g. PDAI, ODSS

*Data expected within 6 months of completion for each cohort***

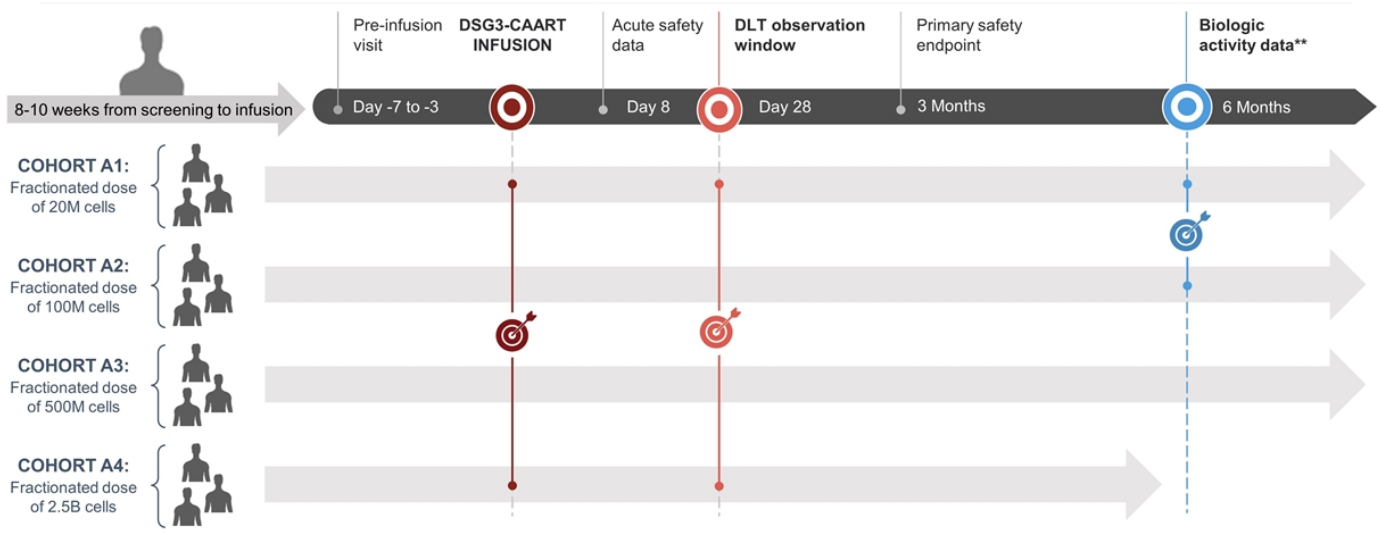
** Clearance of 28-day observation window without DLTs required to initiate next dosing cohort. DLTs include any grade 3 or 4 CRS or neurotoxicity, or any Grade 2 CRS or neurotoxicity that failed to improve to ≤ Grade 1 or baseline within 7 days*

*** For the combination cohort, we believe data on biologic activity at 9 months would be required to appropriately evaluate signals of biologic activity.*

1. This information represents data that we believe can be used to inform potential efficacy endpoints in future clinical development..
2. Spindler, Volker, et al. "Mechanisms causing loss of keratinocyte cohesion in pemphigus." Journal of Investigative Dermatology 138.1 (2018): 32-37.

No DLTs observed to date in first 4 cohorts of DesCAARTes™ trial

Favorable safety profile at all reported doses of DSG3-CAART, including the 2.5B cell dose cohort



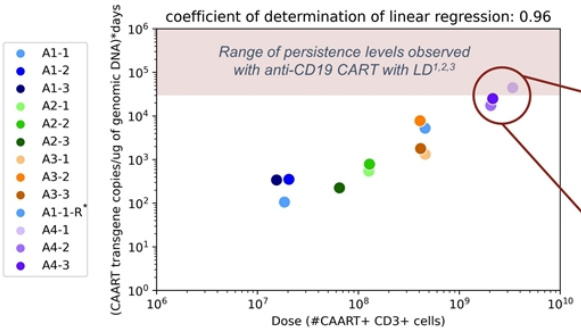
Cohort A5 (two-split fractionated dose of 5.0-7.5B cells) progressing; additional clinical data for cohort A4 expected to be provided the 31st European Association of Dermatology and Venereology (EADV) Congress

** 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).*

** For the combination cohort, we believe data on biologic activity at 9 months would be required to appropriately evaluate signals of biologic activity.

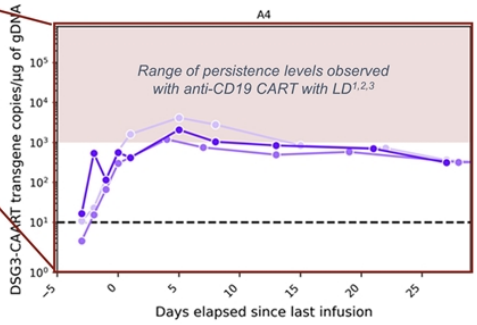
Dose-dependent persistence of DSG3-CAART in cohorts A1 to A4

DSG3-CAART persistence in cohort A4 approached levels seen in CART-19 with lymphodepletion in oncology



Persistence 'area under the curve' throughout 29 days post infusion was dose dependent

Persistence in cohort A4 approached the lower end of the range observed with anti-CD19 CART with lymphodepletion in oncology[1,2,3]



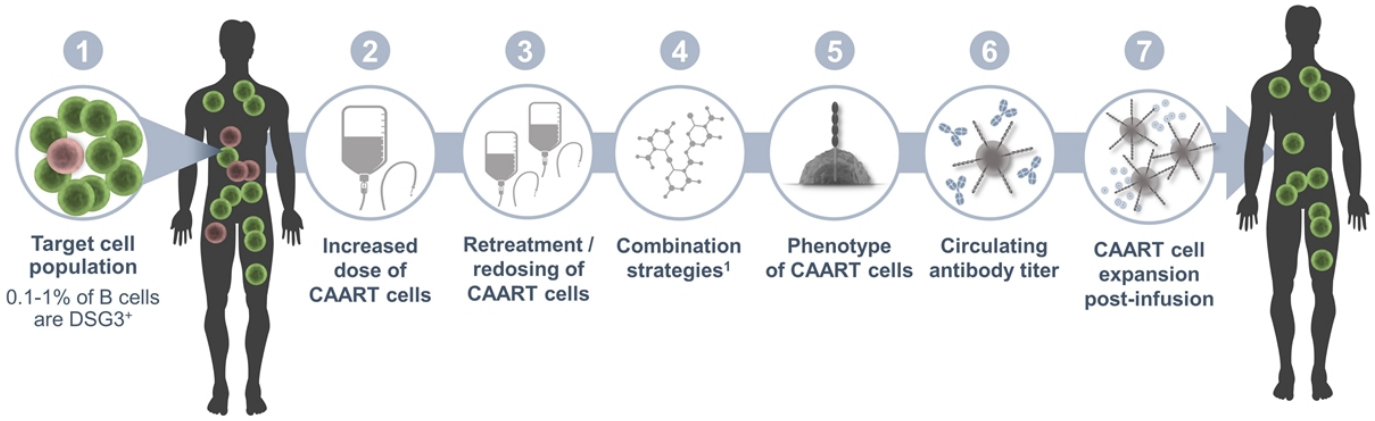
Ongoing & planned cohorts designed to further increase DSG3-CAART exposure

1. Mueller, Karen Thudium, et al. "Cellular kinetics of CTL019 in relapsed/refractory B-cell acute lymphoblastic leukemia and chronic lymphocytic leukemia." Blood, The Journal of the American Society of Hematology 130.21 (2017): 2317-2325.
2. 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
3. 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.

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

Optimizing DSG3-CAART product and patient profiles

Range of strategies being implemented and/or under consideration to increase *in vivo* activity of DSG3-CAART



Many options exist to optimize product and patient profiles; ongoing evaluation to enhance DSG3-CAART exposure in DesCAARTes™ trial

CAART cell

Pathogenic autoreactive B cell

Healthy B cell

1. Combination strategies reflect regimens that include preconditioning and/or immunomodulatory medications prior to administration of DSG3-CAART.

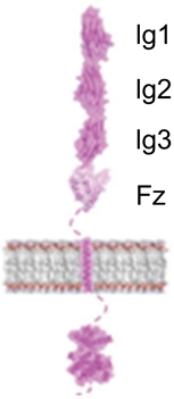
Cabaletta Bio®

High unmet need in MuSK myasthenia gravis; a valuable CAAR target

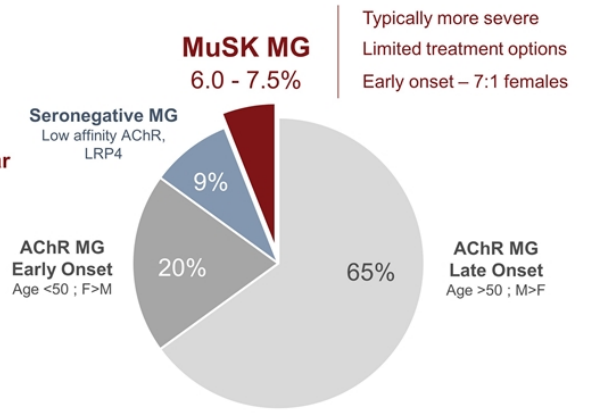
All known extracellular domains can be included in the CAAR design

Similarities to pemphigus support clinical potential of CAAR T in MuSK MG

1. IgG4-dominant disease, similar to PV
2. Autoantibody titers drop after rituximab[1,2]
3. Pathogenic B cells are incompletely eliminated by rituximab and persist during relapse[3]



MuSK has similar modular structure and size as DSG3

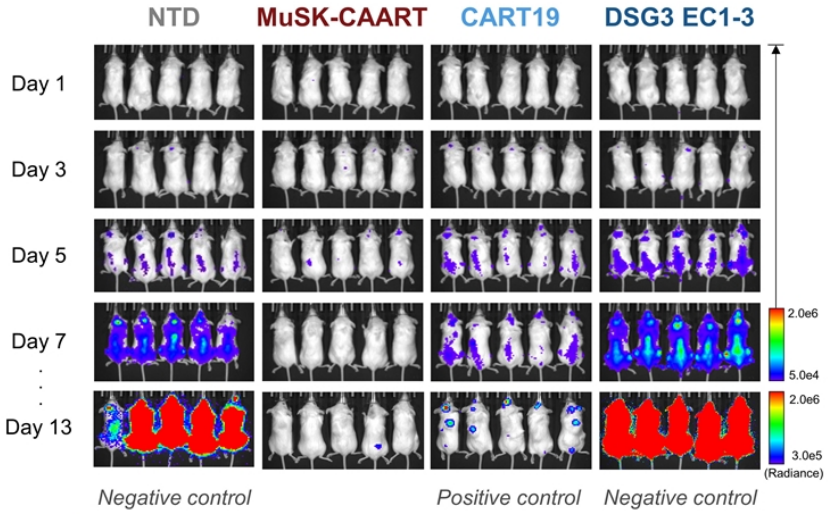


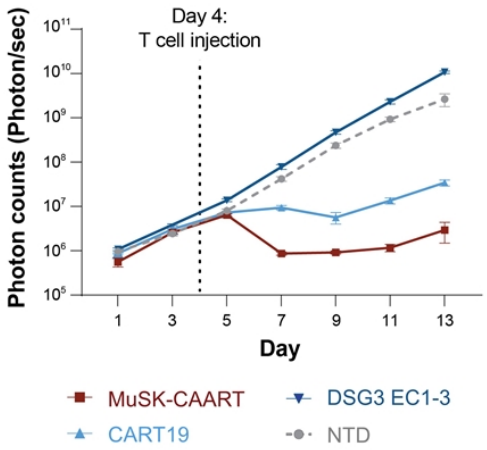
Total US MG Prevalence: 50,000 to 80,000 patients

1. Hain, Berit, et al. "Successful treatment of MuSK antibody–positive myasthenia gravis with rituximab." Muscle & Nerve: Official Journal of the American Association of Electrodiagnostic Medicine 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).

MuSK-CAART demonstrated specific *in vivo* target engagement[1]

MuSK-CAART eliminated anti-MuSK target cells[2] in an animal model where CART19 cells were a positive control





MuSK-CAART IND open and planning to initiate first-in-human MuSK-CAART trial in 2022

1. https://cabalettabio.com/technology/posters-publications; recently presented at AAI Immunology 2022, MGFA International and ASGCT 2022 conferences in May 2022.
2. Target cells represent a B cell tumor line (CD19 positive) that has been modified to express the anti-MuSK antibody.

MusCAARTes™ study of MuSK-CAART

Strategy for upcoming trial evaluating MuSK-CAART informed by progression of DesCAARTes™ study

Fast Track Designation

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

Major Inclusion Criteria

- Age: ≥18
- MG severity Class I-IVa
- MGC ≥ 4
- Anti-MuSK antibody positive
- Negative anti-AChR antibody test

Major Exclusion Criteria

- Prednisone > 0.25-0.5 mg/kg/day
- Other autoimmune disorder requiring immunosuppressive therapies

SCREENING → MANUFACTURING → TREATMENT (SINGLE INFUSION) → MONITORING (2-4 WEEKS) → Next Patient

2

Part	Cohort	# Subjects
A – Dose Escalation Increasing dose levels with 2 (+4) design *(A1 – 100M*; A2 – 500M*; A3 – 2.5B*)*	A1-A3	2 (+4) per cohort
Highest planned selected dose[1] *(A4 – 5 to 7.5B*)*	A4	6
B – Expansion Expanded subject enrollment at final selected dose	B	~12

1 *Higher starting dose*

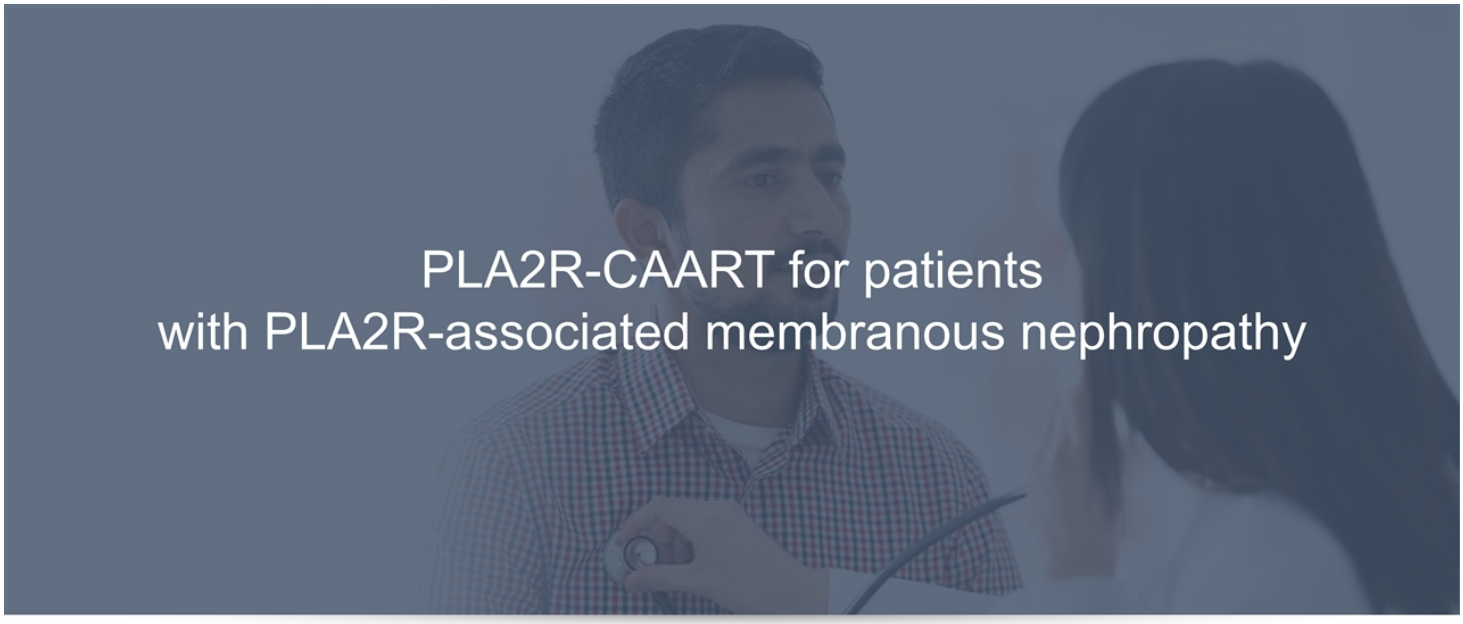
3 *Versus 3 (+3) design in DesCAARTes™ trial*

Study Endpoint & Objectives

Primary Endpoint: Adverse Events, including DLT

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

** 100M, 500M, 2.5B and 5.0B to 7.5B refers to the number of MuSK-CAART cells infused for patients in dosing cohorts A1 to A4 (M – millions; B – billions).*
1. A total of 6 subjects will need to have received the final selected dose in Part A of the study.



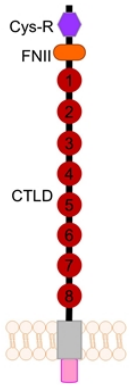
Cabaletta Bio®

Preclinical stage CAART program in membranous nephropathy

Primary MN is an immune-mediated kidney disease with anti-PLA2R antibodies in ~75% of patients

Accumulating evidence of a correlation between PLA2R antibodies and disease activity, remission and relapse in primary MN

1. PLA2R autoantibody levels routinely used as diagnostic and prognostic markers
2. Autoantibody titer shown to rise rapidly before clinical manifestations
3. Co-localization of antigen & PLA2R antibodies at site of damage in kidney



PLA2R+ MN is attractive for CAAR development

- Epitopes are well-defined
- IgG4-dominant disease, similar to PV and MuSK MG
- Eligible US population
  - prevalence of ~4,000-8,000;
  - incidence of ~700-1,400 / yr

PLA2R-CAART showed *in vitro* antigen-specific cytotoxicity[1]

- PLA2R CAARs demonstrated activity in the presence of physiologic levels of anti-PLA2R autoantibodies
- Candidate CAAR contains targets that bind >95% of anti-PLA2R autoantibodies
- Demonstrated no off-target binding interactions in membrane protein array

1. As presented at the ASN Kidney Week 2021.

Cabaletta Bio®

Manufacturing strategy

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

1. Penn-sponsored CD19 CAR IND CMC data has been cross-referenced in DSG3-CAART IND to provide additional data reflecting alignment; cross reference not required for MuSK-CAART IND.

Cabaletta Bio®

Cabaletta Bio leadership

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Multiple potential data catalysts with possible pipeline read-through

DesCAARTes™ trial ongoing: Currently progressing cohort A5 (5.0-7.5B cells)

- Data presented at ASGCT 2022 demonstrate dose-dependent increase in persistence
  - Cohort A4 persistence approached lower end of range seen in anti-CD19 CART with lymphodepletion in oncology[1,2,3]
  - Demonstrated a favorable safety profile in cohorts A1 to A4
- Additional data from the DesCAARTes™ trial anticipated at the 31st EADV Congress
  - Clinical and translational data for cohort A4[4]
  - 28-day safety data for cohort A5[4]
- Multiple additional planned cohorts designed to enhance DSG3-CAART exposure

MuSK-CAART: Plan to initiate first-in-human trial in 2022; received FDA Fast Track Designation

Expanding network of academic & industry partners

WuXi AppTec, ARTISANBIO, Penn, Yale, Stanford Medicine, OxfordBioMedica, Children's Hospital of Philadelphia, UC Davis, Iowa

1. Mueller, Karen Thudium, et al. "Cellular kinetics of CTL019 in relapsed/refractory B-cell acute lymphoblastic leukemia and chronic lymphocytic leukemia." Blood, The Journal of the American Society of Hematology 130.21 (2017): 2317-2325.
2. 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
3. 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.
4. Assumes no dose-limiting toxicities are observed during each cohort, uninterrupted enrollment and no delays due to COVID-19 resurgence occur in the trial.

* *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).*

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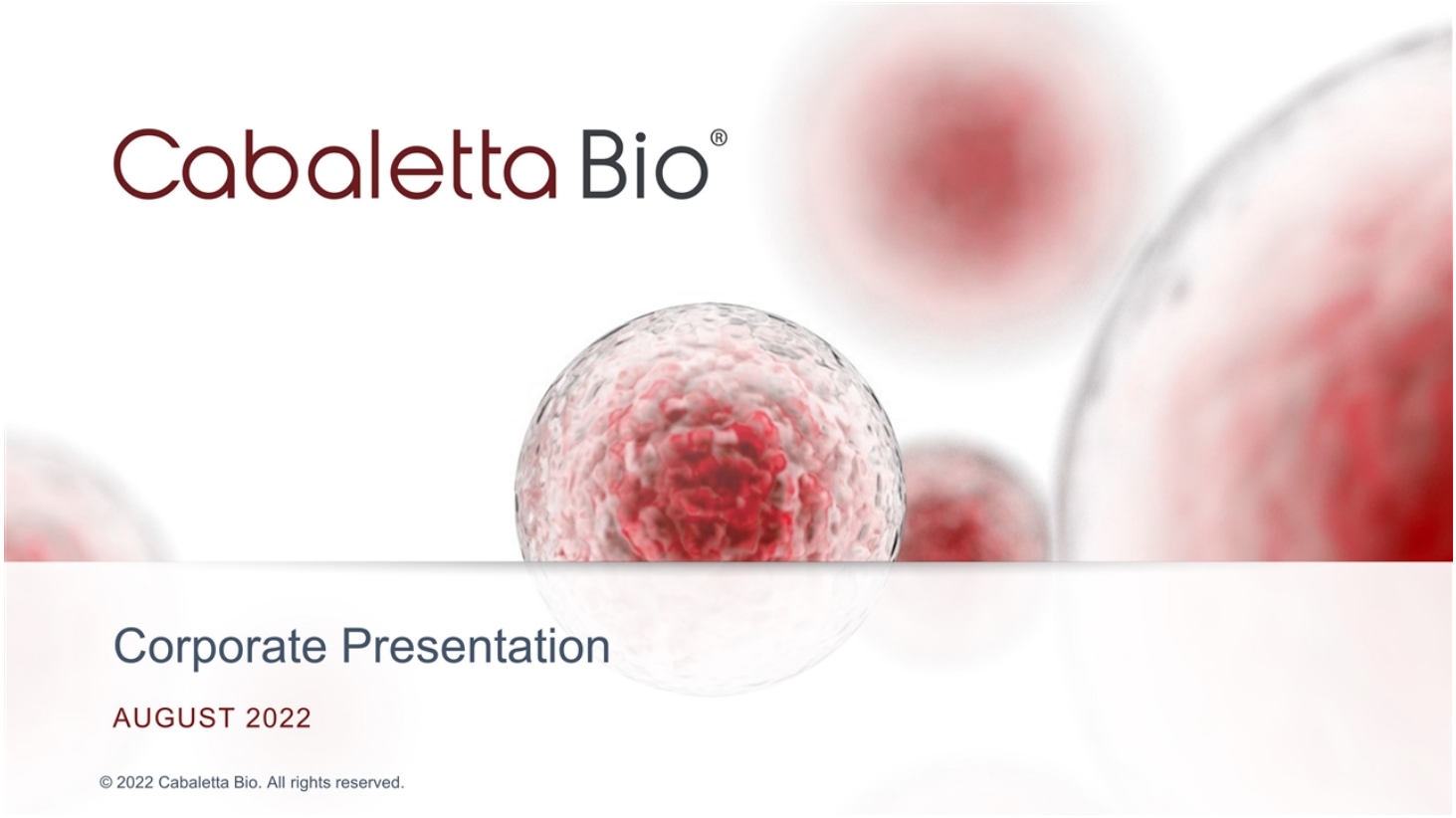

Corporate Presentation

AUGUST 2022