



PREDICTIVE ONCOLOGY INC.

16,671,747 Shares

Common Stock

This prospectus relates to the offer and resale of up to 16,671,747 shares of our common stock, par value \$0.01 per share, by the selling stockholders as listed in the selling stockholders table on page 15 (the "Selling Stockholders").

For more information about the Selling Stockholders, please see the section of this prospectus entitled "Selling Stockholders" beginning on page 15.

The Selling Stockholders may sell any shares offered under this prospectus at fixed prices, prevailing market prices at the time of sale, at varying prices or negotiated prices.

One or more of the Selling Stockholders may be deemed to be "underwriters" within the meaning of the Securities Act of 1933, as amended (the "Securities Act"), in connection with the resale of our common stock, and any broker-dealers or agents that are involved in such resales may be deemed to be "underwriters" within the meaning of the Securities Act in connection therewith. In such event, any commissions received by such broker-dealers or agents and any profit on the resale of the shares purchased by them may be deemed to be underwriting commissions or discounts under the Securities Act. For more information, please see the section of this prospectus titled "Plan of Distribution" beginning on page 19.

We will not receive any proceeds from the resale of shares of common stock by the Selling Stockholders. We will, however, receive the proceeds of any cash exercises of warrants.

Our common stock is listed on the Nasdaq Capital Market under the symbol "POAI." On March 11, 2021, the last reported per share price of our common stock on the Nasdaq Capital Market was \$1.75 per share.

Investing in our common stock involves a high degree of risk. Before deciding whether to invest in our securities, you should consider carefully the risks that we have described beginning on page 10 of this prospectus under the caption "Risk Factors" and in the documents incorporated by reference into this prospectus.

Neither the Securities and Exchange Commission nor any state securities commission has approved or disapproved of these securities or determined if this prospectus is truthful or complete. Any representation to the contrary is a criminal offense.

The date of this prospectus is March 23, 2021.

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ABOUT THIS PROSPECTUS

This prospectus is part of a registration statement that we have filed with the Securities and Exchange Commission (the “SEC”) pursuant to which the Selling Stockholders named herein may, from time to time, offer and sell or otherwise dispose of the securities covered by this prospectus. You should not assume that the information contained in this prospectus is accurate on any date subsequent to the date set forth on the front cover of this prospectus or that any information we have incorporated by reference is correct on any date subsequent to the date of the document incorporated by reference, even though this prospectus is delivered or securities are sold or otherwise disposed of on a later date. It is important for you to read and consider all information contained in this prospectus, including the Information Incorporated by Reference herein, in making your investment decision. You should also read and consider the information in the documents to which we have referred you under the captions “Where You Can Find More Information” and “Incorporation of Information by Reference” in this prospectus.

Neither we nor the Selling Stockholders have authorized any dealer, salesman or other person to give any information or to make any representation other than those contained or incorporated by reference in this prospectus. You should not rely upon any information or representation not contained or incorporated by reference in this prospectus. This prospectus does not constitute an offer to sell or the solicitation of an offer to buy any of our securities other than the securities covered hereby, nor does this prospectus constitute an offer to sell or the solicitation of an offer to buy any securities in any jurisdiction to any person to whom it is unlawful to make such offer or solicitation in such jurisdiction. Persons who come into possession of this prospectus in jurisdictions outside the United States are required to inform themselves about, and to observe, any restrictions as to the offering and the distribution of this prospectus applicable to those jurisdictions.

We further note that the representations, warranties and covenants made in any agreement that is filed as an exhibit to any document that is incorporated by reference in the prospectus were made solely for the benefit of the parties to such agreement, including, in some cases, for the purpose of allocating risk among the parties to such agreements, and should not be deemed to be a representation, warranty or covenant to you. Moreover, such representations, warranties or covenants were accurate only as of the date when made. Accordingly, such representations, warranties and covenants should not be relied on as accurately representing the current state of our affairs.

Unless the context otherwise requires, references in this prospectus to “Predictive,” the “Company,” “we,” “us,” and “our” refer to Predictive Oncology Inc.

You should rely only on the information contained or incorporated by reference, as applicable, in this prospectus, any prospectus supplement, or other offering materials related to an offering of securities described in this prospectus. We have not authorized anyone to provide you with different or additional information. If anyone provides you with different or additional information, you should not rely on it.

You should not assume that the information contained or incorporated by reference, as applicable, in this prospectus, any prospectus supplement, or other offering materials related to an offering of securities described in this prospectus is accurate as of any date other than the date of that document. Neither the delivery of this prospectus, any prospectus supplement or other offering materials related to an offering of securities described in this prospectus, nor any distribution of securities pursuant to this prospectus, any such prospectus supplement, or other offering materials shall, under any circumstances, create any implication that there has been no change in the information set forth or incorporated by reference, as applicable, in this prospectus, any such prospectus supplement or other offering materials since the date of each such document. Our business, financial condition, results of operations and prospects may have changed since those dates.

This prospectus does not constitute, and any prospectus supplement or other offering materials related to an offering of securities described in this prospectus will not constitute, an offer to sell, or a solicitation of an offer to purchase, the offered securities in any jurisdiction to or from any person to whom or from whom it is unlawful to make such offer or solicitation in such jurisdiction.

PROSPECTUS SUMMARY

The following is a summary of what we believe to be the most important aspects of our business and the offering of our securities under this prospectus. We urge you to read this entire prospectus, including the more detailed financial statements, notes to the financial statements and other information incorporated by reference from our other filings with the SEC. Each of the risk factors could adversely affect our business, operating results and financial condition, as well as adversely affect the value of an investment in our securities.

Business Overview

Predictive Oncology Inc. (NASDAQ: POAI) operates in three primary business areas: first, application of artificial intelligence (“AI”) in our precision medicine business, to provide AI-driven predictive models of tumor drug response to improve clinical outcomes for patients and to assist pharmaceutical, diagnostic, and biotech industries in the development of new personalized drugs and diagnostics; second, production of the United States Food and Drug Administration (“FDA”)-cleared STREAMWAY® System for automated, direct-to-drain medical fluid disposal and associated products, and third, contract services and research focused on solubility improvements, stability studies, and protein production.

We have three reportable segments: Helomics, Skyline Medical, and Soluble. The Helomics division consists of clinical testing and contract research. Our Soluble Biotech division is a provider of soluble and stable formulations for proteins. Our Skyline segment consists of the STREAMWAY System product sales, and our TumorGenesis subsidiary specializes in media that help cancer cells grow and retain their DNA/RNA and proteomic signatures providing researchers with a tool to expand and study cancer cell types found in tumors of the blood and organ systems of all mammals, including humans. Going forward, we have determined that we will focus our resources on the Helomics division and our primary mission of applying AI to precision medicine and drug discovery.

Precision Medicine Business

Our precision medicine business, conducted in our Helomics division, is committed to improving the effectiveness of cancer therapy using our proprietary, multi-omic tumor profiling platform, one-of-a-kind database of historical tumor data, and the power of AI to build predictive models of tumor drug response.

Helomics’ mission is to improve clinical outcomes for patients by partnering with pharmaceutical, diagnostic, and academic organizations to bring innovative clinical products and technologies to the marketplace. Our Patient-centric Drug Discovery using Active Learning asset (PeDAL™) is a unique technology that combines our proprietary, clinically validated patient tumor cell line assay (TruTumor™), a vast knowledgebase of proprietary and public data together (TumorSpace™) with active learning - the active learning allowing the efficient exploration of compound drug responses against a large diverse patient “space”. PeDAL offers researchers the opportunity to efficiently and cost-effectively bring patient diversity much earlier in the drug discovery process. PeDAL works by iterative cycles of active-learning powered Learn-Predict-Test (L-P-T) to guide the testing of patient-specific compound responses using the TruTumor assay and patient cell lines to build a comprehensive predictive model of patient responses to compounds. This predictive model can then be used to rank compounds by the fraction of patients of certain profiles that respond as well as the set of compounds that provide the best coverage across patients. PeDAL will be used in fee-for-service projects with pharmaceutical companies.

Contract Research Organization (CRO) and AI-Driven Business

We believe leveraging our unique, historical database of the drug responses of over 150,000 patient tumors to build AI and data-driven multi-omic predictive models of tumor drug response and outcome will provide actionable insights critical to both new drug development and individualizing patient treatment. Our large knowledgebase of tumor drug response and other data, together with proven AI, has created a unique capability for oncology drug discovery that allows for the highly efficient screening of drug responses from thousands of diverse, well-characterized patient primary tumor cell lines. This novel disruptive patient-centric approach is ideally suited to the early part of drug discovery (especially hit-to-lead, lead optimization, and pre-clinical), resulting in better prioritization of compounds and better coverage of patient diversity. This will dramatically improve the chances of successfully translating discoveries, resulting in lowered costs, shortened timelines, and most importantly enhanced “speed-to-patient” for new therapies.

Our CRO services business applies PeDAL to address a range of needs from discovery through clinical and translational research, to clinical trials and diagnostic development and validation as noted below:

Research

- Biomarker discovery
- Drug discovery
- Drug-repurposing

Development

- Patient enrichment & selection for trials
- Clinical trial optimization
- Adaptive trials

Clinical Decision Support

- Patient stratification
- Treatment selection

We believe this market segment has significant growth potential and we believe we are differentiated from traditional CRO's and other precision medicine and AI companies through these unique assets:

- clinically validated TruTumor platform;
- TumorSpace model of over 150,000 tumor cases;
- experienced AI team and AI platform;
- ability to access outcome data going back over ten years for over 120,000 of the tumor cases in our database.

Industry and Market Background and Analysis – Precision Medicine Business

Precision medicine is an emerging approach for disease treatment and prevention that considers individual variability in genes, disease, environment, and lifestyle for each case to develop effective therapies. This approach allows doctors and researchers to predict more accurately which treatment, dose, and therapeutic regimen could provide the best possible outcome.

The global precision medicine market is estimated to reach \$278.6 billion by 2030, up from \$43.6 billion in 2016. (Source: BIS Research's "Global Precision Medicine Market to Reach \$278.6 Billion by 2030", December 2030).

Precision medicine, precisely targeting drugs based on the genomic profile of the patient, has become the aspiration for cancer therapy. Over the past several decades, researchers have identified molecular patterns that are useful in defining the prognosis of a given cancer, determining the appropriate treatments, and designing targeted treatments to address specific molecular alterations. The objective of precision medicine as directed towards cancer therapy is to develop treatments tailored to the genetic changes in each person's cancer, intended to improve the effectiveness of the therapeutic regimen and minimize the treatment's effects on healthy cells. However, for a majority of patients the reality is that while many mutations in the patient's tumor can be identified most are not actionable with current protocols, due to a lack of research regarding which mutations in a tumor confer a sensitivity to a particular drug. As a result, the impact of targeted therapies is low, and uptake in clinical practice is inconsistent.

There is now a growing realization that genomics alone will not be enough to achieve the promise of personalized therapeutics, especially for cancer. A multi-omic approach (e.g. assessing the genome, transcriptome, epigenome, proteome, responseome, and microbiome) provides researchers and clinicians the comprehensive information necessary for new drug development and individualized therapy. Comparatively, the multi-omic approach provides a three-dimensional, 360-degree view of the cancer, while genomics alone is just a flat, one-dimensional view. However, multi-omic data is difficult to access quickly as it is both costly and time consuming to initiate prospective data collection, and few comprehensive, multi-omic datasets exist, especially specific to cancer. Our Helomics TumorSpace database addresses this need.

Clinical Testing

Via our Helomics subsidiary, we offer a group of clinically relevant, cancer-related tumor profiling and biomarker tests for gynecological cancers that determine how likely the patient is to respond to various types of chemotherapy and which therapies might be indicated by relevant tumor biomarkers.

Clinical testing is comprised of Tumor Drug Response Testing (formerly ChemoFx) and Genomic Profiling (formerly BioSpeciFx) tests. The Tumor Drug Response Testing determines how a patient's tumor specimen responds to a panel of various chemotherapy drugs, while the Genomic Profiling evaluates the expression of a specific genes, or biomarkers, in the patient's tumor. Our proprietary TruTumor tumor platform provides us with the ability to work with actual live tumor cells to study the unique biology of the patient's tumor in order to understand how the patient responds to treatment.

Testing involves obtaining tumor tissue during biopsy or surgery which is then sent to our Clinical Laboratory Improvement Amendments ("CLIA") certified laboratory using a special collection kit.

Tumor Drug Response Testing is a fresh tissue platform that uses the patient's own live tumor cells to help physicians identify effective treatment options for each gynecologic cancer patient.

Genomic Profiling offers a select group of clinically relevant protein expression and genetic mutation tests associated with drug response and disease prognosis. Physicians can select biomarkers for testing from carefully chosen panels of relevant tests, intuitively organized by cancer pathway and tumor type. Results for these tests are presented in a clear, easy to understand format, including summaries of the clinical relevance of each marker.

Business Strategy for Precision Medicine Business

We are a data and AI-driven discovery services company that provides AI-driven predictive models of tumor drug response to improve clinical outcomes for patients by leveraging our two primary unique assets:

- TruTumor - a clinically validated tumor-profiling platform that can generate drug response profiles and other multi-omic data.. Over \$200 million has been invested in this platform and was clinically validated in ovarian cancer.

- TumorSpace model contains data on the drug response profiles across 131 cancer types over 10+ years of clinical testing.

Over 38,000 of the more than 150,000 clinically validated cases in our TumorSpace database are specific to ovarian cancer. The data in TumorSpace is highly differentiated, having both drug response data, biomarkers and access to historical outcome data from those patient samples. We intend to generate additional data (genomics and transcriptomics) from these tumor samples to deliver a multi-omic approach to the pharmaceutical industry.

Through our Helomics subsidiary, we will utilize both this historical data and the TumorSpaceplatform to build AI-driven predictive models of tumor drug response and outcome through our CancerQuest 2020 ("CCQ2020") initiative, which is still ongoing. Once validated, we will commercialize these AI-driven predictive models in revenue generating service projects with pharmaceutical, biotech, and diagnostic companies.

A key part of our commercialization strategy for the CCQ2020 initiative is the understanding that our AI-driven models of tumor drug response serves a key unmet need of pharmaceutical, diagnostic, and biotech industries for actionable multi-omic insights on cancer. In collaboration with these companies, using the predictive models, we will accelerate the search for more individualized and effective cancer treatments, through revenue generating projects in biomarker discovery, drug screening, drug repurposing, and clinical trials.

Our commercial strategy has identified a portfolio of revenue generating project types that leverage the predictive models, our AI expertise, PeDAL tumor profiling, and CLIA laboratory to provide custom solutions utilizing our full array of assets and expertise.

The CCQ2020 initiative will focus initially on ovarian cancer, which is where we have the most expertise, samples, data, and access to outcomes. However, we intend to expand the initiative to include cancers of the lung, breast, colon, and prostate, and will actively seek partners to assist in that effort.

Within the clinical sector, we will utilize these predictive models (once validated) for new clinical decision support tools for individualizing therapy for patients with cancer. These clinical decision support tools are a longer revenue horizon than the research projects with pharmaceutical companies but, importantly, will provide a steady stream of additional data generation to refine the predictive models for both clinical and research applications.

Soluble Biotech

Our subsidiary, Soluble Biotech Inc. (“Soluble”), focuses on contract services and research focused on solubility improvements, stability studies, and protein production and operates the assets of Soluble Therapeutics and BioDtech, which the Company acquired in May 2020. Specifically, Soluble provides optimized FDA-approved formulations for vaccines, antibodies, and other protein therapeutics in a faster and lower cost basis to its customers. In addition, Soluble enables protein degradation studies, which is a new and, based on current projections, potentially substantial line of business for the Company.

The primary assets of Soluble are our automated High Throughput Self-Interaction Chromatography (HSC™). HSC is a self-contained, automated system that conducts high-throughput, self-interaction chromatography screens on FDA approved excipients for protein formulations. Our technology measures second virial coefficient (B22 value) of protein-protein interactions to identify excipients that promote protein solubility in solutions. The data generated from HSC screens are analyzed by a proprietary predictive algorithm to identify the optimal combination(s) of buffers, pH, and excipients, resulting in increased solubility and physical stability of proteins. Several of our clients have seen ten-fold and hundred-fold increases in their protein’s solubility while maintaining physical stability. For biopharmaceutical clients this means faster development times and quicker progression of molecules into the clinic. For academic collaborators, this means further progression of biochemical & biology studies necessary to advance fundamental research in areas of unmet medical need.

In addition, Soluble provides comprehensive protein stability analysis. Analysis via time-dependent shelf-life studies and forced degradation studies designed to quickly determine which of the FDA approved additives that will improve the solubility and stability of proteins in solutions. Services include pre-formulation development, formulation stability assessment, and biophysical characterization which evaluate variables including pH, temperature, humidity, light, oxidizing agents, and mechanical stress to determine the most promising additives, formulation of B22 values and confirmation on conformation stability. We provide clients with a list of the most promising additives from a set of over 40 different additives that can increase the solubility and stability of protein formulations.

Soluble also offers protein solubility kits that allow rapid identification of soluble formulations. We provide four different kits to fulfill customer solubility requirements. The kits are in 96-well format and provide the tools and methods to compare relative solubility across 88 common formulations (with 8 controls). Soluble kits utilize a simple mix and spin protocol that quickly evaluates aggregation behavior as a function of pH, salt, and additives costing significantly less than if manually determined. In addition, we provide innovative technologies for bacterial detection and removal in therapeutic proteins that continue to be a significant issue in the pharmaceutical field.

Skyline Medical – The STREAMWAY System

Sold through our subsidiary, Skyline Medical, Inc (“Skyline Medical”), the STREAMWAY System virtually eliminates staff exposure to blood, irrigation fluid and other potentially infectious fluids found in the healthcare environment. Antiquated manual fluid handling methods that require hand carrying and emptying filled fluid canisters present both an exposure risk and potential liability. Skyline Medical’s STREAMWAY System fully automates the collection, measurement, and disposal of waste fluids and is designed to: 1) reduce overhead costs to hospitals and surgical centers; 2) improve compliance with the Occupational Safety and Health Administration (“OSHA”) and other regulatory agency safety guidelines; 3) improve efficiency in the operating room and radiology and endoscopy departments, thereby leading to greater profitability; and 4) provide greater environmental stewardship by helping to eliminate the approximately 50 million potentially disease-infected canisters that go into landfills each year in the United States.

Skyline Medical operated with reduced personnel and associated operating costs in 2020. By streamlining our production, the Company maximized efficiency attaining similar revenue to 2019. Throughout the year we continued to receive indications of interest from several parties for the possible acquisition of the Skyline division, as well as other partnership initiatives. We continue to operate the Skyline Medical business by continually improving our strategic opportunities, while focusing our resources on our precision medicine business.

Industry and Market Background and Analysis - Infectious and Bio-hazardous Waste Management

There has long been recognition of the collective potential for ill effects to healthcare workers from exposure to infectious/bio-hazardous materials. Federal and state regulatory agencies have issued mandatory guidelines for the control of such materials, and in particular, bloodborne pathogens. OSHA's Bloodborne Pathogens Standard (29 CFR 1910.1030) requires employers to adopt engineering and work practice controls that would eliminate or minimize employee exposure from hazards associated with bloodborne pathogens. In 2001, in response to the Needlestick Safety and Prevention Act, OSHA revised the Bloodborne Pathogens Standard. The revised standard clarifies and emphasizes the need for employers to select safer needle devices and to involve employees in identifying and choosing these devices. The revised standard also calls for the use of "automated controls" as it pertains to the minimization of healthcare exposure to bloodborne pathogens.

Most surgical procedures produce potentially infectious materials that must be disposed with the lowest possible risk of cross-contamination to healthcare workers. Current standards of care allow for these fluids to be retained in canisters and located in the operating room where they can be monitored throughout the surgical procedure. Once the procedure is complete these canisters and their contents are disposed using a variety of methods, all of which include manual handling and result in a heightened risk to healthcare workers for exposure to their contents. Canisters are the most prevalent means of collecting and disposing of infectious fluids in hospitals today. Traditional, non-powered canisters and related suction and fluid disposable products are exempt and do not require FDA clearance.

We believe that our virtually hands free direct-to-drain technology (1) significantly reduces the risk of healthcare worker exposure to these infectious fluids by replacing canisters, (2) further reduces the risk of worker exposure when compared to powered canister technology that requires transport to and from the operating room, (3) reduces the cost per procedure for handling these fluids, and (4) enhances the surgical team's ability to collect data to accurately assess the patient's status during and after procedures. In addition to the traditional canister method of waste fluid disposal, several other powered medical devices have been developed that address some of the deficiencies described above. Most of these competing products continue to utilize some variation on the existing canister technology, and while not directly addressing the canister, most have been successful in eliminating the need for an expensive gel and its associated handling and disposal costs. Our existing competitors with products already on the market have a clear competitive advantage over us in terms of brand recognition and market exposure. In addition, many of our competitors have extensive marketing and development budgets that could overpower an emerging growth company like ours.

We expect the hospital surgery market to continue to increase due to population growth, the aging of the population, and expansion of surgical procedures to new areas (for example, use of the endoscope) which requires more fluid management and new medical technology.

STREAMWAY System Product Sales

Our Skyline Medical division consists primarily of sales of the STREAMWAY System, as well as sales of the proprietary cleaning fluid and filters for use with the STREAMWAY System. We manufacture an environmentally conscious system for the collection and disposal of infectious fluids resulting from surgical and other medical procedures. We have been granted patents for the STREAMWAY System in the United States, Canada, and Europe. We distribute our products to medical facilities where bodily and irrigation fluids produced during medical procedures must be contained, measured, documented, and disposed. Our products minimize the exposure potential to the healthcare workers who handle such fluids. In addition to simplifying the handling of these fluids, our goal is to create products that dramatically reduce staff exposure without significant changes to established operative procedures, historically a major industry stumbling block to innovation and product introduction.

The STREAMWAY System is a wall-mounted fully automated system that disposes of an unlimited amount of suction fluid providing uninterrupted performance for physicians while virtually eliminating healthcare workers' exposure to potentially infectious fluids collected during surgical and other patient procedures. The STREAMWAY System also provides an innovative way to dispose of ascites and pleural fluid with no evac bottles, suction canisters, transport, or risk of exposure. We also manufacture and sell two disposable products required for the operation of the STREAMWAY System: a bifurcated dual port procedure filter with tissue trap and a single use bottle of cleaning solution. Both items are utilized on a single procedure basis and must be discarded after use. The STREAMWAY disposables are a critical component of our business model. Recurring revenues from the sale of the disposables are expected to be significantly higher over time than the revenues from the initial sale of the unit. We have exclusive distribution rights to the disposable solution.

We sell our medical device products directly to hospitals and other medical facilities using employed sales representatives, independent contractors and distributors.

TumorGenesis

Our subsidiary, TumorGenesis, is pursuing a new rapid approach to growing tumors in the laboratory, which essentially "fools" the cancer cells into thinking they are still growing inside the patient. We have also announced a proposed joint venture with GLG Pharma focused on using their combined technologies to bring personalized medicines and testing to ovarian and breast cancer patients, especially those who present with ascites fluid (over one-third of patients).

Corporate Information

We were originally incorporated on April 23, 2002 and reincorporated in Delaware in 2013. We changed our name from Skyline Medical, Inc. to Precision Therapeutics, Inc. on February 1, 2018 and to Predictive Oncology, Inc. on June 13, 2019.

Our address is 2915 Commers Drive, Suite 900, Eagan, Minnesota 55121. Our telephone number is (651) 389-4800, and our website address is www.predictive-oncology.com. The information contained on, or that can be accessed through, our website is not part of this prospectus.

Description of the Transactions

The shares of common stock being sold by the Selling Stockholders are (1) shares issuable pursuant to warrants issued to investors in a private placement on February 16, 2021 concurrent with a registered direct offering, (2) shares issued to investors and issuable pursuant to warrants issued to investors in a private placement on February 23, 2021, and (3) designees of H.C. Wainwright & Co., LLC (the "Placement Agent") who received placement agent warrants in both of such transactions.

February 2021 Registered Direct Offering and Concurrent Private Placement

On February 10, 2021, the Company entered into a Securities Purchase Agreement with institutional and accredited investors pursuant to which the Company agreed to issue and sell in a registered direct offering an aggregate of 4,222,288 shares of its common stock, at a purchase price of \$1.75 per share, for gross proceeds of approximately \$7.4 million. The Company also agreed to issue to the purchasers unregistered warrants to purchase up to an aggregate of 2,111,144 shares of common stock. The warrants have an exercise price equal to \$2.00 per share, are exercisable immediately upon issuance and will expire five and one-half years from the issuance date. Such offering and warrant placement were completed on February 16, 2021 (the "February 16, 2021 Financing"). Pursuant to the Company's engagement letter with the Placement Agent dated January 7, 2021 (the "Engagement Letter"), the Company agreed to pay the Placement Agent a cash fee equal to 7.5% of the gross proceeds received in the February 16, 2021 Financing. The Company also agreed to pay the Placement Agent a management fee equal to 1.0% of the gross proceeds of the offering, \$65,000 for non-accountable and legal expenses, and \$15,950 for clearing fees. Also pursuant to the Engagement Letter, the Company, in connection with the February 16, 2021 Financing, granted to the Placement Agent or its assigns warrants to purchase up to an aggregate of 316,672 shares of its common stock (which represents 7.5% of the shares sold to the investors in the February 16, 2021 Financing) at an exercise price equal to 125% of the price of the shares in the February 16, 2021 Financing, or \$2.1875. The placement agent warrants issued in the February 16, 2021 Financing will expire on February 16, 2026.

The Company used or will use the net proceeds of the February 16, 2021 Financing and the proceeds from the exercise of the warrants described above for working capital purposes.

Private Placement

On February 19, 2021, the Company entered into a Securities Purchase Agreement dated February 19, 2021 with purchasers pursuant to which the Company agreed to issue and sell in a private placement offering an aggregate of 9,043,766 shares of its common stock, at a purchase price of \$1.95 per share, for gross proceeds of approximately \$17.6 million. The Company also agreed to issue to the purchasers unregistered warrants to purchase up to an aggregate of 4,521,883 shares of common stock. The warrants have an exercise price equal to \$2.00 per share, are exercisable immediately upon issuance and will expire five and one-half years from the issuance date. The private placement was completed on February 23, 2021 (the "Private Placement").

Pursuant to an Engagement Letter (the "Engagement Letter") with H.C. Wainwright & Co., LLC (the "Placement Agent"), the Company agreed to pay the Placement Agent a cash fee equal to 7.5% of the gross proceeds received in the Private Placement. The Company also agreed to pay the placement agent a management fee equal to 1.0% of the gross proceeds of the offering, \$65,000 for non-accountable and legal expenses, and \$15,950 for clearing fees. The Engagement Letter contains indemnification, representations, warranties, conditions precedent to closing and other provisions customary for transactions of this nature. Also pursuant to the Engagement Letter, the Company, in connection with the Private Placement, granted to the Placement Agent or its assigns warrants to purchase up to an aggregate of 678,282 shares of its common stock (which represents 7.5% of the Shares sold to investors in the Private Placement) at an exercise price equal to 125% of the price of the Shares in the Private Placement, or \$2.4375. The placement agent warrants issued in the Private Placement will expire five and one-half years from the issuance date.

The Company used approximately \$5.88 million of the net proceeds of the Private Placement to repay certain indebtedness and used or will use the remainder of the net proceeds for general corporate purposes.

Recent Developments

Retirement of Chief Executive Officer

On March 19, 2021, Dr. Carl I. Schwartz retired through his resignation as the Chief Executive Officer of the Company effective immediately. In connection with the resignation, Dr. Schwartz and the Company simultaneously entered into a Transition and Separation Agreement (the "Transition Agreement") pursuant to which, among other things, Dr. Schwartz agreed to retire from his employment and resign as a member of the Company's board of directors (the "Board") and to provide certain transition services to the Company in exchange for the issuance to Dr. Schwartz of 100,000 shares of the Company's common stock, par value \$0.01 per share ("Common Stock") on or before March 23, 2021. At the same time, the Company and Dr. Schwartz also entered into an Agreement and Release (the "Release") pursuant to which, among other things, Dr. Schwartz and the Company released each other from any and all claims each may have against the other, and the Company agreed to provide Dr. Schwartz with certain separation benefits, including \$460,000 (gross) in severance pay, which amount is equal to one year of Dr. Schwartz's base salary, and the vesting of the 300,000 restricted stock units previously granted to Dr. Schwartz. The Release also contains a customary mutual non-disparagement provision. Prior to his resignation as a member of the Board, Dr. Schwartz was a member of the Merger & Acquisition and Finance Committees of the Board.

Appointment of Chief Executive Officer

On March 19, 2021, the Company appointed J. Melville Engle, age 71, as its Chief Executive Officer, effective immediately. Mr. Engle has served on the Board since 2016, and is currently its Chairman. Mr. Engle has also worked in the healthcare industry for the past three decades. Since 2012, he has served as President and Chief Executive Officer of Engle Strategic Solutions, a consulting company focused on CEO development and coaching, senior management consulting, corporate problem solving and strategic and operational planning. He is director of Windgap Medical, Inc., and has held executive positions at prominent companies including Chairman and Chief Executive Officer at ThermoGenesis Corp., Regional Head/Director, North America at Merck Generics, President and Chief Executive Officer of Dey, L.P. and CFO, at Allergan, Inc. In addition to ThermoGenesis, he has served on the board of directors of several public companies, including Oxygen Biotherapeutics and Anika Therapeutics. Mr. Engle holds a BS in Accounting from the University of Colorado and a MBA in Finance from the University of Southern California. He has served as a Trustee of the Queen of the Valley Medical Center Foundation, was a Board Member of the Napa Valley Community Foundation, and at the Napa College Foundation. He was also Vice Chair of the Thunderbird Global Council at the Thunderbird School of Global Management in Glendale, Arizona.

In connection with the appointment, the Company entered into an offer letter with Mr. Engle which provides for, among other things, payment to Mr. Engle of an annual base salary equal to \$475,000. Mr. Engle will also be eligible to receive (i) an annual cash bonus equal to up to 50% of his salary, or at the discretion of the Board's Compensation Committee (the "Committee"), a higher percentage based on his and the Company's performance and (ii) 100,000 restricted shares of Common Stock on January 1st of each calendar year of his employment, vesting over three years and subject to continued employment, with the amount that vests to be based on two or more measures of employment performance, including shareholder return. Mr. Engle will also be eligible to participate in the standard employee benefit plans generally available to executive employees of the Company, and, at the discretion of the Committee, to receive grants of stock options or other equity awards. Any grants of equity awards, including those above, will be made from the Company's Amended and Restated 2012 Stock Incentive Plan or successor plans.

Risk Factors

Our business is subject to numerous risks. For a discussion of the risks you should consider before purchasing shares of our common stock, see "Risk Factors" on page 10 of this prospectus.

The Offering

This prospectus relates to the proposed resale or other disposition from time to time of up to 16,671,747 shares of Predictive Oncology Inc. ("Predictive") common stock, \$0.01 par value per share, and common stock held by the Selling Stockholders identified in this prospectus or that may be issued upon exercise of warrants held by such Selling Stockholders. See "Selling Stockholders" and "Plan of Distribution."

The Selling Stockholders may offer to sell the shares being offered in this prospectus at fixed prices, at prevailing market prices at the time of sale, at varying prices or at negotiated prices. Our common stock is listed on the Nasdaq Capital Market under the symbol "POAI."

We have agreed to register the offer and sale of the common stock to satisfy registration rights we have granted to the Selling Stockholders. We will not receive any of the proceeds from the sale of shares of our common stock in this offering. The Selling Stockholders will receive all of the proceeds from this offering. We will, however, receive the proceeds of any cash exercises of the warrants.

OFFERING SUMMARY

Common stock that may be offered by selling stockholders	16,671,747 shares
Common stock outstanding before this offering	48,798,856 shares (1)
Common stock to be outstanding after this offering	56,426,837 shares (2)
Use of proceeds	We will not receive any proceeds from the resale or other disposition of the shares covered by this prospectus by the selling stockholders. We will receive proceeds from the exercise of the warrants held by the Selling Stockholders that are registered under this registration statement, and we intend to use such proceeds for working capital purposes.
Plan of Distribution	<p>The selling stockholders may, from time to time, sell any or all of their shares of our common stock on the stock exchange, market or trading facility on which the shares are traded or in private transactions. These sales may be at fixed or negotiated prices.</p> <p>For further information, see “Plan of Distribution” beginning on page 19.</p>
Risk Factors	You should read the “Risk Factors” section of this prospectus and the other information in this prospectus for a discussion of factors to consider carefully before deciding to invest in shares of our common stock.
(1) The number of shares of our common stock issued and outstanding as of March 9, 2021, which excludes shares issuable upon exercise of the warrants held by the Selling Stockholders that are registered under this registration statement and also excludes:	<ul style="list-style-type: none">• 1,008,292 shares of our common stock issuable upon the exercise of stock options outstanding as of March 9, 2021, having a weighted average exercise price of \$5.24 per share;• 202,206 shares of our common stock available as of March 9, 2021 for future issuance under to our Amended and Restated 2012 Stock Incentive Plan; and• 15,062,139 shares of our common stock issuable upon the exercise of common stock purchase warrants outstanding as of March 9, 2021 (including the shares being sold by the Selling Stockholders), having a weighted-average exercise price of \$2.96 per share.
(2) Assumes the issuance of 7,627,981 shares being offered hereby upon exercise of warrants held by the Selling Stockholders.	

RISK FACTORS

An investment in our securities involves a number of risks. Before deciding to invest in our securities, you should carefully consider the risks described below and discussed under the sections captioned "Risk Factors" contained in our Annual Report on Form 10-K for the year ended December 31, 2020, which report is incorporated by reference in this prospectus, the information and documents incorporated by reference herein, and in any prospectus supplement or free writing prospectus that we have authorized for use in connection with an offering. If any of these risks actually occurs, our business, financial condition, results of operations or cash flow could be harmed. This could cause the trading price of our common stock to decline, resulting in a loss of all or part of your investment. The risks described in the documents referenced above are not the only ones that we face. Additional risks not presently known to us or that we currently deem immaterial may also affect our business.

CAUTIONARY NOTE REGARDING FORWARD-LOOKING STATEMENTS

Some of the statements made in this prospectus are “forward-looking statements” that indicate certain risks and uncertainties related to the Company, many of which are beyond the Company’s control. The Company’s actual results could differ materially and adversely from those anticipated in such forward-looking statements as a result of certain factors, including those set forth below and elsewhere in this report. Important factors that may cause actual results to differ from projections include:

- We may not be able to continue operating without additional financing;
- Current negative operating cash flows;
- Our capital needs to accomplish our goals, including any further financing, which may be highly dilutive and may include onerous terms;
- Risks related to recent and future acquisitions, including the possibility of further impairment of goodwill and risks related to the benefits and costs of acquisition;
- Risks related to our partnerships with other companies, including the need to negotiate the definitive agreements; possible failure to realize anticipated benefits of these partnerships; and costs of providing funding to our partner companies, which may never be repaid or provide anticipated returns;
- Risk that we will be unable to protect our intellectual property or claims that we are infringing on others’ intellectual property;
- The impact of competition;
- Acquisition and maintenance of any necessary regulatory clearances applicable to applications of our technology;
- Inability to attract or retain qualified senior management personnel, including sales and marketing personnel;
- Risk that we never become profitable if our products and services are not accepted by potential customers;
- Possible impact of government regulation and scrutiny;
- Unexpected costs and operating deficits, and lower than expected sales and revenues, if any;
- Adverse results of any legal proceedings;
- The volatility of our operating results and financial condition,
- Management of growth; and
- Risk that our business and operations will continue to be materially and adversely affected by the COVID-19 pandemic, which has impacted on a significant supplier; has resulted in delayed production and less efficiency; and has impacted on our sales efforts, accounts receivable, and terms demanded by suppliers; and may impact financing transactions.

In some cases, you can identify forward-looking statements by terms such as “may”, “will”, “should”, “could”, “would”, “expects”, “plans”, “anticipates”, “believes”, “estimates”, “projects”, “predicts”, “potential” and similar expressions intended to identify forward-looking statements. These statements reflect our current views with respect to future events and are based on assumptions and subject to risks and uncertainties. Given these uncertainties, you should not place undue reliance on these forward-looking statements. 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 documents we have filed with the SEC that are incorporated by reference and any free writing prospectus that we have authorized for use in connection with this offering completely and with the understanding that our actual future results may be materially different from what we expect. We qualify all of the forward-looking statements in the foregoing documents by these cautionary statements.

Information regarding market and industry statistics contained in this prospectus is included based on information available to the Company that it believes is accurate. It is generally based on academic and other publications that are not produced for purposes of securities offerings or economic analysis. The Company has not reviewed or included data from all sources, and the Company cannot assure potential investors of the accuracy or completeness of the data included in this prospectus. Forecasts and other forward-looking information obtained from these sources are subject to the same qualifications and the additional uncertainties accompanying any estimates of future market size, revenue and market acceptance of products and services. The Company has no obligation to update forward-looking information to reflect actual results or changes in assumptions or other factors that could affect those statements.

USE OF PROCEEDS

We will not receive any proceeds from the sale of the shares of our common stock by the Selling Stockholders. However, we will receive proceeds from the exercise, if any, of the Warrants issued to the Selling Stockholders pursuant to the Securities Purchase Agreement. We will use these proceeds for general corporate and working capital purposes, or for other purposes that our board of directors, in its good faith, deems to be in the best interest of our Company. We have agreed to bear the expenses relating to the registration of the offer and resale by the Selling Stockholders of the shares being offered hereby.

DESCRIPTION OF CAPITAL STOCK

The following description summarizes the material terms of our capital stock. This summary is, however, subject to the provisions of our certificate of incorporation and bylaws. For greater detail about our capital stock, please refer to our certificate of incorporation and bylaws.

General

Our authorized capital stock consists of 100,000,000 shares of Common Stock, and 20,000,000 shares of preferred stock, \$0.01 par value per share ("Preferred Stock"). Out of the Preferred Stock, as of March 9, 2021, 2,300,000 shares have been designated Series B Convertible Preferred Stock, of which 79,246 shares were outstanding.

The outstanding shares of our Common Stock and Preferred Stock are fully paid and nonassessable.

The Series B Convertible Preferred Stock is convertible into Common Stock at the option of its holders on a 1:1 basis, subject to a 4.99% beneficial ownership blocker.

Our Board of Directors is authorized, subject to any limitations prescribed by law, to provide for the issuance of the shares of Preferred Stock in series and, by filing a certificate pursuant to the applicable law of the State of Delaware, to establish from time to time the number of shares to be included in each such series, and to fix the designation, powers, preferences and rights of the shares of each such series and any qualifications, limitations or restrictions thereon. The number of authorized shares of Preferred Stock may be increased or decreased (but not below the number of shares thereof then outstanding) by the affirmative vote of the holders of a majority of the outstanding shares of Common Stock without a vote of the holders of the Preferred Stock, or of any series thereof, unless a vote of any such holders is required pursuant to the certificate or certificates establishing the series of Preferred Stock.

Common Stock

As of March 9, 2021, we had 48,798,856 shares of common stock outstanding held by approximately 236 stockholders of record.

Voting Rights. The holders of our Common Stock are entitled to one vote for each outstanding share of Common Stock owned by that shareholder on every matter properly submitted to the shareholders for their vote. Shareholders are not entitled to vote cumulatively for the election of directors.

Dividend Rights. Subject to the dividend rights of the holders of any outstanding series of preferred stock, holders of our Common Stock are entitled to receive ratably such dividends and other distributions of cash or any other right or property as may be declared by our Board of Directors out of our assets or funds legally available for such dividends or distributions.

Liquidation Rights. In the event of any voluntary or involuntary liquidation, dissolution or winding up of our affairs, holders of our Common Stock would be entitled to share ratably in our assets that are legally available for distribution to shareholders after payment of liabilities and after the satisfaction of any liquidation preference owed to the holders of any Preferred Stock.

Conversion, Redemption and Preemptive Rights. Holders of our Common Stock have no conversion, redemption, preemptive, subscription or similar rights.

Anti-Takeover Provisions

Bylaws. Certain provisions of our Bylaws could have anti-takeover effects. These provisions are intended to enhance the likelihood of continuity and stability in the composition of our corporate policies formulated by our Board of Directors. In addition, these provisions also are intended to ensure that our Board of Directors will have sufficient time to act in what our Board of Directors believes to be in the best interests of our Company and our shareholders. Nevertheless, these provisions could delay or frustrate the removal of incumbent directors or the assumption of control of us by the holder of a large block of Common Stock, and could also discourage or make more difficult a merger, tender offer, or proxy contest, even if such event would be favorable to the interest of our shareholders. These provisions are summarized below.

Advance Notice Provisions for Raising Business or Nominating Directors. Sections 2.09 and 2.10 of our Bylaws contain advance-notice provisions relating to the ability of shareholders to raise business at a shareholder meeting and make nominations for directors to serve on our Board of Directors. These advance-notice provisions generally require shareholders to raise business within a specified period of time prior to a meeting in order for the business to be properly brought before the meeting.

Number of Directors and Vacancies. Our Bylaws provide that the exact number of directors shall be determined from time to time solely by resolution adopted by the affirmative vote of a majority of the entire Board of Directors. The Board of Directors is divided into three classes, as nearly equal in number as possible, designated: Class I, Class II and Class III (each, a “Class”). In the case of any increase or decrease, from time to time, in the number of directors, the number of directors in each class shall be apportioned as nearly equal as possible. Except as otherwise provided in the Certificate of Incorporation, each director serves for a term ending on the date of the third annual meeting of the Company’s stockholders following the annual meeting at which such director was elected; provided, that the term of each director shall continue until the election and qualification of a successor and be subject to such director’s earlier death, resignation or removal. Vacancies on the Board of Directors resulting from death, resignation, removal or otherwise and newly created directorships resulting from any increase in the number of directors may be filled solely by a majority of the directors then in office (although less than a quorum) or by the sole remaining director.

Delaware Law. We are subject to Section 203 of the Delaware General Corporation Law. This provision generally prohibits a Delaware corporation from engaging in any business combination with any interested stockholder for a period of three years following the date the stockholder became an interested stockholder, unless:

- prior to such date, the board of directors approved either the business combination or the transaction that resulted in the stockholder becoming an interested stockholder;
- upon consummation of the transaction that resulted in the stockholder becoming an interested stockholder, the interested stockholder owned at least 85% of the voting stock of the corporation outstanding at the time the transaction commenced, excluding for purposes of determining the number of shares outstanding those shares owned by persons who are directors and also officers and by employee stock plans in which employee participants do not have the right to determine confidentially whether shares held subject to the plan will be tendered in a tender or exchange offer; or
- on or subsequent to such date, the business combination is approved by the board of directors and authorized at an annual meeting or special meeting of stockholders and not by written consent, by the affirmative vote of at least 66 2/3% of the outstanding voting stock that is not owned by the interested stockholder.

Section 203 defines a business combination to include:

- any merger or consolidation involving the corporation and the interested stockholder;
- any sale, transfer, pledge or other disposition of 10% or more of the assets of the corporation involving the interested stockholder;
- subject to certain exceptions, any transaction that results in the issuance or transfer by the corporation of any stock of the corporation to the interested stockholder;
- any transaction involving the corporation that has the effect of increasing the proportionate share of the stock of any class or series of the corporation beneficially owned by the interested stockholder; or
- the receipt by the interested stockholder of the benefit of any loans, advances, guarantees, pledges or other financial benefits provided by or through the corporation.

In general, Section 203 defines an “interested stockholder” as any entity or person beneficially owning 15% or more of the outstanding voting stock of a corporation, or an affiliate or associate of the corporation and was the owner of 15% or more of the outstanding voting stock of a corporation at any time within three years prior to the time of determination of interested stockholder status; and any entity or person affiliated with or controlling or controlled by such entity or person.

These statutory provisions could delay or frustrate the removal of incumbent directors or a change in control of our company. They could also discourage, impede, or prevent a merger, tender offer, or proxy contest, even if such event would be favorable to the interests of stockholders. In addition, note that while Delaware law permits companies to opt out of its business combination statute, our Certificate of Incorporation does not include this opt-out provision.

Transfer Agent and Registrar

The transfer agent and registrar for our common stock is Equiniti.

Listing

The shares of our common stock are listed on The Nasdaq Capital Market under the symbol “POAI.” On March 11, 2021, the last reported sale price per share for our common stock as reported by The Nasdaq Capital Market was \$1.75.

SELLING STOCKHOLDERS

This prospectus covers the resale by the Selling Stockholders or their permitted transferees of up to 16,671,747 shares that have been or may be issued by us to the Selling Stockholders under the arrangements and agreements described in “Prospectus Summary – Description of the Private Placements.” The Selling Stockholders have not had any position or office, or other material relationship with us or any of our affiliates over the past three years. The following table sets forth certain information regarding the beneficial ownership of shares of common stock by the Selling Stockholders as of March 11, 2021 and the number of shares of our common stock being offered pursuant to this prospectus.

The table below (i) lists the Selling Stockholders and other information regarding the beneficial ownership of our common stock by the Selling Stockholders; (ii) have been prepared based upon information furnished to us by the Selling Stockholders; and (iii) to our knowledge, is accurate as of the date of this prospectus. The Selling Stockholders may sell all, some or none of their shares in this offering. The Selling Stockholders identified in the table below may have sold, transferred or otherwise disposed of some or all of its shares since the date of this prospectus in transactions exempt from or not subject to the registration requirements of the Securities Act. Information concerning the Selling Stockholders may change from time to time and, if necessary, we will amend or supplement this prospectus accordingly and as required.

Name of selling stockholder	Shares beneficially owned as of the date of this prospectus ⁽¹⁾	Number of shares being offered	Number of shares to be beneficially owned and percentage of beneficial ownership after the offering ⁽¹⁾⁽²⁾	
			Number of shares	Percentage of class ⁽³⁾
Intracoastal Capital, LLC ⁽⁴⁾	3,642,154	3,248,621	393,533	*
Armistice Capital Master Fund ⁽⁵⁾	5,017,571	3,763,698	1,253,873	2.6%
Bigger Capital Fund, LP ⁽⁶⁾	780,000	780,000	0	*
District 2 Capital Fund LP ⁽⁷⁾	780,000	780,000	0	*
Alto Opportunity Master Fund, SPC – Segregated Master Portfolio B ⁽⁸⁾	975,000	975,000	0	*
Cavalry Fund I LP/ Cavalry Special Ops Fund, LLC ⁽⁹⁾	1,529,256	1,095,446	433,810	*
CVI Investments, Inc. ⁽¹⁰⁾	171,695	171,695	0	*
FiveT Capital AG/ FiveT Investment Management Ltd. ⁽¹¹⁾	310,561	171,695	138,866	*
3i, LP ⁽¹²⁾	769,233	769,233	0	*
BPY Limited ⁽¹³⁾	307,692	307,692	0	*
Nomis Bay Ltd. ⁽¹⁴⁾	461,541	461,541	0	*
Lind Global Macro Fund, LP ⁽¹⁵⁾	576,924	576,924	0	*
Alpha Capital Anstalt ⁽¹⁶⁾	1,276,675	671,696	604,979	1.2%
Anson Investments Master Fund LP/ Anson East Master Fund LP ⁽¹⁷⁾	384,480	384,480	0	*
L1 Capital Global Opportunities Master Fund ⁽¹⁸⁾	864,199	206,031	658,168	1.3%
Iroquois Master Fund Ltd./ Iroquois Capital Investment Group LLC ⁽¹⁹⁾	785,816	487,633	298,183	*
KBB Asset Management ⁽²⁰⁾	300,000	300,000	0	*
Boothbay Absolute Return Strategies, LP ⁽²¹⁾	127,386	127,386	0	*
Boothbay Diversified Alpha Master Fund LP ⁽²²⁾	64,923	64,923	0	*
Brio Capital Master Fund Ltd. ⁽²³⁾	415,863	333,099	82,764	*
Michael Vasinkevich ⁽²⁴⁾	1,109,403	638,015	471,388	*
Noam Rubinstein ⁽²⁴⁾	637,301	313,411	323,890	*
Craig Schwabe ⁽²⁴⁾	59,042	33,580	25,462	*
Charles Worthman ⁽²⁴⁾	20,231	9,948	10,283	*

- (1) Beneficial ownership is determined in accordance with SEC rules and generally includes voting or investment power with respect to shares of common stock. Shares of common stock subject to options and warrants currently exercisable, or exercisable within 60 days, are counted as outstanding for computing the percentage of the person holding such options or warrants but are not counted as outstanding for computing the percentage of any other person. Substantially all of the warrants and convertible securities included in the table are subject to restrictions that prevent exercise to the extent that after the exercise the holder or its affiliates would beneficially own in excess of 4.99% of the Company's outstanding stock.
- (2) The amount and percentage of shares of our common stock that will be beneficially owned by the Selling Stockholders after completion of the offering assume that they will sell all shares of our common stock being offered pursuant to this prospectus.
- (3) Based on 48,798,856 shares of our common stock issued and outstanding as of March 9, 2021. All shares of our common stock being offered pursuant to this prospectus by a Selling Stockholder are counted as outstanding for computing the percentage beneficial ownership of such Selling Stockholder.
- (4) Includes 1,197,337 shares issuable upon exercise of warrants held by Intracoastal Capital LLC ("Intracoastal"). Mitchell P. Kopin ("Mr. Kopin") and Daniel B. Asher ("Mr. Asher"), each of whom are managers of Intracoastal, have shared voting control and investment discretion over the securities reported herein that are held by Intracoastal. Such warrants are subject to restrictions that, in some cases, prevent exercise to the extent that after the exercise the holder or its affiliates would beneficially own in excess of 4.99% or 9.99%, as the case may be, of the Company's outstanding stock. As a result, each of Mr. Kopin and Mr. Asher may be deemed to have beneficial ownership (as determined under Section 13(d) of the Securities Exchange Act of 1934, as amended (the "Exchange Act")) of the securities reported herein that are held by Intracoastal.
- (5) Includes 3,271,089 shares issuable upon exercise of warrants held by Armistice Capital Master Fund Ltd. ("Armistice"). Such warrants are subject to restrictions that prevent exercise to the extent that after the exercise the holder or its affiliates would beneficially own in excess of 4.99% of the Company's outstanding stock. Armistice Capital, LLC, the investment manager of Armistice, and Steven Boyd, the managing member of Armistice Capital, LLC, hold shared voting and dispositive power over the shares held by Armistice. Each of Armistice Capital, LLC and Steven Boyd disclaims beneficial ownership of the securities listed except to the extent of their pecuniary interest therein.
- (6) Includes 260,000 shares issuable upon exercise of warrants held by Bigger Capital Fund, LP ("Bigger Capital"). Such warrants are subject to restrictions that prevent exercise to the extent that after the exercise the holder or its affiliates would beneficially own in excess of 4.99% of the Company's outstanding stock. Michael Bigger, Managing Member of GP, of Bigger Capital, may be deemed to have voting and investment power with respect to the securities held by Bigger Capital.
- (7) Includes 260,000 shares issuable upon exercise of warrants held by District 2 Capital Fund, LP ("District 2 Capital"). Such warrants are subject to restrictions that prevent exercise to the extent that after the exercise the holder or its affiliates would beneficially own in excess of 4.99% of the Company's outstanding stock. Michael Bigger, Managing Member of GP, of District 2 Capital, may be deemed to have voting and investment power with respect to the securities held by District 2 Capital.

- (8) Includes 325,000 shares issuable upon exercise of warrants held by Alto Opportunity Master Fund, SPC – Segregated Master Portfolio B (“Alto”). Such warrants are subject to restrictions that prevent exercise to the extent that after the exercise the holder or its affiliates would beneficially own in excess of 4.99% of the Company’s outstanding stock. Ayrton Capital LLC, the investment manager to Alto Opportunity Master Fund, SPC - Segregated Master Portfolio B, has discretionary authority to vote and dispose of the shares held by Alto Opportunity Master Fund, SPC - Segregated Master Portfolio B and may be deemed to be the beneficial owner of these shares. Waqas Khatri, in his capacity as Managing Member of Ayrton Capital LLC, may also be deemed to have investment discretion and voting power over the shares held by Alto Opportunity Master Fund, SPC - Segregated Master Portfolio B. Ayrton Capital LLC and Mr. Khatri each disclaim any beneficial ownership of these shares.
- (9) Includes 508,217 shares issuable upon exercise of warrants held by Cavalry Fund I LP and 508,218 shares issuable upon exercise of warrants held by Cavalry Special Ops Fund, LLC (collectively, the “Cavalry Funds”). Such warrants are subject to restrictions that prevent exercise to the extent that after the exercise the holder or its affiliates would beneficially own in excess of 4.99% of the Company’s outstanding stock. Thomas Walsh, Manager of each of the Cavalry Funds, may be deemed to have voting and investment power with respect to the securities held by the Cavalry Funds.
- (10) Includes 171,695 shares issuable upon exercise of warrants held by CVI Investments, Inc. (“CVI”). Such warrants are subject to restrictions that prevent exercise to the extent that after the exercise the holder or its affiliates would beneficially own in excess of 4.99% of the Company’s outstanding stock. Heights Capital Management, Inc., the authorized agent of CVI, has discretionary authority to vote and dispose of the shares held by CVI and may be deemed to be the beneficial owner of these shares. Martin Kobinger, in his capacity as Investment Manager of Heights Capital Management, Inc., may also be deemed to have investment discretion and voting power over the shares held by CVI. Mr. Kobinger disclaims any such beneficial ownership of the shares. CVI Investments, Inc. is affiliated with one or more FINRA members, none of whom are currently expected to participate in the sale pursuant to the prospectus contained in the Registration Statement of Shares purchased by CVI in this Offering.
- (11) Includes 310,561 shares issuable upon exercise of warrants held by FiveT Capital AG / FiveT Investment Management Ltd. (“FiveT”). Such warrants are subject to restrictions that prevent exercise to the extent that after the exercise the holder or its affiliates would beneficially own in excess of 4.99% of the Company’s outstanding stock. Johannes Minhó Roth, may be deemed to have voting and investment power with respect to the securities held by FiveT.
- (12) Includes 256,411 shares issuable upon exercise of warrants held by 3i, LP (“3i”). Such warrants are subject to restrictions that prevent exercise to the extent that after the exercise the holder or its affiliates would beneficially own in excess of 4.99% of the Company’s outstanding stock. Maier J. Tarlow, Manager of GP, of 3i, may be deemed to have voting and investment power with respect to the securities held by 3i.
- (13) Includes 102,564 shares issuable upon exercise of warrants held by BPY Limited (“BPY”). Such warrants are subject to restrictions that prevent exercise to the extent that after the exercise the holder or its affiliates would beneficially own in excess of 4.99% of the Company’s outstanding stock. Peter Poole, Director of BPY, may be deemed to have voting and investment power with respect to the securities held by BPY.
- (14) Includes 153,847 shares issuable upon exercise of warrants held by Nomis Bay Ltd. (“Nomis Bay”). Such warrants are subject to restrictions that prevent exercise to the extent that after the exercise the holder or its affiliates would beneficially own in excess of 4.99% of the Company’s outstanding stock. Peter Poole, Director of Nomis Bay, may be deemed to have voting and investment power with respect to the securities held by Nomis Bay.
- (15) Includes 192,308 shares issuable upon exercise of warrants held by Lind Global Macro Fund, LP (“Lind”). Such warrants are subject to restrictions that prevent exercise to the extent that after the exercise the holder or its affiliates would beneficially own in excess of 4.99% of the Company’s outstanding stock. Jeff Easton, may be deemed to have voting and investment power with respect to the securities held by Lind.

- (16) Includes 905,050 shares issuable upon exercise of warrants held by Alpha Capital Anstalt (“Alpha Capital”). Such warrants are subject to restrictions that prevent exercise to the extent that after the exercise the holder or its affiliates would beneficially own in excess of 4.99% of the Company’s outstanding stock. Konrad Ackermann, Director of Alpha Capital, may be deemed to have voting and investment power with respect to the securities held by Alpha Capital.
- (17) Includes 96,120 shares issuable upon exercise of warrants held by Anson Investments Master Fund LP and 32,040 shares issuable upon exercise of warrants held by Anson East Master Fund LP (collectively, the “Anson Funds”). Such warrants are subject to restrictions that prevent exercise to the extent that after the exercise the holder or its affiliates would beneficially own in excess of 4.99% of the Company’s outstanding stock. Anson Advisors Inc and Anson Funds Management LP, the Co-Investment Advisers of Anson Investments Master Fund LP (“AIMF”), Anson East Master Fund LP (“AEMF”), hold voting and dispositive power over the Common Shares held by AIMF and AEMF. Bruce Winson is the managing member of Anson Management GP LLC, which is the general partner of Anson Funds Management LP. Moez Kassam and Amin Nathoo are directors of Anson Advisors Inc. Mr. Winson, Mr. Kassam and Mr. Nathoo each disclaim beneficial ownership of these Common Shares except to the extent of their pecuniary interest therein.
- (18) Includes 864,199 shares issuable upon exercise of warrants held by L1 Capital Global Opportunities Master Fund (“L1”). Such warrants are subject to restrictions that prevent exercise to the extent that after the exercise the holder or its affiliates would beneficially own in excess of 4.99% of the Company’s outstanding stock. David Feldman, Portfolio Manager of L1, may be deemed to have voting and investment power with respect to the securities held by L1.
- (19) Includes an aggregate of 329,088 shares issuable upon exercise of warrants held by Iroquois Master Fund Ltd. and Iroquois Capital Investment Group LLC (collectively, “Iroquois”). Such warrants are subject to restrictions that prevent exercise to the extent that after the exercise the holder or its affiliates would beneficially own in excess of 4.99% of the Company’s outstanding stock. Richard Abbe, Managing Member of Iroquois, may be deemed to have voting and investment power with respect to the securities held by Iroquois.
- (20) Includes 100,000 shares issuable upon exercise of warrants held by KBB Asset Management (“KBB”). Such warrants are subject to restrictions that prevent exercise to the extent that after the exercise the holder or its affiliates would beneficially own in excess of 4.99% of the Company’s outstanding stock. Steve Segal of KBB, may be deemed to have voting and investment power with respect to the securities held by KBB.
- (21) Includes 42,462 shares issuable upon exercise of warrants held by Boothbay Absolute Return Strategies, LP, a Delaware limited partnership (“BBARS”), is managed by Boothbay Fund Management, LLC, a Delaware limited liability company (“Boothbay”). Boothbay, in its capacity as the investment manager of BBARS, has the power to vote and the power to direct the disposition of all securities held by BOARS. Ari Glass is the Managing Member of Boothbay. Each of OBARS, Boothbay and Mr. Glass disclaim beneficial ownership of these securities, except to the extent of any pecuniary interest therein.
- (22) Includes 21,641 shares issuable upon exercise of warrants held by Boothbay Diversified Alpha Master Fund LP, a Cayman Islands limited partnership (“BBDAMF”), is managed by Boothbay Fund Management, LLC, a Delaware limited liability company (“Boothbay”). Boothbay, in its capacity as the investment manager of BBDAMF, has the power to vote and the power to direct the disposition of all securities held by BBDAMF. Afi Glass is the Managing Member of Boothbay. Each of BBDAMF, Boothbay and Mr. Glass disclaim beneficial ownership of these securities, except to the extent of any pecuniary interest therein.
- (23) Includes 262,017 shares issuable upon exercise of warrants held by Brio Capital Master Fund Ltd. (“Brio”). Such warrants are subject to restrictions that prevent exercise to the extent that after the exercise the holder or its affiliates would beneficially own in excess of 4.99% of the Company’s outstanding stock. Shaye Hirsch, Director of Brio, may be deemed to have voting and investment power with respect to the securities held by Brio.

- (24) Each such individual is associated with H.C. Wainwright & Co., Inc. and received placement agent warrants in the transactions described under “Prospectus Summary – Description of the Transactions.” The shares set forth under “Number of shares being offered” are shares that may be purchased upon the exercise of such warrants

PLAN OF DISTRIBUTION

The Selling Stockholders or their permitted transferees may, from time to time, sell any or all of shares of our common stock covered hereby on the Nasdaq stock market, or any other stock exchange, market or trading facility on which the shares are traded or in private transactions. The Selling Stockholders may sell all or a portion of the shares being offered pursuant to this prospectus at fixed prices, at prevailing market prices at the time of sale, at varying prices or at negotiated prices. The Selling Stockholders may use any one or more of the following methods when selling securities:

- on any national securities exchange or quotation service on which the securities may be listed or quoted at the time of sale;
- in the over-the-counter market;
- in transactions otherwise than on these exchanges or systems or in the over-the-counter market;
- through the writing or settlement of options, whether such options are listed on an options exchange or otherwise;
- ordinary brokerage transactions and transactions in which the broker-dealer solicits purchasers;
- block trades in which the broker-dealer will attempt to sell the shares as agent but may position and resell a portion of the block as principal to facilitate the transaction;
- purchases by a broker-dealer as principal and resale by the broker-dealer for its account;
- an exchange distribution in accordance with the rules of the applicable exchange;
- privately negotiated transactions.

The Selling Stockholders may also sell securities under Rule 144 under the Securities Act, if available, rather than under this prospectus.

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 securities, from the purchaser) in amounts to be negotiated, provided such amounts are in compliance with FINRA Rule 2121. Discounts, concessions, commissions and similar selling expenses, if any, that can be attributed to the sale of common stock will be paid by the Selling Stockholders and/or the purchasers.

The Selling Stockholders may be deemed to be underwriters within the meaning of the Securities Act and any broker-dealers or agents that are involved in selling the shares 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 purchased by them may be deemed to be underwriting commissions or discounts under the Securities Act. Because the Selling Stockholders may be deemed to be underwriters within the meaning of the Securities Act, they may be subject to the prospectus delivery requirements of the Securities Act.

Under applicable rules and regulations under the Exchange Act, any person engaged in the distribution of the resale of securities may not simultaneously engage in market making activities with respect to the common stock for the applicable restricted period, as defined in Regulation M, prior to the commencement of the distribution. In addition, the Selling Stockholders will be subject to applicable provisions of the Exchange Act and the rules and regulations thereunder, including Regulation M, which may limit the timing of purchases and sales of securities of the common stock by the Selling Stockholders or any other person. We will make copies of this prospectus available to the selling security holders and have informed them of the need to deliver a copy of this prospectus to each purchaser at or prior to the time of the sale.

Placement Agent Warrants

Certain of the Selling Stockholders who hold Placement Agent Warrants are affiliates or designees of the Placement Agent, H.C. Wainwright & Co., LLC. The compensation of the Placement Agent in the Offering is described in the Summary under “Description of the Transactions.”

Under the Engagement, we granted the Placement Agent subject to certain exceptions, a right of first refusal for a period of twelve months following the closing of this offering to act as our exclusive underwriter or placement agent for any further capital raising transactions undertaken by us or any of our subsidiaries. We have also agreed to pay the Placement Agent, subject to certain exceptions, a tail fee equal to the cash and warrant compensation in this offering, if any investor, who was contacted and brought over-the-wall by the Placement Agent during the term of its engagement or introduced to us by the exclusive placement agent during the term of its engagement, provides us with capital in any public or private offering or other financing or capital raising transaction during a period of twelve months following the expiration or termination of the engagement letter.

We have agreed to indemnify the Placement Agent and specified other persons against certain liabilities relating to or arising out of the placement agent's activities and to contribute to payments that the Placement Agent may be required to make in respect of such liabilities.

From time to time, the Placement Agent may provide in the future various advisory, investment and commercial banking and other services to us in the ordinary course of business, for which they have received and may continue to receive customary fees and commissions. Wainwright acts as our sales agent in connection with our at-the-market program, for which it has received, and may in the future receive, compensation. The Placement Agent also acted as our exclusive placement agent for our private offering of common stock and warrants in March 2020, for our registered direct offering consummated in May 2020 and warrant exercise transaction we consummated in June 2020, for which it received compensation; and registered direct offerings in January and February 2021. However, except as disclosed in this prospectus, we have no present arrangements with the Placement Agent for any further services.

LEGAL MATTERS

The validity of any securities offered from time to time by this prospectus and any related prospectus supplement will be passed upon by Maslon LLP, Minneapolis, Minnesota.

EXPERTS

The 2019 financial statements (before the effects of the retrospective adjustments to the financial statement disclosures) (not separately presented herein) incorporated in this prospectus by reference from the Company's Annual Report on Form 10-K for the year ended December 31, 2020 have been audited by Deloitte & Touche LLP, an independent registered public accounting firm, as stated in their report, which is incorporated herein by reference (which report expresses an unqualified opinion and includes an explanatory paragraph relating to the substantial doubt about the Company's ability to continue as a going concern). The retrospective adjustments to the 2019 financial statements have been audited by Baker Tilly US LLP. The 2019 financial statements have been so incorporated in reliance upon the reports of Deloitte & Touche LLP and Baker Tilly US LLP given upon their authority as experts in accounting and auditing.

The 2019 financial statements (before the effects of the retrospective adjustments to the financial statement disclosures discussed in Note 14) (not separately presented herein) incorporated in this prospectus by reference from the Company's Annual Report on Form 10-K for the year ended December 31, 2020 have been audited by Deloitte & Touche LLP, an independent registered public accounting firm, as stated in their report, which is incorporated herein by reference (which report expresses an unqualified opinion and includes an explanatory paragraph relating to the substantial doubt about the Company's ability to continue as a going concern). The retrospective adjustments to the 2019 financial statements discussed in Note 14 have been audited by Baker Tilly US, LLP. The 2019 financial statements have been so incorporated in reliance upon the reports of Deloitte & Touche LLP and Baker Tilly US, LLP given upon their authority as experts in accounting and auditing.

The financial statements of Helomics Holding Corporation for the fiscal year ended December 31, 2018, as restated, incorporated by reference in this prospectus have been so incorporated in reliance on the report of Schneider Downs & Co., Inc., certified public accountants registered with the Public Company Accounting Oversight Board, as auditor for Helomics Holding Corporation prior to the acquisition by the Company.

WHERE YOU CAN FIND MORE INFORMATION

We file annual, quarterly and current reports, proxy statements and other information with the SEC. We have filed with the SEC a registration statement on Form S-3 under the Securities Act with respect to the securities we are offering under this prospectus. This prospectus does not contain all of the information set forth in the registration statement and the exhibits to the registration statement. For further information with respect to us and the securities we are offering under this prospectus, we refer you to the registration statement and the exhibits and schedules filed as a part of the registration statement. Reports filed with the SEC pursuant to the Exchange Act, including proxy statements, annual and quarterly reports, and other reports filed by the Company can be inspected and copied at the public reference facilities maintained by the SEC at the Headquarters Office, 100 F Street N.E., Room 1580, Washington, D.C. 20549. The reader may obtain information on the operation of the public reference room by calling the SEC at 1-800-SEC-0330. The reader can request copies of these documents upon payment of a duplicating fee by writing to the SEC. Our filings are also available on the SEC's internet site at <http://www.sec.gov> and the Company's website at www.predictive-oncology.com. Information on any Company website, any subsection, page, or other subdivision of any Company website, or any website linked to by content on any Company website, is not part of this prospectus and you should not rely on that information unless that information is also in this prospectus or incorporated by reference in this prospectus.

INCORPORATION OF CERTAIN DOCUMENTS BY REFERENCE

The SEC allows us to "incorporate by reference" information into this prospectus, which means that we can disclose important information to you by referring you to another document filed separately with the SEC. The documents incorporated by reference into this prospectus contain important information that you should read about us. The following documents are incorporated by reference into this prospectus:

We are allowed to incorporate by reference information contained in documents that we file with the SEC. This means that we can disclose important information to you by referring you to those documents and that the information in this prospectus is not complete and you should read the information incorporated by reference for more detail. We incorporate by reference in two ways. First, we list certain documents that we have already filed with the SEC. The information in these documents is considered part of this prospectus. Second, the information in documents that we file in the future will update and supersede the current information in, and incorporated by reference in, this prospectus.

We incorporate by reference the documents listed below and any future filings we will make with the SEC under Section 13(a), 13(c), 14 or 15(d) of the Exchange Act (other than information furnished in Current Reports on Form 8-K filed under Item 2.02 or 7.01 of such form unless such form expressly provides to the contrary):

- Our Annual Report on Form [10-K for the fiscal year ended December 31, 2020](#) filed on March 15, 2021;
- Current Reports on Form 8-K filed on [March 23, 2021](#), [March 15, 2021](#), [February 22, 2021](#), [February 12, 2021](#), [January 29, 2021](#), [January 21, 2021](#), [January 12, 2021](#), and [Amendment No. 2 to Form 8-K as filed on September 26, 2019](#) (as to the Restated Audited Financial Statements for 2018 and 2017 of Helomics Holding Corporation); and
- The description of the Company's common stock filed as [Exhibit 4.29](#) "Description of Registrant's Securities" to the Company's Annual Report on Form 10-K on March 15, 2021, and herewith.

We will provide to each person, including any beneficial owner, to whom a prospectus is delivered, a copy of any or all of the information that has been incorporated by reference in this prospectus but not delivered with this prospectus. You may request a copy of this information at no cost, by writing or telephoning us at the following address or telephone number:

Predictive Oncology Inc.
Attention: Corporate Secretary
2915 Commers Drive, Suite 900
Eagan, Minnesota 55121
(651) 389-4800



PREDICTIVE ONCOLOGY INC.

16,671,747 Shares

Common Stock

PROSPECTUS

March 23, 2021