UNITED STATES SECURITIES AND EXCHANGE COMMISSION WASHINGTON, D.C. 20549

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

MORPHIC HOLDING, INC. (Exact name of registrant as specified in its charter)

Delaware

(State or other jurisdiction of incorporation or organization)

47-3878772 (I.R.S. Employer Identification No.)

35 Gatehouse Drive, A2 Waltham, MA 02451 (781) 996-0955

(Address, including zip code, and telephone number, including area code, of registrant's principal executive offices)

Praveen P. Tipirneni Chief Executive Officer Morphic Holding, Inc. 35 Gatehouse Drive, A2 Waltham, MA 02451 (781) 996-0955

(Name, address, including zip code, and telephone number, including area code, of agent for service)

Copies to:

Robert A. Freedman, Esq. Effie Toshav, Esq. Julia Forbess, Esq. Fenwick & West LLP 555 California Street San Francisco, CA 94104 (415) 875-2300 William D. DeVaul, Esq. General Counsel and Secretary Morphic Holding, Inc. 35 Gatehouse Drive, A2 Waltham, MA 02451 (781) 996-0955

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, 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: \Box

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 earliest 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. \boxtimes

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. (Check one):

Large accelerated filer \Box

Non-accelerated filer \boxtimes

Accelerated filer \Box Smaller reporting company \boxtimes Emerging growth company \Box

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. \Box

PROSPECTUS



Morphic Holding, Inc.

2,828,853 Shares of Common Stock

This prospectus relates to the registration for potential offer and sale from time to time of up to 2,828,853 shares of our common stock, par value \$0.0001 per share, or the Shares, by the selling stockholders identified in the "*Selling Stockholders*" section of this prospectus. The Shares registered hereunder consist of (i) 848,655 outstanding shares held by certain of the selling stockholders and (ii) 1,980,198 shares issuable to certain of the selling stockholders, or Pre-Funded Warrants.

The selling stockholders may sell the Shares directly to purchasers or through underwriters, broker-dealers or agents, who may receive compensation in the form of discounts, concessions or commissions. The selling stockholders may sell the Shares at any time at market prices prevailing at the time of sale or at privately negotiated prices. For more information regarding the selling stockholders and the sale of the Shares, see "Selling Stockholders" and "Plan of Distribution" herein.

We are not selling any securities under this prospectus and will not receive any of the proceeds from the sale of the Shares by the selling stockholders. The selling stockholders will bear all underwriting fees, commissions and discounts, if any, attributable to the sales of Shares and any transfer taxes. We will bear all other costs, expenses and fees in connection with the registration of the Shares.

Our common stock is traded on The Nasdaq Global Market under the symbol "MORF." On February 21, 2023 the last reported sales price for our common stock was \$39.98 per share.

An investment in our securities involves a high degree of risk. You should carefully consider the information under the heading "<u>Risk</u> <u>Factors</u>" beginning on page <u>4</u> of this prospectus before investing in our securities.

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 February 23, 2023

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ABOUT THIS PROSPECTUS

This prospectus is part of an automatic shelf registration statement that we filed with the Securities and Exchange Commission, or the SEC, as a "wellknown seasoned issuer" as defined in Rule 405 under the Securities Act of 1933, as amended, or the Securities Act. Under this registration process, the selling stockholders may, from time to time, sell or otherwise distribute the securities offered by them as described in the section titled "*Plan of Distribution*" in this prospectus. We will not receive any proceeds from the sale by such selling stockholders of the securities offered by them described in this prospectus. 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. To the extent there is a conflict between the information contained in this prospectus and the prospectus supplement, you should rely on the information in the prospectus supplement; *provided* that, if any statement in one of these documents is inconsistent with a statement in another document having a later date - for example, a document incorporated by reference in this prospectus or any prospectus supplement - the statement in the document having the later date modifies or supersedes the earlier statement. You should read both this prospectus and any prospectus supplement together with additional information described under the heading "*Where You Can Find More Information*."

Neither we nor the selling stockholders have authorized anyone to give you any information or to make any representation other than the information and representations contained in or incorporated by reference into this prospectus or any applicable prospectus supplement. We and the selling stockholders take no responsibility for, and can provide no assurance as to the reliability of, any other information others may give you. You may not imply from the delivery of this prospectus and any applicable prospectus supplement, nor from a sale made under this prospectus and any applicable prospectus supplement, that our affairs are unchanged since the date of this prospectus and any applicable prospectus supplement or that the information contained in any document incorporated by reference is accurate as of any date other than the date of the document incorporated by reference, regardless of the time of delivery of this prospectus and any applicable prospectus supplement or any sale of a security. This prospectus and any applicable prospectus supplement may only be used where it is legal to sell the securities.

In this prospectus, unless the context otherwise requires, the terms "Morphic," "Morphic Therapeutic," the "Company," "we," "us," and "our" refer to Morphic Holding, Inc., a Delaware corporation, and its subsidiaries.

PROSPECTUS SUMMARY

This summary highlights information contained in other parts of this prospectus or incorporated by reference in this prospectus from our Annual Report on Form 10-K for the year ended December 31, 2022 and our other filings with the SEC listed below under the heading "Incorporation of Information by Reference." This summary may not contain all the information that you should consider before investing in securities. You should read the entire prospectus and the information incorporated by reference in this prospectus carefully, including "Risk Factors" and the financial data and related notes and other information incorporated by reference, before making an investment decision. See "Forward-Looking Statements."

Our Company

We are a biopharmaceutical company applying our proprietary insights into integrins to discover and develop a pipeline of potentially first-in-class oral small molecule integrin therapeutics. Integrins are a target class with multiple approved injectable blockbuster drugs for the treatment of serious chronic diseases, including autoimmune, cardiovascular and metabolic diseases, fibrosis and cancer. To date, no oral small molecule integrin therapies have been approved by the U.S. Food and Drug Administration, or FDA. Despite this, we believe our unique platform can unlock the potential to reliably generate high-quality oral molecules against specific integrin targets. The Morphic integrin technology platform, or MInT Platform, was created leveraging our unique understanding of integrin structure and function to develop novel product candidates designed to achieve the potency, high selectivity, and pharmaceutical properties required for oral administration. We are advancing our pipeline, including our lead product candidate, MORF-057, an $\alpha4\beta7$ -specific integrin inhibitor affecting inflammation, into clinical development for the treatment of inflammatory bowel disease, or IBD. We submitted an investigational new drug application, or IND, for MORF-057 in July 2020, and the FDA permitted the study submitted under the IND to proceed in August 2020. In September 2020, we initiated a Phase 1 clinical trial of MORF-057 in healthy volunteers to establish our clinical program and select doses for our Phase 2 program in IBD with an initial focus on ulcerative colitis, or UC. Based on the results from the Phase 1 studies, we initiated a Phase 2 clinical trial of MORF-057-201), which is an open-label multi-center Phase 2 atrial designed to evaluate the efficacy, safety and tolerability of MORF-057 in adults with moderate to severe UC, completed targeted enrollment in October 2022. EMERALD-2 (MORF-057-202) which is a global Phase 2b randomized controlled trial of MORF-057 began dosing patients in November 2022.

Corporate Information

We were formed under the laws of the State of Delaware in August 2014 under the name Integrin Rock, LLC. We subsequently changed our name to Morphic Rock Holding, LLC in October 2014 and then to Morphic Holding, LLC in June 2016,. On December 5, 2018, we completed a series of transactions, or the Reorganization, pursuant to which Morphic Holding, LLC was converted in a tax-free reorganization into Morphic Holding, Inc. and three wholly-owned subsidiaries, namely Lazuli, Inc., Tourmaline, Inc, and Phyllite, Inc, were merged with and into another wholly-owned subsidiary, Morphic Therapeutic, Inc. Our principal executive offices are located at 35 Gatehouse Drive, A2, Waltham, MA 02451, and our telephone number is (781) 996-0955. Our website address is www.morphictx.com. The information contained on, or that can be accessed through, our website is not part of, and is not incorporated by reference into, this prospectus. Investors should not rely on any such information in deciding whether to purchase our securities.

THE OFFERING

Common stock offered by selling stockholders	2,828,853 Shares, which includes (i) 848,655 outstanding shares held by certain of the selling stockholders and (ii) 1,980,198 shares of common stock issuable upon the exercise of the Pre-Funded Warrants, or Warrant Shares. See the <i>"Selling Stockholders"</i> section of this prospectus.			
Use of proceeds	We will not receive any proceeds from the sale of the Shares.			
Risk factors	See " <i>Risk Factors</i> " included herein, for a discussion of factors you should carefully consider before deciding to invest in our common stock.			
Nasdaq Global Market Symbol	MORF			

The selling stockholders named in this prospectus may offer and sell up to an aggregate of 2,828,853 Shares, which includes (i) 848,655 shares of common stock held by the selling stockholders and (ii) 1,980,198 Warrant Shares.

We agreed to file this prospectus pursuant to the Registration Rights Agreement, dated as of February 13, 2023, between the Company and the investors listed on the signature pages thereto, or the Registration Rights Agreement. Additional information with respect to the Registration Rights Agreement is contained in this prospectus under the heading *"Selling Stockholders"* and in our Current Report on Form 8-K filed with the SEC on February 13, 2023.

When we refer to the selling stockholders, we are referring to the selling stockholders identified in the "Selling Stockholders" section of this prospectus and, as applicable, any donees, pledgees, transferees or other successors-in-interest selling shares received after the date of this prospectus from a selling stockholder as a gift, pledge, or other non-sale related transfer 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

An investment in our securities involves a high degree of risk. The prospectus supplement applicable to each offering of securities will contain a discussion of the risks applicable to an investment in our securities. Prior to making a decision about investing in our securities, you should carefully consider the specific factors discussed under the heading "Risk Factors" in the applicable prospectus supplement, together with all of the other information contained or incorporated by reference in the prospectus supplement or appearing or incorporated by reference in this prospectus. You should also consider the risks, uncertainties and assumptions discussed under Part I, Item 1A, "Risk Factors," in our Annual Report on Form 10-K for the year ended December 31, 2022, which is incorporated herein by reference, and may be amended, supplemented or superseded from time to time by other reports we file with the SEC in the future. The risks and uncertainties we have described are not the only ones we face. Additional risks and uncertainties not presently known to us or that we currently deem immaterial may also affect our operations.

FORWARD-LOOKING STATEMENTS

This prospectus and documents incorporated herein by reference contain "forward-looking statements" within the meaning of the Private Securities Litigation Reform Act of 1995. These forward-looking statements involve a number of risks and uncertainties. We caution readers that any forward-looking statement is not a guarantee of future performance and that actual results could differ materially from those contained in the forward-looking statement. These statements are based on current expectations of future events.

Such statements include, but are not limited to, statements regarding expectations and intentions, costs and expenses, outcome of contingencies, financial condition, results of operations, liquidity, objectives of management, debt financing, our future results of operations and financial position, the impact of macroeconomic events, including the COVID-19 pandemic, business strategies, market size, potential growth opportunities, clinical development activities, efficacy and safety profile of our product candidates, timing and results of our pre-clinical studies and clinical trials, the receipt and timing of potential regulatory designations, our ability to maintain and recognize the benefits of certain designations received by product candidates, the achievement of clinical and commercial milestones, the advancement of our technologies and our proprietary product candidates, collaborations with third parties and the advancement of the product candidates that are the subjects of any such collaborations, the approvals and commercialization of product candidates and other statements that are not historical facts. You can find many of these statements by looking for words like "believes," "expects," "anticipates," "estimates," "may," "might," "should," "will," "could," "plan," "intend," "project," "seek" or similar expressions in this prospectus, in documents incorporated by reference into this prospectus or any free writing prospectus. We intend that such forward-looking statements be subject to the safe harbors created thereby.

These forward-looking statements are based on the current beliefs and expectations of our management and are subject to significant risks and uncertainties. If underlying assumptions prove inaccurate or unknown risks or uncertainties materialize, actual results may differ materially from current expectations and projections. Factors that might cause such a difference include those discussed in Part I, Item 1A, "Risk Factors," in our Annual Report on Form 10-K for the year ended December 31, 2022, as well as those discussed in this prospectus, the documents incorporated by reference into this prospectus and any free writing prospectus. You are cautioned not to place undue reliance on these forward-looking statements, which speak only as of the date of this prospectus or, in the case of documents referred to or incorporated by reference, the date of those documents.

All subsequent written or oral forward-looking statements attributable to us or any person acting on our behalf are expressly qualified in their entirety by the cautionary statements contained or referred to in this section. We do not undertake any obligation to release publicly any revisions to these forward-looking statements to reflect events or circumstances after the date of this prospectus or to reflect the occurrence of unanticipated events, except as may be required under applicable U.S. securities law. If we do update one or more forward-looking statements, no inference should be drawn that we will make additional updates with respect to those or other forward-looking statements.

WHERE YOU CAN FIND MORE INFORMATION

We have filed with the SEC a registration statement on Form S-3 under the Securities Act with respect to the securities offered hereby. This prospectus, which constitutes a part of the registration statement, does not contain all of the information set forth in the registration statement, the exhibits filed therewith or the documents incorporated by reference therein. For further information about us and the securities offered hereby, reference is made to the registration statement, the exhibits filed therewith and the documents incorporated by reference therein. Statements contained in this prospectus regarding the contents of any contract or any other document that is filed as an exhibit to the registration statement are not necessarily complete, and in each instance, we refer you to the copy of such contract or other document filed as an exhibit to the registration statement.

We are subject to the informational requirements of the Securities Exchange Act of 1934, as amended, or the Exchange Act and are required to file annual, quarterly and other reports, proxy statements and other information with the SEC. The SEC maintains an Internet site (http://www.sec.gov) that contains reports, proxy and information statements, and various other information about us. You may also inspect the documents described herein at our principal executive offices, 35 Gatehouse Drive, A2, Waltham, Massachusetts 02451, during normal business hours.

Information about us is also available at our website at http://www.morphictx.com. However, the information on our website is not a part of this prospectus and is not incorporated by reference into this prospectus.

INCORPORATION OF INFORMATION BY REFERENCE

The SEC allows us to "incorporate by reference" information that we file with the SEC, which means that we can disclose important information to you by referring you to those other documents. The information incorporated by reference is an important part of this prospectus, and information we file later with the SEC will automatically update and supersede this information. A Current Report (or portion thereof) furnished, but not filed, on Form 8-K shall not be incorporated by reference into this prospectus. We incorporate by reference the documents listed below and any future filings we make with the SEC under Section 13(a), 13(c), 14, or 15(d) of the Exchange Act prior to the termination of any offering of securities made by this prospectus:

- our Annual Report on Form 10-K for the fiscal year ended December 31, 2022, filed with the SEC on February 23, 2023;
- our Current Reports on Form 8-K filed with the SEC on January 20, 2023 and February 13, 2023;
- the description of our common stock contained in our registration statement on Form 8-A filed with the SEC on June 14, 2019 under Section 12(b) of the Exchange Act, including any amendment or report filed for the purpose of updating such description; and
- filings we make with the SEC pursuant to the Exchange Act after the date of the initial registration statement, of which this prospectus is a part, and prior to the effectiveness of the registration statement.

We will furnish without charge to you, on written or oral request, a copy of any or all of such documents that has been incorporated herein by reference (other than exhibits to such documents unless such exhibits are specifically incorporated by reference into the documents that this prospectus incorporates). Written or oral requests for copies should be directed to Morphic Holding, Inc., 35 Gatehouse Drive, A2, Waltham, Massachusetts 02451, and our telephone number is (781) 996-0955. See the section of this prospectus entitled "Where You Can Find More Information" for information concerning how to obtain copies of materials that we file with the SEC.

Any statement contained in this prospectus, or in a document, all or a portion of which is incorporated by reference, shall be modified or superseded for purposes of this prospectus to the extent that a statement contained in this prospectus, any prospectus supplement or any document incorporated by reference modifies or supersedes such statement. Any such statement so modified or superseded shall not, except as so modified or superseded, constitute a part of this prospectus.

USE OF PROCEEDS

The proceeds from the sale of the Shares offered pursuant to this prospectus are solely for the accounts of the selling stockholders. Accordingly, we will not receive any of the proceeds from the sale of the Shares offered by this prospectus. See "Selling Stockholders" and "Plan of Distribution" below.

The selling stockholders may sell the Shares directly to purchasers or through underwriters, broker-dealers or agents, who may receive compensation in the form of discounts, concessions or commissions. The selling stockholders may sell the Shares at any time at market prices prevailing at the time of sale or at privately negotiated prices. The selling stockholders will bear all underwriting fees, commissions and discounts, if any, attributable to the sales of Shares and any transfer taxes.

PLAN OF DISTRIBUTION

We are registering the Shares to permit the resale of these Shares by the holders of the common stock 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. We will bear all fees and expenses incident to our obligation to register the Shares, except that, if the Shares are sold through underwriters or broker-dealers, the selling stockholders will be responsible for underwriting discounts or commissions or agent's commissions.

The selling stockholders may sell all or a portion of the Shares beneficially owned by them and offered hereby from time to time directly or through one or more underwriters, broker-dealers or agents. The Shares may be sold in one or more transactions at fixed prices, at prevailing market prices at the time of the sale, at varying prices determined at the time of sale, or at negotiated prices. These sales may be effected in transactions, which may involve crosses or block transactions,

- on any national securities exchange or quotation service on which the securities may be listed or quoted at the time of sale;
- in the over-the-counter market;
- in transactions otherwise than on these exchanges or systems or in the over-the-counter market;
- through the writing of options, whether such options are listed on an options exchange or otherwise;
- 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;
- distributions to members, partners, stockholders or other equityholders of the selling stockholders;
- an exchange distribution in accordance with the rules of the applicable exchange;
- short sales;
- sales pursuant to Rule 144 of the Securities Act;
- broker-dealers may agree with the selling stockholder 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.

If the selling stockholders effect such transactions by selling Shares to or through underwriters, broker-dealers or agents, such underwriters, brokerdealers or agents may receive commissions in the form of discounts, concessions or commissions from the selling stockholders or commissions from purchasers of the Shares for whom they may act as agent or to whom they may sell as principal (which discounts, concessions or commissions as to particular underwriters, broker-dealers or agents may be in excess of those customary in the types of transactions involved). In connection with sales of the Shares or otherwise, the selling stockholders may enter into hedging transactions with broker-dealers, which may in turn engage in short sales of the shares of our common stock in the course of hedging in positions they assume. The selling stockholders may also sell shares of our common stock short and deliver Shares to close out short positions and to return borrowed shares in connection with such short sales. The

selling stockholders may also loan or pledge shares of our common stock to broker-dealers that in turn may sell such shares.

The selling stockholders may pledge or grant a security interest in some or all of the shares of our 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 pursuant to this prospectus or other applicable provisions of the Securities Act, amending, if necessary, 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 and donate the shares of our common stock in other circumstances in which case the transferees, donees, pledgees or other successors in interest will be the selling beneficial owners for purposes of this prospectus.

The selling stockholders and any broker-dealer participating in the distribution of the Shares may be deemed to be "underwriters" within the meaning of the Securities Act, and any commission paid, or any discounts or concessions allowed to, any such broker-dealer may be deemed to be underwriting commissions or discounts under the Securities Act. At the time a particular offering of the Shares is made, a prospectus supplement, if required, will be distributed which will set forth the aggregate amount of Shares being offered and the terms of the offering, including the name or names of any broker-dealers or agents, any discounts, commissions and other terms constituting compensation from the selling stockholders and any discounts, commissions or concessions allowed or reallowed or paid to broker-dealers.

Under the securities laws of some states, the Shares may be sold in such states only through registered or licensed brokers or dealers. In addition, in some states the Shares may not be sold unless such shares have been registered or qualified for sale in such state or an exemption from registration or qualification is available and is complied with.

There can be no assurance that any selling stockholder will sell any or all of the Shares.

The selling stockholders and any other person participating in such distribution will be subject to applicable provisions of the Exchange Act, and the rules and regulations thereunder, including, without limitation, Regulation M of the Exchange Act, which may limit the timing of purchases and sales of any of the Shares by the selling stockholders and any other participating person. Regulation M may also restrict the ability of any person engaged in the distribution of the Shares to engage in market-making activities with respect to the Shares. All of the foregoing may affect the marketability of the Shares and the ability of any person or entity to engage in market-making activities with respect to the Shares.

We will pay all expenses of the registration of the Shares pursuant to the registration statement of which this prospectus forms a part, including, without limitation, SEC filing fees and expenses of compliance with state securities or "blue sky" laws; provided, however, that the selling stockholders will pay all underwriting discounts and selling commissions, if any. We will indemnify the selling stockholders against liabilities, including some liabilities under the Securities Act, or the selling stockholders will be entitled to contribution. We may be indemnified by the selling stockholders against civil liabilities, including liabilities under the Securities Act, that may arise from any written information furnished to us by the selling stockholder specifically for use in this prospectus or we may be entitled to contribution.

Once sold under the registration statement of which this prospectus forms a part, the Shares will be freely tradable in the hands of persons other than our affiliates.

SELLING STOCKHOLDERS

The Shares consist of (i) outstanding shares held by certain of the selling stockholders and (ii) shares issuable to certain of the selling stockholders upon exercise of the Pre-Funded Warrants. Pursuant to the Registration Rights Agreement, we have agreed to file a registration statement with the SEC covering the resale of shares of our capital stock, and this registration statement has been filed pursuant to the Registration Rights Agreement.

The table below lists the selling stockholders and other information regarding their beneficial ownership (as determined under Section 13(d) of the Exchange Act and the rules and regulations thereunder) of our common stock as of February 21, 2023. Under Section 13(d) of the Exchange Act, beneficial ownership generally includes voting or investment power with respect to securities, including any securities that grant the holder the right to acquire shares of common stock within 60 days of the date of determination. These shares are deemed to be outstanding for the purpose of computing the percentage ownership of the person holding those securities, but they are not treated as outstanding for the purpose of computing the percentage ownership of any other person. The percentage ownership data is based on 39,534,138 shares of our common stock issued and outstanding as of February 21, 2023 (as reflected in the records of our stock transfer agent). The Pre-Funded Warrants cannot be exercised by a Pre-Funded Warrant holder if, after giving effect thereto, such holder would beneficially own more than 9.99% of our outstanding common stock. The table below gives effect to this 9.99% beneficial ownership limitation.

We have prepared the table below based on information furnished to us by or on behalf of the selling stockholders. The second column of the table lists the number of shares of common stock beneficially owned by the selling stockholders as of February 21, 2023. The third column of the table lists the shares being offered under this prospectus by the selling stockholders or by those persons or entities to whom they transfer, donate, devise, pledge or distribute their shares or by other successors in interest.

Because, among other things, the exercise of the Pre-Funded Warrants is at the option of the holders, the number of shares of common stock that will actually be issued to the selling stockholders pursuant to the Pre-Funded Warrants may be more or less than the number of Shares being offered by this prospectus. In addition, the Shares may be sold pursuant to this prospectus or in privately negotiated transactions. See "*Plan of Distribution*." Because the selling stockholders may sell all, some or none of their Shares in this offering and because there are currently no agreements, arrangements or undertakings with respect to the sale of any of the Shares, we cannot estimate the number of Shares the selling stockholders will sell under this prospectus. The fourth column of the table assumes the sale of all of the Shares offered by the selling stockholders pursuant to this prospectus.

To our knowledge, none of the selling stockholders has, or during the three years prior to the date of this prospectus has had, any position, office or other material relationships with us or any of our affiliates, except that (i) we and each selling stockholder are party to the Registration Rights Agreement and (ii) Timothy A. Springer is a member of our Board of Directors and our Scientific Advisory Board.

Unless otherwise indicated in the footnotes below, we believe that the selling stockholders have sole voting and investment power with respect to all shares of our common stock beneficially owned by them. Since the date on which they provided us with the information below, the selling stockholders may have sold, transferred or otherwise disposed of some or all of their shares in transactions exempt from the registration requirements of the Securities Act.

Name of Selling Stockholder	Shares of Common Stock Owned Prior to Offering		Maximum Number of Shares of Common Stock to be Sold Pursuant to this Prospectus		Common Stock fter Offering ⁽⁵⁾
	Number	Percentage (%)		Number	Percentage (%)
Entities affiliated with EcoR1 Capital L.P. ⁽¹⁾	3,959,466	9.99%	1,980,198 ⁽³⁾	3,846,966	9.73%
Timothy A. Springer and affiliates ⁽²⁾	6,723,611	16.95%	848,655 ⁽⁴⁾	5,874,956	14.86%

* Represents beneficial ownership of less than one percent of the outstanding shares of our common stock.

(1) The Pre-Funded Warrants held by EcoR1 Capital Fund, L.P., or Capital Fund, and EcoR1 Capital Fund Qualified, L.P., or Qualified Fund, are subject to a 9.99% beneficial ownership blocker, pursuant to which Warrant Shares may not be issued to the extent such issuance would cause Capital Fund and Qualified Fund, in the aggregate, to beneficially own more than 9.99% of our common stock. The share ownership numbers and percentages in the table above reflect this 9.99% blocker. The shares of common stock beneficially owned prior to this offering include: (i) 254,974 shares of common stock held by Capital Fund and 6,412 shares of common stock issuable upon the exercise of the Pre-Funded Warrants and (ii) 3,591,992 shares of common stock held by Qualified Fund and 106,088 shares of common stock issuable upon the exercise of the Pre-Funded Warrants. The shares of common stock owned prior to the offering column does not include an aggregate of 1,867,698 Warrant Shares issuable upon the exercise of Pre-Funded Warrants held by Capital Fund and Qualified Fund, which are subject to the 9.99% beneficial ownership blocker. EcoR1 Capital, LLC, or EcoR1, is the general partner of Capital Fund and Qualified Fund. Oleg Nodelman is the control person of EcoR1 and may be deemed to share voting dispositive power over the shares held by Capital Fund and Qualified Fund. The address of the above person and entities is 357 Tehama Street #3, San Francisco, CA 94103.

(2) The shares of common stock beneficially owned prior to this offering include: (i) 4,607,623 shares of common stock held directly, (ii) 42,873 shares of common stock held by Dr. Springer's spouse, (iii) 214,367 shares of common stock held by Springer-Lu Family 2004 Irrevocable Trust dated March 29, 2004, Fiduciary Trust Company of New England LLC, Trustee, over which shares Dr. Springer has no voting or dispositive control, (iv) 1,718,464 shares of common stock held by TAS Partners LLC, of which Dr. Springer is manager and has sole voting and dispositive control, and (v) 140,284 shares underlying options to purchase common stock that are exercisable within 60 days of February 21, 2023.

(3) As noted above, the Pre-Funded Warrants may not be exercised if the holder of the Pre-Funded Warrants, together with its affiliates and any persons who are members of a Section 13(d) group with the holder, would beneficially own more than 9.99% of the number of shares of common stock outstanding immediately after giving effect to such exercise, which limitation we refer to as the Beneficial Ownership Limitation. By written notice to us, the holders of the Pre-Funded Warrants purchased may increase or decrease the Beneficial Ownership Limitation to an amount not to exceed 9.99% of the number of shares of the Pre-Funded Warrants purchased may increase or decrease the Beneficial Ownership Limitation to an amount not to exceed 9.99% of the number of shares in the Beneficial Ownership effect to the issuance of shares of common stock issuable upon exercise of the Pre-Funded Warrant, with any increase to be effective only upon the holder providing. Any increase in the Beneficial Ownership Limitation would not be effective until 61 days after written notice is received by us. The beneficial ownership amounts in the table above do not give effect to the Beneficial Ownership Limitation solely for illustrative purposes.

(4) Represents: (i) 42,432 shares of common stock held directly by Dr. Springer and (ii) 806,223 shares of common stock held by TAS Partners LLC, of which Dr. Springer is manager and has sole voting and dispositive control.

(5) The selling stockholders may offer and sell all or part of the common stock covered by this prospectus, and no assumption can be made as to the actual number of shares of common stock that will be held by the selling stockholders after the completion of this offering.

LEGAL MATTERS

Fenwick & West LLP, San Francisco, California, will issue an opinion about certain legal matters with respect to the securities. Any underwriters or agents will be advised about legal matters relating to any offering by their own counsel.

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, 2022, 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.

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PART II

INFORMATION NOT REQUIRED IN PROSPECTUS

Item 14. Other Expenses of Issuance and Distribution

The following table sets forth estimated expenses in connection with the issuance and distribution of the securities being registered:

SEC registration fee	\$ 12,332
Printing and engraving*	**
Legal fees and expenses*	**
Accounting fees and expenses*	**
Transfer agent and registrar fees and expenses*	**
Miscellaneous expenses*	**
Total*	\$ **

* Estimated expenses cannot be known at this time.

Item 15. Indemnification of Officers and Directors

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 officers under certain circumstances and subject to certain limitations. The terms of Section 145 of the Delaware General Corporation Law are sufficiently broad to permit indemnification under certain circumstances for liabilities, including reimbursement of expenses incurred, arising under the Securities Act of 1933, as amended, or the Securities Act.

As permitted by the Delaware General Corporation Law, the Registrant's restated certificate of incorporation contains a provision that eliminates, to the fullest extent permitted by law, the personal liability of a directors for monetary damages resulting from breach of his or her fiduciary duties as a director, except for liability:

- for any breach of the director's duty of loyalty to the Registrant or its stockholders;
- for acts or omissions not in good faith or that involve intentional misconduct or a knowing violation of law;
- under Section 174 of the Delaware General Corporation Law (regarding unlawful dividends, stock purchases or redemptions); or
- for any transaction from which the director derived an improper personal benefit.

As permitted by the Delaware General Corporation Law, the Registrant's amended and restated bylaws provide that:

- the Registrant is required to indemnify its directors and officers to the fullest extent permitted by the Delaware General Corporation Law, subject to certain very limited exceptions;
- the Registrant may indemnify its other employees and agents as set forth in the Delaware General Corporation Law;
- the Registrant is required to advance expenses, as incurred, to its directors and officers in connection with a legal proceeding to the fullest extent
 permitted by the Delaware General Corporation Law, subject to certain very limited exceptions; and

• the rights conferred in the restated bylaws are not exclusive.

The Registrant has entered, and intends to continue to enter, into indemnification agreements with each of its directors and executive officers to provide these directors and executive officers additional contractual assurances regarding the scope of the indemnification set forth in the Registrant's restated certificate of incorporation and amended and restated bylaws and to provide additional procedural protections. At present, there is no pending litigation or proceeding involving a director or executive officer of the Registrant for which indemnification is sought. The indemnification provisions in the Registrant's restated certificate of incorporation, amended and restated bylaws and the indemnification agreements entered into or to be entered into between the Registrant and each of its directors and executive officers may be sufficiently broad to permit indemnification of the Registrant's directors and executive officers for liabilities arising under the Securities Act.

The Registrant currently carries liability insurance for its directors and officers.

Item 16. Exhibits

The exhibits listed below are filed (except where otherwise indicated) as part of this Registration Statement.

		Incorporated by Reference				
Exhibit Number	Exhibit Description	Form	File No.	Exhibit	Filing Date	Filed Herewith
4.1	Form of Common Stock Certificate	S-1/A	333-231837	4.1	6/14/2019	
4.2	Form of Pre-Funded Warrant	8-K	001-38940	4.1	02/13/2023	
4.3	Form of Registration Rights Agreement	8-K	001-38940	10.2	02/13/2023	
5.1	Opinion of Fenwick & West LLP					Х
23.1	Consent of Ernst & Young LLP					Х
23.2	Consent of Fenwick & West LLP (included in Exhibit 5.1)					Х
24.1	Power of Attorney (included on the signature page hereto)					Х
107.1	<u>Filing Fee Table</u>					Х

Item 17. Undertakings

(a) 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 Securities and Exchange Commission pursuant to Rule 424(b) if, in the aggregate, the changes in volume and price represent no more than 20 percent 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 subparagraphs (i), (ii), and (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 Securities and Exchange Commission by the Registrant pursuant to Section 13 or Section 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 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) The undersigned Registrant hereby undertakes 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.

(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 Securities and Exchange Commission 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.

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SIGNATURES

Pursuant to the requirements of the Securities Act of 1933, 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 Waltham, Commonwealth of Massachusetts, on February 23, 2023.

MORPHIC HOLDING, INC.

By: /s/ Praveen P. Tipirneni, M.D.

Praveen P. Tipirneni, M.D. *Chief Executive Officer*

POWER OF ATTORNEY

KNOW ALL PERSONS BY THESE PRESENTS, that each person whose signature appears below hereby constitutes and appoints Praveen P. Tipirneni and William D. DeVaul, and each of them, as his true and lawful attorneys-in-fact, proxies and agents, each with full power of substitution, for him in any and all capacities, to sign any and all amendments to this registration statement (including pre-effective and post-effective amendments, any supplements, any abbreviated registration statement and any amendments thereto filed pursuant to Rule 462(b) increasing the number of securities for which registration is sought), 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, proxies and agents 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 for all intents and purposes as he might or could do in person, hereby ratifying and confirming all that said attorneys-in-fact, proxies and agents, or their or his 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.

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Signature	Title	Date
/s/ Praveen P. Tipirneni Praveen P. Tipirneni, M.D.	Chief Executive Officer and Director (Principal Executive Officer)	February 23, 2023
/s/ Marc Schegerin Marc Schegerin	Chief Financial Officer and Chief Operating Officer (Principal Financial Officer)	February 23, 2023
/s/ Robert E. Farrell Jr. Robert E. Farrell Jr., CPA	Senior Vice President Finance and Chief Accounting Officer (Principal Accounting Officer)	February 23, 2023
/s/ Gustav Christensen Gustav Christensen	Director	February 23, 2023
/s/ Norbert Bischofberger Norbert Bischofberger	Director	February 23, 2023
/s/ Martin W. Edwards Martin W. Edwards	Director	February 23, 2023
/s/ Susannah Gray	Director	February 23, 2023
/s/ Nisha Nanda Nisha Nanda	Director	February 23, 2023
/s/ Amir Nashat Amir Nashat	Director	February 23, 2023
/s/ Joseph P. Slattery Joseph P. Slattery, CPA	Director	February 23, 2023
/s/ Timothy A. Springer Timothy A. Springer, Ph.D.	Director	February 23, 2023

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CALCULATION OF FILING FEE TABLES

Form S-3 (Form Type)

Morphic Holding, Inc. (Exact Name of Registrant as Specified in its Charter)

Table 1 – Newly Registered Securities

Security Type	Security Class Title	Fee Calculation Rule	Amount Registered(1)	Proposed Maximum Offering Price Per Unit	Maximum Aggregate Offering Price	Fee Rate	Amount of Registration Fee
Equity	Common stock, par value \$0.0001 per share	Rule 457(c)	2,828,853 (2)	\$ 39.56 (3)	\$ 111,909,425	\$0.00011020	\$ 12,332
Total Offering Amounts				\$ 111,909,425		\$ 12,332	
Total Fee Offsets						-	
Net Fee Due						\$ 12,332	

- (1) Represents the shares of common stock, \$0.0001 par value per share (the "Common Stock"), of Morphic Holding, Inc. (the "Registrant") that will be offered for resale by the selling stockholders pursuant to the prospectus to which this exhibit is attached. Pursuant to Rule 416 under the Securities Act of 1933, as amended (the "Securities Act"), the shares being registered hereunder include such indeterminate number of additional shares of Common Stock that become issuable in respect of the securities identified in the above table by reason of any stock dividend, stock split, recapitalization or other similar transaction.
- (2) Represents an aggregate of 2,828,853 shares of Common Stock, including 1,980,198 shares of Common Stock issuable upon the exercise of pre-funded warrants of the Registrant.
- (3) Estimated in accordance with Rule 457(c) under the Securities Act solely for the purpose of calculating the registration fee on the basis of \$39.56, the average of the high and low prices of the Common Stock as reported on the Nasdaq Global Select Market on February 16, 2023.

FENWICK

555 California Street 12th Floor San Francisco, CA 94104 415.875.2300 Ferwick.com

February 23, 2023

Morphic Holding, Inc. 35 Gatehouse Drive, A2 Waltham, MA 02451

Ladies and Gentlemen:

At your request, we have examined the Registration Statement on Form S-3ASR filed by Morphic Holding, Inc. (the "*Company*") with the Securities and Exchange Commission (the "*Commission*") on February 23, 2023 (the "*Registration Statement*"), in connection with the registration for resale under the Securities Act of 1933, as amended (the "*Securities Act*"), of an aggregate of 2,828,853 shares of the Company's common stock, \$0.0001 par value per share (the "*Common Stock*"), which includes 848,655 shares of Common Stock (the "*Common Stock*") and 1,980,198 shares of Common Stock (the "*Warrant Shares*") issuable upon the exercise of pre-funded warrants (the "*Pre-Funded Warrants*"), on behalf of the selling stockholders (the "*Secling Stockholders*") identified in the Registration Statement and the prospectus contained within the Registration Statement (the "*Prospectus*").

In connection with our opinion expressed below we have examined originals or copies of the Company's Restated Certificate of Incorporation (the "*Certificate*"), the Company's Amended and Restated Bylaws (the "*Bylaws*"), the Pre-Funded Warrants, certain corporate proceedings of the Company's board of directors and stockholders relating to the Registration Statement, and such other agreements, documents, certificates and statements of the Company, its transfer agent and public or government officials, as we have deemed advisable, and have examined such questions of law as we have considered necessary. We have assumed the authenticity of all documents submitted to us as originals, the genuineness of all signatures on documents submitted to us, the conformity to originals of all documents submitted to us as copies, and the absence of any undisclosed termination, waiver or amendment to any document reviewed by us. In giving our opinion, we have also relied upon good standing certificates dated February 22, 2023 issued by the Delaware Secretary of State and Massachusetts Secretary of State, and representations made to us by the Company, including representations that the Company has available a sufficient number of authorized shares of Common Stock that are not currently outstanding or reserved for issuance under other outstanding securities or equity plans of the Company, to enable the Company to issue and deliver all of the shares of Common Stock to be sold by the Selling Stockholders pursuant to the Registration Statement and the Prospectus.

We render this opinion only with respect to, and express no opinion herein concerning the application or effect of the laws of any jurisdiction other than, the existing laws of the Delaware General Corporation Law.

Based upon the foregoing, we are of the opinion that, (i) the Common Shares to be sold by the Selling Stockholders pursuant to the Registration Statement and the Prospectus were validly issued, nonassessable and fully paid for, and (ii) the Warrant Shares to be sold by the Selling Stockholders pursuant to the Registration Statement and the Prospectus, when issued upon the exercise of the Pre-Funded Warrants in accordance with the terms thereof, will be validly issued, nonassessable and fully paid.

We consent to the use of this opinion as an exhibit to the Registration Statement and further consent to all references to us, if any, in the Registration Statement, the Prospectus constituting a part thereof and any amendments thereto. We do not thereby admit that we are within the category of persons whose consent is required under Section 7 of the Securities Act or the rules and regulations of the Commission thereunder. This opinion is intended solely for use in connection with sale of the Common Shares and Warrant Shares to be sold by the Selling Stockholders pursuant to the Registration Statement and the Prospectus and is not to be relied upon for any other purpose. In providing this letter, we are opining only as to the specific legal issues expressly set forth above, and no opinion shall be inferred as to any other matter or matters. This opinion is rendered on, and speaks only as of, the date of this letter first written above, and does not address any potential change in facts or law that may occur after the date of this opinion letter. We assume no obligation to advise you of any fact, circumstance, event or change in the law or the facts that may hereafter be brought to our attention, whether or not such occurrence would affect or modify any of the opinions expressed herein.

Very truly yours, /s/ Fenwick & West LLP FENWICK & WEST LLP

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 Morphic Holding, Inc. for the registration of 2,828,853 shares of its common stock and to the incorporation by reference therein of our report dated February 23, 2023, with respect to the consolidated financial statements of Morphic Holding, Inc. included in its Annual Report (Form 10-K) for the year ended December 31, 2022, filed with the Securities and Exchange Commission.

/s/ Ernst & Young LLP

Boston, Massachusetts February 23, 2023