

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

FORM S-3
REGISTRATION STATEMENT

UNDER
THE SECURITIES ACT OF 1933

NAVIDEA BIOPHARMACEUTICALS, INC.

(Exact name of registrant as specified in its charter)

Delaware
(State or other jurisdiction
of incorporation or organization)

31-1080091
(I.R.S. Employer
Identification Number)

**4995 Bradenton Avenue, Suite 240
Dublin, Ohio 43017-3552
(614) 793-7500**

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

**Craig A. Dais
Chief Financial Officer
Navidea Biopharmaceuticals, Inc.
4995 Bradenton Avenue, Suite 240
Dublin, Ohio 43017-3552
(614) 793-7500**

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

Copy to:

**William M. Mower, Esq.
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Minneapolis, MN 55402
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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 U.S. Securities and Exchange Commission pursuant to Rule 462(e) under the Securities Act, check the following box.

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

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

Large accelerated filer	<input type="checkbox"/>	Accelerated filer	<input type="checkbox"/>
Non-accelerated filer	<input checked="" type="checkbox"/>	Smaller reporting company	<input checked="" type="checkbox"/>
Emerging Growth Company	<input type="checkbox"/>		

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, or until the registration statement shall become effective on such date as the U.S. Securities and Exchange Commission, acting pursuant to said Section 8(a), may determine.

The information contained in this preliminary prospectus is not complete and may be changed. We may not sell these securities until this registration statement becomes effective. This prospectus is not an offer to sell these securities and it is not soliciting an offer to buy these securities in any jurisdiction where the offer or sale is not permitted.

SUBJECT TO COMPLETION, DATED AUGUST 28, 2023

PRELIMINARY PROSPECTUS



Navidea Biopharmaceuticals, Inc.

10,576,923 Shares of Common Stock Issuable Upon Conversion of Series J Convertible Preferred Stock

This prospectus relates to the proposed resale from time to time by the selling stockholders named herein, together with any of such stockholders' transferees, pledgees, donees or successors, of up to 10,576,923 shares of our common stock that are issuable upon the conversion of our Series J convertible preferred stock. The selling stockholders acquired the shares of Series J convertible preferred stock from us pursuant to a separate stock purchase agreement, each dated as of May 22, 2023, by and between Navidea Biopharmaceuticals, Inc. and the selling stockholder.

We are not selling any of our common stock pursuant to this prospectus, and we will not receive any proceeds from the sale of our common stock offered by this prospectus by the selling stockholders.

The selling stockholders may offer and sell or otherwise dispose of the shares of our common stock described in this prospectus from time to time through public or private transactions at prevailing market prices, at prices related to prevailing market prices or at privately negotiated prices. The selling stockholders will bear all 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. See "Plan of Distribution" for more information about how the selling stockholders may sell or dispose of their shares of our common stock.

Our common stock is listed on the NYSE American exchange (the "NYSE American") under the symbol "NAV.B." The last reported sale price of our common stock on August 25, 2023 was \$0.08 per share.

Investing in our securities involves a high degree of risk. Before investing in our securities, you carefully review the risks and uncertainties described under the heading "Risk Factors" on page 10 of this prospectus, and under similar headings in other documents that are incorporated by reference into this prospectus.

Neither the Securities and Exchange Commission nor any state securities commission has approved or disapproved of these securities or passed upon the adequacy or delivery of accuracy of this prospectus. Any representation to the contrary is a criminal offense.

The date of this prospectus is , 2023.

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ABOUT THIS PROSPECTUS

This prospectus is a part of a resale registration statement that we filed with the U.S. Securities and Exchange Commission (the “SEC”). By using a resale registration statement, the selling stockholders may sell from time to time in one or more offerings the shares of common stock described in this prospectus.

This prospectus provides a general description of our company and our securities. For further information about our business and our securities, please refer to the registration statement and the documents incorporated by reference in this prospectus.

Neither we nor the selling stockholders have authorized anyone to provide you with any information other than that contained in, or incorporated by reference into, this prospectus. We take no responsibility for, and can provide no assurance as to the reliability of, any other information that others may give you. This prospectus is an offer to sell only the shares of our common stock offered hereby, but only under circumstances and in jurisdictions where it is lawful to do so. You should not assume that the information contained in or incorporated by reference in this prospectus is accurate as of any date other than their respective dates. Our business, financial condition, results of operations and prospects may have changed since those dates.

This prospectus contains summaries of certain provisions contained in some of the documents described herein, but reference is made to the actual documents for complete information. All of the summaries are qualified in their entirety by the actual documents. Copies of some of the documents referred to herein have been filed, will be filed or will be incorporated by reference as exhibits to the registration statement of which this prospectus is a part, and you may obtain copies of those documents as described below under the section titled “Where You Can Find Additional Information.”

In this prospectus, “we,” “us,” “our” and “Navidea” refer to Navidea Biopharmaceuticals, Inc. and its subsidiaries.

CAUTIONARY NOTE REGARDING FORWARD-LOOKING STATEMENTS

This prospectus and the documents we have filed with the SEC that are incorporated by reference contain “forward-looking statements” within the meaning of Section 27A of 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 that 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 (including their use in the negative). Forward-looking statements may include, but are not limited to, statements about:

- the impact of the global COVID-19 pandemic on our business, financial condition or prospects,;
- the impact of the conflict between Ukraine and Russia on our business, financial condition or prospects;
- our ability to successfully complete research and further development of our drug candidates;
- the timing and cost of obtaining regulatory approvals for our drug candidates;
- our ability to successfully commercialize our drug candidates;
- our ability to successfully enter into new collaborative or strategic arrangements;
- regulatory and legal developments with respect to our business;
- our ability to raise capital sufficient to fund our development programs and operations;
- our ability to contract with third-party suppliers and manufacturers and their ability to perform adequately;
- our ability to execute on our business strategy;
- our expectations regarding future expenses and need for additional financing;
- the outcome of any pending litigation; and
- our ability to comply with NYSE American continued listing standards and maintain our listing on the NYSE American.

These statements reflect our current views with respect to future events and are based on assumptions and subject to risks and uncertainties. Given these uncertainties, you should not place undue reliance on these forward-looking statements. We discuss many of these risks in greater detail under the heading “Risk Factors” in our SEC filings. Also, these forward-looking statements represent our estimates and assumptions only as of the date of the document containing the applicable statement.

You should read this prospectus, the registration statement of which this prospectus is a part, and the documents incorporated by reference herein 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. 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.

PROSPECTUS SUMMARY

This summary highlights selected information about us, this offering and information appearing elsewhere in this prospectus or incorporated by reference in this prospectus. This summary is not complete and does not contain all the information you should consider before investing in our securities. You should carefully read this entire prospectus, including under the risks and uncertainties of investing in our securities discussed under the heading “Risk Factors” contained in this prospectus and under similar headings in the other documents that are incorporated by reference into this prospectus. You should also carefully read the information incorporated by reference into this prospectus, including our financial statements, and the exhibits to the registration statement of which this prospectus is a part.

The Company

Navidea Biopharmaceuticals, Inc., a Delaware corporation (NYSE American: NAVB), is a biopharmaceutical company focused on the development and commercialization of precision immunodiagnostic agents and immunotherapeutics. Navidea is developing multiple precision-targeted products based on our Manocept platform to enhance patient care by identifying the sites and pathways of undetected disease and enable better diagnostic accuracy, clinical decision-making and targeted treatment.

Navidea’s Manocept platform is predicated on the ability to specifically target the CD206 mannose receptor expressed on activated macrophages. The Manocept platform serves as the molecular backbone of Tc99m tilmanocept, the first product developed and commercialized by Navidea based on the platform. Other than Tc99m tilmanocept, which the Company has a license to distribute outside of Canada, Mexico and the United States, none of the Company’s drug product candidates have been approved for sale in any market.

Our business is focused on two primary types of drug products: (i) diagnostic substances, including Tc99m tilmanocept and other diagnostic applications of our Manocept platform, and (ii) therapeutic development programs, including therapeutic applications of our Manocept platform.

Technology and Product Candidates

Our primary development efforts over the last several years were focused on diagnostic products, including Tc99m tilmanocept, which the Company has a license to distribute outside of Canada, Mexico and the United States. Our more recent initiatives have been focused on diagnostic and therapeutic line extensions based on our Manocept platform.

During the ongoing COVID-19 global pandemic, the Company’s primary concern is the safety of its employees, the employees of its clinical trial sites, and the patients enrolled in its clinical trials. The Company is working hard to mitigate any safety risk along with any long-term impact on its clinical development programs. We do not believe there has been a significant impact to the Company’s clinical development and regulatory timelines resulting from the ongoing COVID-19 global pandemic. However, the COVID-19 outbreak delayed enrollment in our NAV3-32 clinical study in the United Kingdom due to national COVID-19-related shutdowns. In addition, the regulatory approval process in India was delayed by the impact of COVID-19 in that country.

As a brief overview of recent developments in the Company’s diagnostics area (additional details in following sections), Navidea has completed the Phase 2b clinical trial (NAV3-31) evaluating imaging repeatability, reproducibility, and stability, as well as the capacity of Tc99m tilmanocept imaging to serve as an early predictor of treatment efficacy of anti-tumor necrosis factor alpha (“TNF α ”) therapy in patients with moderate to severe Rheumatoid Arthritis (“RA”). In addition, the Company has completed enrollment into a Phase 2b clinical trial (NAV3-35) designed to accrue hand and wrist planar and single photon emission computed tomography/computed tomography (“SPECT/CT”) images from healthy subjects (with SPECT/CT imaging also done on a small group of RA patients) so that Navidea can complete a normative database in support of its RA imaging commercial product development. The Company’s currently enrolling pivotal Phase 3 trial for RA (NAV3-33) is the next step in the development plan for indications in RA. The additional Phase 2b trial (NAV3-32) correlating Tc99m tilmanocept uptake in RA-involved joints with CD206 immunohistochemistry findings from synovial biopsies is actively recruiting. In addition, the investigator-initiated Phase 2 cardiovascular (“CV”) study was completed at Massachusetts General Hospital and a manuscript has been published by the investigators. Results of this study provided to date have paralleled data in our earlier published article, and these data are supportive of Navidea’s hypothesis that tilmanocept can provide marked signal to background in a host of CV disease applications.

Navidea's Manocept platform is predicated on the ability to specifically target the mannose receptor (CD206) expressed primarily on activated macrophages. This flexible and versatile platform serves as a molecular backbone for purpose-built targeted imaging molecules that may significantly impact patient care by providing enhanced diagnostic accuracy, clinical decision-making, and target-specific treatment. This CD206-targeted drug platform is applicable to a range of diagnostic modalities, including SPECT, positron emission tomography ("PET"), gamma-scanning and intra-operative and/or optical-fluorescence detection, as well as delivery of therapeutic compounds that target macrophages and their role in a variety of immune- and inflammation-involved diseases. The United States Food and Drug Administration ("FDA")-approved sentinel node/lymphatic mapping agent, Tc99m tilmanocept, is representative of the ability to successfully exploit this mechanism to develop powerful new products and to expand this technology into additional diagnostic and therapeutic applications.

Activated macrophages play important roles in many disease states and are an emerging target in many diseases where diagnostic uncertainty exists. Impairment of the macrophage-driven disease mechanisms is an area of increasing and proven focus in medicine. The number of people affected by all the inflammatory diseases combined is estimated at more than 40 million in the United States and up to 700 million worldwide, making macrophage-mediated diseases an area of remarkable clinical importance. There are many recognized disorders having macrophage involvement, including RA, atherosclerosis/vulnerable plaque/cardiovascular disease, nonalcoholic steatohepatitis ("NASH"), inflammatory bowel disease ("IBD"), systemic lupus erythematosus, cancer generally including Kaposi's sarcoma ("KS"), leishmaniasis, and others that span general clinical areas in cancer immunology, autoimmunity, infectious diseases, cardiology, central nervous system diseases, and inflammation. For the near term, we have selected target diseases that may, if successfully developed, benefit from this technology.

The Company has developed processes for producing the first four therapeutic Manocept immuno-construct series, the Manocept doxorubicin ("MAN-DOX") series, which is designed to specifically target and kill or modify activated CD206+ macrophages by delivering doxorubicin, a Manocept paclitaxel series ("MAN-PAC"), and a Manocept Bisphosphonate series ("MAN-BIS"). The MAN-PAC and MAD-BIS series are designed to modify CD206+ macrophages to make them more proinflammatory. The Company has also created a Manocept dexamethasone ("MAN-DEX") series, which is designed to inhibit the inflammatory activity of activated CD206+ macrophages by delivering a potent anti-inflammatory agent, dexamethasone. We have expended significant efforts in recent years to improve chemical syntheses and to produce sufficient quantities of Manocept constructs representing all 4 series agents, along with the concomitant analytical standards, to provide material for current and planned preclinical animal studies and future clinical trials. Evaluation of representative examples of constructs from all four series have been successfully performed in human macrophage cell culture assays with MAN-DOX and MAN-PAC advancing to evaluations in various syngeneic mouse models of cancer.

Manocept Platform – Immuno-Diagnostics Clinical Data

Rheumatoid Arthritis

Two Tc99m tilmanocept dose escalation studies in RA have been completed. The first study was completed and included 18 subjects (nine with active disease and nine healthy subjects) dosed subcutaneously ("SC") with 50 and 200 $\mu\text{g}/2\text{mCi}$ Tc99m tilmanocept (ClinicalTrials.gov NCT02683421). The results of this study were presented at five international meetings, including Biotechnology Innovation Organization, Society of Nuclear Medicine and Molecular Imaging ("SNMMI"), and The American College of Rheumatology ("ACR"). In addition, based on completion of extensive preclinical dosing studies pursuant to our dialog with the FDA, we have completed a Phase 1/2 study involving intravenous ("IV") dosing of 39 subjects with IV-administered Tc99m tilmanocept (ClinicalTrials.gov NCT02865434). In conjunction with this study, we completed pharmacokinetic, pharmacodynamics and radiation dosimetry phases in human subjects as well. The majority of the costs of these studies were supported through a Small Business Innovation Research ("SBIR") grant (NIH/NIAMSD Grant 1 R44 AR067583-01A1). Results of the Phase 1/2 study were presented at the June 2018 and June 2019 SNMMI meetings, the 2018 European League Against Rheumatism ("EULAR") meeting and the 2018 ACR meeting. A manuscript intended for peer reviewed publication is in preparation.

The Phase 1/2 study enrolled subjects with active, moderate-to-severe RA, and healthy controls. Results from the completed trial demonstrated that Tc99m tilmanocept is well-tolerated with no serious adverse events, adverse drug reactions, or drug-related adverse events observed. Additionally, static planar images revealed joint-specific Tc99m tilmanocept localization in RA subjects to disease-involved joints of the shoulders, knees, hands, and feet, but no joint-specific localization in healthy control subjects, revealing potentially significant immunodiagnostic information about CD206-expressing synovial macrophage involvement in RA. An optimal imaging time window post-Tc99m tilmanocept IV administration, as well as optimal dosing, were also determined.

In April 2019, the Company received feedback from the FDA regarding the Company's planned clinical studies to evaluate joint disease in patients with RA and monitor patient response to therapy. The Company's proposed RA studies were discussed with the FDA during an in-person meeting and through follow-up collaborative efforts. The FDA communicated that the first study, a Phase 2b trial, was aligned with expectations for the studies and that they would continue to work with Navidea as the Company progressed into the second Phase 2b trial correlating Tc99m tilmanocept uptake in RA-involved joints with CD206 immunohistochemistry findings from synovial biopsies and into the planned Phase 3 clinical trial.

In May 2019, we began enrolling patients into the first Phase 2b study, (NAV3-31), entitled "Evaluation of the Precision and Sensitivity of Tilmanocept Uptake Value ("TUV") on Tc99m Tilmanocept Planar Imaging" (ClinicalTrials.gov NCT03938636). This study, since completed, provided confirmatory support necessary to initiate Navidea's Phase 3 study program. In October 2019, the Company performed its first interim analysis of this trial, covering subjects enrolling into Arms 1 and 2. The results of this interim analysis were in line with the Company's hypotheses that Tc99m tilmanocept can provide robust, stable imaging in healthy subjects as well as in patients with active RA, and provide the fundamental information needed to keep moving forward into the Phase 3. A summary of these results was presented at the 2020 EULAR meeting. In May 2020, the Company announced the results of its second interim analysis, covering Arm 3 of the trial. This Arm mirrored the Phase 3 in design and provided information relevant for sample size calculation for the Phase 3 as well as support for the hypothesis that Tc99m tilmanocept imaging can provide an early indicator of treatment efficacy of anti-TNF α therapeutics. These interim results were presented at the 2020 ACR meeting. In June 2020, the Company announced full enrollment into this trial, with imaging events completed in each patient enrolled in Arm 3. A poster presentation based on the completed NAV3-31 study was presented at the 2022 ACR meeting. The Company also presented interim results of its NAV3-32 study at the 2022 ACR meeting.

In February 2021, the Company submitted its formal briefing book to the FDA, containing detailed analysis and discussion of the Company's then-ongoing Phase 2b study (NAV3-31) and prior studies in RA as well as the design and statistical analysis plan for the proposed Phase 3 for FDA comment. Following the feedback received from the FDA at the end of March 2021, the Company continued to work toward completing the analysis of the full NAV3-31 trial dataset and submitted the resultant briefing book containing the results of this analysis in preparation for the standard End-of-Phase 2 Type B meeting, which took place on September 1, 2021. The Company had a constructive meeting with the FDA and, based on the discussion in this meeting and follow-up communication, made agreed-upon modifications to the trial design for the Phase 3 study (NAV3-33). The Company submitted the modified protocol back to the FDA and initiated the study in December 2021. Following additional feedback from the FDA, the Company made modifications to several of the objectives. Enrollment into the Phase 3 study is ongoing. The pivotal Phase 3 study program will determine Tc99m tilmanocept's capability to serve as an early predictor of treatment response to anti-TNF α therapy in patients with RA. The current aim is for enrollment completion of the Phase 3 by end of 2023 with NDA submission targeted for late 2024 or early 2025.

Cardiovascular Disease

In collaboration with researchers at Massachusetts General Hospital, Navidea has completed two investigator-initiated clinical studies evaluating Tc99m tilmanocept's ability to enable imaging of atherosclerotic plaques. Results of these studies provide strong preliminary evidence of the potential of Tc99m tilmanocept to accumulate specifically in and enable imaging of non-calcified atherosclerotic plaques. Non-calcified atherosclerotic plaques include plaques with morphologies indicating a high risk of rupture. Rupture of such plaques causes myocardial infarctions (heart attacks) and a significant portion of ischemic strokes. The studies compared aortic Tc99m tilmanocept uptake imaged by SPECT/CT in clinically asymptomatic subjects with intermediate Framingham Risk Scores ("FRS") who were infected with Human Immunodeficiency Virus ("HIV") as compared to healthy, uninfected, FRS and age-matched subjects. Tc99m tilmanocept SPECT/CT images were compared to aortic images of the same subjects obtained by contrast enhanced coronary computed tomography angiography and/or [18F]NaF PET/CT.

A nine-subject study to evaluate diagnostic imaging of emerging atherosclerosis plaque with the Tc99m tilmanocept product dosed SC was performed (ClinicalTrials.gov NCT02542371). The results of this study were presented at two major international meetings (Conference on Retroviruses and Opportunistic Infections and SNMMI, 2017) and published in early release in the Journal of Infectious Diseases in January 2017 (published in the circulated version, Journal of Infectious Diseases (2017) 215 (8): 1264-1269), confirming that the Tc99m tilmanocept product can both quantitatively and qualitatively target non-calcified plaque in the aortic arch of Acquired Immunodeficiency Syndrome (“AIDS”) patients (supported by NIH/NHLBI Grant 1 R43 HL127846-01). This study was later expanded to include up to 31 participants, achieved full enrollment, and a publication has resulted in the Journal of Infectious Diseases (2022) Nov 11; 226(10):1823-1833.

A second Phase 1/2 investigator-initiated study in cooperation with Massachusetts General Hospital in subjects with HIV was initiated that expanded the original study in both the scope of the drug administration as well as the diagnostic assessment of the subjects. This study enrolled both AIDS subjects and healthy controls in imaging non-calcified plaque using IV and SC-administered Tc99m tilmanocept and will expand the initial investigation to the assessment of aortic plaque as well as carotid and coronary arteries. Initial analysis suggested that the SC route of administration led to superior signal-to-background in areas of non-calcified plaque. These results are being further assessed.

Navidea was also awarded a \$225,000 phase 1 Small Business Technology Transfer grant (1R41HL147640-01A1) entitled Gallium 68 Tilmanocept for PET Imaging of Atherosclerosis Plaques. This grant supported a research collaboration between Navidea and Dr. Suzanne Lapi of the University of Alabama Birmingham evaluating a mouse model of atherosclerosis. This work had as its aim the evaluation of [68]gallium tilmanocept and various next generation imaging agents for visualizing plaques. Activities began in the fourth quarter of 2019. All images have been acquired with efforts now focused on final data analysis.

Kaposi's Sarcoma

We initiated and completed a study of KS in 2015 (ClinicalTrials.gov NCT022201420) and received additional funding from the National Institutes of Health (“NIH”) in 2016 to continue diagnostic studies in this disease. The new support not only continues the imaging of the cutaneous form of this disease but expands this to imaging of visceral disease via IV administration of Tc99m tilmanocept (NIH/NCI 1 R44 CA192859-01A1; ClinicalTrials.gov NCT03157167). This now-escalated study includes a pathology/biopsy component as well as an imaging component to determine pathology concordance with image assessment. We received Institutional Review Board approval of the clinical protocol and initiated a Phase 1/2 clinical study in KS in 2017. This trial has completed enrollment and imaging, with final data analysis and clinical study report preparation well underway.

Tuberculosis (“TB”)

In April 2019, the Company announced that Professor Mike Sathekge, MBChB, M. Med (Nuclear Medicine), PhD, Professor and Head of the Department of Nuclear Medicine in the Faculty of Health Sciences at the University of Pretoria/Steve Biko Academic Hospital, planned to initiate a comparative study evaluating the use of tilmanocept in patients with TB. The purpose of this ongoing study is to explore using 68Ga tilmanocept as an aid in TB patient management while contributing to the better understanding of the biology of TB granulomas. CD206+ macrophages constitute one of the most abundant cell types in TB granulomas. Therefore, a molecular probe such as 68Ga-labeled tilmanocept targeting mannose receptor CD206 expressed on macrophages holds great promise not only in understanding the biology of TB granulomas, but may also support future development of a tilmanocept-like drug delivery vehicle for delivering therapeutic interventions to TB granulomas. Navidea has provided tilmanocept for use in this study, and several subjects have been injected and imaged to date. Successful completion of this study could support an extended claim of 68Ga-tilmanocept.

Biomarker Application and Qualification

In November 2017, the Company commenced the qualification of the biomarker CD206 with the FDA Biomarker Section of The Center for Drug Evaluation and Research (“CDER”). As per FDA protocol, Navidea submitted a draft letter of intent (“LOI”) to CDER prior to the November 2017 meeting. According to the CDER directive, “the Biomarker Qualification Program was established to support the CDER’s work with external stakeholders to develop biomarkers that aid in the drug development process. Through the FDA’s Biomarker Qualification Program, an entity may request regulatory qualification of a biomarker for a particular context of use (“COU”) in drug development.” Following the meeting with the FDA, and because of Navidea’s data sets and the general external publication database, Navidea, in conjunction with FDA, is now reviewing the LOI with the FDA’s recommended consultants. Navidea has revised the LOI draft strategy in order to expedite the application process. In March 2018, Navidea had a follow-up meeting with the FDA’s assigned strategist, during which the potential to further narrow the LOI elements was reviewed. Navidea is continuing the process of finalizing the COU LOI and will be providing the background data sets for qualification review with the FDA/CDER. Additional meetings have taken place and the pursuit of this qualification is ongoing. A pivotal element of this will be the data obtained from the NAV3-32 clinical trial.

Manocept Platform – In-Vitro and Pre-Clinical Immunotherapeutics Data

The Company has been developing Manocept platform drug delivery constructs that carry various payloads. Chemical synthesis techniques have advanced considerably, resulting in more robust and reproducible synthesis protocols that provide products with chemical attributes indicative of enhanced *in vivo* activity. Particularly significant results included improved processes for adding mannose moieties to the amine-terminated linkers on the dextran backbone and significant advances in the design and functionality of the degradable linkers to which drug payloads are attached. These advances in chemical methods are the subject matter of several patent applications currently under review by the USPTO. Experiments utilizing human macrophage assays show that at treatment doses of MAN-DOX, MAN-PAC, and MAN-BIS below what is required to kill macrophages, all three construct series dramatically alter the immunological behavior of macrophages, making them more proinflammatory. Results indicate that MAN-BIS and MAN-PAC constructs are more active at altering macrophage behavior towards a proinflammatory status than MAN-DOX. In syngeneic mouse tumor experiments, the MAN-DOX and MAN-PAC constructs significantly synergized the activity of another anticancer therapy producing anti-tumor activity that was greater than either treatment alone. Consistent with the macrophage cell assay results, MAN-PAC was more active than MAN-DOX in synergizing the activity of the other anti-cancer therapy. Similar studies evaluating the MAN-BIS constructs in syngeneic mouse tumor models are pending. Results from the completed studies have been presented at the New York Academy of Sciences Frontiers in Cancer Immunotherapy 2021 (MAN-DOX, May 14, 2021), at the Tumor Myeloid-Directed Therapies Summit (MAN-BIS, June 2022), and at the Society for Immunotherapy of Cancer (SITC) (MAN-PAC, Nov. 10, 2022). Work involving a second generation Manocept dexamethasone-carrying construct (MAN-DEX) has progressed to evaluations in human macrophage culture assays, showing that the MAN-DEX suppressed the proinflammatory behavior of human macrophages as expected.

Kaposi’s Sarcoma

The novel MAN-DOX class constructs are designed to specifically deliver doxorubicin, a chemotoxin, which can kill KS tumor cells and their tumor-associated macrophages, potentially altering the course of cancer. We received additional funding to continue therapeutic studies in this disease with the goal of completing an investigational new drug (“IND”) submission for a Manocept construct (MAN-DOX class of compounds) consisting of tilmanocept linked to doxorubicin for the treatment of KS. Efforts supported by this grant (NIH/NCI 1 R44 CA206788-01) are now complete. The results greatly advanced our knowhow for robustly and reproducibly synthesizing MAN-DOX and related constructs carrying other payloads. The grant-supported efforts were presented at the New York Academy of Sciences Frontiers in Cancer Immunotherapy 2021.

Other Immunotherapeutic Applications

The Company continues to evaluate emerging data in other disease states to define areas of focus, development pathways and partnering options to capitalize on the Manocept platform, including ongoing studies in KS, RA and infectious diseases such as leishmaniasis. The immuno-inflammatory process is remarkably complex and tightly regulated with indicators that initiate, maintain and shut down the process. Macrophages are immune cells that play a critical role in the initiation, maintenance, and resolution of inflammation. They are activated and deactivated in the inflammatory process. Because macrophages may promote dysregulation that accelerates or enhances disease progression, diagnostic and therapeutic interventions that target macrophages may open new avenues for controlling inflammatory diseases. There can be no assurance that further evaluation or development will be successful, that any Manocept platform product candidate will ultimately achieve regulatory approval, or if approved, the extent to which it will achieve market acceptance.

Risks Associated with Our Business

Our business and our ability to implement our business strategy are subject to numerous risks, as more fully described under the heading “Risk Factors” in this prospectus and under similarly titled headings of the documents incorporated herein by reference. You should read these risks before you invest in our securities. We may be unable, for many reasons, including those that are beyond our control, to implement our business strategy. In particular, risks associated with our business include:

- The global COVID-19 pandemic may continue to impact our business, financial condition or prospects, including a decline in the volume of procedures using our products, potential delays and disruptions to clinical trials, global supply chains, manufacturing activities, logistics, operations, employees and contractors, the business activities of our suppliers, distributors, customers and other business partners, as well as the effects on worldwide economies, financial markets, social institutions, labor markets and healthcare systems.
- The current conflict between Ukraine and Russia may impact our business, financial condition or prospects, including extreme volatility in the global capital markets making debt or equity financing more difficult to obtain, more costly or more dilutive, delays and disruptions of the global supply chains and the business activities of our suppliers, distributors, customers and other business partners.
- There is substantial doubt about our ability to continue as a going concern, which may affect our ability to obtain future financing and may require us to curtail our operations. We will need to raise additional capital to support our operations.
- We have incurred losses since our inception and anticipate that we will continue to incur significant losses for the foreseeable future, and our future profitability is uncertain.
- Our product candidates must undergo rigorous clinical testing, such clinical testing may fail to demonstrate safety and efficacy and any of our product candidates could cause undesirable side effects, which would substantially delay or prevent regulatory approval or commercialization.
- We are dependent on patents and proprietary technology. If we fail to adequately protect this intellectual property or if we otherwise do not have exclusivity for the marketing of our products, our ability to commercialize products could suffer.
- If our competitors are able to develop and market products that are more effective, safer or more affordable than ours, or obtain marketing approval before we do, our commercial opportunities may be limited.

Series J Preferred Stock Financing

On May 22, 2023, we entered into a Stock Purchase Agreement with each selling stockholder (each, a “Purchase Agreement”), pursuant to which we issued and sold to the selling stockholders in a private placement a total of 11,000 shares of Series J convertible preferred stock, par value \$0.001 per share (“Series J preferred stock”), for an aggregate purchase price of \$1,100,000. Under each Purchase Agreement, we agreed to register for resale by the selling stockholder the shares of the Company’s common stock underlying the Series J preferred stock.

Smaller Reporting Company

We are a “smaller reporting company” as defined in the Securities Exchange Act of 1934, as amended (the “Exchange Act”). We may take advantage of certain of the scaled disclosures available to smaller reporting companies and will be able to take advantage of these scaled disclosures for so long as our voting and non-voting common stock held by non-affiliates is less than \$250.0 million measured on the last business day of our second fiscal quarter, or our annual revenue is less than \$100.0 million during the most recently completed fiscal year and our voting and non-voting common stock held by non-affiliates is less than \$700.0 million measured on the last business day of our second fiscal quarter.

Corporate Information

Our corporate headquarters are located at 4995 Bradenton Avenue, Suite 240, Dublin, Ohio 43017-3552 and our telephone number is (614) 793-7500. We maintain a website at www.navidea.com. The information contained in, or that can be accessed through, our website is not part of, and is not incorporated into, this prospectus and should not be considered part of this prospectus.

THE OFFERING

Common stock offered by the selling stockholders

Up to 10,576,923 shares of our common stock issuable upon conversion of our Series J preferred stock.

Use of proceeds

We will not receive any proceeds from the sale of the shares of common stock covered by this prospectus.

Listing

Our common stock is listed on the NYSE American under the symbol "NAVB."

On July 28, 2023, the Company received written notification from NYSE American stating that the staff of NYSE Regulation has determined to commence proceedings to delist the Company's Common Stock. NYSE Regulation has determined that the Company is no longer suitable for listing pursuant to Section 1009(a) of the NYSE American Company Guide as the Company was unable to demonstrate that it had regained compliance with Sections 1003(a)(i), (ii) and (iii) of the NYSE American Company Guide by the end of the maximum 18-month compliance plan period, which expired on July 28, 2023. The NYSE American's application with the SEC to delist the Company's Common Stock is pending, subject to completion of all applicable procedures, including the Company's appeal of the NYSE Regulation staff's decision.

On August 4, 2023, the Company filed a written request to appeal the NYSE Regulation staff's decision. The Company's Common Stock will continue to be listed and traded on NYSE American during the pendency of the Company's appeal, subject to NYSE American's discretion to immediately suspend trading if it believes suspension to be in the public interest, for the protection of investors, or to promote just and equitable principles of trade. Navidea intends to make arrangements to have its common stock quoted in the over-the-counter market if its common stock is delisted from the NYSE American.

Risk Factors

See "Risk Factors" on page 10 of this prospectus and under similar headings in the other the documents incorporated by reference in this prospectus for a discussion of risks and uncertainties you should consider before deciding to invest in shares of our common stock.

RISK FACTORS

Investing in our common stock involves a high degree of risk. Prior to making a decision about investing in our common stock, you should carefully consider the risks and uncertainties discussed under the heading "Risk Factors" in our most recent annual report on Form 10-K and as described or updated by our other filings we make with the SEC, which are incorporated by reference into this prospectus, together with other information in this prospectus and the documents incorporated by reference. The risks described in these documents are not the only ones we face, but those that we consider to be material. There may be other unknown or unpredictable economic, business, competitive, regulatory or other factors that could have material adverse effects on our future results. Past financial performance may not be a reliable indicator of future performance, and historical trends should not be used to anticipate results or trends in future periods. If any of these risks actually occur, our business, financial condition, results of operations or cash flow could be seriously harmed. This could cause the trading price of our common stock to decline, resulting in a loss of all or part of your investment.

USE OF PROCEEDS

All the shares of our common stock to be sold pursuant to this prospectus will be sold by the selling stockholders. We will not receive any of the proceeds from such sales.

DESCRIPTION OF CAPITAL STOCK

The following summary of the material terms of our securities is not intended to be a complete description of all of the rights and preferences of such securities. Because it is only a summary, it does not contain all of the information that may be important to you, and is qualified by reference to our amended and restated certificate of incorporation, as amended, our amended and restated bylaws, the certificates of designation establishing the terms of each series of our preferred stock (together, the "Certificates of Designation"), the Section 382 Rights Agreement and the form of common stock purchase warrant. We urge you to read each of the amended and restated certificate of incorporation, amended and restated bylaws, Certificates of Designation, the Section 382 Rights Agreement and the form of common stock purchase warrant in their entirety for a complete description of the rights and preferences of our securities.

Common Stock

Subject to the preferences of any outstanding preferred stock at the time, each share of common stock is entitled to receive, when and as declared by the board of directors, out of our available assets at such time, such dividends as may be declared from time to time by the board of directors.

If our company is liquidated, any assets that remain after the creditors are paid, and the owners of preferred stock receive any liquidation preferences, will be distributed to the holders of our common stock pro-rata.

Each share of our common stock entitles the owner to one vote. There is no cumulative voting. Our directors are elected by a plurality of the votes of the shares present in person or represented by proxy at meetings of our stockholders and entitled to vote. Our Board of Directors is divided into three classes of directors, each serving a staggered three-year term and with one class being elected at each year's annual meeting of stockholders.

Our common stock is not entitled to preemptive rights, and is not subject to conversion, redemption or sinking fund provisions.

Preferred Stock

Our certificate of incorporation authorizes our board of directors to issue "blank check" preferred stock. The board of directors may divide this stock into series and set their rights. Under the terms of our certificate of incorporation, our board of directors has the authority, without further action by our stockholders, to issue up to 5,000,000 shares of preferred stock in one or more series and to determine and alter all rights, preferences, and privileges and qualifications, limitations, and restrictions thereof (including, without limitation, voting rights and the limitation and exclusion thereof), applicable to the shares of each series. The ability of our board to issue preferred stock without stockholder approval could have the effect of delaying, deferring or preventing a change of control of us or the removal of existing management.

Series G Preferred Stock

In April 2022, a series of our preferred stock was designated as Series G Redeemable Preferred Stock ("Series G preferred stock"), consisting of 3,260 designated shares.

Holders of Series G preferred stock are entitled to receive dividends commencing from July 1, 2022 at the rate of 6% per annum, compounded quarterly, of the stated value of \$1,000 per share, subject to adjustment. The Series G dividends will increase by 1% per annum every quarter to a max of 12% per annum.

In the event of our liquidation, holders of Series G preferred stock will be entitled to receive an amount equal to \$1,000 per share plus any accrued and unpaid dividends thereon (the "Series G Liquidation Preference Amount"). After payment of the full Series G Liquidation Preference Amount, holders of Series G preferred stock will not be entitled to any further participation in the assets of our company.

We have the right to redeem the Series G preferred stock at any time at a redemption price equal to the sum of the original issuance price per share and accrued and unpaid dividends.

The Series G preferred stock has no voting rights, other than the right to vote for any amendment, waiver or repeal of any of the powers, designations, preferences and rights of the Series G preferred stock.

Holders of Series G preferred stock have no conversion rights.

Series H Preferred Stock

The Series H Junior Participating Preferred Stock (“Series H preferred stock”) is reserved for issuance pursuant to the Rights Agreement (defined below). Upon issuance, each share of Series H preferred stock (i) will entitle the holder thereof, when, as and if declared, to quarterly dividend payments equal to the greater of \$1.00 per share and 1,000 times the dividend declared per share of our common stock, (ii) will entitle the holder thereof to receive the greater of \$1.00 per share (plus accrued and unpaid dividends) and 1,000 times the payment made per share of our common stock upon liquidation, and (iii) will entitle the holder thereof to receive 1,000 times the amount received per share of our common stock if shares of common stock are exchanged via merger, consolidation or a similar transaction.

Holders of our Series H preferred stock have no preemptive, subscription, redemption or conversion rights.

There are currently no shares of Series H preferred stock issued and outstanding.

Description of Rights Agreement

On April 7, 2022, we entered into a Section 382 Rights Agreement (the “Rights Agreement”) pursuant to which we issued the purchase rights. Pursuant to the Rights Agreement, our board of directors declared a dividend of one preferred share purchase right (a “Right”) for each outstanding share of our common stock to purchase from us one one-thousandth of a share of our Series H preferred stock at a price of \$10.00 per one one-thousandth of a share of Series H preferred stock, subject to adjustment. The dividend was payable to stockholders of record on April 12, 2022.

The Rights Agreement is designed to prevent our company from facing a substantial limitation on our ability to use our Tax Benefits (as such term is defined in the Rights Agreement) to offset potential future income taxes for federal income tax purposes. Our ability to use our Tax Benefits would be substantially limited if we experience an “ownership change,” as such term is defined in Section 382 of the Internal Revenue Code of 1986, as amended (the “Code”). A company generally experiences an ownership change if the percentage of its shares of stock owned by its “5-percent shareholders,” as such term is defined in Section 382 of the Code, increases by more than 50 percentage points over a rolling three-year period. The Rights Agreement is intended to reduce the likelihood of an ownership change under Section 382 of the Code by deterring any Person (as such term is defined in the Rights Agreement) or group of affiliated or associated Persons from acquiring Beneficial Ownership (as such term is defined in the Rights Agreement) of 4.99% or more of the outstanding common stock.

The following is a summary of the terms of the Rights Agreement. The summary does not purport to be complete and is qualified in its entirety by reference to the full text of the Rights Agreement.

Effectiveness. The Rights Agreement became effective on April 7, 2022 (the “Effective Date”). Upon and following the Effective Date, Rights will be issued in respect of all outstanding shares of common stock on the record date of April 12, 2022, and for all shares of common stock issued after such record date and, subject to the terms described in the Rights Agreement, prior to the earliest of the Distribution Date (as defined below), the redemption of the Rights or the expiration of the Rights as provided by the Rights Agreement.

Distribution and Transfer of Rights; Distribution Date; Rights Certificates. Subject to certain exceptions specified in the Rights Agreement, the Rights will separate from our common stock and become exercisable following the earlier of (i) 10 business days from the public announcement that a person or group of affiliated or associated persons has become an Acquiring Person (as defined below) or such earlier date on which a majority of our board becomes aware of the existence of an Acquiring Person or (ii) such date (prior to such time as any person or group of affiliated persons becomes an Acquiring Person), if any, as may be determined by action of the board, in its sole discretion, following the commencement of, or public announcement of an intention to commence, a tender or exchange offer the consummation of which would result in any person or group of affiliated or associated persons becoming an Acquiring Person (the earlier of such dates being called the “Distribution Date”). A person or group of affiliated or associated persons becomes an “Acquiring Person” upon acquiring Beneficial Ownership of 4.99% or more of the outstanding shares of common stock, except in certain situations (including a person or group of affiliated or associated persons that currently has Beneficial Ownership of the outstanding shares of common stock in excess of such thresholds unless and until such person or group becomes the Beneficial Owner of a percentage of shares of common stock outstanding that exceeds by 0.5% or more the percentage of shares of common stock outstanding that such person or group owned as of the first public announcement of the adoption of the Rights Agreement).

The Rights Agreement provides that, until the Distribution Date (or earlier redemption or expiration of the Rights), the Rights will be transferred with and only with the common stock. Until the Distribution Date (or earlier redemption or expiration of the Rights), new common stock certificates issued after the record date of April 12, 2022 upon transfer or new issuances of common stock will contain a legend incorporating the Rights Agreement by reference (and notice of such legend will be furnished to holders of book entry shares). Until the Distribution Date (or earlier redemption or expiration of the Rights), the surrender for transfer of any certificates for shares of common stock (or of any book entry shares of common stock) outstanding as of the record date of April 12, 2022, even without such legend (or notice of such legend) or a copy of the Summary of Rights, will also constitute the transfer of the Rights associated with the shares of common stock represented by such certificate (or book entry). As soon as practicable following the Distribution Date, separate certificates evidencing the Rights (“Right Certificates”) will be mailed to holders of record of the common stock as of the close of business on the Distribution Date and such separate Right Certificates alone will evidence the Rights.

The Rights are not exercisable until the Distribution Date. The Rights will expire on the earliest of (i) April 6, 2025, (ii) the effective date of the repeal of Section 382 or any successor statute if our board determines in its sole discretion that the Rights Agreement is no longer necessary or desirable for the preservation of NOLs or other tax benefits, (iii) the first day of our taxable year to which the our board determines in its sole discretion that no NOLs or other Tax Benefits may be carried forward or (iv) the day following the certification of the voting results of our 2022 annual meeting of stockholders, or any adjournment thereof, if at or before such annual meeting or adjournment thereof, a proposal to approve the Rights Agreement has not been approved by stockholders, unless the Rights are earlier redeemed or exchanged by us, in each case as described below, or upon the occurrence of certain transactions.

Exempt Persons and Transactions. The Rights Agreement includes procedures whereby our board will consider requests to exempt (a) any person or group (an “Exempt Person”) which would otherwise be an “Acquiring Person”, or (b) any transaction (an “Exempt Transaction”) resulting in the Beneficial Ownership of common stock, prior to the consummation of such transaction, from the Acquiring Person trigger, in each case as determined by our board in its sole discretion, provided that it shall only grant such an exemption if it determines in its sole discretion that such ownership would not reasonably be expected to jeopardize or endanger the availability of the NOLs or other tax benefits to our company or if it otherwise determines that the exemption is in our best interests; provided further that, (A) in the case of an Exempt Person, if our board later makes a contrary determination with respect to the effect of such person or group’s Beneficial Ownership with respect to the availability to us of our NOLs or other tax benefits, such person or group shall cease to be an Exempt Person and (B) in the case of an Exempt Person or Exempt Transaction, our board in its sole discretion may require the applicable person or group to make certain representations or undertakings, the violation or attempted violation of which will be subject to such consequences as our board may determine in its sole discretion, including that such person or group shall become an “Acquiring Person”.

Flip-In Trigger. If any person or group of affiliated or associated persons becomes an Acquiring Person, each holder of a Right (other than Rights beneficially owned by the Acquiring Person, affiliates and associates of the Acquiring Person and certain transferees thereof which will thereupon become null and void) will thereafter have the right to receive upon exercise of a Right that number of shares of common stock having a market value of two times the exercise price of the Right.

Flip-Over Trigger. If, after a person or group has become an Acquiring Person, the Company is acquired in a merger or other business combination transaction or 50% or more of its consolidated assets or earning power are sold, proper provisions will be made so that each holder of a Right (other than Rights beneficially owned by an Acquiring Person, affiliates and associates of the Acquiring Person and certain transferees thereof which will have become null and void) will thereafter have the right to receive upon the exercise of a Right that number of shares of common stock of the person with whom the Company has engaged in the foregoing transaction (or its parent) that at the time of such transaction have a market value of two times the exercise price of the Right.

Exchange. At any time after any person or group becomes an Acquiring Person and prior to the earlier of one of the events described in the previous paragraph or the acquisition by such Acquiring Person of 50% or more of the outstanding shares of common stock, our board may exchange the Rights (other than Rights owned by such Acquiring Person, affiliates and associates of the Acquiring Person and certain transferees thereof which will have become null and void), in whole or in part, for shares of our common stock at an exchange ratio of three shares of common stock per Right.

Redemption. At any time prior to the time any person or group becomes an Acquiring Person, our board may redeem the Rights in whole, but not in part, at a price of \$0.001 per Right (the "Redemption Price") payable, at our option, in cash, shares of common stock or such other form of consideration as our board shall determine in its sole discretion. The redemption of the Rights may be made effective at such time, on such basis and with such conditions as our board in its sole discretion may establish. Immediately upon any redemption of the Rights, the right to exercise the Rights will terminate and the only right of the holders of Rights will be to receive the Redemption Price.

Series I Preferred Stock

In August 2022, a series of our preferred stock was designated as Series I Convertible Preferred Stock ("Series I preferred stock"), consisting of 35,000 designated shares.

Holders of Series I preferred stock will be entitled to receive dividends (on an as-if-converted-to-common-stock basis) in the same form as dividends actually paid on shares of the common stock when, as and if such dividends are paid on shares of common stock.

Upon our liquidation, dissolution or winding-up, whether voluntary or involuntary, holders of Series I preferred stock will be entitled to receive out of our assets, whether capital or surplus, the same amount that a holder of common stock would receive if the Series I preferred stock were fully converted (disregarding for such purpose any conversion limitations under the certificate of designation) to common stock, which amounts shall be paid *pari passu* with all holders of common stock.

We are not obligated to redeem or repurchase any shares of Series I preferred stock. Shares of Series I preferred stock are not otherwise entitled to any redemption rights, or mandatory sinking fund or analogous provisions.

Except as otherwise provided in the Series I certificate of designation or as otherwise required by law, the Series I preferred stock has no voting rights.

Each share of Series I preferred stock will be convertible at the option of the holder at any time, into the number of shares of our common stock determined by dividing the \$1,000 stated value per share of the Series I preferred stock by a conversion price of \$0.45 per share. In addition, the conversion price per share is subject to adjustment for stock dividends, distributions, subdivisions, combinations or reclassifications and for certain dilutive issuances. Subject to limited exceptions, a holder of the Series I preferred stock will not have the right to convert any portion of the Series I preferred stock to the extent that, after giving effect to the conversion, the holder, together with its affiliates, would beneficially own in excess of 4.99% of the number of shares of our common stock outstanding immediately after giving effect to its conversion. A holder of the Series I preferred stock may not increase the beneficial ownership limitation provisions of such holder's Series I preferred stock without our prior consent (which may be withheld in our sole discretion).

In the event we effect certain mergers, consolidations, sales of substantially all of our assets, tender or exchange offers, reclassifications or share exchanges in which our common stock is effectively converted into or exchanged for other securities, cash or property, we consummate a business combination in which another person acquires 50% of the outstanding shares of our common stock, or any person or group becomes the beneficial owner of 50% of the aggregate ordinary voting power represented by our issued and outstanding common stock, then, upon any subsequent conversion of the Series I preferred stock, the holders of the Series I preferred stock will have the right to receive any shares of the acquiring corporation or other consideration it would have been entitled to receive if it had been a holder of the number of shares of common stock then issuable upon conversion in full of the Series I preferred stock.

If, at any time while the Series I preferred stock is outstanding, we sell or grant (or announce any offer, sale or grant) of any shares of common stock or common stock equivalents entitling any person to acquire shares of our common stock at an effective price per share that is lower than the then conversion price (such lower price, the "Base Conversion Price"), then the conversion price will be reduced to equal the Base Conversion Price. The Base Conversion Price may not be less than \$0.16. In addition, no conversion price adjustment will be made in respect of the following exempt issuances (each, an "Exempt Issuance"): (i) shares of common stock or options issued as acquisition consideration pursuant to the acquisition of another entity by the Company by merger, purchase of substantially all of the assets or other reorganization or convertible into shares of common stock issued and outstanding on the date of the Series I certificate of designation, provided that such securities have not been amended since the date of the Series I certificate of designation to increase the number of such securities or to decrease the exercise price, exchange price or conversion price of such securities (other than in connection with stock splits or combinations) or to extend the term of such securities; (ii) shares of common stock, options or convertible securities issued as acquisition consideration pursuant to the acquisition of another entity by the Company by merger, purchase of substantially all of the assets or other reorganization or to a joint venture agreement, provided that such issuances are approved by the Board and that such securities are issued as "restricted securities" (as defined in Rule 144) and carry no registration rights that require or permit the filing of any registration statement in connection therewith until the 180th day after the date of the Series I certificate of designation, and provided further that any such issuance shall only be to a Person (or to the equity holders of a Person) which is, itself or through its subsidiaries, an operating company or an owner of an asset in a business synergistic with the business of the Company and shall provide to the Company additional benefits in addition to the investment of funds, but shall not include a transaction in which the Company is issuing securities primarily for the purpose of raising capital or to an entity whose primary business is investing in securities; (iv) shares of common stock, options or convertible securities issued in connection with sponsored research, collaboration, technology license, development, OEM, marketing or other similar agreements or strategic partnerships approved by the Board, provided that such securities are issued as "restricted securities" (as defined in Rule 144) and carry no registration rights that require or permit the filing of any registration statement in connection therewith until the 180th day after the date of the Series I certificate of designation, and provided that any such issuance shall not include a transaction in which the Company is issuing securities primarily for the purpose of raising capital or to an entity whose primary business is investing in securities; and (v) shares of common stock issued in connection with the issuance of bona fide commercial bank debt or equipment lease transactions, provided that such issuances are approved by the Board and that such securities are issued as "restricted securities" (as defined in Rule 144) and carry no registration rights that require or permit the filing of any registration statement in connection therewith until the 180th day after the date of the Serie I certificate of designation.

Series J Preferred Stock

In May 2023, a series of our preferred stock was designated as Series J Convertible Preferred Stock ("Series J preferred stock"), consisting of 150,000 designated shares.

The Series J preferred stock will be convertible into a number of shares of common stock equal to the original issuance price divided by \$0.104, subject to adjustment as provided in the Series J certificate of designation. However, the holder may not convert shares of the Series J preferred stock if, as a result of such conversion, the holder would beneficially own more than 4.99% of the total number of shares of common stock outstanding at such time unless the holder of Series J preferred stock obtains the prior written consent of the Company (which consent the Company may withhold in its sole absolute discretion).

Except with respect to transactions which may adversely affect any right, preference, privilege or voting power of the Series J preferred stock, the Series J preferred stock has no voting rights. If dividends are declared on our common stock, the holder of Series J preferred stock will be entitled to receive an amount equal to the dividend declared on one share of common stock multiplied by the number of shares of common stock into which the Series J Preferred Stock could be converted on the record date, without regard to any conversion limitations.

Upon any liquidation, the holder of Series J preferred stock will be entitled to receive, before any assets may be distributed to the holders of common stock, an amount per share of Series J preferred stock calculated by taking the total amount available for distribution to holders of all of the Company's outstanding common stock divided by the total of (x) all of the then outstanding shares of the Company's common stock plus (y) all of the shares of the Company's common stock into which all of the outstanding shares of the Series J preferred stock can be converted, and then (z) multiplying the sum so obtained by the number of shares of common stock into which such share of Series J Preferred Stock could then be converted

Warrants

The warrants were issued in connection with our rights offering completed in August 2022 and pursuant to a warrant agent agreement between us and Continental Stock Transfer & Trust Company, LLC, the warrant agent. There is no public trading market for the warrants.

Exercisability

Each warrant will be exercisable at any time and will expire five years from the date of issuance. The warrants will be exercisable, at the option of each holder, in whole or in part by delivering to us a duly executed exercise notice and payment in full for the number of shares of our common stock purchased upon such exercise, except in the case of a cashless exercise as discussed below. The number of shares of common stock issuable upon exercise of the warrants is subject to adjustment in certain circumstances, including a stock split of, stock dividend on, or a subdivision, combination or recapitalization of the common stock. If we effect a merger, consolidation, sale of substantially all of our assets, or other similar transaction, then, upon any subsequent exercise of a warrants, the warrant holder will have the right to receive any shares of the acquiring corporation or other consideration it would have been entitled to receive if it had been a holder of the number of shares of common stock then issuable upon exercise in full of the warrant.

Cashless Exercise

If at any time there is no effective registration statement registering, or the prospectus contained therein is not available for issuance of, the shares issuable upon exercise of the warrant, the holder may exercise the warrant on a cashless basis. When exercised on a cashless basis, a portion of the warrant is cancelled in payment of the purchase price payable in respect of the number of shares of our common stock purchasable upon such exercise.

Exercise Price

Each warrant represents the right to purchase 2,222 shares of common stock at an exercise price of \$0.50 per share. In addition, the exercise price per share is subject to adjustment for stock dividends, distributions, subdivisions, combinations, or reclassifications, and for certain dilutive issuances. Subject to limited exceptions, a holder of warrants will not have the right to exercise any portion of the warrant to the extent that, after giving effect to the exercise, the holder, together with its affiliates, and any other person acting as a group together with the holder or any of its affiliates, would beneficially own in excess of 4.99% of the number of shares of our common stock outstanding immediately after giving effect to its exercise. The holder may not increase the beneficial ownership limitation provisions of the warrant with our prior consent (which may be withheld in our sole discretion).

Anti-Dilution Protection

If, at any time after the initial exercise date of the warrants until the two (2) year anniversary of the initial exercise date, we sell or grant (or announce any offer to sell or grant) any shares of common stock or common stock equivalents entitling any person to acquire shares of our common Stock at an effective price per share that is lower than the then exercise price (such lower price, the “Base Share Price”), then the exercise price will be reduced to equal the Base Share Price. The Base Share Price may not be less than \$0.16. In addition, no conversion price adjustment will be made in respect of an Exempt Issuance.

Redemption Right

We may redeem the warrants at a price of \$0.01 per underlying share of common stock at any time following the one-year anniversary of issuance if the volume-weighted average price of our common stock is above \$2.10 for ten consecutive trading days, subject to certain conditions and limitations.

Fundamental Transactions

In the event of a fundamental transaction, as described in the warrants and generally including, with certain exceptions, any reorganization, recapitalization or reclassification of our common stock, the sale, transfer or other disposition of all or substantially all of our properties or assets, our consolidation or merger with or into another person, the acquisition of more than 50% of our outstanding common stock, or any person or group becoming the beneficial owner of 50% of the voting power represented by our outstanding common stock, the holders of the warrants will be entitled to receive upon exercise of the warrants the kind and amount of securities, cash or other property that the holders would have received had they exercised the warrants immediately prior to such fundamental transaction. Additionally, as more fully described in the warrant, in the event of certain fundamental transactions, the holders of the warrants will be entitled to receive consideration in an amount equal to the Black Scholes value of the warrants on the date of consummation of such transaction.

Transferability

Subject to applicable laws and restrictions, a holder may transfer a warrant upon surrender of the warrant to us with a completed and signed assignment in the form attached to the warrant. The transferring holder will be responsible for any tax that liability that may arise as a result of the transfer.

Rights as Stockholder

Except as set forth in the warrant, the holder of a warrant, solely in such holder’s capacity as a holder of a warrant, will not be entitled to vote, to receive dividends, or to any of the other rights of our stockholders.

Amendments and Waivers

The provisions of each warrant may be modified or amended or the provisions thereof waived with the written consent of us and the holder.

Anti-Takeover Charter Provisions and Laws

Some features of our certificate of incorporation and amended and restated bylaws and the Delaware General Corporation Law (the “DGCL”), which are further described below, may have the effect of deterring third parties from making takeover bids for control of our company or may be used to hinder or delay a takeover bid.

Limitations on Stockholder Actions

Our certificate of incorporation provides that stockholder action may only be taken at a meeting of the stockholders. Thus, an owner of a majority of the voting power could not take action to replace the board of directors, or any class of directors, without a meeting of the stockholders, nor could he amend the bylaws without presenting the amendment to a meeting of the stockholders. Furthermore, under the provisions of the certificate of incorporation and bylaws, only the board of directors has the power to call a special meeting of stockholders. Therefore, a stockholder, even one who owns a majority of the voting power, may neither replace sitting board of directors members nor amend the bylaws before the next annual meeting of stockholders.

Advance Notice Provisions

Our bylaws establish advance notice procedures for the nomination of candidates for election as directors by stockholders, as well as for other stockholder proposals to be considered at annual meetings. Generally, we must receive a notice of intent to nominate a director or raise any other matter at a stockholder meeting not less than 120 days before the first anniversary of the mailing of our proxy statement for the previous year's annual meeting. The notice must contain required information concerning the person to be nominated or the matters to be brought before the meeting and concerning the stockholder submitting the proposal.

Delaware Law

As a Delaware corporation, we are subject to Section 203 of the DGCL, which provides that a corporation may not engage in any business combination with an interested stockholder during the three years after the stockholder becomes an interested stockholder unless:

- the corporation's board of directors approved in advance either the business combination or the transaction which resulted in the stockholder becoming an interested stockholder;
- the interested stockholder owned at least 85 percent of the corporation's voting stock at the time the transaction commenced; or
- the business combination is approved by the corporation's board of directors and the affirmative vote of at least two-thirds of the voting stock which is not owned by the interested stockholder.

An interested stockholder is anyone who owns 15% or more of a corporation's voting stock, or who is an affiliate or associate of the corporation and was the owner of 15% or more of the corporation's voting stock at any time within the previous three years; and the affiliates and associates of any those persons. Section 203 of the DGCL makes it more difficult for an interested stockholder to implement various business combinations with our company for a three-year period, although our stockholders may vote to exclude it from the law's restrictions.

Classified Board

Our certificate of incorporation and bylaws divide our board of directors into three classes with staggered three-year terms. There are currently four directors. One class is comprised of two directors and a second and third classes are comprised on one director each. At each annual meeting of stockholders, the terms of one class of directors will expire and the newly nominated directors of that class will be elected for a term of three years. The board of directors will be able to determine the total number of directors constituting the full board of directors and the number of directors in each class, but the total number of directors may not exceed nine nor may the number of directors in any class exceed six. No reduction in the total number of directors or in the number of directors in a given class will have the effect of removing a director from office or reducing the term of any then-sitting director. Stockholders may only remove directors for cause. If the board of directors increases the number of directors in a class, it will be able to fill the vacancies created for the full remaining term of a director in that class even though the term may extend beyond the next annual meeting. The directors will also be able to fill any other vacancies for the full remaining term of the director whose death, resignation or removal caused the vacancy.

A person who has a majority of the voting power at a given meeting will not in any one year be able to replace a majority of the directors since only one class of the directors will stand for election in any one year. As a result, at least two annual meeting elections will be required to change the majority of the directors by the requisite vote of stockholders. The purpose of classifying the board of directors is to provide for a continuing body, even in the face of a person who accumulates a sufficient amount of voting power, whether by ownership or proxy or a combination, to have a majority of the voting power at a given meeting and who may seek to take control of our Company without paying a fair premium for control to all of the owners of our common stock. This will allow the board of directors time to negotiate with such a person and to protect the interests of the other stockholders who may constitute a majority of the shares not actually owned by that person. However, it may also have the effect of deterring third parties from making takeover bids for control of our Company or may be used to hinder or delay a takeover bid.

Transfer Agent and Registrar

The transfer agent and registrar for our common stock is Continental Stock Transfer & Trust Company, located in New York, New York.

SELLING STOCKHOLDERS

We have prepared this prospectus to allow the selling stockholders to offer and sell from time to time up to 10,576,923 shares of our common stock issuable upon the conversion of our Series J preferred stock held by them.

On May 22, 2023, we entered into a Stock Purchase Agreement with each selling stockholder (each, a “Purchase Agreement”), pursuant to which we issued and sold to the selling stockholders in a private placement a total of 11,000 shares of Series J preferred stock for an aggregate purchase price of \$1,100,000. Under each Purchase Agreement, we agreed to register for resale by the selling stockholder the shares of the Company’s common stock underlying the Series J preferred stock.

The shares of the Series J preferred stock may not be converted if, as a result of such conversion, the holder would beneficially own more than 4.99% of the total number of shares of common stock outstanding at such time unless the holder of Series J preferred stock obtains our prior written consent (which consent we may withhold in our sole absolute discretion) (the “Series J Beneficial Ownership Limitation”). As a result of the Series J Beneficial Ownership Limitation, the number of shares of common stock that may be issued upon conversion of the shares of Series J preferred stock by the selling stockholder may change depending upon changes in the outstanding shares of our common stock.

The following table sets forth (i) the name of each selling stockholder; (ii) the number of shares of common stock beneficially owned by each of the selling stockholders; (iii) the number of shares of common stock that the selling stockholders may offer under this prospectus; and (iv) the number of shares of common stock beneficially owned by each of the selling stockholders assuming all of the shares covered hereby are sold. We do not know how long the selling stockholders will hold the shares before selling them. We currently have no agreements, arrangements or understandings with the selling stockholders regarding the sale or other disposition of any shares.

The information set forth in the table below is based upon information obtained from the selling stockholders. Beneficial ownership of the selling stockholders is determined in accordance with Rule 13d-3(d) under the Exchange Act. The percentage of shares beneficially owned before and after the offering is based on 100,084,385 shares of our common stock outstanding as of August 23, 2023. Solely for purposes of the table below, the information under the headings “Shares Beneficially Owned Before the Offering” and “Shares Beneficially Owned After the Offering” disregards the Series J Beneficial Ownership Limitation.

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

Name of Selling Stockholder	Shares Beneficially Owned Before the Offering ⁽¹⁾		Number of Shares Being Offered	Shares Beneficially Owned After the Offering ⁽¹⁾	
	Number	Percent		Number	Percent
Irwin Bain ⁽²⁾	4,000,000	3.89%	961,538	3,038,462	2.96%
Donald E. Garlikov ⁽³⁾	9,949,900	9.07%	9,615,385	334,515	*

*Less than 1%

- (1) Solely for purposes of this table, disregards the Series J Beneficial Ownership Limitation described above, and presumes full conversion of the Series J preferred stock.
- (2) Consists of (i) 1,344,062 shares of common stock; (ii) 1,250,000 shares of common stock issuable upon conversion of Series I convertible preferred stock; (iii) 444,400 shares of common stock issuable upon the exercise of warrants; and (iv) 961,538 shares of common stock issuable upon conversion of Series J preferred stock. The number in the column “Number of Shares Being Offered” includes 961,538 shares of common stock issuable upon conversion of Series J preferred stock. The address of Mr. Bain is 185 South Drezel Avenue, Bexley, Ohio 43209.
- (3) Consists of (i) 299,261 shares of common stock; (ii) 9,615,385 shares of common stock issuable upon conversion of Series J preferred stock; (iii) 14,507 shares of common stock held by Donald Garlikov Roth IRA; (iv) 427 shares of common stock held by Edith Garlikov Roth IRA; and (v) 20,320 shares of common stock held by Garlikov Private Foundation. The number in the column “Number of Shares Being Offered” includes 9,615,385 shares of common stock issuable upon conversion of Series J preferred stock. Mr. Garlikov’s address is 41 South High Street, Suite 3400, Columbus, Ohio 43215.

PLAN OF DISTRIBUTION

We are registering the resale of up to 10,576,923 shares of our common stock by the selling stockholders. We will not receive any of the proceeds from the sale by the selling stockholders of the shares of our common stock. The selling stockholders will bear all 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 shares of our common stock to be sold by the selling stockholders pursuant to this prospectus.

The term “selling stockholders” includes donees, pledgees, transferees or other successors in interest selling securities received after the date of this prospectus from a selling securityholder as a gift, pledge, partnership distribution or other transfer. The selling stockholders will act independently of us in making decisions with respect to the timing, manner and size of each sale. Such sales may be made on the principal trading market for our common stock or any other stock exchange, market or trading facility on which our common stock is traded or in private transactions. These sales may be at fixed or negotiated prices. A selling stockholder may use any one or more of the following methods when selling securities:

- ordinary brokerage transactions and transactions in which the broker dealer solicits purchasers;
- block trades in which the broker dealer will attempt to sell the common stock as agent but may position and resell a portion of the block as principal to facilitate the transaction;
- purchases by a broker dealer as principal and resale by the broker dealer for its account;
- an exchange distribution in accordance with the rules of the applicable exchange;
- privately negotiated transactions;
- settlement of short sales entered into after the effective date of the registration statement of which this prospectus is a part;
- distribution to employees, members, limited partners or stockholders of the selling stockholders;
- in transactions through broker dealers that agree with the selling stockholders to sell a specified number of such common stock at a stipulated price per security;
- through the writing or settlement of options or other hedging transactions, whether through an options exchange or otherwise;
- by pledge to secured debts and other obligations;
- delayed delivery arrangements;
- to or through underwriters or broker-dealers;
- in “at the market” offerings, as defined in Rule 415 under the Securities Act, at negotiated prices, at prices prevailing at the time of sale or at prices related to such prevailing market prices, including sales made directly on a national securities exchange or sales made through a market maker other than on an exchange or other similar offerings through sales agents;
- in privately negotiated transactions;
- in options transactions;
- a combination of any such methods of sale; or
- any other method permitted pursuant to applicable law.

The selling stockholders may also sell the shares of our common stock under Rule 144 or any other exemption from registration under the Securities Act, if available, rather than under this prospectus.

In addition, a selling securityholder that is an entity may elect to make a pro rata in-kind distribution of securities to its members, partners or stockholders pursuant to the registration statement of which this prospectus is a part by delivering a prospectus with a plan of distribution. Such members, partners or stockholders would thereby receive freely tradeable securities pursuant to the distribution through a registration statement. To the extent a distributee is our affiliate (or to the extent otherwise required by law), we may, at our option, file a prospectus supplement in order to permit the distributees to use the prospectus to resell the securities acquired in the distribution.

Broker-dealers engaged by the selling stockholders may arrange for other brokers-dealers to participate in sales. Broker-dealers may receive commissions or discounts from the selling stockholders (or, if any broker-dealer acts as agent for the purchaser of our common stock, from the purchaser) in amounts to be negotiated, but, except as set forth in a supplement to this prospectus, in the case of an agency transaction not in excess of a customary brokerage commission in compliance with Financial Industry Regulatory Authority, or FINRA, Rule 5110; and in the case of a principal transaction a markup or markdown in compliance with FINRA Rule 2121.

To the extent required, this prospectus may be amended or supplemented from time to time to describe a specific plan of distribution. 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 our common stock in the course of hedging the positions they assume. The selling stockholders may also sell our common stock short and if such short sale shall take place after the date that this registration statement is declared effective by the SEC, the selling stockholders may deliver these shares of common stock covered by the prospectus to close out their short positions and to return borrowed shares in connection with such short sales. The selling stockholders may also loan or pledge the securities to broker-dealers that in turn may sell these shares, to the extent permitted by applicable law. The selling stockholders may also enter into option or other transactions with broker-dealers or other financial institutions or create one or more derivative securities which require the delivery to such broker-dealer or other financial institution of securities offered by this prospectus, which securities such broker-dealer or other financial institution may resell pursuant to this prospectus (as supplemented or amended to reflect such transaction). Notwithstanding the foregoing, the selling stockholders have been advised that they may not use shares registered on this registration statement to cover short sales of our common stock made prior to the date the registration statement, of which this prospectus forms a part, has been declared effective by the SEC.

The selling stockholders may also pledge securities to a broker-dealer or other financial institution, and, upon a default, such broker-dealer or other financial institution, may effect sales of the pledged securities pursuant to this prospectus (as supplemented or amended to reflect such transaction).

In effecting sales, broker-dealers or agents engaged by the selling stockholders may arrange for other broker-dealers to participate. Broker-dealers or agents may receive commissions, discounts or concessions from the selling stockholders in amounts to be negotiated immediately prior to the sale.

The selling stockholders and any broker-dealers or agents that are involved in selling the securities may be deemed to be “underwriters” within the meaning of the Securities Act in connection with such sales. In such event, any commissions received by such broker-dealers or agents and any profit on the resale of the shares of our common stock purchased by them may be deemed to be underwriting commissions or discounts 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 and may be subject to certain statutory liabilities of, including but not limited to, Sections 11, 12 and 17 of the Securities Act and Rule 10b-5 under the Securities Exchange Act of 1934, as amended, or the Exchange Act. Each selling stockholder has informed us that it does not have any written or oral agreement or understanding, directly or indirectly, with any person to distribute the shares of our common stock. Upon us being notified in writing by a selling stockholder that any material arrangement has been entered into with a broker-dealer for the sale of common stock through a block trade, special offering, exchange distribution or secondary distribution or a purchase by a broker or dealer, a supplement to this prospectus will be filed, if required, pursuant to Rule 424(b) under the Securities Act, disclosing (i) the name of each such selling stockholder and of the participating broker-dealer(s), (ii) the number of shares involved, (iii) the price at which such the shares of common stock were sold, (iv) the commissions paid or discounts or concessions allowed to such broker-dealer(s), where applicable, (v) that such broker-dealer(s) did not conduct any investigation to verify the information set out or incorporated by reference in this prospectus, and (vi) other facts material to the transaction.

The resale securities will be sold only through registered or licensed brokers or dealers if required under applicable state securities laws. In addition, in certain states, the resale securities covered hereby may not be sold unless they have been registered or qualified for sale in the applicable state or an exemption from the registration or qualification requirement is available and is complied with.

There can be no assurance that any selling stockholder will sell any or all of the shares of common stock registered pursuant to the shelf registration statement, of which this prospectus forms a part.

Each selling stockholder 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 of common stock by the selling stockholder and any other participating person. Regulation M may also restrict the ability of any person engaged in the distribution of the shares of common stock to engage in market-making activities with respect to the shares of common stock. All of the foregoing may affect the marketability of the shares of common stock and the ability of any person or entity to engage in market-making activities with respect to the shares of common stock.

We will pay all expenses of the registration of the shares of common stock including, without limitation, SEC filing fees and expenses of compliance with state securities or “blue sky” laws; provided, however, that each selling stockholder will pay all underwriting discounts and selling commissions, if any, and any legal expenses incurred by it.

LEGAL MATTERS

Maslon LLP, Minneapolis, Minnesota, will pass upon validity of the shares of common stock offered by this prospectus.

EXPERTS

The financial statements for the years ended December 31, 2022 and 2021 incorporated in this prospectus by reference to the Annual Report on Form 10-K for the year ended December 31, 2022, have been so incorporated in reliance on the report (which contains an explanatory paragraph relating to substantial doubt about the ability of the Company to continue as a going concern as described in Note 2 to the financial statements) of Marcum LLP, an independent registered public accounting firm, given on the authority of said firm as experts in auditing and accounting.

WHERE YOU CAN FIND MORE INFORMATION

This prospectus is part of the registration statement on Form S-3 we filed with the SEC under the Securities Act and does not contain all the information set forth in the registration statement. Whenever a reference is made in this prospectus to any of our contracts, agreements or other documents, the reference may not be complete and you should refer to the exhibits that are a part of the registration statement or the exhibits to the reports or other documents incorporated by reference into this prospectus for a copy of such contract, agreement or other document. Because we are subject to the information and reporting requirements of the Exchange Act, we file annual, quarterly and current reports, proxy statements and other information with the SEC. Our SEC filings are available to the public over the Internet at the SEC's website at <http://www.sec.gov>. Our website address is <http://www.navidea.com>. Information contained on or accessible through our website is not a part of this prospectus and is not incorporated by reference herein, and the inclusion of our website address in this prospectus is an inactive textual reference only.

INCORPORATION BY REFERENCE

The SEC allows us to “incorporate by reference” information from other documents that we file with it, which means that we can disclose important information to you by referring you to those documents. The information incorporated by reference is considered to be part of this prospectus, and subsequent information that we file with the Commission will automatically update and supersede that information.

We are incorporating by reference the information or documents listed below that we have filed with the SEC (other than current reports furnished under Item 2.02 or Item 7.01 of Form 8-K):

- our annual report on Form 10-K for the year ended December 31, 2022, filed with the SEC on [March 27, 2023](#);
- our quarterly reports on Form 10-Q for the quarter ended March 31, 2023 and June 30, 2023, filed with the SEC on [May 11, 2023](#) and [August 11, 2023](#);
- our current reports on Form 8-K and all amendments thereto, filed with the SEC on [January 10, 2023](#), [March 16, 2023](#), [March 31, 2023](#), [April 13, 2023](#), [April 28, 2023](#), [May 25, 2023](#), [June 5, 2023](#), [June 16, 2023](#), [July 6, 2023](#), [July 13, 2023](#), [July 28, 2023](#) and [August 8, 2023](#); and
- the description of our common stock contained in our registration statement on Form 8-A, filed with the SEC on [February 8, 2011](#), including all amendments and reports filed for the purpose of updating such description.

In addition, all documents subsequently filed by us pursuant to Sections 13(a), 13(c), 14 or 15(d) of the Exchange Act, prior to the termination of the offering shall be deemed to be incorporated by reference into this prospectus, including all such documents we may file with the Commission after the date of the initial registration statement and prior to the effectiveness of the registration statement, but excluding any information deemed furnished and not filed with the Commission.

We will provide to each person, including any beneficial owners, to whom a prospectus is delivered, a copy of any or all of the reports or documents that have been incorporated by reference in the prospectus contained in the registration statement but not delivered with the prospectus. We will provide these reports or documents upon written or oral request at no cost to the requester. You should direct any written requests for documents to Navidea Biopharmaceuticals, Inc., Attention: Chief Financial Officer, 4995 Bradenton Avenue, Suite 240, Dublin, Ohio 43017-3552. You may also telephone us at (614) 793-7500.

You may also access these documents, free of charge, on the Commission’s website at www.sec.gov or on our website at <https://ir.navidea.com/sec-filings>. Except for the specific incorporated documents listed above, the information contained in, or that can be accessed through, our website is not incorporated by reference into this prospectus supplement or the registration statement of which it forms a part.

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 table sets forth the fees and expenses expected to be incurred by us in connection with the issuance and distribution of the securities being registered.

SEC registration fee	\$	93.25
FINRA filing fee		(1)
NYSE American listing fee		(1)
Legal fees and expenses		(1)
Accounting fees		(1)
Printing expenses		(1)
Miscellaneous		(1)
Total	\$	<u>(1)</u>

(1) These fees are calculated based on the securities offered and the number of issuances and accordingly cannot be estimated at this time.

Item 15. Indemnification of Directors and Officers.

Section 102(b)(7) of the Delaware General Corporation Law (“DGCL”) permits a corporation in its certificate of incorporation or an amendment to eliminate or limit the personal liability of its directors or its stockholders for monetary damages for a breach of fiduciary duty as a director, except where the director breached his or her duty of loyalty, failed to act in good faith, engaged in intentional misconduct or knowingly violated a law, authorized the payment of a dividend or approved a stock repurchase in violation of law or obtained an improper personal benefit. Our certificate of incorporation provides for this limitation of liability.

Section 145 of the DGCL provides that a corporation has the power to indemnify a director, officer, employee or agent of the corporation and certain other persons serving at the request of the corporation in related capacities against expenses (including attorneys’ fees), judgments, fines and amounts paid in settlements actually and reasonably incurred by the person in connection with any threatened, pending or completed action, suit or proceeding, whether civil, criminal, administrative or investigative, other than an action by or in the right of the corporation, to which he or she is a party by reason of such position, if such person acted in good faith and in a manner he or she reasonably believed to be in or not opposed to the best interests of the corporation and, with respect to any criminal action or proceeding, had no reasonable cause to believe his or her conduct was unlawful. Section 145 further provides that in the case of actions brought by or in the right of the corporation, no indemnification shall be made with respect to any claim, issue or matter as to which such person shall have been adjudged to be liable to the corporation unless and only to the extent that the Court of Chancery or other adjudicating court determines that, despite the adjudication of liability but in view of all of the circumstances of the case, such person is fairly and reasonably entitled to indemnify for such expenses which the Court of Chancery or such other court shall deem proper.

Section 145(g) of the DGCL further authorizes a corporation to purchase and maintain insurance on behalf of any indemnified person against any liability asserted against and incurred by such person in any indemnified capacity, or arising out of such person’s status as such, regardless of whether the corporation would otherwise have the power to indemnify under Delaware law.

We have entered into indemnification agreements with each of our directors and executive officers. In general, these agreements provide that we will indemnify the director or executive officer to the fullest extent permitted by law for claims arising in his or her capacity as a director or officer or in connection with his or her service at our request for another corporation or entity.

Article Nine, Section (b), of our certificate of incorporation further provides that no director will be personally liable to us or our stockholders for monetary damages or for any breach of fiduciary duty except for breach of the director's duty of loyalty to us or our stockholders, for acts or omissions not in good faith or involving intentional misconduct or a knowing violation of law, pursuant to Section 174 of the Delaware General Corporation Law (which imposes liability in connection with the payment of certain unlawful dividends, stock purchases or redemptions), or any amendment or successor provision thereto, or for any transaction from which a director derived an improper personal benefit.

The indemnification rights set forth above shall not be exclusive of any other right which an indemnified person may have or hereafter acquire under any statute, provision of our certificate of incorporation, our bylaws, agreement, vote of stockholders or disinterested directors or otherwise.

We maintain standard policies of insurance that provide coverage (1) to our directors and officers against loss rising from claims made by reason of breach of duty or other wrongful act and (2) to us with respect to indemnification payments that we may make to such directors and officers.

The foregoing discussion of indemnification summarizes certain aspects of indemnification provisions of, and is limited by reference to, the above discussed sections of the DGCL and our certificate of incorporation.

Item 16. Exhibits.

Exhibit No.	Exhibit Description
3.1	<u>Amended and Restated Certificate of Incorporation of Navidea Biopharmaceuticals, Inc., as corrected February 18, 1994, and amended June 27, 1994, July 25, 1995, June 3, 1996, March 17, 1999, May 9, 2000, June 13, 2003, July 29, 2004, June 22, 2005, November 20, 2006, December 26, 2007, April 30, 2009, July 27, 2009, August 2, 2010, January 5, 2012, June 26, 2013 and August 18, 2016) (incorporated by reference to Exhibit 3.1 to the Company's Annual Report on Form 10-K filed March 31, 2017).</u>
3.2	<u>Certificate of Amendment to Amended and Restated Certificate of Incorporation of Navidea Biopharmaceuticals, Inc. (incorporated by reference to Exhibit 3.1 to the Company's Current Report on Form 8-K filed April 26, 2019).</u>
3.3	<u>Second Amended and Restated By-Laws dated July 21, 1993, as amended July 18, 1995, May 30, 1996, July 26, 2007, November 7, 2013, April 2, 2021 and September 26, 2022 (incorporated by reference to Exhibit 3.1 to the Company's Current Report on Form 8-K filed September 30, 2022).</u>
4.1	<u>Form of Common Stock Certificate (incorporated by reference to Exhibit 4.3 to the Company's Registration Statement on Form S-3 filed December 31, 2019).</u>
4.2	<u>Registration Rights Agreement, dated December 6, 2019, among Navidea Biopharmaceuticals, Inc. and the stockholders named therein (incorporated by reference to Exhibit 10.1 to the Company's Current Report on Form 8-K filed December 11, 2019).</u>
4.3	<u>Form of Underwriter Warrants (incorporated by reference to Exhibit 4.1 to the Company's Current Report on Form 8-K filed June 17, 2019).</u>
4.4	<u>Registration Rights Agreement, dated February 13, 2020, by and between Navidea Biopharmaceuticals, Inc. and John K. Scott, Jr. (incorporated by reference to Exhibit 4.5 to the Company's Registration Statement on Form S-3 filed August 25, 2020).</u>

- 4.5 [Registration Rights Agreement, dated March 2, 2021, by and between Navidea Biopharmaceuticals, Inc. and John K. Scott, Jr. \(incorporated by reference to Exhibit 10.2 to the Company's Current Report on Form 8-K filed March 4, 2021\).](#)
- 4.6 [Certificate of Designation of Series H Junior Participating Preferred Stock of Navidea Biopharmaceuticals, Inc. \(incorporated by reference to Exhibit 3.1 to the Company's Current Report on Form 8-K filed April 12, 2022\).](#)
- 4.7 [Certificate of Designations of Voting Powers, Preferences, Limitations, Restrictions and Relative Rights of Series G Redeemable Preferred Stock of Navidea Biopharmaceuticals, Inc. \(incorporated by reference to Exhibit 3.3 to the Company's Current Report on Form 8-K filed April 12, 2022\).](#)
- 4.8 [Section 382 Rights Agreement, dated as of April 7, 2022, between Navidea Biopharmaceuticals, Inc. and Continental Stock Transfer & Trust Company, LLC, as Rights Agent \(incorporated by reference to Exhibit 4.1 to the Company's Current Report on Form 8-K filed April 12, 2022\).](#)
- 4.9 [Registration Rights Agreement effective as of April 10, 2022 by and between Navidea Biopharmaceuticals, Inc. and John K. Scott, Jr. \(incorporated by reference to Exhibit 10.4 to the Company's Current Report on Form 8-K filed April 12, 2022\).](#)
- 4.10 [Certificate of Designation of Preferences, Rights and Limitations of Series I Convertible Preferred Stock of Navidea Biopharmaceuticals, Inc. *](#)
- 4.11 [Form of Warrant to Purchase Common Stock \(incorporated by reference to Exhibit 4.19 to the Company's Pre-Effective Amendment No. 3 to Form S-1 Registration Statement filed August 2, 2022\).](#)
- 4.12 [Form of Warrant Agency Agreement between Navidea Biopharmaceuticals, Inc. and Continental Stock Transfer & Trust Company, LLC \(incorporated by reference to Exhibit 4.20 to the Company's Pre-Effective Amendment No. 3 to Form S-1 Registration Statement filed August 2, 2022\).](#)
- 4.13 [First Amendment to Section 382 Rights Agreement, dated as of January 10, 2023, between Navidea Biopharmaceuticals, Inc. and Continental Stock Transfer & Trust Company, LLC, as Rights Agent \(incorporated by reference to Exhibit 4.1 to the Company's Current Report on Form 8-K filed January 10, 2023\).](#)
- 5.1 [Opinion of Maslon LLP *](#)
- 23.1 [Consent of Marcum LLP *](#)
- 23.2 [Consent of Maslon LLP \(included in Exhibit 5.1\)*](#)
- 24.1 [Power of Attorney \(included on the signature page to this registration statement\) *](#)
- 107 [Calculation of Filing Fees *](#)

* Filed herewith

Item 17. Undertakings.

The undersigned registrant hereby undertakes:

- (1) To file, during any period in which offers or sales are being made, a post-effective amendment to this registration statement:
 - (i) To include any prospectus required by Section 10(a)(3) of the Securities Act of 1933, as amended (the "Securities Act");
 - (ii) To reflect in the prospectus any facts or events arising after the effective date of the registration statement (or the most recent post-effective amendment thereof) which, individually or in the aggregate, represent a fundamental change in the information set forth in the registration statement. Notwithstanding the foregoing, any increase or decrease in volume of securities offered (if the total dollar value of securities offered would not exceed that which was registered) and any deviation from the low or high end of the estimated maximum offering range may be reflected in the form of prospectus filed with the SEC pursuant to Rule 424(b) if, in the aggregate, the changes in volume and price represent no more than a 20% change in the maximum aggregate offering price set forth in the "Calculation of Registration Fee" table in the effective registration statement; and
 - (iii) To include any material information with respect to the plan of distribution not previously disclosed in the registration statement or any material change to such information in the registration statement.

provided, however, that paragraphs (i), (ii) and (iii) above do not apply if the information required to be included in a post-effective amendment by those paragraphs is contained in periodic reports filed with or furnished to the SEC by the registrant pursuant to Section 13 or Section 15(d) of the Securities Exchange Act of 1934, as amended (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 a part of the registration statement;
- (2) That, for the purpose of determining any liability under the Securities Act, each such post-effective amendment shall be deemed to be a new registration statement relating to the securities offered therein, and the offering of such securities at that time shall be deemed to be the initial bona fide offering thereof.
- (3) To remove from registration by means of a post-effective amendment any of the securities being registered which remain unsold at the termination of the offering.
- (4) That, for the purpose of determining liability under the Securities Act to any purchaser:
 - (i) Each prospectus filed by the registrant pursuant to Rule 424(b)(3) shall be deemed to be part of the registration statement as of the date the filed prospectus was deemed part of and included in the registration statement; and
 - (ii) Each prospectus required to be filed pursuant to Rule 424(b)(2), (b)(5), or (b)(7) as part of a registration statement in reliance on Rule 430B relating to an offering made pursuant to Rule 415(a)(1)(i), (vii), or (x) for the purpose of providing the information required by Section 10(a) of the Securities Act shall be deemed to be part of and included in the registration statement as of the earlier of the date such form of prospectus is first used after effectiveness or the date of the first contract of sale of securities in the offering described in the prospectus. As provided in Rule 430B, for liability purposes of the issuer and any person that is at that date an underwriter, such date shall be deemed to be a new effective date of the registration statement relating to the securities in the registration statement to which that prospectus relates, and the offering of such securities at that time shall be deemed to be the initial bona fide offering thereof. *Provided, however,* that no statement made in a registration statement or prospectus that is part of the registration statement or made in a document incorporated or deemed incorporated by reference into the registration statement or prospectus that is part of the registration statement will, as to a purchaser with a time of contract of sale prior to such effective date, supersede or modify any statement that was made in the registration statement or prospectus that was part of the registration statement or made in any such document immediately prior to such effective date.

- (5) That, for the purpose of determining liability of the registrant under the Securities Act to any purchaser in the initial distribution of the securities, the undersigned registrant undertakes that in a primary offering of securities of the undersigned registrant pursuant to this registration statement, regardless of the underwriting method used to sell the securities to the purchaser, if the securities are offered or sold to such purchaser by means of any of the following communications, the undersigned registrant will be a seller to the purchaser and will be considered to offer or sell such securities to such purchaser: (i) any preliminary prospectus or prospectus of the undersigned registrant relating to the offering required to be filed pursuant to Rule 424; (ii) any free writing prospectus relating to the offering prepared by or on behalf of the undersigned registrant or used or referred to by the undersigned registrant; (iii) the portion of any other free writing prospectus relating to the offering containing material information about the undersigned registrant or its securities provided by or on behalf of the undersigned registrant; and (iv) any other communication that is an offer in the offering made by the undersigned registrant to the purchaser.
- (6) That, for the purpose 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.

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

SIGNATURES

Pursuant to the requirements of the Securities Act, the registrant certifies that it has reasonable grounds to believe that it meets all of the requirements for filing this registration statement 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 Dublin, State of Ohio, on August 28, 2023.

NAVIDEA BIOPHARMACEUTICALS, INC.

/s/ Craig A. Dais

Name: Craig A. Dais

Title: Chief Financial Officer

POWER OF ATTORNEY

Each person whose signature appears below constitutes and appoints Joshua Wilson and Craig A. Dais as true and lawful attorney-in-fact and agent, with full power of substitution and re-substitution, for and in his or her name, place and stead, in any and all capacities, to sign any and all amendments (including pre-effective and post-effective amendments) to this registration statement, and to sign any registration statement for the same offering covered by this registration statement, and to file the same, with all exhibits thereto, and other documents in connection therewith, with the U.S. Securities and Exchange Commission, and generally to do all such things in his name and behalf in his or her capacities as officer to enable Navidea Biopharmaceuticals, Inc. to comply with the provisions of the Securities Act of 1933, as amended, and all requirements of the Securities and Exchange Commission, granting unto said attorney-in-fact and agent, full power and authority to do and perform each and every act and thing requisite and necessary to be done in connection therewith, as fully to all intents and purposes as he might or could do in person, ratifying and confirming all that said attorneys-in-fact and agents, or his or her substitutes or substitute, 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/ John K. Scott, Jr.</u> John K. Scott, Jr.	Vice Chair, Director <i>(Principal Executive Officer)</i>	August 28, 2023
<u>/s/ Craig A. Dais</u> Craig A. Dais	Chief Financial Officer <i>(Principal Financial Officer and Principal Accounting Officer)</i>	August 28, 2023
<u>/s/ Dana Moss, JD</u> Dana Moss, JD	Director	August 28, 2023
<u>/s/ Jill Bieker Stefanelli, Ph.D.</u> Jill Bieker Stefanelli, Ph.D.	Director	August 28, 2023
<u>/s/ Joshua Wilson</u>	Director	August 28, 2023

**CERTIFICATE OF DESIGNATION OF PREFERENCES, RIGHTS AND LIMITATIONS
OF SERIES I CONVERTIBLE PREFERRED STOCK OF
NAVIDEA BIOPHARMACEUTICALS, INC.**

Pursuant to Section 151 of the General Corporation Law of the State of Delaware, Navidea Biopharmaceuticals, Inc., a corporation organized and existing under the General Corporation Law of the state of Delaware (the "Corporation"), does hereby submit the following:

WHEREAS, the Amended and Restated Certificate of Incorporation, as amended, of the Corporation (the "Certificate of Incorporation") authorizes the issuance of up to 5,000,000 shares of preferred stock, par value \$0.001 per share, of the Corporation ("Preferred Stock") in one or more series, and expressly authorizes the Board of Directors of the Corporation (the "Board"), subject to limitations prescribed by law, to provide, out of the unissued shares of Preferred Stock, for series of Preferred Stock, and, with respect to each such series, to establish and fix the number of shares to be included in any series of Preferred Stock and the designation, rights, preferences, powers, restrictions, and limitations of the shares of such series; and

WHEREAS, it is the desire of the Board to establish and fix the number of shares to be included in a new series of Preferred Stock and the designation, rights, preferences, and limitations of the shares of such new series.

NOW, THEREFORE, BE IT RESOLVED, that the Board does hereby provide for the issue of a series of Preferred Stock and does hereby in this Certificate of Designation (the "Certificate of Designation") establish and fix and herein state and express the designation, rights, preferences, powers, restrictions, and limitations of such series of Preferred Stock as follows:

Section 1. Definitions.

For the purposes hereof, the following terms shall have the following meanings:

"Affiliate" means any Person that, directly or indirectly through one or more intermediaries, controls or is controlled by or is under common control with a Person, as such terms are used in and construed under Rule 405 of the Securities Act.

"Alternate Consideration" shall have the meaning set forth in Section 7(d).

"Beneficial Ownership Limitation" shall have the meaning set forth in Section 6(d).

"Board" shall have the meaning set forth in the Recitals.

"Business Day" means any day other than Saturday, Sunday or other day on which commercial banks in The City of New York are authorized or required by law to remain closed; provided, however, for clarification, commercial banks shall not be deemed to be authorized or required by law to remain closed due to "stay at home", "shelter-in-place", "non-essential employee" or any other similar orders or restrictions or the closure of any physical branch locations at the direction of any governmental authority so long as the electronic funds transfer systems (including for wire transfers) of commercial banks in The City of New York are generally are open for use by customers on such day.

“Commission” means the United States Securities and Exchange Commission.

“Common Stock” means the Corporation’s common stock, par value \$0.001 per share, and stock of any other class of securities into which such securities may hereafter be reclassified or changed.

“Common Stock Equivalents” means any securities of the Corporation or the Subsidiaries which would entitle the holder thereof to acquire at any time Common Stock, including, without limitation, any debt, preferred stock, rights, options, warrants or other instrument that is at any time convertible into or exercisable or exchangeable for, or otherwise entitles the holder thereof to receive, Common Stock.

“Conversion Amount” means the sum of the Stated Value at issue.

“Conversion Date” shall have the meaning set forth in Section 6(a).

“Conversion Price” shall have the meaning set forth in Section 6(b).

“Conversion Shares” means, collectively, the shares of Common Stock issuable upon conversion of the shares of Series I Preferred Stock in accordance with the terms hereof.

“Dealer Manager Agreement” means the dealer manager agreement, dated August 4, 2022, by and between the Corporation and Maxim Group LLC.

“Exchange Act” means the Securities Exchange Act of 1934, as amended, and the rules and regulations promulgated thereunder.

“Exchange Agent” means Continental Stock Transfer & Trust Company, LLC.

“Exempt Issuance” means the sale or issuance of (i) shares of Common Stock or options issued to employees or directors of the Company pursuant to a plan, agreement or arrangement approved by the Board of Directors; (ii) securities exercisable or exchangeable for or convertible into shares of Common Stock issued and outstanding on the date of this Certificate of Designations, provided that such securities have not been amended since the date of this Certificate of Designations to increase the number of such securities or to decrease the exercise price, exchange price or conversion price of such securities (other than in connection with stock splits or combinations) or to extend the term of such securities; (iii) shares of Common Stock, options or convertible securities issued as acquisition consideration pursuant to the acquisition of another entity by the Company by merger, purchase of substantially all of the assets or other reorganization or to a joint venture agreement, provided that such issuances are approved by the Board of Directors provided that such securities are issued as “restricted securities” (as defined in Rule 144) and carry no registration rights that require or permit the filing of any registration statement in connection therewith until the 180th day after the date of this Certificate of Designations, and provided that any such issuance shall only be to a Person (or to the equity holders of a Person) which is, itself or through its subsidiaries, an operating company or an owner of an asset in a business synergistic with the business of the Company and shall provide to the Company additional benefits in addition to the investment of funds, but shall not include a transaction in which the Company is issuing securities primarily for the purpose of raising capital or to an entity whose primary business is investing in securities; (iv) shares of Common Stock, options or convertible securities issued in connection with sponsored research, collaboration, technology license, development, OEM, marketing or other similar agreements or strategic partnerships approved by the Board of Directors provided that such securities are issued as “restricted securities” (as defined in Rule 144) and carry no registration rights that require or permit the filing of any registration statement in connection therewith until the 180th day after the date of this Certificate of Designations, and provided that any such issuance shall not include a transaction in which the Company is issuing securities primarily for the purpose of raising capital or to an entity whose primary business is investing in securities; and (v) shares of Common Stock issued in connection with the issuance of bona fide commercial bank debt or equipment lease transactions, provided that such issuances are approved by the Board of Directors provided that such securities are issued as “restricted securities” (as defined in Rule 144) and carry no registration rights that require or permit the filing of any registration statement in connection therewith until the 180th day after the date of this Certificate of Designations.

“Fundamental Transaction” shall have the meaning set forth in Section 7(d).

“Holder” shall mean each of the holders of the Series I Preferred Stock.

“Liquidation” shall have the meaning set forth in Section 5.

“Notice of Conversion” shall have the meaning set forth in Section 6(a).

“Original Issue Date” means the date of the first issuance of any shares of the Series I Preferred Stock regardless of the number of transfers of any particular shares of Series I Preferred Stock and regardless of the number of certificates which may be issued to evidence such Series I Preferred Stock.

“Person” means an individual or corporation, partnership, trust, incorporated or unincorporated association, joint venture, limited liability company, joint stock company, government (or an agency or subdivision thereof) or other entity of any kind.

“Preferred Stock” has the meaning set forth in the Recitals.

“Securities Act” means the Securities Act of 1933, as amended, and the rules and regulations promulgated thereunder.

“Series I Preferred Stock” shall have the meaning set forth in Section 2.

“Share Delivery Date” shall have the meaning set forth in Section 6(c).

“Stated Value” shall have the meaning set forth in Section 2.

“Subscription Rights Certificate” shall mean, as to each Holder, the subscription rights certificate completed by such Holder and countersigned by Broadridge.

“Subsidiary” means any direct or indirect subsidiary of the Corporation.

“Successor Entity” shall have the meaning set forth in Section 7(d).

“Trading Day” means a day on which the principal Trading Market is open for business.

“Trading Market” means any of the following markets or exchanges on which the Common Stock is listed or quoted for trading on the date in question: the NYSE American, the Nasdaq Capital Market, the Nasdaq Global Market, the Nasdaq Global Select Market, or the New York Stock Exchange (or any successors to any of the foregoing).

“Transaction Documents” means this Certificate of Designation, the Dealer Manager Agreement, the Warrant Agreement, the Warrants, all exhibits and schedules thereto and hereto and any other documents or agreements executed in connection with the transactions contemplated therein.

“Transfer Agent” means Continental Stock Transfer & Trust Company, LLC and a facsimile number of (212) 616-7615 and any successor transfer agent of the Corporation.

“Warrant Agreement” means the warrant agency agreement, dated on or about August 29, 2022, between the Corporation and the Transfer Agent.

“Warrants” means, collectively, the Common Stock purchase warrants delivered to the Holders at the closing in accordance with the Warrant Agreement, which Warrants shall be exercisable immediately and have a term of exercise equal to five (5) years, in the form of Exhibit A attached to the Warrant Agreement.

Section 2. Designation, Amount and Par Value.

The series of preferred stock shall be designated as its Series I Convertible Preferred Stock (the “Series I Preferred Stock”) and the number of shares so designated shall be up to 35,000 (which shall not be subject to increase without the written consent of a majority of the holders of the Series I Preferred Stock then outstanding). Each share of Series I Preferred Stock shall have a par value of \$0.001 per share and a stated value equal to \$1,000 (the “Stated Value”). The shares of Series I Preferred Stock shall initially be issued and maintained in the form of securities held in book-entry form and the Depository Trust Company or its nominee (“DTC”) shall initially be the sole registered holder of the shares of Series I Preferred Stock.

Section 3. Dividends.

Except for stock dividends or distributions for which adjustments are to be made pursuant to Section 7, the Holders shall be entitled to receive, and the Corporation shall pay, dividends on shares of Series I Preferred Stock equal (on an as-if-converted-to-Common-Stock basis, disregarding for such purposes any conversion limitations hereunder) to and in the same form as dividends actually paid on shares of the Common Stock when, as and if such dividends are paid on shares of the Common Stock. No other dividends shall be paid on shares of Series I Preferred Stock, subject to and in accordance with Section 7 below. The Corporation shall not pay any dividends on the Common Stock unless the Corporation simultaneously complies with this provision.

Section 4. Voting Rights.

Except as otherwise provided herein or as otherwise required by law, the Preferred Stock shall have no voting rights. However, as long as any shares of Series I Preferred Stock are outstanding, the Corporation shall not, without the affirmative vote of the Holders of a majority of the then outstanding shares of the Series I Preferred Stock, (a) alter or change adversely the powers, preferences or rights given to the Series I Preferred Stock or alter or amend this Certificate of Designation, (b) amend its certificate of incorporation or other charter documents in any manner that adversely affects any rights of the Holders disproportionately to the rights of holders of other capital stock of the Corporation, (c) increase the number of authorized shares of Series I Preferred Stock, or (d) enter into any agreement with respect to any of the foregoing.

Section 5. Liquidation.

Upon any liquidation, dissolution or winding-up of the Corporation, whether voluntary or involuntary (a “Liquidation”), the Holders shall be entitled to receive out of the assets, whether capital or surplus, of the Corporation the same amount that a holder of Common Stock would receive if the Series I Preferred Stock were fully converted (disregarding for such purpose any conversion limitations hereunder) to Common Stock which amounts shall be paid pari passu with all holders of Common Stock. For the avoidance of any doubt, a Fundamental Transaction shall not be deemed a Liquidation. The Corporation shall mail written notice of any such Liquidation, not less than 45 days prior to the payment date stated therein, to each Holder.

Section 6. Conversion.

a. Conversion at Option of Holder

i. Each share of Series I Preferred Stock shall be convertible, at any time and from time to time from and after the Original Issue Date, at the option of the Holder thereof, into that number of shares of Common Stock (subject to the limitations set forth in Section 6(d)) determined by dividing the Stated Value of such share of Series I Preferred Stock by the Conversion Price. Holders shall effect conversions by providing the Corporation with the form of conversion notice attached hereto as Annex A (a “Notice of Conversion”). Each Notice of Conversion shall specify the number of shares of Series I Preferred Stock to be converted, the number of shares of Series I Preferred Stock owned prior to the conversion at issue, the number of shares of Series I Preferred Stock owned subsequent to the conversion at issue and the date on which such conversion is to be effected, which day may not be prior to the date the applicable Holder delivers by facsimile or email such Notice of Conversion to the Corporation (such date or the date the Corporation effects an option conversion, the “Conversion Date”). The Conversion Date for a holder whose interest in the shares of Series I Preferred Stock is a beneficial interest in certificate(s) representing the shares of Series I Preferred Stock held in book-entry form through DTC (or another established clearing corporation performing similar functions), shall be the date that DTC (or another established clearing corporation performing similar functions) provides such Notice of Conversion to the Corporation and its Exchange Agent.

ii. Upon delivery of the Notice of Conversion, the Holder shall be deemed for all corporate purposes to have become the holder of record of the Conversion Shares with respect to which the shares of Series I Preferred Stock have been converted irrespective of the date of delivery of the Conversion Shares, provided that the Holder shall deliver such converted shares of Series I Preferred Stock to the Transfer Agent via the DTC’s Deposit/Withdrawal at Custodian system within two Trading Days of delivery of the Notice of Conversion. If no Conversion date is specified in a Notice of Conversion, the Conversion Date shall be the date that such Notice of Conversion to the Corporation is deemed delivered hereunder. No ink-original Notice of Conversion shall be required, nor shall any medallion guarantee (or other type of guarantee or notarization) of any Notice of Conversion form be required. The calculations and entries set forth in the Notice of Conversion shall control in the absence of manifest or mathematical error. To effect conversions of shares of Series I Preferred Stock, a Holder shall not be required to surrender the certificate(s) representing the shares of Series I Preferred Stock to the Corporation unless all of the shares of Series I Preferred Stock represented thereby are so converted, in which case such Holder shall deliver the certificate representing such shares of Series I Preferred Stock promptly following the Conversion Date at issue. Shares of Series I Preferred Stock converted into Common Stock or redeemed in accordance with the terms hereof shall be canceled and shall not be reissued. Notwithstanding anything herein to the contrary, with respect to any conversion at the option of the Corporation hereunder, the Corporation shall exercise such option to convert shares of Series I Preferred Stock on a pro rata basis among Holders based on such Holders’ shares of Series I Preferred Stock. Notwithstanding the foregoing, with respect to any Notice(s) of Conversion delivered by 12:00 p.m. (New York City time) on the Original issue Date, the Corporation agrees to deliver the Conversion Shares subject to such notice(s) by 4:00 p.m. (New York City time) on the Original Issue Date.

iii. Without limiting the rights and remedies of a holder of Series I Preferred Stock hereunder and without limiting the right of a Holder to deliver a Notice of Conversion to the Corporation, a holder whose interest in the shares of Series I Preferred Stock is a beneficial interest in certificate(s) representing the shares of Series I Preferred Stock held in book-entry form through DTC (or another established clearing corporation performing similar functions), shall effect conversions made pursuant to this Section 6(a) by delivering to DTC (or such other clearing corporation, as applicable) the appropriate instruction form for conversion, complying with the procedures to effect conversions that are required by DTC (or such other clearing corporation, as applicable).

b. Conversion Price. The conversion price for the Series I Preferred Stock shall equal \$0.45, subject to adjustment herein (the "Conversion Price").

c. Mechanics of Conversion.

i. Delivery of Conversion Shares Upon Conversion. Not later than the earlier of (y) two (2) Trading Days after each Conversion Date and (z) the number of Trading Days comprising the Standard Settlement Period (as defined below) (the "Share Delivery Date"), the Corporation shall deliver, or cause to be delivered, to the converting Holder the number of Conversion Shares being acquired upon the conversion of the Series I Preferred Stock, which Conversion Shares shall be free of restrictive legends and trading restrictions. The Corporation shall deliver the Conversion Shares electronically through the Depository Trust Company or another established clearing corporation performing similar functions. As used herein, "Standard Settlement Period" means the standard settlement period, expressed in a number of Trading Days, on the Corporation's primary Trading Market with respect to the Common Stock as in effect on the date of delivery of the Notice of Conversion.

ii. Failure to Deliver Conversion Shares. If, in the case of any Notice of Conversion, such Conversion Shares are not delivered to or as directed by the applicable Holder by the Share Delivery Date, the Holder shall be entitled to elect by written notice to the Corporation at any time on or before its receipt of such Conversion Shares, to rescind such Conversion, in which event the Corporation shall promptly return to the Holder any original Series I Preferred Stock certificate delivered to the Corporation and the Holder shall promptly return to the Corporation the Conversion Shares issued to such Holder pursuant to the rescinded Notice of Conversion.

iii. Obligation Absolute; Partial Liquidated Damages. The Corporation's obligation to issue and deliver the Conversion Shares upon conversion of Series I Preferred Stock in accordance with the terms hereof are absolute and unconditional, irrespective of any action or inaction by a Holder to enforce the same, any waiver or consent with respect to any provision hereof, the recovery of any judgment against any Person or any action to enforce the same, or any setoff, counterclaim, recoupment, limitation or termination, or any breach or alleged breach by such Holder or any other Person of any obligation to the Corporation or any violation or alleged violation of law by such Holder or any other person, and irrespective of any other circumstance which might otherwise limit such obligation of the Corporation to such Holder in connection with the issuance of such Conversion Shares; provided, however, that such delivery shall not operate as a waiver by the Corporation of any such action that the Corporation may have against such Holder. In the event a Holder shall elect to convert any or all of the Stated Value of its Preferred Stock, the Corporation may not refuse conversion based on any claim that such Holder or any one associated or affiliated with such Holder has been engaged in any violation of law, agreement or for any other reason, unless an injunction from a court, on notice to Holder, restraining and/or enjoining conversion of all or part of the Preferred Stock of such Holder shall have been sought and obtained, and the Corporation posts a surety bond for the benefit of such Holder in the amount of 150% of the Stated Value of Preferred Stock which is subject to the injunction, which bond shall remain in effect until the completion of arbitration/litigation of the underlying dispute and the proceeds of which shall be payable to such Holder to the extent it obtains judgment. In the absence of such injunction, the Corporation shall issue Conversion Shares and, if applicable, cash, upon a properly noticed conversion. If the Corporation fails to deliver to a Holder such Conversion Shares pursuant to Section 6(c)(i) by the Share Delivery Date applicable to such conversion, the Corporation shall pay to such Holder, in cash, as liquidated damages and not as a penalty, for each \$5,000 of Stated Value of Preferred Stock being converted, \$50 per Trading Day (increasing to \$100 per Trading Day on the third Trading Day and increasing to \$200 per Trading Day on the sixth Trading Day after the Share Delivery Date) for each Trading Day after the Share Delivery Date until such Conversion Shares are delivered or Holder rescinds such conversion. Nothing herein shall limit a Holder's right to pursue actual damages for the Corporation's failure to deliver Conversion Shares within the period specified herein and such Holder shall have the right to pursue all remedies available to it hereunder, at law or in equity including, without limitation, a decree of specific performance and/or injunctive relief. The exercise of any such rights shall not prohibit a Holder from seeking to enforce damages pursuant to any other Section hereof or under applicable law.

i. Compensation for Buy-In on Failure to Timely Deliver Conversion Shares Upon Conversion. In addition to any other rights available to the Holder, if the Corporation fails for any reason to deliver to a Holder the applicable Conversion Shares by the Share Delivery Date pursuant to Section 6(c) (i), and if after such Share Delivery Date such Holder is required by its brokerage firm to purchase (in an open market transaction or otherwise), or the Holder's brokerage firm otherwise purchases, shares of Common Stock to deliver in satisfaction of a sale by such Holder of the Conversion Shares which such Holder was entitled to receive upon the conversion relating to such Share Delivery Date (a "Buy-In"), then the Corporation shall (A) pay in cash to such Holder (in addition to any other remedies available to or elected by such Holder) the amount, if any, by which (x) such Holder's total purchase price (including any brokerage commissions) for the Common Stock so purchased exceeds (y) the product of (1) the aggregate number of shares of Common Stock that such Holder was entitled to receive from the conversion at issue multiplied by (2) the actual sale price at which the sell order giving rise to such purchase obligation was executed (including any brokerage commissions) and (B) at the option of such Holder, either reissue (if surrendered) the shares of Preferred Stock equal to the number of shares of Preferred Stock submitted for conversion (in which case, such conversion shall be deemed rescinded) or deliver to such Holder the number of shares of Common Stock that would have been issued if the Corporation had timely complied with its delivery requirements under Section 6(c)(i). For example, if a Holder purchases shares of Common Stock having a total purchase price of \$11,000 to cover a Buy-In with respect to an attempted conversion of shares of Preferred Stock with respect to which the actual sale price of the Conversion Shares (including any brokerage commissions) giving rise to such purchase obligation was a total of \$10,000 under clause (A) of the immediately preceding sentence, the Corporation shall be required to pay such Holder \$1,000. The Holder shall provide the Corporation written notice indicating the amounts payable to such Holder in respect of the Buy-In and, upon request of the Corporation, evidence of the amount of such loss. Nothing herein shall limit a Holder's right to pursue any other remedies available to it hereunder, at law or in equity including, without limitation, a decree of specific performance and/or injunctive relief with respect to the Corporation's failure to timely deliver the Conversion Shares upon conversion of the shares of Preferred Stock as required pursuant to the terms hereof.

i v. Reservation of Shares issuable Upon Conversion. The Corporation covenants that it will at all times reserve and keep available out of its authorized and unissued shares of Common Stock for the sole purpose of issuance upon conversion of the Series I Preferred Stock, each as herein provided, free from preemptive rights or any other actual contingent purchase rights of Persons other than the Holder (and the other holders of the Series I Preferred Stock), not less than such aggregate number of shares of the Common Stock as shall be issuable (taking into account the adjustments and restrictions of Section 7) upon the conversion of the then outstanding shares of Series I Preferred Stock. The Corporation covenants that all shares of Common Stock that shall be so issuable shall, upon issue, be duly authorized, validly issued, fully paid and nonassessable.

v . Fractional Shares. No fractional shares or scrip representing fractional shares shall be issued upon the conversion of the Series I Preferred Stock. As to any fraction of a share which the Holder would otherwise be entitled to purchase upon such conversion, the Corporation shall at its election, either pay a cash adjustment in respect of such final fraction in an amount equal to such fraction multiplied by the Conversion Price or round up to the next whole share. Notwithstanding anything to the contrary contained herein, but consistent with the provisions of this subsection with respect to fractional Conversion Shares, nothing shall prevent any Holder from converting fractional shares of Series I Preferred Stock.

vi. Transfer Taxes and Expenses. The issuance of Conversion Shares on conversion of this Series I Preferred Stock shall be made without charge to any Holder for any documentary stamp or similar taxes that may be payable in respect of the issue or delivery of such Conversion Shares, provided that the Corporation shall not be required to pay any tax that may be payable in respect of any transfer involved in the issuance and delivery of any such Conversion Shares upon conversion in a name other than that of the Holders of such shares of Series I Preferred Stock and the Corporation shall not be required to issue or deliver such Conversion Shares unless or until the Person or Persons requesting the issuance thereof shall have paid to the Corporation the amount of such tax or shall have established to the satisfaction of the Corporation that such tax has been paid. The Corporation shall pay all Transfer Agent fees required for same-day processing of any Notice of Conversion and all fees to the Depository Trust Company (or another established clearing corporation performing similar functions) required for same-day electronic delivery of the Conversion Shares.

d . Beneficial Ownership Limitation. The Corporation shall not effect any conversion of the Series I Preferred Stock, and a Holder shall not have the right to convert any portion of the Series I Preferred Stock, to the extent that, after giving effect to the conversion set forth on the applicable Notice of Conversion, such Holder (together with such Holder's Affiliates, and any Persons acting as a group together with such Holder or any of such Holder's Affiliates (such Persons, "Attribution Parties")) would beneficially own in excess of the Beneficial Ownership Limitation (as defined below). For purposes of the foregoing sentence, the number of shares of Common Stock beneficially owned by such Holder and its Affiliates and Attribution Parties shall include the number of shares of Common Stock issuable upon conversion of the Series I Preferred Stock with respect to which such determination is being made, but shall exclude the number of shares of Common Stock which are issuable upon (i) conversion of the remaining, unconverted Stated Value of Series I Preferred Stock beneficially owned by such Holder or any of its Affiliates or Attribution Parties and (ii) exercise or conversion of the unexercised or unconverted portion of any other securities of the Corporation subject to a limitation on conversion or exercise analogous to the limitation contained herein (including, without limitation, the Series I Preferred Stock or the Warrants) beneficially owned by such Holder or any of its Affiliates or Attribution Parties. Except as set forth in the preceding sentence, for purposes of this Section 6(d), beneficial ownership shall be calculated in accordance with Section 13(d) of the Exchange Act and the rules and regulations promulgated thereunder. To the extent that the limitation contained in this Section 6(d) applies, the determination of whether the Series I Preferred Stock is convertible (in relation to other securities owned by such Holder together with any Affiliates and Attribution Parties) and of how many shares of Series I Preferred Stock are convertible shall be in the sole discretion of such Holder, and the submission of a Notice of Conversion shall be deemed to be such Holder's determination of whether the shares of Series I Preferred Stock may be converted (in relation to other securities owned by such Holder together with any Affiliates and Attribution Parties) and how many shares of the Series I Preferred Stock are convertible, in each case subject to the Beneficial Ownership Limitation. To ensure compliance with this restriction, each Holder will be deemed to represent to the Corporation each time it delivers a Notice of Conversion that such Notice of Conversion has not violated the restrictions set forth in this paragraph and the Corporation shall have no obligation to verify or confirm the accuracy of such determination. In addition, a determination as to any group status as contemplated above shall be determined in accordance with Section 13(d) of the Exchange Act and the rules and regulations promulgated thereunder. For purposes of this Section 6(d), in determining the number of outstanding shares of Common Stock, a Holder may rely on the number of outstanding shares of Common Stock as stated in the most recent of the following: (i) the Corporation's most recent periodic or annual report filed with the Commission, as the case may be, (ii) a more recent public announcement by the Corporation or (iii) a more recent written notice by the Corporation or the Transfer Agent setting forth the number of shares of Common Stock outstanding. Upon the written or oral request (which may be via email) of a Holder, the Corporation shall within two Trading Days confirm orally and in writing to such Holder the number of shares of Common Stock then outstanding. In any case, the number of outstanding shares of Common Stock shall be determined after giving effect to the conversion or exercise of securities of the Corporation, including the Series I Preferred Stock, by such Holder or its Affiliates or Attribution Parties since the date as of which such number of outstanding shares of Common Stock was reported. The "Beneficial Ownership Limitation" shall be 4.99% of the number of shares of the Common Stock outstanding immediately after giving effect to the issuance of shares of Common Stock issuable upon conversion of Series I Preferred Stock held by the applicable Holder. A Holder may not increase the Beneficial Ownership Limitation provisions of this Section 6(d) applicable to its Series I Preferred Stock without the prior written consent of the Corporation, which may be withheld in the sole discretion of the Corporation; it being understood that in no case shall the Beneficial Ownership Limitation exceed 9.99% of the number of shares of Common Stock outstanding after giving effect to the issuance of shares of Common Stock upon exercise of this Warrant held by the holder and the provisions of this Section 6(d) shall continue to apply. Any such increase in the Beneficial Ownership Limitation will not be effective until the 61st day after such notice is delivered and approved by the Corporation and shall only apply to such Holder and no other Holder. The provisions of this paragraph shall be construed and implemented in a manner otherwise than in strict conformity with the terms of this Section 6(d) to correct this paragraph (or any portion hereon which may be defective or inconsistent with the intended Beneficial Ownership Limitation contained herein or to make changes or supplements necessary or desirable to properly give effect to such limitation. The limitations contained in this paragraph shall apply to a successor holder of Series I Preferred Stock.

Section 7. Certain Adjustments.

a . Stock Dividends and Stock Splits. If the Corporation, at any time while this Series I Preferred Stock is outstanding: (i) pays a stock dividend or otherwise makes a distribution or distributions that is payable in shares of Common Stock on shares of Common Stock or any other Common Stock Equivalents (which, for avoidance of doubt, shall not include any shares of Common Stock issued by the Corporation upon conversion of, or payment of a dividend on, this Series I Preferred Stock), (ii) subdivides outstanding shares of Common Stock into a larger number of shares, (iii) combines (including by way of a reverse stock split) outstanding shares of Common Stock into a smaller number of shares, or (iv) issues, in the event of a reclassification of shares of the Common Stock, any shares of capital stock of the Corporation, then the Conversion Price shall be multiplied by a fraction of which the numerator shall be the number of shares of Common Stock (excluding any treasury shares of the Corporation) outstanding immediately before such event, and of which the denominator shall be the number of shares of Common Stock outstanding immediately after such event. Any adjustment made pursuant to this Section 7(a) shall become effective immediately after the record date for the determination of stockholders entitled to receive such dividend or distribution and shall become effective immediately after the effective date in the case of a subdivision, combination or re-classification.

b. Subsequent Rights Offerings. In addition to any adjustments pursuant to Section 7(a) above, if at any time the Corporation grants, issues or sells any Common Stock Equivalents or rights to purchase stock, warrants, securities or other property pro rata to the record holders of any class of shares of Common Stock (the "Purchase Rights"), then the Holder will be entitled to acquire, upon the terms applicable to such Purchase Rights, the aggregate Purchase Rights which the Holder could have acquired if the holder had held the number of shares of Common Stock acquirable upon complete conversion of such Holder's Series I Preferred Stock (without regard to any limitations on exercise hereof, including without limitation, the Beneficial Ownership Limitation) immediately before the date on which a record is taken for the grant, issuance or sale of such Purchase Rights, or, if no such record is taken, the date as of which the record holders of shares of Common Stock are to be determined for the grant, issue or sale of such Purchase Rights (provided, however, to the extent that the Holder's right to participate in any such Purchase Right would result in the Holder exceeding the Beneficial Ownership Limitation, then the Holder shall not be entitled to participate in such Purchase Right to such extent (or beneficial ownership of such shares of Common Stock as a result of such Purchase Right to such extent) and such Purchase Right to such extent shall be held in abeyance for the Holder until such time, if ever, as its right thereto would not result in the Holder exceeding the Beneficial Ownership Limitation).

c . Pro Rata Distributions. During such time as this Series I Preferred Stock is outstanding, if the Corporation shall declare or make any dividend or other distribution of its assets (or rights to acquire its assets) to holders of shares of Common Stock, by way of return of capital or otherwise (including, without limitation, any distribution of cash, stock or other securities, property or options by way of a dividend, spin off, reclassification, corporate rearrangement, scheme of arrangement or other similar transaction) (a "Distribution"), at any time after the issuance of this Series I Preferred Stock, then, in each such case, the Holder shall be entitled to participate in such Distribution to the same extent that the Holder would have participated therein if the Holder had held the number of shares of Common Stock acquirable upon complete conversion of this Series I Preferred Stock (without regard to any limitations on conversion hereof, including without limitation, the Beneficial Ownership Limitation) immediately before the date of which a record is taken for such Distribution, or, if no such record is taken, the date as of which the record holders of shares of Common Stock are to be determined for the participation in such Distribution (provided, however, to the extent that the Holder's right to participate in any such Distribution would result in the Holder exceeding the Beneficial Ownership Limitation, then the Holder shall not be entitled to participate in such Distribution to such extent (or in the beneficial ownership of any shares of Common Stock as a result of such Distribution to such extent) and the portion of such Distribution shall be held in abeyance for the benefit of the Holder until such time, if ever, as its right thereto would not result in the Holder exceeding the Beneficial Ownership Limitation).

d. Fundamental Transaction. If, at any time while this Series I Preferred Stock is outstanding, (i) the Corporation, directly or indirectly, in one or more related transactions effects any merger or consolidation of the Corporation with or into another Person, (ii) the Corporation, directly or indirectly, effects any sale, lease, license, assignment, transfer, conveyance or other disposition of all or substantially all of its assets in one or a series of related transactions, (iii) any, direct or indirect, purchase offer, tender offer or exchange offer (whether by the Corporation or another Person) is completed pursuant to which holders of Common Stock are permitted to sell, tender or exchange their shares for other securities, cash or property and has been accepted by the holders of 50% or more of the outstanding Common Stock, (iv) the Corporation, directly or indirectly, in one or more related transactions effects any reclassification, reorganization or recapitalization of the Common Stock or any compulsory share exchange pursuant to which the Common Stock is effectively converted into or exchanged for other securities, cash or property, or (v) the Corporation, directly or indirectly, in one or more related transactions consummates a stock or share purchase agreement or other business combination (including, without limitation, a reorganization, recapitalization, spin-off or scheme of arrangement) with another Person whereby such other Person acquires more than 50% of the outstanding shares of Common Stock (each a “Fundamental Transaction”), then, upon any subsequent conversion of this Series I Preferred Stock, the Holder shall have the right to receive, for each Conversion Share that would have been issuable upon such conversion immediately prior to the occurrence of such Fundamental Transaction (without regard to any limitation in Section 6(d) on the conversion of this Series I Preferred Stock), the number of shares of Common Stock of the successor or acquiring corporation or of the Corporation, if it is the surviving corporation, and any additional consideration (the “Alternate Consideration”) receivable as a result of such Fundamental Transaction by a holder of the number of shares of Common Stock for which this Series I Preferred Stock is convertible immediately prior to such Fundamental Transaction (without regard to any limitation in Section 6(d) on the conversion of this Series I Preferred Stock). For purposes of any such conversion, the determination of the Conversion Price shall be appropriately adjusted to apply to such Alternate Consideration based on the amount of Alternate Consideration issuable in respect of one share of Common Stock in such Fundamental Transaction, and the Corporation shall apportion the Conversion Price among the Alternate Consideration in a reasonable manner reflecting the relative value of any different components of the Alternate Consideration. If holders of Common Stock are given any choice as to the securities, cash or property to be received in a Fundamental Transaction, then the Holder shall be given the same choice as to the Alternate Consideration it receives upon any conversion of this Series I Preferred Stock following such Fundamental Transaction. To the extent necessary to effectuate the foregoing provisions, any successor to the Corporation or surviving entity in such Fundamental Transaction shall file a new Certificate of Designation with the same terms and conditions and issue to the Holders new preferred stock consistent with the foregoing provisions and evidencing the Holders’ right to convert such preferred stock into Alternate Consideration. The Corporation shall cause any successor entity in a Fundamental Transaction in which the Corporation is not the survivor (the “Successor Entity”) to assume in writing all of the obligations of the Corporation under this Certificate of Designation and the other Transaction Documents in accordance with the provisions of this Section 7(d) pursuant to written agreements prior to such Fundamental Transaction and shall, at the option of the holder of this Series I Preferred Stock, deliver to the Holder in exchange for this Series I Preferred Stock a security of the Successor Entity evidenced by a written instrument substantially similar in form and substance to this Series I Preferred Stock which is convertible for a corresponding number of shares of capital stock of such Successor Entity (or its parent entity) equivalent to the shares of Common Stock acquirable and receivable upon conversion of this Series I Preferred Stock (without regard to any limitations on the conversion of this Series I Preferred Stock) prior to such Fundamental Transaction, and with a conversion price which applies the conversion price hereunder to such shares of capital stock (but taking into account the relative value of the shares of Common Stock pursuant to such Fundamental Transaction and the value of such shares of capital stock, such number of shares of capital stock and such conversion price being for the purpose of protecting the economic value of this Series I Preferred Stock immediately prior to the consummation of such Fundamental Transaction), and which is reasonably satisfactory in form and substance to the Holder. Upon the occurrence of any such Fundamental Transaction, the Successor Entity shall succeed to, and be substituted for (so that from and after the date of such Fundamental Transaction, the provisions of this Certificate of Designation and the other Transaction Documents referring to the “Corporation” shall refer instead to the Successor Entity), and may exercise every right and power of the Corporation and shall assume all of the obligations of the Corporation under this Certificate of Designation and the other Transaction Documents with the same effect as if such Successor Entity had been named as the Corporation herein.

e . Subsequent Equity Sales. If, at any time while the Series I Preferred Stock is outstanding, the Corporation or any subsidiary thereof, as applicable, sells or grants any option to purchase or sells or grants any right to reprice, or otherwise disposes of or issues (or announces any offer, sale, grant or any option to purchase or other disposition), any Common Stock or Common Stock Equivalents entitling any Person to acquire shares of Common Stock at an effective price per share that is lower than the Conversion Price then in effect (such lower price, the "Base Conversion Price" and such issuances, collectively, a "Dilutive Issuance") (it being understood and agreed that if the holder of the Common Stock or Common Stock Equivalents so issued shall at any time, whether by operation of purchase price adjustments, reset provisions, floating conversion, exercise or exchange prices or otherwise, or due to warrants, options or rights per share which are issued in connection with such issuance, be entitled to receive shares of Common Stock at an effective price per share that is lower than the Conversion Price, such issuance shall be deemed to have occurred for less than the Conversion Price on such date of the Dilutive Issuance at such effective price), then simultaneously with the consummation (or, if earlier, the announcement) of each Dilutive Issuance the Conversion Price shall be reduced and only reduced to equal the Base Conversion Price, provided that the Base Conversion Price shall not be less than \$0.16 (subject to adjustment for reverse and forward stock splits, recapitalizations and similar transactions following the date of this Certificate of Designations). Notwithstanding the foregoing, no adjustment will be made under this Section 7(e) in respect of an Exempt Issuance. The Corporation shall notify the Holders in writing, no later than the Trading Day following the issuance or deemed issuance of any Common Stock or Common Stock Equivalents subject to this Section 7(e), indicating therein the applicable issuance price, or applicable reset price, exchange price, conversion price, exercise price and other pricing terms (such notice, the "Dilutive Issuance Notice"). For purposes of clarification, whether or not the Corporation provides a Dilutive Issuance Notice pursuant to this Section 7(e), upon the occurrence of any Dilutive Issuance, the Holders are entitled to receive a number of Conversion Shares based upon the Base Conversion Price on or after the date of such Dilutive Issuance, regardless of whether a Holder accurately refers to the Base Conversion Price in the Notice of Conversion. If the Company enters into a Variable Rate Transaction, the Company shall be deemed to have issued Common Stock or Common Stock Equivalents at the lowest possible price, conversion price or exercise price at which such securities may be issued, converted or exercised. The adjustment under this Section 7(e) may be waived with respect to a particular Dilutive Issuance on behalf of all holders of Series I Preferred Stock by the affirmative written consent or vote of the holders of at least a majority of the shares of Series I Preferred Stock then outstanding.

f . Calculations. All calculations under this Section 7 shall be made to the nearest cent or the nearest 1/100th of a share, as the case may be. For purposes of this Section 7, the number of shares of Common Stock deemed to be issued and outstanding as of a given date shall be the sum of the number of shares of Common Stock (excluding any treasury shares of the Corporation) issued and outstanding.

g. Notice to the Holders.

i. Adjustment to Conversion Price. Whenever the Conversion Price is adjusted pursuant to any provision of this Section 7, the Corporation shall promptly deliver to each Holder by facsimile or email a notice setting forth the Conversion Price after such adjustment and setting forth a brief statement of the facts requiring such adjustment.

ii. Notice to Allow Conversion by Holder. If (A) the Corporation shall declare a dividend (or any other distribution in whatever form) on the Common Stock, (B) the Corporation shall declare a special nonrecurring cash dividend on or a redemption of the Common Stock, (C) the Corporation shall authorize the granting to all holders of the Common Stock of rights or warrants to subscribe for or purchase any shares of capital stock of any class or of any rights, (D) the approval of any stockholders of the Corporation shall be required in connection with any reclassification of the Common Stock, any consolidation or merger to which the Corporation is a party, any sale or transfer of all or substantially all of the assets of the Corporation, or any compulsory share exchange whereby the Common Stock is converted into other securities, cash or property or (E) the Corporation shall authorize the voluntary or involuntary dissolution, liquidation or winding up of the affairs of the Corporation, then, in each case, the Corporation shall cause to be filed at each office or agency maintained for the purpose of conversion of this Series I Preferred Stock, and shall cause to be delivered by facsimile or email to each Holder at its last facsimile number or email address as it shall appear upon the stock books of the Corporation, at least twenty (20) calendar days prior to the applicable record or effective date hereinafter specified, a notice stating (x) the date on which a record is to be taken for the purpose of such dividend, distribution, redemption, rights or warrants, or if a record is not to be taken, the date as of which the holders of the Common Stock of record to be entitled to such dividend, distributions, redemption, rights or warrants are to be determined or (y) the date on which such reclassification, consolidation, merger, sale, transfer or share exchange is expected to become effective or close, and the date as of which it is expected that holders of the Common Stock of record shall be entitled to exchange their shares of the Common Stock for securities, cash or other property deliverable upon such reclassification, consolidation, merger, sale, transfer or share exchange, provided that the failure to deliver such notice or any defect therein or in the delivery thereof shall not affect the validity of the corporate action required to be specified in such notice. To the extent that any notice provided hereunder constitutes, or contains, material, non-public information regarding the Corporation or any of the Subsidiaries, the Corporation shall simultaneously file such notice with the Commission pursuant to a Current Report on Form 8-K. The Holder shall remain entitled to convert the Conversion Amount of this Series I Preferred Stock (or any part hereof) during the 20-day period commencing on the date of such notice through the effective date of the event triggering such notice except as may otherwise be expressly set forth herein.

Section 8. Miscellaneous.

a . Notices. Any and all notices or other communications or deliveries to be provided by the Holders hereunder including, without limitation, any Notice of Conversion, shall be in writing and delivered personally, by facsimile or e-mail, or sent by a nationally recognized overnight courier service, addressed to the Corporation, at the following address: 4995 Bradenton Avenue, Suite 240, Dublin, Ohio 43017 Attention: Vice President of Finance & Administration, facsimile number 614-793-7520, e-mail address EEves@navidea.com, or such other facsimile number, e-mail address or address as the Corporation may specify for such purposes by notice to the Holders delivered in accordance with this Section 8a. Any and all notices or other communications or deliveries to be provided by the Corporation hereunder shall be in writing and delivered personally, by facsimile or e-mail, or sent by a nationally recognized overnight courier service addressed to each Holder at the facsimile number, e-mail address or address of such Holder appearing on the books of the Corporation, or if no such facsimile number, e-mail address or address appears on the books of the Corporation, at the principal place of business of such Holder, as set forth in such Holder's Subscription Rights Certificate. Any notice or other communication or deliveries hereunder shall be deemed given and effective on the earliest of (i) the date of transmission, if such notice or communication is delivered via facsimile at the facsimile number or e-mail at the e-mail address set forth in this Section 8 prior to 5:30 p.m. (New York City Time) on any date, (ii) the next Trading Day after the date of transmission, if such notice or communication is delivered via facsimile at the facsimile number or e-mail address set forth in this Section on a day that is not a Trading Day or later than 5:30 p.m. (New York City time) on any Trading Day, (iii) the second Trading Day following the date of mailing, if sent by U.S. nationally recognized overnight courier service, or (if) upon actual receipt by the party to whom such notice is required to be given.

b . Absolute Obligation. Except as expressly provided herein, no provision of this Certificate of Designation shall alter or impair the obligation of the Corporation, which is absolute and unconditional, to pay liquidated damages, accrued dividends and accrued interest, as applicable, on the shares of Preferred Stock at the time, place, and rate, and in the coin or currency, herein prescribed.

c . Lost or Mutilated Preferred Stock Certificate. If a Holder's Series I Preferred Stock certificate shall be mutilated, lost, stolen or destroyed, the Corporation shall execute and deliver, in exchange and substitution for and upon cancellation of a mutilated certificate, or in lieu of or in substitution for a lost, stolen or destroyed certificate, a new certificate for the shares of Series I Preferred Stock so mutilated, lost, stolen or destroyed, but only upon receipt of evidence of such loss, theft or destruction of such certificate, and of the ownership thereof reasonably satisfactory to the Corporation.

d . Governing Law. All questions concerning the construction, validity, enforcement and interpretation of this Certificate of Designation shall be governed by and construed and enforced in accordance with the internal laws of the State of Delaware, without regard to the principles of conflict of laws thereof. All legal proceedings concerning the interpretation, enforcement and defense of the transactions contemplated by any of the Transaction Documents (whether brought against a party hereto or its respective Affiliates, directors, officers, shareholders, employees or agents) shall be commenced in the state and federal courts sitting in the City of New York, Borough of Manhattan (the "New York Courts"). The Corporation and each Holder hereby irrevocably submits to the exclusive jurisdiction of the New York Courts for the adjudication of any dispute hereunder or in connection herewith or with any transaction contemplated hereby or discussed herein (including with respect to the enforcement of any of the Transaction Documents), and hereby irrevocably waives, and agrees not to assert in any suit, action or proceeding, any claim that it is not personally subject to the jurisdiction of such New York Courts, or such New York Courts are improper or inconvenient venue for such proceeding. The Corporation and each Holder hereby irrevocably waives personal service of process and consents to process being served in any such suit, action or proceeding by mailing a copy thereof via registered or certified mail or overnight delivery (with evidence of delivery) to such party at the address in effect for notices to it under this Certificate of Designation and agrees that such service shall constitute good and sufficient service of process and notice thereof. Nothing contained herein shall be deemed to limit in any way any right to serve process in any other manner permitted by applicable law. The Corporation and each Holder hereby irrevocably waives, to the fullest extent permitted by applicable law, any and all right to trial by jury in any legal proceeding arising out of or relating to this Certificate of Designation or the transactions contemplated hereby. If the Corporation or any Holder shall commence an action or proceeding to enforce any provisions of this Certificate of Designation, then the prevailing party in such action or proceeding shall be reimbursed by the other party for its attorneys' fees and other costs and expenses incurred in the investigation, preparation and prosecution of such action or proceeding.

e . Waiver. Any waiver by the Corporation or a Holder of a breach of any provision of this Certificate of Designation shall not operate as or be construed to be a waiver of any other breach of such provision or of any breach of any other provision of this Certificate of Designation or a waiver by any other Holders. The failure of the Corporation or a Holder to insist upon strict adherence to any term of this Certificate of Designation on one or more occasions shall not be considered a waiver or deprive that party (or any other Holder) of the right thereafter to insist upon strict adherence to that term or any other term of this Certificate of Designation on any other occasion. Any waiver by the Corporation or a Holder must be in writing.

f . Severability. If any provision of this Certificate of Designation is invalid, illegal or unenforceable, the balance of this Certificate of Designation shall remain in effect, and if any provision is inapplicable to any Person or circumstance, it shall nevertheless remain applicable to all other Persons and circumstances. If it shall be found that any interest or other amount deemed interest due hereunder violates the applicable law governing usury, the applicable rate of interest due hereunder shall automatically be lowered to equal the maximum rate of interest permitted under applicable law.

g . Next Business Day. Whenever any payment or other obligation hereunder shall be due on a day other than a Business Day, such payment shall be made on the next succeeding Business Day.

h . Headings. The headings contained herein are for convenience only, do not constitute a part of this Certificate of Designation and shall not be deemed to limit or affect any of the provisions hereof.

i . Status of Converted or Redeemed Preferred Stock. Shares of Series I Preferred Stock may only be issued pursuant to the Dealer Manager Agreement. If any shares of Series I Preferred Stock shall be converted, redeemed or reacquired by the Corporation, such shares shall resume the status of authorized but unissued shares of Preferred Stock and shall no longer be designated as Series I Convertible Preferred Stock.

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IN WITNESS WHEREOF, the undersigned have executed this Certificate of Designation this 26th day of August, 2022.

NAVIDEA BIOPHARMACEUTICALS, INC.

/s/ Michael S. Rosol
Name: Michael S. Rosol, Ph.D
Title: Chief Medical Officer

ANNEX A

NOTICE OF CONVERSION

(TO BE EXECUTED BY THE REGISTERED HOLDER IN ORDER TO CONVERT SHARES OF PREFERRED STOCK)

The undersigned hereby elects to convert the number of shares of Series I Convertible Preferred Stock indicated below into shares of common stock, par value \$0.001 per share (the "Common Stock"), of Navidea Biopharmaceuticals, Inc., a Delaware corporation (the "Corporation"), according to the conditions hereof, as of the date written below. If shares of Common Stock are to be issued in the name of a Person other than the undersigned, the undersigned will pay all transfer taxes payable with respect thereto and is delivering herewith such certificates and opinions as may be required by the Corporation in accordance with the Dealer Manager Agreement. No fee will be charged to the Holders for any conversion, except for any such transfer taxes.

Conversion calculations:

Date to Effect Conversion: _____

Number of shares of Series I Preferred Stock owned prior to Conversion: _____

Number of shares of Series I Preferred Stock to be Converted: _____

Stated Value of shares of Series I Preferred Stock to be Converted: _____

Number of shares of Common Stock to be Issued: _____

Applicable Conversion Price: _____

Number of shares of Series I Preferred Stock subsequent to Conversion: _____

Address for Delivery: _____

or

DWAC Instructions:

Broker no: _____

Account no: _____

[HOLDER]

By:
Name:
Title:

August 28, 2023

Navidea Biopharmaceuticals, Inc.
4995 Bradenton Avenue, Suite 240
Dublin, Ohio 43017

Re: Registration Statement on Form S-3

Ladies and Gentlemen:

We have acted as counsel to Navidea Biopharmaceuticals, 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 U.S. Securities and Exchange Commission (the “**Commission**”), including the prospectus included in the Registration Statement (the “**Prospectus**”), covering the registration for resale by the selling stockholders named therein of up to 10,576,923 shares (the “**Conversion Shares**”) of the Company’s common stock, par value \$0.001 per share (the “**Common Stock**”), issuable upon conversion of the Company’s Series J convertible preferred stock, par value \$0.001 per share (the “**Series J Preferred Stock**”). This opinion letter is being furnished in accordance with Item 601(b)(5) of Regulation S-K under the Securities Act of 1933, as amended (the “**Securities Act**”).

We have examined copies of such agreements, instruments and documents and undertaken such further inquiry as we consider necessary or advisable for purposes of rendering the opinions set forth below. In our examination, we have assumed the authenticity of all documents submitted to us as originals, the genuineness of all signatures, the legal capacity of all natural persons, and the conformity to the originals of all documents submitted to us as copies. For purposes of the opinion set forth below, we have assumed that no event occurs that causes the number of authorized shares of Common Stock available for issuance by the Company to be less than the number of then unissued Conversion Shares.

We are members of the bar of the State of Minnesota and express no opinion as to the laws of any state or jurisdiction other than the General Corporation Law of the State of Delaware.

Subject to the foregoing and the other matters set forth herein, it is our opinion that the Conversion Shares have been duly authorized and, when issued and paid for in accordance with the certificate of designation of the Series J Preferred Stock, the Conversion Shares will be validly issued, fully paid and non-assessable.

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We hereby consent to the filing of this opinion letter as an exhibit to the Registration Statement and to the reference to this firm under the caption "Legal Matters" in the Prospectus. In giving this consent, we do not thereby admit that we are an "expert" within the meaning of the Securities Act.

Very truly yours,

/s/ MASLON LLP

INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM'S CONSENT

We consent to the incorporation by reference in this Registration Statement of Navidea Biopharmaceuticals, Inc. on Form S-3 of our report dated March 27, 2023, which includes an explanatory paragraph as to the Company's ability to continue as a going concern, with respect to our audits of the consolidated financial statements of Navidea Biopharmaceuticals, Inc. as of December 31, 2022 and 2021 and for the years ended December 31, 2022 and 2021 appearing in the Annual Report on Form 10-K of Navidea Biopharmaceuticals, Inc. for the year ended December 31, 2022. We also consent to the reference to our firm under the heading "Experts" in the Prospectus, which is part of this Registration Statement.

/s/ Marcum LLP

Marcum LLP
Hartford, CT
August 28, 2023

Calculation of Filing Fee Tables

S-3
(Form Type)

Navidea Biopharmaceuticals, Inc.
(Exact Name of Registrant as Specified in its Charter)

Table 1: Newly Registered Securities

Security Type	Security Class Title	Fee Calculation Rate	Amount Registered(1)	Proposed Maximum Offering Price Per Unit	Maximum Aggregate Offering Price	Fee Rate	Amount of Registration Fee
Fees to be paid	Equity Common Stock, par value \$0.001 per share	457(c)	10,576,923(2)	\$ 0.080(3)	\$ 846,153.84(3)	0.0001102	\$ 93.25
Total Offering Amount					<u>\$ 846,153.84</u>		\$ 93.25
Fees Previously Paid					--		\$ --
Net Fee Due							<u>\$ 93.25</u>

- (1) Pursuant to Rule 416 under the Securities Act of 1933, as amended (the "Securities Act"), 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.
- (2) Consists of shares of common stock registered for resale by the selling stockholders named in this registration statement issuable upon the conversion of Series J convertible preferred stock.
- (3) Pursuant to Rule 457(c) under the Securities Act, calculated on the basis of the average of the high and low prices per share of the common stock reported on the NYSE American on August 24, 2023.