

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

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

Lyell Immunopharma, Inc.
(Exact name of registrant as specified in its charter)

Delaware
(State or other jurisdiction of
incorporation or organization)

83-1300510
(I.R.S. Employer
Identification Number)

201 Haskins Way
South San Francisco, California 94080
(650) 695-0677
(Address, including zip code, and telephone number, including area code, of registrant's principal executive offices)

Lynn Seely, M.D.
President and Chief Executive Officer
Lyell Immunopharma, Inc.
201 Haskins Way
South San Francisco, California 94080
(650) 695-0677
(Name, address, including zip code, and telephone number, including area code, of agent for service)

Copies to:
Asa M. Henin
Kenneth Guernsey
Cooley LLP
10265 Science Center Drive
San Diego, CA 92121
(858) 550-6000

Approximate date of commencement of proposed sale to the public: From time to time after the effective date of this Registration Statement.

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, as amended, 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 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 ☐
Non-accelerated filer ☒

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 that specifically states that this registration statement shall thereafter become effective in accordance with Section 8(a) of the Securities Act of 1933, as amended, 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.

The information in this prospectus is not complete and may be changed. The selling stockholders may not sell 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 an offer to buy these securities in any state where the offer or sale is not permitted.

SUBJECT TO COMPLETION, DATED AUGUST 12, 2025

PROSPECTUS



3,753,752 Shares of Common Stock

This prospectus covers the offer and resale by the selling stockholders identified in this prospectus of up to an aggregate of 3,753,752 shares of our common stock. An aggregate of 3,753,752 shares of our common stock were sold to the selling stockholders in a private placement that closed on July 25, 2025 (the "Private Placement").

We are not selling any shares of common stock under this prospectus and will not receive any proceeds from the sale by the selling stockholders of such shares.

Sales of the shares by the selling stockholders may occur at fixed prices, at market prices prevailing at the time of sale, at prices related to prevailing market prices or at negotiated prices. The selling stockholders may sell shares to or through underwriters, broker-dealers or agents, who may receive compensation in the form of discounts, concessions or commissions from the selling stockholders, the purchasers of the shares, or both.

We are paying the cost of registering the shares of common stock covered by this prospectus as well as various related expenses. The selling stockholders are responsible for all selling commissions, transfer taxes and other costs related to the offer and sale of their shares.

Our common stock is listed on Nasdaq Global Select Market under the symbol "LYEL." On August 11, 2025, the last reported sale price of our common stock was \$10.58 per share.

Investing in our common stock involves a high degree of risk. Before making an investment decision, please read the information under "[Risk Factors](#)" on page 3 of this prospectus and under similar headings in any amendment or supplement to this prospectus or in any filing with the Securities and Exchange Commission that is incorporated by reference herein.

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 _____, 2025

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ABOUT THIS PROSPECTUS

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

We have not authorized anyone to provide you with information other than the information that we have provided or incorporated by reference in this prospectus and your reliance on any unauthorized information or representation is at your own risk. This prospectus may be used only in jurisdictions where offers and sales of these securities are permitted. You should assume that the information appearing in this prospectus is accurate only as of the date of this prospectus and that any information we have incorporated by reference is accurate only as of the date of the document incorporated by reference, regardless of the time of delivery of this prospectus, or any sale of our common stock. Our business, financial condition and results of operations may have changed since those dates.

SPECIAL NOTE REGARDING FORWARD-LOOKING STATEMENTS

This prospectus and any applicable prospectus supplement or free writing prospectus, including the documents that we incorporate by reference herein and therein, contain “forward-looking statements” within the meaning of Section 27A of the Securities Act of 1933, as amended (the “Securities Act”), and Section 21E of the Securities Exchange Act of 1934, as amended (the “Exchange Act”). These statements relate to future events or to our future operating or financial performance and involve known and unknown risks, uncertainties and other factors which may cause our actual results, performance or achievements to be materially different from any future results, performances or achievements expressed or implied by the forward-looking statements.

In some cases, you can identify forward-looking statements by terms such as “may,” “will,” “should,” “could,” “would,” “expects,” “plans,” “anticipates,” “believes,” “estimates,” “projects,” “predicts,” “potential” and similar expressions intended to identify forward-looking statements. These statements reflect our current views with respect to future events and are based on assumptions and are subject to risks and uncertainties. As such, our actual results may differ significantly from those expressed in any forward-looking statements. Given these uncertainties, you should not place undue reliance on these forward-looking statements. In addition, statements indicating that “we believe” and similar statements reflect our beliefs and opinions on the relevant subject. These statements are based upon information available to us as of the date they were made, and while we believe such information formed a reasonable basis for such statements, such information may be limited or incomplete, and our statements should not be read to indicate that we have conducted an exhaustive inquiry into, or review of, all potentially available relevant information. These statements are inherently uncertain and investors are cautioned not to unduly rely upon these statements.

We discuss many of these risks in greater detail under “Risk Factors” in this prospectus and in the “Risk Factors,” “Business” and “Management’s Discussion and Analysis of Financial Condition and Results of Operations” sections incorporated by reference from our most recent Annual Report on Form 10-K and in our Quarterly Reports on Form 10-Q for the quarterly periods ended subsequent to our filing of such Annual Report on Form 10-K, as well as any amendments thereto reflected in subsequent filings with the SEC.

Also, these forward-looking statements represent our estimates and assumptions only as of the date of the document containing the applicable statement. Unless required by law, we undertake no obligation to update or revise any forward-looking statements to reflect new information or future events or developments. Thus, you should not assume that our silence over time means that actual events are bearing out as expressed or implied in such forward-looking statements. You should read this prospectus, any applicable prospectus supplement, together with the documents that we have filed with the SEC that are incorporated by reference and any free writing prospectus we have authorized for use in connection with this offering, completely and with the understanding that our actual future results may be materially different from what we expect. We qualify all of the forward-looking statements in the foregoing documents by these cautionary statements.

PROSPECTUS SUMMARY

This summary highlights certain information about us, the Private Placement and selected information contained elsewhere in or incorporated by reference into this prospectus. This summary is not complete and does not contain all of the information that you should consider before making an investment decision. For a more complete understanding of our company, you should read and consider carefully the more detailed information included or incorporated by reference in this prospectus and any applicable prospectus supplement, including the factors described under the heading “Risk Factors” on page 3 of this prospectus, as well as the information incorporated herein by reference, before making an investment decision.

Unless otherwise stated, all references in this prospectus to “we,” “us,” “our,” “Lyell,” the “Company” and similar designations refer to Lyell Immunopharma, Inc.

Company Overview

We are a cell therapy company advancing a pipeline of proprietary next-generation autologous chimeric antigen receptor (CAR) T-cell product candidates for patients with hematologic malignancies and solid tumors. We are pioneering novel approaches designed to generate T-cell therapies that drive long-lasting clinical responses. The patient’s own living cells are the starting point for our investigational CAR T-cell therapies, and we enhance them with our innovative CAR constructs, technology and manufacturing protocols.

Company Information

We were incorporated in June 2018 as a Delaware corporation. Our principal executive offices are located at 201 Haskins Way, South San Francisco, California 94080 and our telephone number is (650) 695-0677. Our website address is www.lyell.com. Information found on, or accessible through, our website is not a part of, and is not incorporated into, this prospectus, and you should not consider it as part of this prospectus. Our website address is included in this prospectus as an inactive textual reference only.

The Lyell logo and other trademarks or service marks of Lyell Immunopharma, Inc. appearing in this prospectus are the property of Lyell. Other trademarks, service marks or trade names appearing in this prospectus are the property of their respective owners. We do not intend our use or display of other companies’ trade names, trademarks or service marks to imply a relationship with, or endorsement or sponsorship of us by, these other companies.

Private Placement

On July 24, 2025, we entered into a Securities Purchase Agreement (the “Purchase Agreement”) with the selling stockholders named in this prospectus, pursuant to which we sold and issued, in a private placement transaction, 3,753,752 shares of our common stock at a price of \$13.32 per share at an initial closing on July 25, 2025. The Purchase Agreement provides for the sale of up to \$50.0 million of an additional common stock to the selling stockholders named in this prospectus. For additional information regarding the Purchase Agreement, refer to the summary included under Item 1.01 of our Current Report on Form 8-K filed with the SEC on July 25, 2025, which is incorporated by reference herein.

Under the terms of the Purchase Agreement, we agreed to prepare and file, within 30 days after the initial closing of the Private Placement, one or more registration statements with the SEC to register for resale the shares of our common stock issued at the initial closing under the Purchase Agreement, and generally to cause the applicable registration statements to promptly become effective.

The Offering

Common stock offered by the selling stockholders	3,753,752 shares
Terms of the offering	Each selling stockholder will determine when and how it will sell the common stock offered in this prospectus, as described in “Plan of Distribution.”
Use of proceeds	We will not receive any proceeds from the sale of the shares of common stock covered by this prospectus.
Risk factors	See “Risk Factors” on page 3 for a discussion of factors you should carefully consider before deciding to invest in our common stock.
Nasdaq Global Select Market symbol	LYEL

The selling stockholders named in this prospectus may offer and sell up to 3,753,752 shares of our common stock. Our common stock is currently listed on Nasdaq Global Select Market under the symbol “LYEL.” Shares of our common stock that may be offered under this prospectus are fully paid and non-assessable. We will not receive any of the proceeds of sales by the selling stockholders of any of the common stock covered by this prospectus. Throughout this prospectus, when we refer to the shares of our common stock being registered on behalf of the selling stockholders for offer and resale, we are referring to the shares of common stock that have been issued to the selling stockholders. When we refer to the selling stockholders in this prospectus, we are referring to the selling stockholders identified in this prospectus and, as applicable, their permitted transferees or other successors-in-interest that may be identified in a supplement to this prospectus or, if required, a post-effective amendment to the registration statement of which this prospectus is a part.

RISK FACTORS

Investing in our common stock involves a high degree of risk. Before making an investment decision, you should carefully consider the risks described in the sections entitled “Risk Factors” in our most recent Annual Report on Form 10-K and subsequent Quarterly Reports on Form 10-Q, as filed with the SEC, which are incorporated herein by reference in their entirety, as well as any amendment or updates to our risk factors reflected in subsequent filings with the SEC, including any applicable prospectus supplement. Our business, financial condition, results of operations or prospects could be materially adversely affected by any of these risks. The trading price of our securities could decline due to any of these risks, and you may lose all or part of your investment. This prospectus and the documents incorporated herein by reference also contain forward-looking statements that involve risks and uncertainties. Our actual results could differ materially from those anticipated in these forward-looking statements as a result of certain factors, including the risks mentioned elsewhere in this prospectus. For more information, see the section entitled “Where You Can Find Additional Information.” Please also read carefully the section entitled “Special Note Regarding Forward-Looking Statements.”

USE OF PROCEEDS

We will not receive any of the proceeds from the sale or other disposition of shares of our common stock held by the selling stockholders pursuant to this prospectus. We will bear the out-of-pocket costs, expenses and fees incurred in connection with the registration of shares of our common stock to be sold by the selling stockholders pursuant to this prospectus. Other than registration expenses, the selling stockholders will bear underwriting discounts, commissions, placement agent fees or other similar expenses payable with respect to sales of shares of our common stock.

SELLING STOCKHOLDERS

The selling stockholders may sell some, all or none of their shares. We do not know how long the selling stockholders will hold the shares before selling them, and we currently have no agreements, arrangements or understandings with the selling stockholders regarding the sale or other disposition of any of the shares. The shares covered hereby may be offered from time to time by the selling stockholders. As a result, we cannot estimate the number of shares of common stock each of the selling stockholders will beneficially own after termination of sales under this prospectus. In addition, each of the selling stockholders may have sold, transferred or otherwise disposed of all or a portion of its shares of common stock since the date on which it provided information for the table below.

Beneficial ownership is determined in accordance with the rules of the SEC and includes voting or investment power with respect to our common stock. Generally, a person “beneficially owns” shares of our common stock if the person has or shares with others the right to vote those shares or to dispose of them, or if the person has the right to acquire voting or disposition rights within 60 days.

The information in the table below and the footnotes thereto regarding shares of common stock to be beneficially owned after the offering assumes the sale of all shares being offered by the selling stockholders under this prospectus. This information has been obtained from the selling stockholders or in Schedules 13G or 13D and other public documents filed with the SEC. The percentage of shares owned after the offering is based on 19,211,202 shares outstanding as of August 7, 2025.

Name	Number of Shares Beneficially Owned	Number of Shares Offered	After Offering Number of Shares Beneficially Owned ⁽¹⁾	Percentage of Shares Beneficially Owned
ARCH Venture Fund XIII, L.P.	2,759,072 ⁽²⁾	938,438	1,820,634	9.5%
Euler Fund, L.P.	938,438 ⁽³⁾	938,438	—	*
Gates Frontier, LLC	1,040,964 ⁽⁴⁾	938,438	102,526	*
Explore Investments LLC	1,040,964 ⁽⁵⁾	938,438	102,526	*

* Less than one percent.

- (1) Assumes sale of all shares available for sale under this prospectus and no further acquisitions or other dispositions of shares by the selling stockholders.
- (2) Includes (i) 938,438 shares of common stock issued to ARCH Venture Fund XIII, L.P. (“AVF XIII”) at the initial closing of the Private Placement under the Purchase Agreement, (ii) 910,317 shares of common stock held of record by ARCH Venture Fund IX, L.P. (“AVF IX”) and (iii) 910,317 shares of common stock held of record by ARCH Venture Fund IX Overage, L.P. (“AVF IX Overage”). ARCH Venture Partners XIII, L.P. (“AVP XIII LP”), as the sole general partner of AVF XIII, may be deemed to beneficially own the shares held by AVF XIII. ARCH Venture Partners XIII, LLC (“AVP XIII LLC”), as the sole general partner of AVP XIII LP, may be deemed to beneficially own the shares held by AVF XIII. Keith Crandell, Robert Nelsen, Kristina Burow, Paul Berns and Steven Gillis are members of the investment committee of AVP XIII LLC (each, a “AVP XIII LLC Committee Member”). Each of AVP XIII LP and AVP XIII LLC may be deemed to beneficially own the shares held by AVF XIII, and each AVP XIII LLC Committee Member may be deemed to share the power to direct the disposition and vote of the shares held by AVF XIII. ARCH Venture Partners IX, L.P. (“AVP IX LP”), as the sole general partner of AVF IX, may be deemed to beneficially own the shares held by AVF IX. ARCH Venture Partners IX Overage, L.P. (“AVX IX Overage GP”), as the sole general partner of AVF IX Overage, may be deemed to beneficially own the shares held by AVF IX Overage. ARCH Venture Partners IX, LLC (“AVP IX LLC”), as the sole general partner of AVP IX LP and AVF IX Overage GP, may be deemed to beneficially own the shares held by AVF IX and AVF IX Overage. As managing directors of AVP IX LLC, each of Keith Crandell, Clinton Bybee and Robert Nelsen may also be deemed to share the power to direct the disposition and vote of the shares held by AVF IX and AVF IX Overage.

- (3) Consists of the shares of common stock issued to Euler Fund, L.P. (“Euler Fund”) at the initial closing of the Private Placement under the Purchase Agreement. Antonis Indianos, as the indirect owner of Euler Managers Limited, the general partner of EF, has voting and dispositive power over these shares.
- (4) Consists of shares of common stock held by Gates Frontier, LLC (“Gates Frontier”), including the 938,438 shares of common stock issued to Gates Frontier at the initial closing of the Private Placement under the Purchase Agreement. All shares held by Gates Frontier may be deemed beneficially owned by William H. Gates III as the sole member of Gates Frontier.
- (5) Consists of shares of common stock held by Explore Investments LLC (“Explore Investments”), including the 938,438 shares of common stock issued to Explore Investments at the initial closing of the Private Placement under the Purchase Agreement. All shares held by Explore Investments may be deemed beneficially owned by Jeffrey P. Bezos as the sole member of Explore Investments.

Relationship with Selling Stockholders

As discussed in greater detail above under the section “Prospectus Summary—Private Placement,” on July 24, 2025, we entered into the Purchase Agreement with the selling stockholders pursuant to which we sold shares of common stock and agreed with the selling stockholders to file a registration statement to enable the resale of the shares of common stock covered by this prospectus. None of the selling stockholders or any persons having control over such selling stockholders has held any position or office with us or our affiliates within the last three years or has had a material relationship with us or any of our predecessors or affiliates within the past three years, other than (i) as a result of the ownership of our shares and (ii) Robert Nelsen, managing director of AVP IX LLC and an AVP XIII LLC Committee Member, served on our Board of Directors from September 2018 until May 2025.

PLAN OF DISTRIBUTION

We are registering the shares of common stock issued to the selling stockholders in the Private Placement to permit the resale of such shares of common stock by such holders from time to time after the date of this prospectus. We will not receive any of the proceeds from the sale by the selling stockholders of the shares of common stock. We will bear all fees and expenses incident to our obligation to register such shares of common stock.

Each selling stockholder, which may include 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 its 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 privately negotiated prices.

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

- 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 own account;
- an exchange distribution in accordance with the rules of the applicable exchange;
- privately negotiated transactions;
- distributions to their employees, partners, members or stockholders;
- through the writing or settlement of options or other hedging transactions, whether through an options exchange or otherwise;
- through agreements between broker-dealers and 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 by 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) 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 pledgees, transferees or other successors in interest will be the selling beneficial owners 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 options or other transactions with broker-dealers or other financial institutions or the creation of one or more

derivative securities which require the delivery to each 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 its 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.

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

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(11) of the Securities Act. 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(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 agents, 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.

If underwriters are used in the sale, the shares of common stock will be acquired by the underwriters for their own account and may be resold from time to time in one or more transactions, including negotiated transactions, at a fixed public offering price or at varying prices determined at the time of sale. In connection with any such underwritten sale of shares of common stock, underwriters may receive compensation from the selling stockholders, for whom they may act as agents, in the form of discounts, concessions or commissions. If the selling stockholders use an underwriter or underwriters to effectuate the sale of shares of common stock, we and/or they will execute an underwriting agreement with those underwriters at the time of sale of those shares of common stock. To the extent required by law, the names of the underwriters will be set forth in a prospectus supplement or, if appropriate, a post-effective amendment to the registration statement that includes the prospectus supplement and the accompanying prospectus used by the underwriters to sell those securities. The obligations of the underwriters to purchase those shares of common stock will be subject to certain conditions precedent, and unless otherwise specified in a prospectus supplement, the underwriters will be obligated to purchase all the shares of common stock offered by such prospectus supplement if any of such shares of common stock are purchased. Any public offering price and any discounts or concessions allowed or re-allowed or paid to dealers may be changed from time to time.

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. 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 are required to pay certain fees and expenses incurred by us incident to the registration of the shares of common stock of the selling stockholders. We have agreed to indemnify the selling stockholders against certain losses, claims, damages and liabilities, including liabilities under the Securities Act, and the selling stockholders may be entitled to contribution. We may be indemnified by the selling stockholders against certain losses, claims,

damages and liabilities, including liabilities under the Securities Act that may arise from any written information furnished to us by the selling stockholders specifically for use in this prospectus, or we may be entitled to contribution.

We have agreed with the selling stockholders to keep the registration statement of which this prospectus forms a part effective until the earlier of (1) July 25, 2028 and (2) the date on which all of the shares no longer constitute “Registrable Securities” under the Purchase Agreement.

EXPERTS

Ernst & Young LLP, independent registered public accounting firm, has audited our consolidated financial statements included in our Annual Report on Form 10-K for the year ended December 31, 2024, as set forth in their report, which is incorporated by reference in this prospectus and elsewhere in the registration statement. Our financial statements are incorporated by reference in reliance on Ernst & Young LLP's report, given on their authority as experts in accounting and auditing.

LEGAL MATTERS

Certain legal matters, including the validity of the shares of common stock offered pursuant to this registration statement, will be passed upon for us by Cooley LLP, San Diego, California.

WHERE YOU CAN FIND ADDITIONAL INFORMATION

We must comply with the informational requirements of the Exchange Act, and we are required to file reports and proxy statements and other information with the SEC. You may read and copy these reports, proxy statements and other information on the SEC's website at <http://www.sec.gov>, which contains reports, proxy and information statements and other information regarding issuers like us that file electronically with the SEC. We maintain a website at www.lyell.com. The information contained in, or that can be accessed through, our website is not incorporated by reference herein and is not part of this prospectus.

Statements contained in this prospectus as to the contents of any contract or other document are not necessarily complete, and in each instance we refer you to the copy of the contract or document filed as an exhibit to the registration statement, each such statement being qualified in all respects by such reference.

INCORPORATION OF CERTAIN INFORMATION BY REFERENCE

The SEC allows us to “incorporate by reference” information 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 an important 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 (in each case, 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, or are otherwise not incorporated into registration statements 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 (i) after the date of the initial filing of the registration statement of which this prospectus is a part and prior to effectiveness of the registration statement, and (ii) after the effectiveness of the registration statement but prior to the termination of the offering of the securities covered by this prospectus:

- our Annual Report on [Form 10-K](#) for the year ended December 31, 2024, filed with the SEC on March 11, 2025;
- the information specifically incorporated by reference into our Annual Report on Form 10-K for the year ended December 31, 2024 from our definitive proxy statement on [Schedule 14A](#), filed with the SEC on April 21, 2025; and
- our Quarterly Reports on Form 10-Q for the quarters ended March 31, 2025 and June 30, 2025, filed with the SEC on [May 13, 2025](#) and [August 12, 2025](#), respectively;
- our Current Reports on Form 8-K and 8-K/A, filed with the SEC on [January 10, 2025](#), [January 24, 2025](#), [April 1, 2025](#), [May 21, 2025](#), [May 28, 2025](#), [June 9, 2025](#), [June 17, 2025](#), [June 26, 2025](#) and [July 25, 2025](#), respectively, in each case other than information furnished under Item 2.02 or 7.01 of Form 8-K (and exhibits filed on such form that are related to such items); and
- the description of our common stock filed as [Exhibit 4.3](#) to our Annual Report on Form 10-K for the fiscal year ended December 31, 2024.

We will furnish without charge to each person, including any beneficial owner, to whom this prospectus is delivered, upon written or oral request, a copy of any document incorporated by reference at no cost. Requests should be addressed to 201 Haskins Way, South San Francisco, CA 94080, Attn: Chief Financial Officer or may be made telephonically at (650) 695-0677.

In accordance with Rule 412 of the Securities Act, any statement contained in a document incorporated by reference herein shall be deemed modified or superseded to the extent that a statement contained herein or in any other subsequently filed document which also is or is deemed to be incorporated by reference herein modifies or supersedes such statement.

PART II
INFORMATION NOT REQUIRED IN PROSPECTUS

Item 14. Other Expenses of Issuance and Distribution.

The following is a statement of the estimated expenses to be incurred by us in connection with the registration of the securities under this registration statement, all of which will be borne by us. All the amounts shown are estimates, except for the SEC registration fee.

SEC Registration Fee	\$ 5,994
Legal Fees and Expenses	\$ 30,000
Accounting Fees and Expenses	\$ 5,000
Miscellaneous	\$ 4,006
Total	\$ 45,000

Item 15. Indemnification of Directors and Officers.

Section 145 of the Delaware General Corporation Law, authorizes a court to award, or a corporation's board of directors to grant, indemnity to directors and executive officers in terms sufficiently broad to permit such indemnification under certain circumstances for liabilities, including reimbursement for expenses incurred, arising under the Securities Act. Our certificate of incorporation permits indemnification of our directors, officers, employees and other agents to the maximum extent permitted by the Delaware General Corporation Law, and our bylaws provide that we will indemnify our directors and executive officers and permit us to indemnify our employees and other agents, in each case to the maximum extent permitted by the Delaware General Corporation Law.

We have entered into indemnification agreements with our directors and executive officers, whereby we have agreed to indemnify our directors and executive officers to the fullest extent permitted by law, including indemnification against expenses and liabilities incurred in legal proceedings to which the director or executive officer was, or is threatened to be made, a party by reason of the fact that such director or executive officer is or was a director, executive officer, employee, or agent of ours, provided that such director or executive officer acted in good faith and in a manner that the director or executive officer reasonably believed to be in, or not opposed to, our best interest.

At present, there is no pending litigation or proceeding involving a director or executive officer of ours regarding which indemnification is sought, nor is the registrant aware of any threatened litigation that may result in claims for indemnification.

We maintain insurance policies that indemnify our directors and officers against various liabilities arising under the Securities Act and the Exchange Act, that might be incurred by any director or officer in his capacity as such. Insofar as indemnification for liabilities arising under the Securities Act may be permitted for directors, executive officers or persons controlling us, we have been informed that in the opinion of the SEC, such indemnification is against public policy as expressed in the Securities Act and is therefore unenforceable.

The indemnification agreements also set forth certain procedures, presumptions and remedies that will apply in the event of a claim for indemnification thereunder.

Item 16. Exhibit Index.
EXHIBIT INDEX

Exhibit Number	Exhibit Description	Incorporation by Reference				Filed Herewith
		Form	File Number	Exhibit/Appendix Reference	Filing Date	
2.1	Agreement and Plan of Merger, dated as of October 24, 2024, by and among ImmPACT Bio USA Inc., Lyell Immunopharma, Inc., Inspire Merger Sub Inc. and WT Representative LLC, solely in its capacity as the Representative	8-K	001-40502	2.1	October 24, 2024	
4.1	Amended and Restated Certificate of Incorporation of Lyell Immunopharma, Inc.	S-8	333-257249	4.1	June 21, 2021	
4.2	Certificate of Amendment of the Amended and Restated Certificate of Incorporation of Lyell Immunopharma, Inc.	8-K	001-40502	3.1	May 28, 2025	
4.3	Amended and Restated Bylaws of Lyell Immunopharma, Inc.	10-Q	001-40502	3.2	November 7, 2023	
4.4	Securities Purchase Agreement, dated July 24, 2025, by and among Lyell Immunopharma, Inc. and the Purchasers party thereto	8-K	001-40502	10.1	July 25, 2025	
5.1	Opinion of Cooley LLP					X
23.1	Consent of Independent Registered Public Accounting Firm					X
23.2	Consent of Cooley LLP (See Exhibit 5.1)					X
24.1	Power of Attorney (See signature page)					X
107	Filing Fee Table					X

Item 17. Undertakings.

The undersigned registrant hereby undertakes:

(a) (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 the undertakings set forth in paragraphs (1)(i), (1)(ii) and (1)(iii) above 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 Section 15(d) of the Exchange Act, that are incorporated by reference in this registration statement, or are contained in a form of prospectus filed pursuant to Rule 424(b) that is part of this 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 the 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.

(b) 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 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.

(c) 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 of the registrant 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, the registrant certifies that it has reasonable grounds to believe that it meets all of the requirements for filing on Form S-3 and has duly caused this registration statement to be signed on its behalf by the undersigned, thereunto duly authorized, in the city of South San Francisco, State of California, on August 12, 2025.

Lyell Immunopharma, Inc.

By: /s/ Lynn Seely
Lynn Seely
President and Chief Executive Officer

POWER OF ATTORNEY

Each person whose signature appears below constitutes and appoints Lynn Seely and Charles Newton, and each of them, as his/her true and lawful attorney-in-fact and agent, each acting alone, with full power of substitution and resubstitution, for him/her and in his/her name, place and stead, in any and all capacities, to sign any or all amendments (including post-effective amendments) to this registration statement on Form S-3, and to file the same, with all exhibits thereto, and all documents in connection therewith, with the Securities and Exchange Commission, granting unto said attorneys-in-fact and agents, full power and authority to do and perform each and every act and thing requisite and necessary to be done in and about the premises, as fully to all intents and purposes as he or she might or could do in person, hereby ratifying and confirming all that said attorneys-in-fact and agents, or his/her substitute or substitutes, may lawfully do or cause to be done by virtue hereof.

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

Signature	Title	Date
<u>/s/ Lynn Seely</u> Lynn Seely, M.D.	President, Chief Executive Officer and Director (Principal Executive Officer)	August 12, 2025
<u>/s/ Charles Newton</u> Charles Newton	Chief Financial Officer (Principal Financial and Accounting Officer)	August 12, 2025
<u>/s/ Richard D. Klausner</u> Richard D. Klausner, M.D.	Chair of the Board of Directors	August 12, 2025
<u>/s/ Mark Bachleda</u> Mark Bachleda, Pharm.D.	Director	August 12, 2025
<u>/s/ Otis Brawley</u> Otis Brawley, M.D.	Director	August 12, 2025
<u>/s/ Catherine Friedman</u> Catherine Friedman	Director	August 12, 2025

Signature	Title	Date
/s/ Elizabeth Nabel Elizabeth Nabel, M.D.	Director	August 12, 2025
/s/ Sumant Ramachandra Sumant Ramachandra, M.D., Ph.D.	Director	August 12, 2025
/s/ William Riefelin William Riefelin	Director	August 12, 2025



Asa M. Henin
+1 858 550 6104
ahenin@cooley.com

August 12, 2025

Lyell Immunopharma, Inc.
201 Haskins Way,
South San Francisco, California 94080

Ladies and Gentlemen:

We have acted as counsel to Lyell Immunopharma, Inc., a Delaware corporation (the “*Company*”), in connection with the filing by the Company 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 3,753,752 shares of the common stock, \$0.0001 par value, of the Company (the “*Shares*”). The Shares were issued by the Company pursuant to that certain Securities Purchase Agreement (the “*Agreement*”) dated July 24, 2025.

In connection with this opinion, we have examined and relied upon the Registration Statement, the Prospectus, the Agreement, the Company’s certificate of incorporation and bylaws, each as currently in effect, 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 securities law, rule or regulation.

On the basis of the foregoing, and in reliance thereon, and subject to the assumption, qualifications, limitations and exceptions set forth herein, we are of the opinion that the Shares are validly issued, fully paid and nonassessable.

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.

COOLEY LLP 10265 SCIENCE CENTER DRIVE SAN DIEGO, CA 92121-1117
T: +1 858 550-6000 F: +1 858 550-6420 COOLEY.COM



Lyell Immunopharma, Inc.
August 12, 2025
Page Two

We hereby consent to the reference to our firm under the caption “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/ Asa M. Henin

Asa M. Henin

COOLEY LLP 10265 SCIENCE CENTER DRIVE SAN DIEGO, CA 92121-1117
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Consent of Independent Registered Public Accounting Firm

We consent to the reference to our firm under the caption “Experts” in the Registration Statement (Form S-3) and related Prospectus of Lyell Immunopharma, Inc. for the registration of 3,753,752 shares of its common stock, and to the incorporation by reference therein of our report dated March 11, 2025, with respect to the consolidated financial statements of Lyell Immunopharma, Inc., included in its Annual Report (Form 10-K) for the year ended December 31, 2024, filed with the Securities and Exchange Commission.

/s/ Ernst & Young LLP

San Mateo, California
August 12, 2025

Calculation of Filing Fee Tables

S-3

Lyell Immunopharma, 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 \$0.0001 per share	457(a)	3,753,752	\$ 10.43	39,151,633.36	\$ 0.0001531	\$ 5,994.12				
Fees Previously Paid												
Carry Forward Securities												
Carry Forward Securities												
Total Offering Amounts:						\$ 39,151,633.36		\$ 5,994.12				
Total Fees Previously Paid:								\$ 0.00				
Total Fee Offsets:								\$ 0.00				
Net Fee Due:								\$ 5,994.12				

Offering Note

¹ (a) Consists of an aggregate of 3,753,752 shares of the registrant's common stock, all of which were acquired by the selling stockholders in a private placement. 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), calculated on the basis of the average of the high and low prices per share of common stock reported on The Nasdaq Stock Market on August 11, 2025.

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	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Fee Offset Sources	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Rule 457(p)												
Fee Offset Claims	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Fee Offset Sources	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

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
N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A