

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

**FORM S-3
REGISTRATION STATEMENT**
*UNDER
THE SECURITIES ACT OF 1933*

CUE BIOPHARMA, INC.
(Exact name of registrant as specified in its charter)

Delaware
(State or other jurisdiction of
incorporation or organization)

47-3324577
(I.R.S. Employer
Identification Number)

40 Guest Street
Boston, Massachusetts 02135
(617) 949-2680
(Address, including zip code, and telephone number, including area code, of registrant's principal executive offices)

Shao-Lee Lin
President and Chief Executive Officer
Cue Biopharma, Inc.
40 Guest Street
Boston, Massachusetts 02135
(617) 949-2680
(Name, address, including zip code, and telephone number, including area code, of agent for service)

Copies to:
Divakar Gupta
Sara Semnani
Courtney M.W. Tygesson
Cooley LLP
1333 2nd Street, Suite 400
Santa Monica, CA 90401
(310) 883-6400
From time to time after the effective date of this Registration Statement
(Approximate date of commencement of proposed sale to the public)

If the only securities being registered on this Form are being offered pursuant to dividend or interest reinvestment plans, please check the following box. ☐

If any of the securities being registered on this Form are to be offered on a delayed or continuous basis pursuant to Rule 415 under the Securities Act of 1933, other than securities offered only in connection with dividend or interest reinvestment plans, check the following box. ☒

If this Form is filed to register additional securities for an offering pursuant to Rule 462(b) under the Securities Act, please check the following box and list the Securities Act registration statement number of the earlier effective registration statement for the same offering. ☐

If this Form is a post-effective amendment filed pursuant to Rule 462(c) under the Securities Act, check the following box and list the Securities Act registration statement number of the earlier effective registration statement for the same offering. ☐

If this Form is a registration statement pursuant to General Instruction I.D. or a post-effective amendment thereto that shall become effective upon filing with the Securities and Exchange Commission pursuant to Rule 462(e) under the Securities Act, check the following box. ☐

If this Form is a post-effective amendment to a registration statement filed pursuant to General Instruction I.D. filed to register additional securities or additional classes of securities pursuant to Rule 413(b) under the Securities Act, check the following box. ☐

Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, a smaller reporting company, or an emerging growth company. See the definitions of "large accelerated filer," "accelerated filer," "smaller reporting company" and "emerging growth company" in Rule 12b-2 of the Exchange Act.

Large accelerated filer	☐	Accelerated filer	☐
Non-accelerated filer	☒	Smaller reporting company	☒
		Emerging growth company	☐

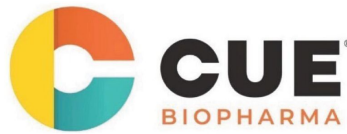
If an emerging growth company, indicate by check mark if the registrant has elected not to use the extended transition period for complying with any new or revised financial accounting standards provided pursuant to Section 7(a)(2)(B) of the Securities Act. ☐

The Registrant hereby amends this Registration Statement on such date or dates as may be necessary to delay its effective date until the Registrant shall file a further amendment which specifically states that this Registration Statement shall thereafter become effective in accordance with section 8(a) of the Securities Act or until the Registration Statement shall become effective on such date as the Securities and Exchange Commission acting pursuant to said section 8(a), may determine.

SUBJECT TO COMPLETION, DATED AUGUST 12, 2026

PROSPECTUS

1,505,570 Shares



Common Stock Offered by the Selling Stockholders

This prospectus relates to the proposed resale from time to time of up to 1,505,570 shares, or the Shares, of our common stock, par value \$0.001 per share, or the common stock, by the selling stockholders named herein, together with any additional selling stockholders listed in a prospectus supplement (together with any of such stockholders' transferees, pledgees, donees or successors), which consist of (i) 1,418,070 shares of our common stock held by the selling stockholders, and (ii) 87,500 shares of our common stock issuable upon the exercise of outstanding pre-funded warrants, or the Pre-Funded Warrants, to purchase shares of our common stock held by the selling stockholders. We will not receive any proceeds from the sale of the shares offered by this prospectus, except the nominal exercise price of \$0.001 per share of any of the Pre-Funded Warrants exercised for cash.

The selling stockholders acquired the shares of common stock and Pre-Funded Warrants from us in a private placement transaction that closed on July 13, 2026, or the Private Placement. We are filing this Registration Statement on Form S-3, of which this prospectus forms a part, to fulfill our contractual obligations with the selling stockholders to provide for the resale by the selling stockholders of the Shares. See "Selling Stockholders" beginning on page 11 of this prospectus for more information about the selling stockholders. The registration of the Shares to which this prospectus relates does not require the selling stockholders to sell any of their Shares, including any shares of common stock issuable upon the exercise of Pre-Funded Warrants.

We are not offering any shares of our common stock under this prospectus and will not receive any proceeds from the sale or other disposition of the Shares covered hereby; however, we will receive nominal proceeds from the cash exercise of the Pre-Funded Warrants. See "Use of Proceeds" beginning on page 10 of this prospectus.

The selling stockholders may offer and sell or otherwise dispose of the Shares described in this prospectus from time to time through public or private transactions at prevailing market prices, at prices related to prevailing market prices or at privately negotiated prices. The selling stockholders will bear all selling commissions applicable to the sales of Shares, any transfer taxes and all fees and expenses of legal counsel for the selling stockholders, subject to certain specified exceptions. We will bear all other costs, expenses and fees in connection with the registration of the Shares. See the section titled "Plan of Distribution" for more information about how the selling stockholders may sell or dispose of their Shares.

Our common stock is traded on the Nasdaq Capital Market under the symbol "CUE." On August 11, 2026, the last reported sales price of our common stock was \$28.24 per share.

Investing in our securities involves a high degree of risk. Before making an investment decision, you should review carefully the risks and uncertainties described under the heading "Risk Factors" on page 7 of this prospectus as well as those contained in the applicable prospectus supplement and in any free writing prospectuses we may authorize for use in connection with a specific offering, and under similar headings in the other documents that are incorporated by reference into this prospectus.

NEITHER THE SECURITIES AND EXCHANGE COMMISSION NOR ANY STATE SECURITIES COMMISSION HAS APPROVED OR DISAPPROVED OF THESE SECURITIES OR DETERMINED IF THIS PROSPECTUS IS TRUTHFUL OR COMPLETE. ANY REPRESENTATION TO THE CONTRARY IS A CRIMINAL OFFENSE.

The date of this prospectus is _____, 2026.

The information in this preliminary prospectus is not complete and may be changed. The selling stockholders may not sell these securities or accept an offer to buy these securities until the registration statement filed with the Securities and Exchange Commission is effective. This prospectus is not an offer to sell these securities and it is not soliciting offers to buy these securities in any state where such offer or sale is not permitted.

TABLE OF CONTENTS

ABOUT THIS PROSPECTUS	Page 1
PROSPECTUS SUMMARY	2
THE OFFERING	6
RISK FACTORS	7
CAUTIONARY NOTE REGARDING FORWARD-LOOKING STATEMENTS	8
USE OF PROCEEDS	10
SELLING STOCKHOLDERS	11
PLAN OF DISTRIBUTION	13
LEGAL MATTERS	15
EXPERTS	15
WHERE YOU CAN FIND MORE INFORMATION	15
INCORPORATION OF CERTAIN INFORMATION BY REFERENCE	16

ABOUT THIS PROSPECTUS

This prospectus is a part of a registration statement on Form S-3 that we filed with the Securities and Exchange Commission, or the SEC, using a “shelf” registration process. Under this shelf registration process, the selling stockholders may from time to time sell the shares of common stock described in this prospectus in one or more offerings or otherwise as described under “Plan of Distribution.”

This prospectus may be supplemented from time to time by one or more prospectus supplements. Such prospectus supplement may also add, update or change information contained in this prospectus. If there is any inconsistency between the information in this prospectus and the applicable prospectus supplement, you must rely on the information in the prospectus supplement. You should carefully read both this prospectus and any applicable prospectus supplement together with additional information described under the heading “Where You Can Find Additional Information” before deciding to invest in any shares being offered.

Neither we nor the selling stockholders have authorized anyone to provide any information other than that contained or incorporated by reference in this prospectus or in any related prospectus supplement or any free writing prospectus that we have authorized. We take no responsibility for, and can provide no assurance as to the reliability of, any other information that others may give you. The Shares are not being offered in any jurisdiction where the offer is not permitted. You should not assume that the information contained in or incorporated by reference in this prospectus is accurate as of any date other than the respective dates of such document. Our business, financial condition, results of operations and prospects may have changed since those dates.

Unless otherwise stated, all references in this prospectus to “we,” “us,” “our,” “the company” and “Cue,” and similar designations, except where the context requires otherwise, refer collectively to Cue Biopharma, Inc. and its consolidated subsidiary. We own various U.S. federal trademark applications and unregistered trademarks, including our company name. All other trademarks or trade names referred to in this prospectus, including any relating to a selling stockholder, are the property of their respective owners. Solely for convenience, the trademarks and trade names in this prospectus are referred to without the symbols ® and ™, but such references should not be construed as any indication that their respective owners will not assert, to the fullest extent under applicable law, their rights thereto.

PROSPECTUS SUMMARY

This summary highlights selected information from this prospectus or incorporated by reference in this prospectus and does not contain all of the information that you need to consider in making your investment decision. You should carefully read the entire prospectus, including the risks of investing in our securities discussed under the heading “Risk Factors” and under similar headings in our SEC filings, including the documents that are incorporated by reference into this prospectus. You should also carefully read the information incorporated by reference into this prospectus, including our financial statements, and the exhibits to the registration statement of which this prospectus is a part.

Unless the context requires otherwise, references in this prospectus to “Cue,” “the company,” “we,” “us,” “our” or similar terms refer to Cue Biopharma, Inc. and its consolidated subsidiary.

Company Overview

We are a clinical-stage biopharmaceutical company focused on advancing a portfolio of potentially transformative therapies aimed at enabling functional cures across immunological disorders. Our lead asset, CUE-221, is a novel humanized anti-IgE monoclonal antibody with a dual-mechanism of action currently in Phase 2 development for allergic diseases. In addition, we developed the Immuno-STAT® platform designed to engineer therapies that selectively target disease-specific T cells in vivo without broad immune modulation. Our lead autoimmune candidate, CUE-401, is advancing towards Phase 1 development and was designed to regulate inflammation and drive Treg-mediated tolerance.

Private Placement

On July 9, 2026, we entered into a securities purchase agreement, or the Purchase Agreement, with accredited investors, or the Investors, pursuant to which we, in a private placement, agreed to issue and sell to the Investors an aggregate of (i) 1,418,070 shares of our common stock, at a price per share of \$33.21 and (ii) to certain Investors, in lieu of shares of our common stock, Pre-Funded Warrants to purchase up to 87,500 shares of our common stock at a price per Pre-Funded Warrant of \$33.209, for gross proceeds of approximately \$50.0 million. The closing of the Private Placement occurred on July 13, 2026, or the Closing Date.

Each Pre-Funded Warrant has an exercise price of \$0.001 per share and is cashless exercisable. In certain circumstances, upon a fundamental transaction (as described in the Pre-Funded Warrants), a holder of Pre-Funded Warrants will be entitled to receive, upon exercise of the Pre-Funded Warrants, the kind and amount of securities, cash or other property that such holder would have received had they exercised the Pre-Funded Warrants immediately prior to the fundamental transaction; provided, however, that in the event of a fundamental transaction where the consideration consists solely of cash, solely of marketable securities or a combination thereof, each Pre-Funded Warrant will be deemed to be exercised in full in a cashless exercise effective immediately prior to and contingent upon the consummation of such fundamental transaction. Under the Pre-Funded Warrants, we may not effect the exercise of any such warrants, and a holder will not be entitled to exercise any portion of any such warrant that, upon giving effect to such exercise, would cause: (i) the aggregate number of shares of our common stock beneficially owned by such holder (together with its affiliates) to exceed 4.99% or 9.99%, as elected by the holder, of the number of shares of our common stock outstanding immediately after giving effect to the exercise; or (ii) the combined voting power of our securities beneficially owned by such holder (together with its affiliates) to exceed 4.99% or 9.99%, as elected by the holder, of the combined voting power of all of our securities outstanding immediately after giving effect to the exercise, as such percentage ownership is determined in accordance with the terms of the applicable warrant, which percentage may be changed at the holder's election to a higher percentage not in excess of 19.99% upon 61 days' notice to us.

Based in part upon the representations of the Investors in the Purchase Agreement, the offering and sale of the shares of common stock and Pre-Funded Warrants was exempt from registration under Section 4(a)(2) of the Securities Act and/or Rule 506 of Regulation D under the Securities Act.

In connection with the Private Placement, we entered into a registration rights agreement, dated July 9, 2026, or the Registration Rights Agreement, with the Investors, pursuant to which we agreed to file a registration statement with the SEC covering the resale of the Shares within 30 days following the closing of the Private Placement, or the Filing Deadline. We have agreed to use reasonable best efforts to cause such registration statement to be declared effective as promptly as possible but no later than the earlier of (i) the 60th calendar day following the Filing Deadline if the SEC notifies us that it will review such registration statement and (ii) the fifth business day after we are notified by the SEC that such registration statement will not be reviewed or will not be subject to further review. We have also agreed to keep the registration statement continuously effective until the earlier of (i) the date on which the selling stockholders shall have resold or otherwise disposed of all the shares covered by this prospectus and (ii) the date on which the shares covered by this prospectus no longer constitute “Registrable Securities” as such term is defined in the Registration Rights Agreement, such that they may be resold by the selling stockholders without registration and without regard to any volume or manner-of-sale limitations and without current public information pursuant to Rule 144 under the Securities Act or any other rule of similar effect. We have agreed to be responsible for all fees and expenses incurred in connection with the registration of the Shares.

We granted the Investors customary indemnification rights in connection with the registration statement. The Investors have also granted us customary indemnification rights in connection with the registration statement.

The registration statement of which this prospectus is a part relates to the offer and resale of the Shares issued to the Investors pursuant to the Purchase Agreement, including the shares of our common stock issuable upon the exercise of outstanding Pre-Funded Warrants. When we refer to the selling stockholders in this prospectus, we are referring to the Investors and, as applicable, any donees, pledgees, assignees, transferees or other successors-in-interest selling the Shares received after the date of this prospectus from the selling stockholders as a gift, pledge, or other non-sale related transfer.

Following the closing of the Private Placement, as of July 24, 2026 we had 6,826,387 shares of common stock outstanding.

Risks Associated with Our Business

Our business is subject to a number of risks of which you should be aware before making an investment decision. These risks are discussed more fully in the section titled “Risk Factors” immediately following this prospectus summary and under similar headings in our filings with the SEC which are incorporated by reference in this prospectus. These risks include the following:

- We are a clinical-stage biopharmaceutical company, have no history of generating commercial revenue, have a history of operating losses and may never achieve or maintain profitability.
- We currently do not have, and may never develop, any U.S Food and Drug Administration, or FDA,-approved or commercialized products.
- We are substantially dependent on the success of our drug product candidates, and significant additional research and development and clinical testing will be required before we can potentially seek regulatory approval for or commercialize any of our drug product candidates.
- We have no history of commercializing biologic products, which may make it difficult to evaluate the prospects for our future viability.

- Success in preclinical studies or early clinical trials may not be indicative of results obtained in later trials.
- We may derive results and data for CUE-221 from clinical trials conducted by UBI/Ascendant in China; our access to the clinical results and data may be limited and there is no assurance that the clinical data from any such trials will be accepted or considered by the FDA, or other comparable regulatory authorities.
- We plan to continue to seek collaborations or strategic alliances. However, we may not be able to establish such relationships, and relationships we have established may not provide the expected benefits.
- We may not be successful in our efforts to identify additional drug product candidates. Due to our limited resources and access to capital, we must prioritize the development of certain drug product candidates; these decisions may prove to be wrong and may adversely affect our business.
- We face significant competition from other biotechnology and pharmaceutical companies, and our operating results will suffer if we fail to compete effectively. Our competitors may be able to develop other compounds or drugs that are able to achieve similar or better results than our drug product candidates.
- We rely on third parties to conduct our clinical trials. If these third parties do not successfully carry out their contractual duties or meet expected deadlines, we may not be able to successfully complete development of, obtain regulatory approval for, or commercialize our drug product candidates and our business could be substantially harmed.
- We rely completely on third parties to manufacture our preclinical and clinical drug supplies for our drug product candidates.
- If we or our licensor(s) are unable to protect our or its intellectual property, then our financial condition, results of operations and the value of our technology and potential products could be adversely affected.
- Even if we, or any collaborators we may have, obtain marketing approvals for any of our drug product candidates, the terms of approvals and ongoing regulation of our products could require the substantial expenditure of resources and may limit how we, or they, manufacture and market our products, which could materially impair our ability to generate revenue.
- We will need substantial additional financing to support our growth and ongoing operations. Additional capital may be difficult to obtain, restrict our operations, require us to relinquish rights to our technologies or drug product candidates, encumber our assets and result in ongoing debt service cost, or result in additional dilution to our stockholders.

Implications of Being a Smaller Reporting Company

We are a “smaller reporting company” as defined in the Securities Exchange Act of 1934, as amended, or the Exchange Act. For as long as we remain a smaller reporting company, we may take advantage of certain exemptions from various public company reporting requirements, including not being required to comply with the auditor attestation requirements of Section 404 of the Sarbanes-Oxley Act and reduced disclosure obligations regarding executive compensation. We will be able to take advantage of these scaled disclosures for so long as our voting and non-voting common stock held by non-affiliates is less than \$250.0 million measured on the last business day of our second fiscal quarter, or our annual revenue is less than \$100.0 million during the most recently completed fiscal year and our voting and non-voting common stock held by non-affiliates is less than \$700.0 million measured on the last business day of our second fiscal quarter.

Corporate Information

We were incorporated as Imagen Biopharma, Inc. in Delaware on December 31, 2014. In October 2016, we changed our name to Cue Biopharma, Inc. The address of our corporate headquarters is 40 Guest Street, Boston, Massachusetts 02135 and our telephone number is (617) 949-2680. Our website address is www.cuebiopharma.com. Our website and the information contained on, or that can be accessed through, our website will not be deemed to be incorporated by reference in, and are not considered part of, this prospectus.

THE OFFERING	
Common Stock Offered by the Selling Stockholders	1,505,570 Shares (consisting of 1,418,070 shares of our common stock and 87,500 shares of our common stock issuable upon exercise of the Pre-Funded Warrants).
Use of Proceeds	The selling stockholders will receive all of the proceeds from the sale of the Shares hereunder. Accordingly, we will not receive any of the proceeds from the sale of the Shares in this offering; however, we will receive nominal proceeds from any cash exercise of the Pre-Funded Warrants. See “Use of Proceeds.”
Risk Factors	An investment in our common stock involves a high degree of risk. See the information contained in or incorporated by reference in the section titled “Risk Factors” and under similar headings in the other documents that are incorporated by reference herein, as well as the other information included in or incorporated by reference in this prospectus.
Nasdaq Capital Market Symbol	Our common stock is listed on The Nasdaq Capital Market under the symbol “CUE.”

RISK FACTORS

Investing in our securities involves a high degree of risk. You should carefully review the risks and uncertainties described under the heading “Risk Factors” contained in our Annual Report on Form 10-K for the fiscal year ended December 31, 2025, as updated by our quarterly and other reports and documents that are incorporated by reference into this prospectus, before deciding whether to purchase any of the securities being registered pursuant to the registration statement of which this prospectus is a part. Each of the risk factors could adversely affect our business, operating results and financial condition, as well as adversely affect the value of an investment in our securities, and the occurrence of any of these risks might cause you to lose all or part of your investment. Additional risks not presently known to us or that we currently believe are immaterial may also significantly impair our business operations. Please also read carefully the section below titled “Cautionary Note Regarding Forward-Looking Statements.”

CAUTIONARY NOTE REGARDING FORWARD-LOOKING STATEMENTS

This prospectus and the documents incorporated by reference herein contain “forward-looking statements” within the meaning of Section 27A of the Securities Act, and Section 21E of the Exchange Act. Forward-looking statements, which are based on certain assumptions and describe our future plans, strategies and expectations, can generally be identified by the use of forward-looking terms such as “believe,” “expect,” “may,” “will,” “should,” “would,” “could,” “seek,” “intend,” “plan,” “goal,” “project,” “estimate,” “anticipate,” “strategy,” “future,” “likely” or other comparable terms. All statements, other than statements of historical fact, contained in this prospectus and the documents incorporated by reference herein, including statements regarding our strategy, future operations, future financial position, future revenue, projected costs, prospects, plans and objectives of management, are forward-looking statements.

The forward-looking statements in this prospectus and the documents incorporated by reference herein include, among other things, statements about:

- the initiation, timing, progress and results of our ongoing and planned preclinical studies and any future clinical trials and our research and development programs;
- our estimates regarding expenses, future revenue, capital requirements and need for additional financing;
- our expectations regarding our ability to fund our projected operating requirements with our existing cash resources and the period in which we expect that such cash resources will enable us to fund such operating requirements;
- our plans to develop our drug product candidates, including our prioritization of our autoimmune programs, including CUE-221 (formerly known as Ascendant-221), CUE-401 and the CUE-500 series (excluding CUE-501, which has been licensed to Boehringer Ingelheim International GmbH);
- the timing of and our ability to submit applications for, and to obtain and maintain regulatory approvals for, our drug product candidates;
- the potential advantages of our drug product candidates;
- the rate and degree of market acceptance and clinical utility of our drug product candidates, if approved;
- our estimates regarding the potential market opportunity for our drug product candidates;
- our commercialization, marketing and manufacturing capabilities and strategy;
- our intellectual property position;
- our ability to identify additional products, drug product candidates or technologies with significant commercial potential that are consistent with our commercial objectives;
- the impact of government laws and regulations, general economic and market conditions, inflation, and the imposition of new or revised global trade tariffs;
- our competitive position;
- developments relating to our competitors and our industry; and
- our ability to maintain and establish collaborations or obtain additional funding.

We may not actually achieve the plans, intentions or expectations disclosed in our forward-looking statements, and you should not place undue reliance on our forward-looking statements. Actual results or events could differ materially from the plans, intentions and expectations disclosed in the forward-looking statements we make. See the “Risk Factors” section included in our periodic reports filed with the SEC and in the other documents incorporated by reference in this prospectus for more information. Our forward-looking statements do not reflect the potential impact of any future acquisitions, mergers, dispositions, collaborations, joint ventures or investments we may make or enter into.

You should read this prospectus and the documents incorporated by reference herein and therein completely and with the understanding that our actual future results may be materially different from what we expect. The forward-looking statements contained in this prospectus or incorporated by reference herein speak only as of the date on which they are made, and we do not assume any obligation to update any forward-looking statements, whether as a result of new information, future events or otherwise, except as required by applicable law.

This prospectus incorporates by reference statistical and other industry and market data that we obtained from industry publications and research, surveys and studies conducted by third parties as well as our own estimates of potential market opportunities based on our analysis of these data, research, surveys and studies. All of the market data incorporated by reference in this prospectus involves a number of assumptions and limitations, and you are cautioned not to give undue weight to such data. Industry publications and third-party research, surveys and studies generally indicate that their information has been obtained from sources believed to be reliable, although they do not guarantee the accuracy or completeness of such information. Our estimates of the potential market opportunities for our drug product candidates include a number of key assumptions based on our industry knowledge, industry publications and third-party research, surveys and studies, which may be based on a small sample size and fail to accurately reflect market opportunities. While we believe that our internal assumptions are reasonable, and we are responsible for such information, no independent source has verified such assumptions.

USE OF PROCEEDS

The selling stockholders will receive all of the proceeds from the sale of the Shares hereunder. Accordingly, we will not receive any of the proceeds from the sale of the Shares in this offering; however, we will receive nominal proceeds from any cash exercise of the Pre-Funded Warrants.

SELLING STOCKHOLDERS

We have prepared this prospectus to allow the selling stockholders to offer and sell from time to time up to 1,505,570 shares of our common stock for their own account, consisting of (i) 1,418,070 shares of our common stock and (ii) 87,500 shares of our common stock issuable to the selling stockholders upon exercise of the Pre-Funded Warrants, without giving effect to any beneficial ownership limitation contained in any Pre-Funded Warrant.

We are registering the offer and sale of the Shares to satisfy certain registration obligations that we granted the selling stockholders in connection with the purchase of the Shares pursuant to the Registration Rights Agreement. Under the terms of the Registration Rights Agreement, we agreed to file a registration statement covering the resale of the Shares by the Filing Deadline, and we agreed to use reasonable best efforts to cause such registration statement to be declared effective as promptly as possible but no later than the earlier of (i) the 60th calendar day following the Filing Deadline if the SEC notifies us that it will review such registration statement and (ii) the fifth business day after we are notified by the SEC that such registration statement will not be reviewed or will not be subject to further review. We have also agreed to keep the registration statement continuously effective until the earlier of (i) the date on which the selling stockholders shall have resold or otherwise disposed of all the shares covered by this prospectus and (ii) the date on which the shares covered by this prospectus no longer constitute “Registrable Securities” as such term is defined in the Registration Rights Agreement, such that they may be resold by the selling stockholders without registration and without regard to any volume or manner-of-sale limitations and without current public information pursuant to Rule 144 under the Securities Act or any other rule of similar effect.

The Pre-Funded-Warrants provide that we may not effect the exercise of any such warrants, and a holder will not be entitled to exercise any portion of any such warrant that, upon giving effect to such exercise, would cause: (i) the aggregate number of shares of our common stock beneficially owned by such holder (together with its affiliates) to exceed 4.99% or 9.99%, as elected by the holder, of the number of shares of our common stock outstanding immediately after giving effect to the exercise; or (ii) the combined voting power of our securities beneficially owned by such holder (together with its affiliates) to exceed 4.99% or 9.99%, as elected by the holder, of the combined voting power of all of our securities outstanding immediately after giving effect to the exercise, as such percentage ownership is determined in accordance with the terms of the applicable warrant, which percentage may be changed at the holder’s election to a higher percentage not in excess of 19.99% upon 61 days’ notice to us.

The selling stockholders have not had any material relationship with us within the past three years.

The following table sets forth, to our knowledge, information concerning the beneficial ownership of shares of our common stock by the selling stockholders as of July 24, 2026. Beneficial ownership is determined in accordance with the rules of the SEC, and includes voting or investment power with respect to our common stock. Except as indicated by the footnotes below, we believe, based on the information furnished to us, that each selling stockholder named in the table below has sole voting and investment power with respect to all shares of common stock that they beneficially own, subject to applicable community property laws.

The number of shares of common stock that may be offered under this prospectus includes all shares of our common stock underlying Pre-Funded Warrants purchased by such selling stockholder in the Private Placement, without giving effect to any beneficial ownership limitations in the Pre-Funded Warrants. The number of shares of common stock beneficially owned by each selling stockholder following the offering assumes all of the Shares covered hereby are sold and such stockholder does not acquire beneficial ownership of any additional shares of common stock.

The percentage of shares owned before and after the offering are based on 6,826,387 shares of our common stock outstanding as of July 24, 2026, which does not include any shares of common stock offered by this prospectus that are issuable pursuant to the Pre-Funded Warrants, and assumes the selling stockholders dispose

of all of the Shares covered by this prospectus and do not acquire beneficial ownership of any additional shares of common stock. The registration of the Shares does not necessarily mean that the selling stockholders will sell all or any portion of the Shares covered by this prospectus.

The selling stockholders may sell some, all or none of the Shares offered by this prospectus from time to time. We do not know how long the selling stockholders will hold the Shares covered hereby before selling them and we currently have no agreements, arrangements or understandings with the selling stockholders regarding the sale or other disposition of any Shares.

As used in this prospectus, the term “selling stockholders” includes the selling stockholders listed in the table below, together with any additional selling stockholders listed in a prospectus supplement, and their donees, pledgees, assignees, transferees, distributees and successors-in-interest that receive Shares in any non-sale transfer after the date of this prospectus.

Name of Selling Stockholder	Beneficial Ownership Prior to this Offering		Number of Shares Being Offered(2)	Beneficial Ownership After this Offering(1)	
	Number of Shares	Percentage of Outstanding Common Stock		Number of Shares	Percentage of Outstanding Common Stock
Cormorant Global Healthcare Master Fund(3)	681,956	9.99%	752,785	—	—
Entities affiliated with Vivo Opportunity(4)	150,557	2.21%	150,557	—	—
Seligman Healthcare Spectrum (Master) Fund(5)	602,228	8.82%	602,228	—	—

* Represents beneficial ownership of less than 1%.

- (1) Assumes each selling stockholder sells the maximum number of shares of our common stock possible in this offering.
- (2) Represents all of the shares of our common stock that the selling stockholders may offer and sell from time to time under this prospectus without giving effect to the beneficial ownership limitations in the Pre-Funded Warrants.
- (3) Consists of (i) 665,285 shares of common stock issued in the Private Placement and (ii) 16,671 shares of common stock issuable upon the exercise of Pre-Funded Warrants issued in the Private Placement, in each case held by Cormorant Global Healthcare Master Fund. Due to a beneficial ownership blocker in the Pre-Funded Warrants, the number of shares beneficially owned prior to the offering excludes 70,829 shares of common stock issuable upon the exercise of Pre-Funded Warrants. Bihua Chen is the Managing Member of Cormorant Global Healthcare GP, LLC, the General Partner of Cormorant Global Healthcare Master Fund, and exercises investment discretion with respect to these shares. The address for the selling stockholder is 200 Clarendon Street, 50th Floor, Boston, MA 02116.
- (4) Consists of (i) 136,751 shares of common stock issued in the Private Placement held by Vivo Opportunity Fund Holdings and (ii) 13,806 shares of common stock issued in the Private Placement held by Vivo Opportunity Cayman Fund. Kevin Dai, Gaurav Aggarwal, Frank Kung and Shan Fu are the managing members of Vivo Opportunity, LLC, General Partner of Vivo Opportunity Fund Holdings, L.P. and Vivo Opportunity Cayman, LLC, General Partner of Vivo Opportunity Cayman Fund, L.P., and exercise investment discretion with respect to these shares. The address for the selling stockholder is 192 Lytton Ave., Palo Alto, CA 94301.
- (5) Consists of 602,228 shares of common stock issued in the Private Placement held by Seligman Healthcare Spectrum (Master) Fund. Columbia Management Investment Advisers, LLC serves as investment manager to Seligman Healthcare Spectrum (Master) Fund, or SHS Master. Kosta Kleyman, portfolio manager of SHS Master, may be deemed to exercise ultimate investment power with respect to these shares. The address for the selling stockholder is c/o Columbia Management Investment Advisers, 290 Congress St., Boston, MA 02210.

PLAN OF DISTRIBUTION

The selling stockholders, which as used herein includes donees, pledgees, transferees or other successors-in-interest selling shares of common stock or interests in shares of common stock received after the date of this prospectus from a selling stockholder as a gift, pledge, partnership distribution or other transfer, may, from time to time, sell, transfer or otherwise dispose of any or all of their shares of common stock or interests in shares of common stock on any stock exchange, market or trading facility on which the shares are traded or in private transactions. These dispositions may be at fixed prices, at prevailing market prices at the time of sale, at prices related to the prevailing market price, at varying prices determined at the time of sale, or at negotiated prices.

The selling stockholders may use any one or more of the following methods when disposing of shares or interests therein:

- distributions to members, partners, stockholders or other equityholders of the selling stockholders;
- ordinary brokerage transactions and transactions in which the broker-dealer solicits purchasers;
- block trades in which the broker-dealer will attempt to sell the shares as agent, but may position and resell a portion of the block as principal to facilitate the transaction;
- purchases by a broker-dealer as principal and resale by the broker-dealer for its account;
- an exchange distribution in accordance with the rules of the applicable exchange;
- privately negotiated transactions;
- short sales and settlement of short sales entered into after the effective date of the registration statement of which this prospectus is a part;
- through the writing or settlement of options or other hedging transactions, whether through an options exchange or otherwise;
- broker-dealers may agree with the selling stockholders to sell a specified number of such shares at a stipulated price per share;
- a combination of any such methods of sale; and
- any other method permitted pursuant to applicable law.

The selling stockholders may, from time to time, pledge or grant a security interest in some or all of the shares of common stock owned by them and, if they default in the performance of their secured obligations, the pledgees or secured parties may offer and sell the shares of common stock, from time to time, under this prospectus, or under an amendment to this prospectus under Rule 424(b)(3) or other applicable provision of the Securities Act, amending the list of selling stockholders to include the pledgee, transferee or other successors in interest as selling stockholders under this prospectus. The selling stockholders also may transfer the shares of common stock in other circumstances, in which case the transferees, pledgees or other successors in interest will be the selling stockholders for purposes of this prospectus.

In connection with the sale of our common stock or interests therein, the selling stockholders may enter into hedging transactions with broker-dealers or other financial institutions, which may in turn engage in short sales of the common stock in the course of hedging the positions they assume. The selling stockholders may also sell shares of our common stock short and deliver these securities to close out their short positions, or loan or pledge the common stock to broker-dealers that in turn may sell these securities. The selling stockholders may also enter into option or other transactions with broker-dealers or other financial institutions or the creation of one or more derivative securities which require the delivery to such broker-dealer or other financial institution of shares offered by this prospectus, which shares such broker-dealer or other financial institution may resell pursuant to this prospectus (as supplemented or amended to reflect such transaction).

The aggregate proceeds to the selling stockholders from the sale of the common stock offered by them will be the purchase price of the common stock less discounts or commissions, if any. Each of the selling stockholders reserves the right to accept and, together with their agents from time to time, to reject, in whole or in part, any proposed purchase of common stock to be made directly or through agents. We will not receive any of the proceeds from this offering. Upon any exercise of the pre-funded warrants by payment of cash, however, we will receive the exercise price of the pre-funded warrants.

The selling stockholders also may resell all or a portion of the shares in open market transactions in reliance upon Rule 144 under the Securities Act, provided that they meet the criteria and conform to the requirements of that rule, or another available exemption from the registration requirements under the Securities Act.

The selling stockholders and any underwriters, broker-dealers or agents that participate in the sale of the common stock or interests therein may be “underwriters” within the meaning of Section 2(a)(11) of the Securities Act (it being understood that the selling stockholders shall not be deemed to be underwriters solely as a result of their participation in this offering). Any discounts, commissions, concessions or profit they earn on any resale of the shares may be underwriting discounts and commissions under the Securities Act. Selling stockholders who are “underwriters” within the meaning of Section 2(a)(11) of the Securities Act will be subject to the prospectus delivery requirements of the Securities Act.

To the extent required, the shares of our common stock to be sold, the names of the selling stockholders, the respective purchase prices and public offering prices, the names of any agent, dealer or underwriter, and any applicable commissions or discounts with respect to a particular offer will be set forth in an accompanying prospectus supplement or, if appropriate, a post-effective amendment to the registration statement that includes this prospectus.

In order to comply with the securities laws of some states, if applicable, the common stock may be sold in these jurisdictions only through registered or licensed brokers or dealers. In addition, in some states the common stock may not be sold unless it has been registered or qualified for sale or an exemption from registration or qualification requirements is available and is complied with.

We have advised the selling stockholders that the anti-manipulation rules of Regulation M under the Exchange Act may apply to sales of shares in the market and to the activities of the selling stockholders and their affiliates. In addition, to the extent applicable, we will make copies of this prospectus (as it may be supplemented or amended from time to time) available to the selling stockholders for the purpose of satisfying the prospectus delivery requirements of the Securities Act. The selling stockholders may indemnify any broker-dealer that participates in transactions involving the sale of the shares against certain liabilities, including liabilities arising under the Securities Act.

We have agreed to indemnify the selling stockholders against liabilities, including liabilities under the Securities Act and state securities laws, relating to the registration of the shares of common stock offered by this prospectus.

We have agreed with the selling stockholders to use commercially reasonable efforts to cause the registration statement of which this prospectus constitutes a part to become effective and to remain continuously effective until the earlier of: (i) the date on which the selling stockholders shall have resold or otherwise disposed of all the shares covered by this prospectus and (ii) the date on which the shares covered by this prospectus no longer constitute “Registrable Securities” as such term is defined in the Registration Rights Agreement, such that they may be resold by the selling stockholders without registration and without regard to any volume or manner-of-sale limitations and without current public information pursuant to Rule 144 under the Securities Act or any other rule of similar effect.

LEGAL MATTERS

Certain legal matters in connection with the offering and the validity of the securities offered by this prospectus will be passed upon by Cooley LLP, Santa Monica, California.

EXPERTS

The consolidated financial statements of Cue Biopharma, Inc. as of December 31, 2025 and 2024 and for each of the years in the two-year period ended December 31, 2025, incorporated in the prospectus by reference from the Cue Biopharma, Inc. Annual Report on Form 10-K for the year ended December 31, 2025 have been audited by RSM US LLP, an independent registered public accounting firm, as stated in their report thereon (which report expresses an unqualified opinion and includes an explanatory paragraph relating to the Company's ability to continue as a going concern), incorporated herein by reference, and have been incorporated in this prospectus and registration statement in reliance upon such report and upon the authority of such firm as experts in accounting and auditing.

WHERE YOU CAN FIND MORE INFORMATION

This prospectus is part of a registration statement we filed with the SEC. This prospectus does not contain all of the information set forth in the registration statement and the exhibits to the registration statement. For further information with respect to us and the securities we are offering under this prospectus, we refer you to the registration statement and the exhibits and schedules filed as a part of the registration statement. We have not authorized any person to provide you with different information. We are not making an offer of these securities in any state where the offer is not permitted. You should not assume that the information in this prospectus is accurate as of any date other than the date on the front page of this prospectus, regardless of the time of delivery of this prospectus or any sale of the securities offered by this prospectus.

We file annual, quarterly and current reports, proxy statements and other information with the SEC. The SEC maintains a website that contains reports, proxy statements and other information regarding issuers that file electronically with the SEC, including our company, Cue Biopharma, Inc. The address of the SEC website is www.sec.gov.

Copies of certain information filed by us with the SEC are also available on our website at www.cuebiopharma.com. Information contained in or accessible through our website does not constitute a part of this prospectus and is not incorporated by reference into this prospectus.

INCORPORATION OF CERTAIN INFORMATION BY REFERENCE

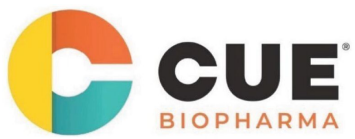
The SEC allows us to “incorporate by reference” information from other documents that we file with it, which means that we can disclose important information to you by referring you to those documents. The information incorporated by reference is considered to be part of this prospectus. Information in this prospectus supersedes information incorporated by reference that we filed with the SEC prior to the date of this prospectus, while information that we file later with the SEC will automatically update and supersede the information in this prospectus. We also incorporate by reference into this prospectus the documents listed below and any future filings made by us with the SEC (other than Current Reports or portions thereof furnished under Item 2.02 or Item 7.01 of Form 8-K and exhibits filed on such form that are related to such items and other portions of documents that are furnished, but not filed, pursuant to applicable rules promulgated by the SEC) that are filed by us with the SEC pursuant to Sections 13(a), 13(c), 14 or 15(d) of the Exchange Act, including those made after the date of the initial filing of the registration statement of which this prospectus is a part but prior to the effectiveness of such registration statement, until we file a post-effective amendment that indicates the termination of all offerings of securities covered by this prospectus:

- our Annual Report on [Form 10-K](#) for the fiscal year ended December 31, 2025, as filed with the SEC on March 16, 2026, including the information specifically incorporated by reference into the Annual Report on Form 10-K from our [definitive proxy statement](#) for the 2026 Annual Meeting of Stockholders;
- our Quarterly Report on Form 10-Q for the fiscal quarter ended March 31, 2026, as filed with the SEC on [May 14, 2026](#);
- our Current Reports on Form 8-K as filed with the SEC on [February 12, 2026](#), [February 18, 2026](#), [March 27, 2026](#), [April 7, 2026](#), [April 13, 2026](#), [April 22, 2026](#), [May 1, 2026](#), [June 2, 2026](#), [June 3, 2026](#), [July 10, 2026](#), and [August 3, 2026](#) (each to the extent the information in such reports is filed and not furnished); and
- the description of our common stock in our registration statement on [Form 8-A](#) filed with the SEC on December 13, 2017, including any amendments or reports filed for the purpose of updating such description, including [Exhibit 4.2](#) to the Annual Report on Form 10-K for the year ended December 31, 2025, which was filed with the SEC on March 16, 2026.

We will provide to each person, including any beneficial owner, to whom a prospectus is delivered, without charge upon written or oral request, a copy of any or all of the documents that are incorporated by reference into this prospectus but not delivered with the prospectus, including exhibits which are specifically incorporated by reference into such documents. You should direct any requests for documents by writing us at 40 Guest Street, Boston, Massachusetts 02135, or by telephoning us at (617) 949-2680.

Any statement contained herein or in a document incorporated or deemed to be incorporated by reference into this document will be deemed to be modified or superseded for purposes of the document to the extent that a statement contained in this document or any other subsequently filed document that is deemed to be incorporated by reference into this document modifies or supersedes the statement.

1,505,570 Shares



Common Stock

PROSPECTUS

PART II
INFORMATION NOT REQUIRED IN PROSPECTUS

Item 14. Other Expenses of Issuance and Distribution

The following table sets forth the estimated costs and expenses to be incurred in connection with the sale and distribution of the securities being registered hereby, all of which will be borne by the Registrant (except any underwriting discounts and commissions and expenses incurred by the selling stockholders for brokerage, accounting, tax or legal services or any other expenses incurred by the selling stockholders in disposing of its shares). All amounts shown are estimates, except for the SEC registration fee.

SEC registration fee	\$ 5,466.20
Accounting fees and expenses	30,000.00
Legal fees and expenses	30,000.00
Printing and miscellaneous expenses	3,000.00
Total	<u>\$ 68,466.20</u>

Item 15. Indemnification of Directors and Officers

The following summary is qualified in its entirety by reference to the complete Delaware General Corporation Law, or the DGCL, and our Amended and Restated Certificate of Incorporation, as amended, or the Amended and Restated Certificate of Incorporation, and our Amended and Restated Bylaws.

Section 145 of the DGCL provides, generally, that a corporation shall have the power to indemnify any person who was or is a party or is threatened to be made a party to any threatened, pending or completed action, suit or proceeding (except actions by or in the right of the corporation) by reason of the fact that such person is or was a director, officer, employee or agent of the corporation against all expenses, judgments, fines and amounts paid in settlement actually and reasonably incurred by such person in connection with such action, suit or proceeding if such person acted in good faith and in a manner such person reasonably believed to be in or not opposed to the best interests of the corporation and, with respect to any criminal action or proceeding, had no reasonable cause to believe his or her conduct was unlawful. A corporation may similarly indemnify such person for expenses actually and reasonably incurred by such person in connection with the defense or settlement of any action or suit by or in the right of the corporation, provided that such person acted in good faith and in a manner he or she reasonably believed to be in or not opposed to the best interests of the corporation, and, in the case of claims, issues and matters as to which such person shall have been adjudged liable to the corporation, provided that a court shall have determined, upon application, that, despite the adjudication of liability but in view of all of the circumstances of the case, such person is fairly and reasonably entitled to indemnity for such expenses which such court shall deem proper.

Section 102(b)(7) of the DGCL provides, generally, that our Amended and Restated Certificate of Incorporation may contain a provision eliminating or limiting the personal liability of a director or officer to the corporation or its stockholders for monetary damages for breach of fiduciary duty as a director or officer, provided that such provision may not eliminate or limit the liability of (i) a director or officer for any breach of the director's or officer's duty of loyalty to the corporation or its stockholders, (ii) a director or officer for acts or omissions not in good faith or which involve intentional misconduct or a knowing violation of law, (iii) a director under section 174 of the DGCL, (iv) a director or officer for any transaction from which the director or officer derived an improper personal benefit, or (v) an officer in any action by or in the right of the corporation. No such provision may eliminate or limit the liability of a director or officer for any act or omission occurring prior to the date when such provision became effective.

Article VI of our Amended and Restated Certificate of Incorporation states that our directors shall not be personally liable to us or to our stockholders for monetary damages for any breach of fiduciary duty as a director,

notwithstanding any provision of law imposing such liability. Under Section 102(b)(7) of the DGCL, the personal liability of a director to the corporation or its stockholders for monetary damages for breach of fiduciary duty can be limited or eliminated except (i) for any breach of the director's duty of loyalty to the corporation or its stockholders; (ii) for acts or omissions not in good faith or which involve intentional misconduct or a knowing violation of law; (iii) under Section 174 of the DGCL (relating to unlawful payment of dividend or unlawful stock purchase or redemption); or (iv) for any transaction from which the director derived an improper personal benefit.

Article V of our Amended and Restated Certificate of Incorporation provides that we shall indemnify (and advance expenses to) our officers and directors to the full extent permitted by the DGCL.

We have directors' and officers' liability insurance insuring our directors and officers against liability for acts or omissions in their capacities as directors or officers, subject to certain exclusions. Such insurance also insures us against losses which we may incur in indemnifying our officers and directors. As permitted by the DGCL, we have entered into indemnification agreements with each of our directors and executive officers that require us to indemnify such persons against various actions including, but not limited to, third-party actions where such director or executive officer, by reason of his or her corporate status, is a party or is threatened to be made a party to an action, or by reason of anything done or not done by such director in any such capacity. We intend to indemnify directors and executive officers against all costs, judgments, penalties, fines, liabilities, amounts paid in settlement by or on behalf such directors or executive officers and for any expenses actually and reasonably incurred by such directors or executive officers in connection with such action, if such directors or executive officers acted in good faith and in a manner they reasonably believed to be in or not opposed to the best interests of the Company, and with respect to any criminal proceeding, had no reasonable cause to believe their conduct was unlawful. We also intend to advance to our directors and executive officers expenses (including attorney's fees) incurred by such directors and executive officers in advance of the final disposition of any action after the receipt by the Company of a statement or statements from directors or executive officers requesting such payment or payments from time to time, provided that such statement or statements are accompanied by an undertaking, by or on behalf of such directors or executive officers, to repay such amount if it shall ultimately be determined that they are not entitled to be indemnified against such expenses by the Company.

The indemnification agreements also set forth certain procedures that will apply in the event of a claim for indemnification or advancement of expenses, including, among others, provisions about providing notice to the Company of any action in connection with which a director or executive officer seeks indemnification or advancement of expenses from the Company and provisions concerning the determination of entitlement to indemnification or advancement of expenses.

Item 16. Exhibits

Exhibit Number	Description of Document	Form	Incorporated by Reference		
			File No.	Exhibit	Filing Date
3.1	Amended and Restated Certificate of Incorporation of the Registrant, as amended.	10-Q	001-38327	3.1	August 12, 2025
3.2	Certificate of Amendment to the Registrant's Amended and Restated Certificate of Incorporation, as amended	8-K	001-38327	3.1	April 22, 2026
3.3	Amended and Restated Bylaws of the Registrant.	S-1	333-220550	3.5	December 5, 2017
4.1	Form of Pre-Funded Warrant to Purchase Common Stock issued to the Investors	8-K	001-38327	4.1	July 10, 2026

Exhibit Number	Description of Document	Form	Incorporated by Reference		
			File No.	Exhibit	Filing Date
4.2	Specimen Certificate representing shares of common stock of the Registrant	S-1	333-220550	4.1	December 5, 2017
5.1*	Opinion of Cooley LLP				
10.1	Form of Securities Purchase Agreement, dated July 9, 2026, by and among Cue Biopharma, Inc. and the Investors.	8-K	001-38327	10.1	July 10, 2026
10.2	Form of Registration Rights Agreement, dated July 9, 2026, by and among Cue Biopharma, Inc. and the Investors.	8-K	001-38327	10.2	July 10, 2026
23.1*	Consent of independent registered public accounting firm.				
23.2*	Consent of Cooley LLP (included in Exhibit 5.1).				
24.1*	Power of Attorney (included on signature page hereto).				
107*	Filing Fee Table.				

* Filed herewith.

Item 17. Undertakings

The undersigned registrant hereby undertakes:

(1) To file, during any period in which offers or sales are being made, a post-effective amendment to this registration statement:

(i) To include any prospectus required by Section 10(a)(3) of the Securities Act;

(ii) To reflect in the prospectus any facts or events arising after the effective date of the registration statement (or the most recent post-effective amendment thereof) which, individually or in the aggregate, represent a fundamental change in the information set forth in the registration statement. Notwithstanding the foregoing, any increase or decrease in volume of securities offered (if the total dollar value of securities offered would not exceed that which was registered) and any deviation from the low or high end of the estimated maximum offering range may be reflected in the form of prospectus filed with the SEC pursuant to Rule 424(b) if, in the aggregate, the changes in volume and price represent no more than a 20% change in the maximum aggregate offering price set forth in the "Calculation of Registration Fee" table in the effective registration statement; and

(iii) To include any material information with respect to the plan of distribution not previously disclosed in the registration statement or any material change to such information in the registration statement.

Provided, however, that paragraphs (1)(i), (1)(ii) and (1)(iii) do not apply if the information required to be included in a post-effective amendment by those paragraphs is contained in reports filed with or furnished to the SEC by the registrant pursuant to Section 13 or 15(d) of the Exchange Act that are incorporated by reference in the registration statement, or is contained in a form of prospectus filed pursuant to Rule 424(b) that is part of the registration statement.

(2) That, for the purpose of determining any liability under the Securities Act, each such post-effective amendment shall be deemed to be a new registration statement relating to the securities offered therein, and the offering of such securities at that time shall be deemed to be the initial bona fide offering thereof.

(3) To remove from registration by means of a post-effective amendment any of the securities being registered which remain unsold at the termination of the offering.

(4) That, for the purpose of determining liability under the Securities Act to any purchaser:

(i) Each prospectus filed by the registrant pursuant to Rule 424(b)(3) shall be deemed to be part of the registration statement as of the date the filed prospectus was deemed part of and included in the registration statement; and

(ii) Each prospectus required to be filed pursuant to Rule 424(b)(2), (b)(5), or (b)(7) as part of a registration statement in reliance on Rule 430B relating to an offering made pursuant to Rule 415(a)(1)(i), (vii), or (x) for the purpose of providing the information required by Section 10(a) of the Securities Act shall be deemed to be part of and included in the registration statement as of the earlier of the date such form of prospectus is first used after effectiveness or the date of the first contract of sale of securities in the offering described in the prospectus. As provided in Rule 430B, for liability purposes of the issuer and any person that is at that date an underwriter, such date shall be deemed to be a new effective date of the registration statement relating to the securities in the registration statement to which that prospectus relates, and the offering of such securities at that time shall be deemed to be the initial bona fide offering thereof. Provided, however, that no statement made in a registration statement or prospectus that is part of the registration statement or made in a document incorporated or deemed incorporated by reference into the registration statement or prospectus that is part of the registration statement will, as to a purchaser with a time of contract of sale prior to such effective date, supersede or modify any statement that was made in the registration statement or prospectus that was part of the registration statement or made in any such document immediately prior to such effective date.

(5) That, for purposes of determining any liability under the Securities Act, each filing of the registrant's annual report pursuant to Section 13(a) or Section 15(d) of the Exchange Act (and, where applicable, each filing of an employee benefit plan's annual report pursuant to Section 15(d) of the Exchange Act) that is incorporated by reference in the registration statement shall be deemed to be a new registration statement relating to the securities offered therein, and the offering of such securities at that time shall be deemed to be the initial *bona fide* offering thereof.

Insofar as indemnification for liabilities arising under the Securities Act may be permitted to directors, officers and controlling persons of the registrant pursuant to the foregoing provisions, or otherwise, the registrant has been advised that in the opinion of the SEC such indemnification is against public policy as expressed in the Securities Act and is, therefore, unenforceable. In the event that a claim for indemnification against such liabilities (other than the payment by the registrant of expenses incurred or paid by a director, officer or controlling person of the registrant in the successful defense of any action, suit or proceeding) is asserted by such director, officer or controlling person in connection with the securities being registered, the registrant will, unless in the opinion of its counsel the matter has been settled by controlling precedent, submit to a court of appropriate jurisdiction the question whether such indemnification by it is against public policy as expressed in the Securities Act and will be governed by the final adjudication of such issue.

SIGNATURES

Pursuant to the requirements of the Securities Act of 1933, as amended, the registrant has duly caused this registration statement to be signed on its behalf by the undersigned, thereunto duly authorized, in the City of Boston, Commonwealth of Massachusetts on August 12, 2026.

Cue Biopharma, Inc.

By: /s/ Shao-Lee Lin, M.D., Ph.D.

Name: Shao-Lee Lin, M.D., Ph.D.

Title: President and Chief Executive Officer

POWER OF ATTORNEY

KNOW ALL PERSONS BY THESE PRESENTS, that each person whose signature appears below constitutes and appoints Shao-Lee Lin, M.D., Ph.D., and Sumita Ray, J.D., and each one of them, as his or her true and lawful attorneys-in-fact and agents, with full power of substitution and resubstitution, for him or her and in their name, place and stead, in any and all capacities, to sign any and all amendments (including post-effective amendments) to this registration statement, and to sign any registration statement for the same offering covered by this registration statement that is to be effective on filing pursuant to Rule 462(b) under the Securities Act of 1933, as amended, and all post-effective amendments thereto, and to file the same, with all exhibits thereto and other documents in connection therewith, with the Securities and Exchange Commission, granting unto said attorneys-in-fact and agents, and each of them, full power and authority to do and perform each and every act and thing requisite and necessary to be done in connection therewith, as fully to all intents and purposes as he might or could do in person, hereby ratifying and confirming all that said attorneys-in-fact and agents or any of them, or his substitute or substitutes, may lawfully do or cause to be done by virtue hereof.

Pursuant to the requirements of the Securities Act of 1933, as amended, this registration statement has been signed by the following persons in the capacities and on the dates indicated.

Signature	Title	Date
<u>/s/ Shao-Lee Lin, M.D., Ph.D.</u> Shao-Lee Lin, M.D., Ph.D.	President and Chief Executive Officer and Director (Principal Executive Officer)	August 12, 2026
<u>/s/ James Ahlers</u> James Ahlers	Chief Financial Officer (Principal Financial Officer)	August 12, 2026
<u>/s/ Michael Meluzio</u> Michael Meluzio	Vice President, Principal Accounting Officer (Principal Accounting Officer)	August 12, 2026
<u>/s/ Pasha Sarraf, M.D., Ph.D.</u> Pasha Sarraf, M.D., Ph.D.	Chairman of the Board	August 12, 2026
<u>/s/ Daniel Camardo</u> Daniel Camardo	Director	August 12, 2026
<u>/s/ Pamela D. Garzone</u> Pamela D. Garzone	Director	August 12, 2026
<u>/s/ Viola Meehan</u> Viola Meehan	Director	August 12, 2026



Courtney M.W. Tygesson
+1 312 881 6680
tygesson@cooley.com

August 12, 2026

Cue Biopharma, Inc.
40 Guest Street
Boston, MA 02135

Ladies and Gentlemen:

We have acted as counsel to Cue Biopharma, Inc., a Delaware corporation (the “**Company**”), in connection with the filing of a Registration Statement on Form S-3 (the “**Registration Statement**”) with the Securities and Exchange Commission (the “**Commission**”) under the Securities Act of 1933, as amended (the “**Securities Act**”), including a related prospectus included in the Registration Statement (the “**Prospectus**”), covering the registration for resale of up to 1,505,570 shares of the Company’s common stock, par value \$0.001 per share (“**Common Stock**”), consisting of (a) 1,418,070 shares (the “**Shares**”) of Common Stock that are currently outstanding and (b) up to 87,500 shares (the “**Warrant Shares**”) of Common Stock, issuable upon the exercise of pre-funded warrants to purchase shares of Common Stock (the “**Warrants**”). The Shares and the Warrants were issued by the Company pursuant to that certain Securities Purchase Agreement, dated July 9, 2026, by and among the Company and the investors named therein (the “**Purchase Agreement**”).

In connection with this opinion, we have examined and relied upon the Registration Statement, the Prospectus, the Company’s certificate of incorporation and bylaws, each as currently in effect, the Purchase Agreement, the form of the Warrants and such other records, documents, opinions, certificates, memoranda and instruments as in our judgment are necessary or appropriate to enable us to render the opinion expressed below. We have assumed the genuineness of all signatures, the authenticity of all documents submitted to us as originals, the conformity to originals of all documents submitted to us as copies, the accuracy, completeness and authenticity of certificates of public officials and the due authorization, execution and delivery of all documents by all persons other than the Company. As to certain factual matters, we have relied upon a certificate of an officer of the Company and have not independently verified such matters.

Our opinion is expressed only with respect to the General Corporation Law of the State of Delaware. We express no opinion to the extent that any other laws are applicable to the subject matter hereof and express no opinion and provide no assurance as to compliance with any federal or state anti-fraud law, rule or regulation relating to securities or to the sale or issuance thereof.

With respect to the Warrant Shares, we express no opinion to the extent that future issuances of securities by the Company, adjustments to outstanding securities of the Company or other matters cause the Warrants to be exercisable for more shares of Common Stock than the number available for issuance by the Company, or that the consideration paid upon exercise of the Warrants is below the par value per share of the Common Stock.

On the basis of the foregoing, in reliance thereon and subject to the assumptions, exceptions, limitations and qualifications set forth herein, we are of the opinion that (i) the Shares are validly issued, fully paid and nonassessable and (ii) the Warrant Shares, when issued and paid for in accordance with the terms of the Warrants, will be validly issued, fully paid and nonassessable.

Cooley LLP 110 North Wacker, Suite 4200 Chicago, Illinois 60606
t: (312) 881-6500 f: (312) 881-6598 cooley.com



Cue Biopharma, Inc.
August 12, 2026
Page Two

Our opinion is limited to the matters expressly set forth in this letter, and no opinion has been or should be implied, or may be inferred, beyond the matters expressly stated. This opinion speaks only as to law and facts in effect or existing as of the date hereof, and we have no obligation or responsibility to update or supplement this letter to reflect any facts or circumstances that may hereafter come to our attention or any changes in law that may hereafter occur.

We hereby consent to the reference to our firm under the heading "Legal Matters" in the Prospectus and to the filing of this opinion as an exhibit to the Registration Statement. In giving such consents, we do not thereby admit that we are in the category of persons whose consent is required under Section 7 of the Securities Act or the rules and regulations of the Commission thereunder.

Very truly yours,

Cooley LLP

By: /s/ Courtney M.W. Tygesson
Courtney M.W. Tygesson

Cooley LLP 110 North Wacker, Suite 4200 Chicago, Illinois 60606
t: (312) 881-6500 f: (312) 881-6598 cooley.com

Consent of Independent Registered Public Accounting Firm

We consent to the incorporation by reference in this Registration Statement on Form S-3 and related Prospectuses of Cue Biopharma, Inc. of our report dated March 16, 2026, relating to the consolidated financial statements of Cue Biopharma, Inc. and its subsidiary appearing in the Annual Report on Form 10-K of Cue Biopharma, Inc. for the year ended December 31, 2025.

We also consent to the reference to our firm under the heading “Experts” in such Prospectuses.

/s/ RSM US LLP

Boston, Massachusetts
August 12, 2026

Calculation of Filing Fee Tables

S-3

Cue Biopharma, Inc.

Table 1: Newly Registered and Carry Forward Securities

☐Not Applicable

	Security Type	Security Class Title	Fee Calculation or Carry Forward Rule	Amount Registered	Proposed Maximum Offering Price Per Unit	Maximum Aggregate Offering Price	Fee Rate	Amount of Registration Fee	Carry Forward Form Type	Carry Forward File Number	Carry Forward Initial Effective Date	Filing Fee Previously Paid in Connection with Unsold Securities to be Carried Forward
Newly Registered Securities												
Fees to be Paid	1 Equity	Common Stock, par value \$0.001 per share	457(a)	1,505,570	\$ 26.29	39,581,435.30	\$ 0.0001381	\$ 5,466.20				
Fees Previously Paid												
Carry Forward Securities												
Carry Forward Securities												
Total Offering Amounts:						\$ 39,581,435.30		\$ 5,466.20				
Total Fees Previously Paid:								\$ 0.00				
Total Fee Offsets:								\$ 0.00				
Net Fee Due:								\$ 5,466.20				

Offering Note

¹ (a) Consists of an aggregate of up to 1,505,570 shares of the Registrant's common stock, par value \$0.001 per share ("common stock"), including 87,500 shares of common stock issuance upon the exercise of outstanding pre-funded warrants to purchase shares of common stock held by the selling stockholders, issued by the Registrant in a private placement pursuant to a securities purchase agreement dated July 9, 2026. Pursuant to Rule 416 under the Securities Act of 1933, as amended, the shares of common stock being registered hereunder include such indeterminate number of shares of common stock as may be issuable with respect to the shares of common stock being registered hereunder as a result of stock splits, stock dividends or similar transactions. (b) Pursuant to Rule 457(c) under the Securities Act, calculated on the basis of the average of the high and low prices per share of common stock reported on The Nasdaq Capital Market on August 10, 2026.

Table 2: Fee Offset Claims and Sources

☒Not Applicable

	Registrant or Filer Name	Form or Filing Type	File Number	Initial Filing Date	Filing Date	Fee Offset Claimed	Security Type Associated with Fee Offset Claimed	Security Title Associated with Fee Offset Claimed	Unsold Securities Associated with Fee Offset Claimed	Unsold Aggregate Offering Amount Associated with Fee Offset Claimed	Fee Paid with Fee Offset Source
Rules 457(b) and 0-11(a)(2)											
Fee Offset Claims											
Fee Offset Sources											
Rule 457(p)											
Fee Offset Claims											
Fee Offset Sources											

Table 3: Combined Prospectuses

☒Not Applicable

Security Type	Security Class Title	Amount of Securities Previously Registered	Maximum Aggregate Offering Price of Securities Previously Registered	Form Type	File Number	Initial Effective Date
---------------	----------------------	--	--	-----------	-------------	------------------------