Filed Pursuant to Rule 424(b)(5)
Registration No. 333-222332

PROSPECTUS SUPPLEMENT
(To the Prospectus dated January 19, 2018)

Up to $18,951,753
American Depositary Shares Representing Ordinary Shares

This prospectus supplement, or the Prospectus Supplement, updates and amends certain information contained in the prospectus supplement dated September 25, 2020, or the Original Supplement, as amended by the prospectus supplement dated November 13, 2020, or the First Amendment Supplement, to the prospectus dated January 19, 2018, or the Base Prospectus, and, together with Original Supplement and First Amendment Supplement, the Original Prospectus, relating to the offer and sale of American Depositary Shares, or ADSs, representing our ordinary shares, par value NIS 0.10 per share, offered by this Prospectus Supplement. Each ADS represents 15 ordinary shares. This Prospectus Supplement should be read in conjunction with the Original Prospectus, and is qualified by reference to the Original Prospectus, except to the extent that the information presented herein supersedes the information contained in the Original Prospectus. This Prospectus Supplement is not complete without, and may only be delivered or used in connection with, the Original Prospectus, including any amendments or supplements thereto.

Our ADSs are listed on Nasdaq under the symbol "BLRX". On December 30, 2020, the closing price of our ADSs on Nasdaq was US$2.55 per ADS. Our ordinary shares also trade on the Tel Aviv Stock Exchange, or the TASE, under the symbol "BLRX". On December 30, 2020, the last reported sale price of our ordinary shares on the TASE was NIS 0.53 or $0.167 per share (based on the exchange rate reported by the Bank of Israel on the same day).

Pursuant to the Original Prospectus, we sold ADSs having an aggregate offering price of $6,048,247 from time to time through H.C. Wainwright & Co., LLC, or Wainwright, as sales agent, in "at-the-market" offerings as defined in Rule 415 promulgated under the Securities Act of 1933, as amended pursuant to an at-the-market offering agreement, or the Offering Agreement, dated September 25, 2020, that we entered into with Wainwright. We are filing this Prospectus Supplement to update and amend the Original Prospectus to update the dollar amount of shares we may sell under General Instruction I.B.1 of Form F-3. Pursuant to this Prospectus Supplement, we may offer and sell an additional $18,951,753 of our ADSs under the Offering Agreement, representing the balance of the original $25.0 million of our ADSs that may be sold pursuant to the Offering Agreement.

Investing in our securities involves a high degree of risk. You should read this Prospectus Supplement and the Original Prospectus as well as the information incorporated herein and therein by reference carefully before you make your investment decision. See "Risk Factors" beginning on page S-9 of this Prospectus Supplement under the same heading in the Original Prospectus to read about the factors you should consider before investing in our securities.

Neither the Securities and Exchange Commission, the Israel Securities Authority nor any state or other foreign securities commission has approved or disapproved of these securities or determined if this Prospectus Supplement or the Original Prospectus is truthful or complete. Any representation to the contrary is a criminal offense.

H.C. Wainwright & Co.

The date of this Prospectus Supplement is December 31, 2020

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Prospectus Supplement

SUMMARY

This summary highlights selected information contained elsewhere in, or incorporated by reference into, this Prospectus Supplement and the Original Prospectus that we consider important. This summary does not contain all of the information you should consider before investing in the ADSs or our ordinary shares. You should read this summary together with the entire Prospectus Supplement, the Original Prospectus and the information incorporated by reference herein and therein, including the risks related to our main therapeutic candidates, motixafortide (BL-8040) and AGI-134, our therapeutic product, BL-5010, our business, our industry, investing in the ADSs or our ordinary shares and our location in Israel, that we describe under "Risk Factors," and our consolidated financial statements and the related notes, which are incorporated by reference herein and therein, before making an investment in the ADSs. Generally, when we refer to this prospectus, we are referring to this Prospectus Supplement and the Original Prospectus.

Our Business

We are a late clinical-stage biopharmaceutical development company with a strategic focus on oncology. Our current development and commercialization pipeline consists of two clinical-stage therapeutic candidates – motixafortide (BL-8040), a novel peptide for the treatment of solid tumors, acute myeloid leukemia, or AML, and stem cell mobilization, and AGI-134, an immuno-oncology agent in development for solid tumors. In addition, we have an off-strategy, legacy therapeutic product called BL-5010 for the treatment of skin lesions. We have generated our pipeline by systematically identifying, rigorously validating and in-licensing therapeutic candidates that we believe exhibit a high probability of therapeutic and commercial success. To date, except for BL-5010, none of our therapeutic candidates have been approved for marketing or sold commercially. Our strategy includes commercializing our therapeutic candidates through out-licensing arrangements with biotechnology and pharmaceutical companies and evaluating, on a case-by-case basis, the commercialization of our therapeutic candidates independently.

In January 2016, we entered into a collaboration with MSD (a tradename of Merck & Co., Inc., Kenilworth, New Jersey) in the field of cancer immunotherapy, in the framework of which we are carrying out a clinical trial in pancreatic cancer.

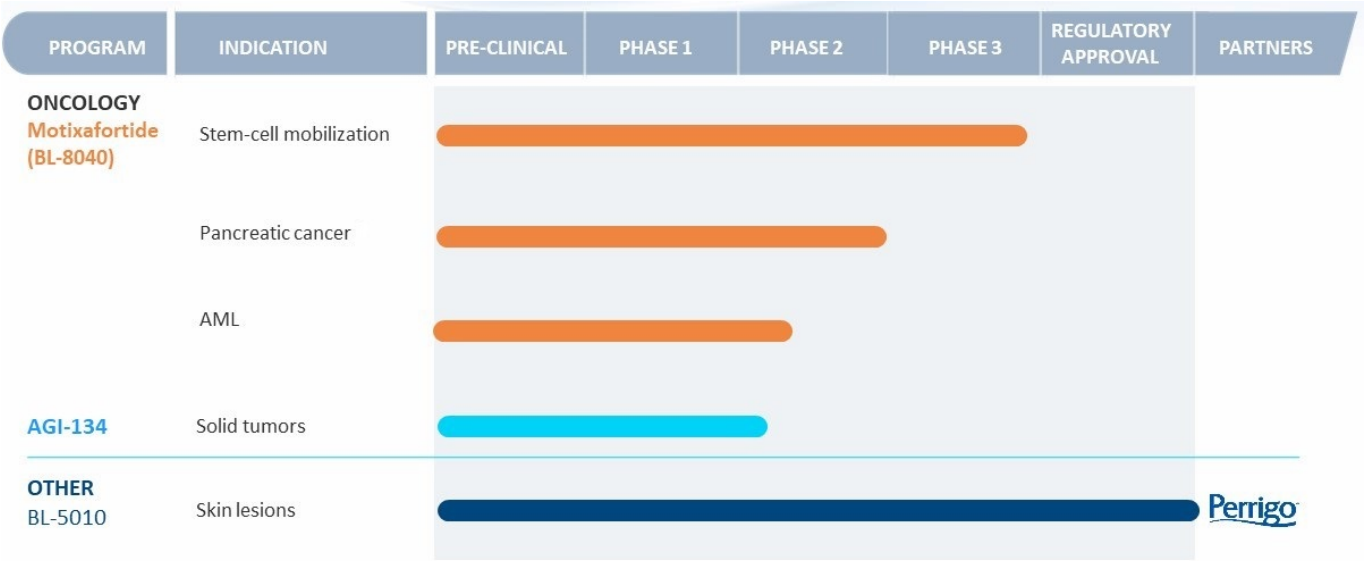
Our Product Development Approach

We seek to develop a pipeline of promising therapeutic candidates that exhibit distinct advantages over currently available therapies or address unmet medical needs. Our resources are focused on advancing our therapeutic candidates through development and toward commercialization. Our current drug development pipeline consists of two clinical-stage therapeutic candidates.

We have established close relationships with various universities, academic and research institutions and biotechnology companies that permit us to identify and select compounds at various stages of clinical and pre-clinical development. Our approach is consistent with our objective of proceeding only with therapeutic candidates that we believe exhibit a relatively high probability of therapeutic and commercial success.

Our Product Pipeline

The table below summarizes our current pipeline of therapeutic candidates, including the target indications and status of each candidate and our development partners:



Motixafortide

Our clinical-stage lead therapeutic candidate, motixafortide, is a novel, short peptide that functions as a high-affinity antagonist for CXCR4. We are developing motixafortide for the treatment of solid tumors, AML and stem cell mobilization. CXCR4 is expressed by normal hematopoietic cells and overexpressed in various human cancers where its expression correlates with disease severity. CXCR4 is a chemokine receptor that mediates the homing and retention of hematopoietic stem cells, or HSCs, in the bone marrow, and also mediates tumor progression, angiogenesis (growth of new blood vessels in the tumor), metastasis (spread of tumor to other organs) and survival. Before "motixafortide" was approved by the World Health Organization in 2019 as an International Nonproprietary Name, this therapeutic candidate was known as BL-8040.

Inhibition of CXCR4 by motixafortide leads to the mobilization of HSCs from the bone marrow to the peripheral blood, enabling their collection for subsequent autologous or allogeneic transplantation in cancer patients. Clinical data has demonstrated the ability of motixafortide to mobilize higher numbers of long-term engrafting HSCs ($CD34^+CD38^-CD45RA^-CD90^+CD49f^+$) as compared to G-CSF.

Motixafortide also mobilizes cancer cells from the bone marrow, detaching them from their survival signals and sensitizing them to chemotherapy. In addition, motixafortide has demonstrated a direct anti-cancer effect by inducing apoptosis (cell death) and inhibiting proliferation in various cancer cell models (multiple myeloma, non-Hodgkin's lymphoma, leukemia, non-small-cell lung carcinoma, neuroblastoma and melanoma).

In the field of immuno-oncology, motixafortide mediates infiltration of T-cells while reducing immune regulatory cells in the tumor microenvironment. In clinical studies, the combination of motixafortide with immune checkpoint inhibitors, such as anti PD-1, has shown T-cell activation and a reduction in tumor cell numbers.

The following is a summary of the clinical trials being carried out with motixafortide.

Solid tumors

In January 2016, we entered into a collaboration with MSD (a tradename of Merck & Co., Inc., Kenilworth, New Jersey) in the field of cancer immunotherapy. Based on this collaboration, in September 2016 we initiated a Phase 2a study, known as the COMBAT/KEYNOTE-202 study, focusing on evaluating the safety and efficacy of motixafortide in combination with KEYTRUDA® (pembrolizumab), MSD's anti-PD-1 therapy, in 37 patients with metastatic pancreatic adenocarcinoma, or PDAC. The study was an open-label, multicenter, single-arm trial designed to evaluate the clinical response, safety and tolerability of the combination of these therapies as well as multiple pharmacodynamic parameters, including the ability to improve infiltration of T-cells into the tumor and their reactivity. Top-line results showed that the dual combination demonstrated encouraging disease control and overall survival in patients with metastatic pancreatic cancer. In addition, assessment of patient biopsies supported motixafortide's ability to induce infiltration of tumor-reactive T-cells into the tumor, while reducing the number of immune regulatory cells.

In July 2018, we announced the expansion of the COMBAT/KEYNOTE-202 study under the collaboration to include a triple combination arm investigating the safety, tolerability and efficacy of motixafortide, KEYTRUDA and chemotherapy. We initiated this arm of the trial in December 2018. In December 2019, we announced that preliminary data from the study indicated that the triple combination therapy showed a high level of disease control, including seven partial responders and 10 patients with stable disease out of 22 evaluable patients. In February 2020, we completed recruiting a total of 43 patients for the study and in December 2020, we announced the final results of the study. The results of the study showed substantial improvement as compared to comparable historical results of other pancreatic cancer studies across all study endpoints. Of the 38 evaluable patients, median overall survival was 6.5 months, median progression free survival was 4 months, confirmed overall response rate was 13.2%, overall response rate was 21.2% and disease control rate was 63.2%. The combination was generally well tolerated, with a safety profile consistent with the individual safety profile of each component alone; adverse event and severe adverse event profiles were as expected with chemotherapy-based treatment regimens.

In August 2016, in the framework of an agreement with MD Anderson Cancer Center, or MD Anderson, we entered into an additional collaboration for the investigation of motixafortide in combination with KEYTRUDA in pancreatic cancer. The focus of this study, in addition to assessing clinical response, was the mechanism of action by which both drugs might synergize, as well as multiple assessments to evaluate the biological anti-tumor effects induced by the combination. We supplied motixafortide for this Phase 2b study, which commenced in January 2017. Final results from this study (based on a cut-off in July 2019 from 20 enrolled patients out of which 15 were evaluable) showed that the dual combination demonstrated clinical activity and encouraging overall survival in patients with metastatic pancreatic cancer. In addition, assessment of patient biopsies supported motixafortide's ability to induce infiltration of tumor-reactive T-cells into the tumor.

In October 2020, we announced that motixafortide will be tested in combination with the anti-PD-1 cemiplimab (LIBTAYO®) and standard-of-care chemotherapy (gemcitabine and nab-paclitaxel) in first-line PDAC. This investigator-initiated Phase 2 study, led by Columbia University, will initially enroll 10-12 PDAC patients, and will be expanded to a total of 40 patients following an evaluation of the initial 10-12 patients based on pre-defined criteria. The primary endpoint of the study is the overall response rate. Secondary endpoints include safety and tolerability, progression free survival, duration of clinical benefit and overall survival. Data from the study is anticipated in mid-2022.

AML

During 2016, we completed and reported on a Phase 2a proof-of-concept trial for the treatment of relapsed or refractory acute myeloid leukemia, or r/r AML, which was conducted on 42 patients at six world-leading cancer research centers in the United States and at five premier sites in Israel. The study included both a dose-escalation and a dose-expansion phase. Results from the trial showed positive safety and response rate data for subjects treated with a combination of motixafortide and high-dose cytarabine (Ara-C), or HiDAC. At the annual meeting of the European Hematology Association, or EHA, in June 2018, we presented positive overall survival data from the long-term follow-up part of this study. We continue to monitor long-term survival data for patients in the study and, in parallel, are evaluating our next clinical development steps in this indication.

Since August 2015, we have been conducting a double-blind, placebo-controlled, randomized, multi-center, Phase 2b trial in Germany, in collaboration with the German Study Alliance Leukemia Group, to assess the efficacy of motixafortide in addition to standard consolidation therapy (cytarabine) in AML patients who have responded to standard induction treatment and are in complete remission. Earlier this year, we finalized plans with our collaboration partners to conduct an interim analysis on 2/3 (N=128) of the 194 patients originally planned in the study, all of which had already completed treatment. Based on the interim analysis, the investigational arm of motixafortide combined with cytarabine did not demonstrate a statistically significant effect in the study's primary endpoint, and therefore, the Data Monitoring Committee, or DMC, recommended not to continue the study. We continue to believe in the relevance of CXCR4 as a viable target in other AML treatment lines, such as rr/AML and induction treatment, and we intend to decide on next steps in AML once we have had an opportunity to review and analyze the unblinded data, including detailed biomarker and subpopulation data, from the study.

Stem cell mobilization

In March 2015, we reported successful top-line results from a Phase 1 safety and efficacy trial for the use of motixafortide as a novel stem cell mobilization treatment for allogeneic bone marrow transplantation at Hadassah Medical Center in Jerusalem.

In March 2016, we initiated a Phase 2 trial for motixafortide in allogeneic stem cell transplantation, conducted in collaboration with the Washington University School of Medicine, Division of Oncology and Hematology. In May 2018, we announced positive top-line results of this study showing, among other things, that a single injection of motixafortide mobilized sufficient amounts of CD34+ cells required for transplantation at a level of efficacy similar to that achieved by using 4-6 injections of G-CSF, the current standard of care.

In December 2017, we commenced a randomized, placebo-controlled Phase 3 registrational trial for motixafortide, known as the GENESIS trial, for the mobilization of HSCs for autologous transplantation in patients with multiple myeloma. The trial began with a lead-in period for dose confirmation, which was to include 10-30 patients and then progress to the placebo-controlled main part, which was designed to include 177 patients in more than 25 centers. Following review of the positive results from treatment of the first 11 patients, the DMC recommended that the lead-in part of the study be stopped and that we should move immediately to the second part. Additional positive results from the lead-in period were reported at the annual meeting of the European Society for Blood and Marrow Transplantation held in March 2019, where it was announced that HSCs mobilized by motixafortide in combination with G-CSF were successfully engrafted in all 11 patients.

In August 2020, we announced a decision to perform an interim analysis on approximately 65% of the original study sample size, primarily based on a significantly lower-than-anticipated patient-dropout rate in the study. In October 2020, we announced positive results from the interim analysis. Based on the statistically significant evidence favoring treatment with motixafortide, the study's independent DMC issued a recommendation to us that patient enrollment may be ceased immediately, without the need to recruit all 177 patients originally planned for the study. In accordance with the DMC's recommendation, study enrollment was complete at 122 patients. Full results for the study, including secondary and exploratory efficacy endpoints, as well as extended safety data, will be announced after the last patient enrolled reaches 100 days of follow-up post-transplantation, which is expected to occur in the first half of 2021.

Other matters

In addition to the above, we are currently conducting, or planning to conduct, a number of investigator-initiated, open-label studies in a variety of indications to support the interest of the scientific and medical communities in exploring additional uses for motixafortide. These studies serve to further elucidate the mechanism of action for motixafortide. The results of studies such as these are presented from time to time at relevant professional conferences.

Motixafortide has been granted three Orphan Drug Designations by the FDA: for use to mobilize HSCs from the bone marrow to peripheral blood for collection in autologous or allogeneic transplantation (granted in July 2012); for the treatment of AML (granted in September 2013); and for the treatment of pancreatic cancer (granted in February 2019). In January 2020, the European Medicines Agency, or EMA, granted Orphan Drug Designation to motixafortide for the treatment of pancreatic cancer.

AGI-134

AGI-134, a clinical therapeutic candidate in-licensed by our subsidiary, Agalimmune Ltd., is a synthetic alpha-Gal glycolipid immunotherapy in development for solid tumors. AGI-134 harnesses the body's pre-existing, highly abundant, anti-alpha-Gal antibodies to induce a hyper-acute, systemic, specific anti-tumor response to the patient's own tumor neo-antigens. This response not only kills the tumor cells at the site of injection, but also brings about a durable, follow-on, anti-metastatic immune response. In August 2018, we initiated a Phase 1/2a clinical study for AGI-134 that is primarily designed to evaluate the safety and tolerability of AGI-134, given both as monotherapy and in combination with an immune checkpoint inhibitor, in unresectable metastatic solid tumors. The multi-center, open-label study is currently being carried out in the UK, US and Israel. Initial safety results from the first part of the study were announced at the beginning of September 2019; at the end of the same month, the second part of the study was commenced. Due to clinical operating issues associated with the COVID-19 pandemic, approximately half a year ago the clinical trial was temporarily suspended, which we continue to expect will lead to an approximate nine-month delay. Recently we have started study recruitment. As a result, initial proof-of-mechanism of action and efficacy results from the second part of the study are now expected in the second half of 2021.

BL-5010

Our commercialized, legacy therapeutic product, BL-5010, is a customized, proprietary pen-like applicator containing a novel, acidic, aqueous solution for the non-surgical removal of skin lesions. In December 2014, we entered into an exclusive out-licensing arrangement with Perrigo Company plc, or Perrigo, for the rights to BL-5010 for over-the-counter, or OTC, indications in Europe, Australia and additional selected countries. In March 2016, Perrigo received CE Mark approval for BL-5010 as a novel OTC treatment for the non-surgical removal of warts. The commercial launch of products for treatment of this first OTC indication (warts/verrucas) commenced in Europe in the second quarter of 2016. Since then, Perrigo has invested in improving the product and during 2019 launched an improved version of the product in several European countries. In March 2020, we agreed that Perrigo could relinquish its license rights for certain countries that had been included in its territory according to the original license agreement and was also no longer obligated to develop, obtain regulatory approval for and commercialize products for a second OTC indication. In turn, in March 2020, we agreed with our licensor of the rights to BL-5010, Innovative Pharmaceutical Concepts (IPC) Inc., or IPC, to return to IPC those license rights no longer out-licensed to Perrigo as a result of the agreement described in the preceding sentence, in consideration of the payment to us of royalties or fees on sublicense receipts.

Our Strategy

Our objective is to become a leader in the development of novel therapeutics for the treatment of cancer. We have successfully advanced a number of therapeutic candidates into clinical development. We intend to commercialize our two clinical candidates, motixafortide and AGI-134, and any future candidates through out-licensing or co-development arrangements with third parties that may perform any or all of the following tasks: completing development, securing regulatory approvals, securing reimbursement codes from insurance companies and health maintenance organizations, manufacturing and/or marketing. If appropriate, we may also enter into co-development and similar arrangements with respect to any therapeutic candidate with third parties or commercialize a therapeutic candidate ourselves.

Recent Developments

Motixafortide as therapy for COVID-19-induced inflammatory lung disorders, including acute respiratory distress syndrome (ARDS)

Over the last few months, we have been evaluating motixafortide as a potential therapy for COVID-19-induced inflammatory lung disorders, including ARDS. In this regard, substantial data is emerging regarding the involvement of neutrophils, neutrophil extracellular traps (NETs), monocytes and macrophages in the development of ARDS secondary to COVID-19 and other viral infections; as well as the key involvement of CXCR4 as a mediator of those cells in the inflamed pulmonary tissue. Based on the scientific data indicating the importance of blocking the CXCR4/CXCL12 axis during ARDS, we believe that motixafortide may be of potential benefit for patients with ARDS.

Following our initial evaluation, in November 2020, we announced initiation of a Phase 1b study in patients with ARDS secondary to COVID-19 and other respiratory viral infections. The study is an investigator-initiated study, led by Wolfson Medical Center, in Israel, to evaluate motixafortide in patients hospitalized with ARDS. The primary endpoint of the study is to assess the safety of motixafortide in these patients; respiratory parameters and inflammatory biomarkers will be assessed as exploratory endpoints. Up to 25 patients will be enrolled in the study, with a preliminary analysis planned after ten patients have completed the initial treatment period. Results of the preliminary analysis are expected in the first half of 2021.

Termination of BTIG Sales Agreement

Pursuant to that certain At-the-Market Sales Agreement, dated October 31, 2017, or the Sales Agreement, by and between us and BTIG, LLC we had been able to elect from time to time, to offer and sell ADSs through an “at the market offering” as defined in Rule 415(a)(4), or the ATM Offering, promulgated under the Securities Act, having an aggregate offering price of up to $30 million. Under the ATM Offering, we had sold an aggregate of 2,923,553 ADSs for an aggregate offering price of $12.96 million. On May 26, 2020, we terminated the prospectus supplement dated April 17, 2020 related to the ATM Offering, and we terminated the Sales Agreement effective September 24, 2020.

Recent Financings

On September 25, 2020, we entered into the Offering Agreement with Wainwright, pursuant to which we may offer and sell, from time to time, at our option, up to $25.0 million of our ADSs through an "at-the-market" equity offering program under which Wainwright has agreed to act as sales agent. As of December 30, 2020, we have sold ADSs having an aggregate offering price of $6,048,247 under the Offering Agreement pursuant to the Original Prospectus. Under this Prospectus Supplement, we may sell up to an $18,951,753 of our ADSs pursuant to the Offering Agreement, representing the balance of the original $25.0 million of our ADSs that may be sold pursuant to the Offering Agreement.

On June 3, 2020, we sold to certain institutional investors an aggregate of 2,510,286 ADSs in a registered direct offering at $1.75 per ADS, resulting in gross proceeds of approximately $4,400,000. In addition, we issued to the investors unregistered warrants to purchase up to an aggregate of 2,510,286 ADSs in a private placement, or the June 2020 Private Placement. The warrants are immediately exercisable and will expire two and one-half years from issuance at an exercise price of $2.25 per ADS, subject to adjustment as set forth therein. The warrants may be exercised on a cashless basis if on or following three months after issuance there is no effective registration statement registering the ADSs underlying the warrants. We paid an aggregate of $308,000 in placement agent fees plus certain expenses and issued unregistered placement agent warrants to purchase up to an aggregate of 125,514 ADS on substantially the same terms as the warrants except they have an exercise price of $2.1875 per ADS.

On May 28, 2020, we sold to certain institutional investors an aggregate of 5,142,859 ADSs in a registered direct offering at $1.75 per ADS, resulting in gross proceeds of approximately $9,000,000. In addition, we issued to the investors unregistered warrants to purchase up to an aggregate of 5,142,859 ADSs in a private placement, or the May 2020 Private Placement. The warrants are immediately exercisable and will expire two and one-half years from issuance at an exercise price of $2.25 per ADS, subject to adjustment as set forth therein. The warrants may be exercised on a cashless basis if on or following three months after issuance there is no effective registration statement registering the ADSs underlying the warrants. We paid an aggregate of $630,000 in placement agent fees plus certain expenses and issued unregistered placement agent warrants to purchase up to an aggregate of 257,143 ADSs on substantially the same terms as the warrants except they have an exercise price of $2.1875 per ADS.

Our Corporate Information

Our principal executive offices are located at 2 HaMa'ayan Street, Modi'in 7177871, Israel, and our telephone number is +972 (8) 642-9100. Our website is www.biolinerx.com. Information contained in our website is not incorporated by reference into and does not constitute part of this Prospectus Supplement.

THE OFFERING

Issuer	BioLineRx, Ltd.
ADSs offered by us	ADSs with aggregate gross sale proceeds of up to $18,951,753. Each ADS represents 15 ordinary shares.
Ordinary shares to be outstanding immediately after this offering	Up to 463,797,081 ordinary shares, assuming a sales price of $2.48 per ADS, which was the closing price of our ADSs on Nasdaq on December 29, 2020. The actual number of ADSs issued will vary depending on the price at which ADSs may be sold from time to time during this offering.
Form of offering	The Sales Agent may, according to the terms of the Offering Agreement, sell the ADSs offered under this Prospectus Supplement in an "at-the-market" offering as defined in Rule 415 under the Securities Act. Wainwright has agreed to use commercially reasonable efforts consistent with its normal trading and sales practices to make sales of the ADSs offered hereby.
Depositary	The Bank of New York Mellon.
Use of Proceeds	We intend to use the net proceeds of this offering for general corporate purposes, which may include but are not limited to working capital and funding clinical trials. See "Use of Proceeds" on page S-12.
Listings	The ADSs are listed on Nasdaq under the symbol "BLRX." Our ordinary shares currently trade on the TASE under the symbol "BLRX."
Risk Factors	Before investing in our securities, you should carefully read and consider the "Risk Factors" beginning on page S-9 of this Prospectus Supplement and in the documents we incorporate by reference in this Prospectus Supplement and the Original Prospectus.

Unless otherwise indicated, the number of ordinary shares outstanding prior to and after this offering is based on 296,508,550 ordinary shares outstanding as of September 30, 2020, and excludes:

- 34,904,449 ordinary shares issuable upon the exercise of outstanding warrants, at a weighted average exercise price of $1.14 per share, as of September 30, 2020;
- 18,913,808 ordinary shares issuable upon the exercise of outstanding options, at a weighted average exercise price of $0.77 per share, as of September 30, 2020;
- 77,142,885 ordinary shares represented by 5,142,859 ADSs issuable upon exercise of unregistered warrants issued to the investors in the May 2020 Private Placement, at an exercise price of $2.25 per ADS;
- 3,857,145 ordinary shares represented by 257,143 ADSs issuable upon exercise of unregistered warrants issued to the placement agent or its designees as compensation in connection the May 2020 Private Placement, at an exercise price of $2.1875 per ADS;
- 37,654,290 ordinary shares represented by 2,510,286 ADSs issuable upon exercise of unregistered warrants issued to the investors in the June 2020 Private Placement, at an exercise price of $2.25 per ADS;
- 1,882,710 ordinary shares represented by 125,514 ADSs issuable upon exercise of unregistered warrants issued to the placement agent or its designees as compensation in connection with the June 2020 Private Placement, at an exercise price of $2.1875 per ADS;
- 31,201,350 ordinary shares represented by 2,080,090 ADSs issued in an “at the market” equity offering under the Offering Agreement since September 30, 2020; and
- 13,125,000 ordinary shares represented by 875,000 ADSs issued upon exercise of unregistered warrants issued to investors at an exercise price of $2.25 per ADS since September 30, 2020.

Unless otherwise indicated, all information in this Prospectus Supplement assumes no exercise of the outstanding options or warrants described above.

RISK FACTORS

An investment in our securities involves a high degree of risk, you should carefully consider the risk factors set forth in our most recent Annual Report on Form 20-F on file with the SEC and our Forms 6-K filed on May 20, 2020, August 6, 2020 and November 23, 2020, which are incorporated by reference into this Prospectus Supplement, as well as the following risk factors, which supplement or augment the risk factors set forth in our Annual Report on Form 20-F and our Forms 6-K filed on May 20, 2020, August 6, 2020 and November 23, 2020. Before making an investment decision, you should carefully consider these risks as well as other information we include or incorporate by reference in this prospectus. The risks and uncertainties not presently known to us or that we currently deem immaterial may also materially harm our business, operating results and financial condition and could result in a complete loss of your investment.

Risks Related to Our Business and Regulatory Matters

Our business is subject to risks arising from a widespread outbreak of an illness or any other communicable disease, or any other public health crisis, such as the COVID-19 pandemic, which has impacted and could continue to impact our business.

The novel coronavirus outbreak, or COVID-19, has affected segments of the global economy and may materially affect our operations, including potentially interrupting our supply chain, clinical trial and commercialization activities. COVID-19 originated in Wuhan, China, in December 2019 and was declared a pandemic by the World Health Organization in March 2020. The virus has since spread to multiple countries, including to the United States, Europe and Israel, where we currently have our therapeutic candidates manufactured and conduct our clinical trials. The COVID-19 pandemic has negatively impacted the global economy, disrupted global supply chains and created significant volatility and disruption of financial markets. The COVID-19 pandemic has resulted in travel and other restrictions in order to reduce the spread of the disease, including public health directives and orders in Israel, the United States and Europe that, among other things and for various periods of time, directed individuals to shelter at their places of residence, directed businesses and governmental agencies to cease non-essential operations at physical locations, prohibited certain non-essential gatherings and events and ordered cessation of non-essential travel. Israel is currently experiencing a "third wave" of COVID-19 which has resulted in the reinstatement of restrictions on movement and other measures to control the spread of the virus. In addition, due to clinical operating issues associated with the COVID-19 pandemic, we previously reported the expectation of a delay of approximately nine months in the phase 1/2a study we are currently conducting for AGI-134, our second lead compound. The uncertainty surrounding the severity and continued spread of the coronavirus may result in a period of prolonged business disruption. COVID-19 may continue to impact our future operations, including potential interruptions to supply chains, clinical trials, commercialization activities and regulatory reviews and approvals. COVID-19 may also affect our employees and employees and operations at suppliers that may result in delays or disruptions in supply. In addition, a recession or market correction resulting from the spread of COVID-19 could materially affect our business and the value of our shares. Additionally, if the COVID-19 pandemic has a significant impact on our business and financial results for an extended period of time, our liquidity and cash resources could be negatively impacted. Capital and credit markets have been disrupted by the crisis and exchanges have experienced increased volatility. As a result, access to additional financing may be challenging and is largely dependent upon evolving market conditions and other factors. We have taken precautionary measures, including, for example, a Company-wide salary reduction related to the COVID-19 pandemic carried out in the second quarter of 2020, and may take additional measures, intended to minimize the risk of COVID-19 to our employees and operations. The extent of the impact of COVID-19 on our operational and financial performance, including our ability to execute our business strategies in the expected time frame or at all, will depend on future developments, such as the duration and spread of the COVID-19 pandemic and related restrictions and implications, all of which are uncertain and cannot be predicted.

Risks Related to this Offering

Management has broad discretion as to the use of proceeds of this offering, and we may not use these proceeds in a manner desired by our shareholders.

Our management will have broad discretion as to the use of the net proceeds from this offering and could use them for purposes other than those contemplated at the time of this offering. Accordingly, you will be relying on the judgment of our management with regard to the use of these net proceeds, and you will not have the opportunity as part of your investment decision to assess whether the proceeds are being used appropriately. Our needs may change as our business evolves. As a result, the proceeds to be received in this offering may be used in a manner significantly different from our current expectations. It is possible that the proceeds will be invested in a way that does not yield a favorable, or any, return.

You will experience immediate dilution in book value of any ADSs you purchase.

Because the price per ADS being offered is substantially higher than our net tangible book value per ADS, you will suffer substantial dilution in the net tangible book value of any ADSs you purchase in this offering. Assuming that an aggregate of 7,641,836 ADSs are sold at a public offering price of $2.48 per ADS, the last reported sale price of our ADSs on Nasdaq on December 29, 2020 for aggregate gross proceeds of $18,951,753 and after deducting estimated commissions and estimated offering expenses payable by us, our adjusted net tangible book value as of September 30, 2020, would have been approximately $21.4 million, or approximately $0.78 per ADS. As a result, if you purchase ADSs in this offering at that assumed public offering price, you would suffer immediate and substantial dilution of $1.70 per ADS with respect to the net tangible book value of the ADSs. See “Dilution” on page S-13 for a more detailed discussion of the dilution you will incur in connection with this offering.

If we raise additional capital in the future, your ownership in us could be diluted.

In order to raise additional capital, we may at any time, including during this offering, offer additional ADSs, ordinary shares or other securities convertible into or exchangeable for our ADSs or ordinary shares at prices that may not be the same as the price per ADS in this offering. We may sell ADSs or other securities in any other offering at a price per ADS that is less than the price per ADS paid by investors in this offering, and investors purchasing ADSs or other securities in the future could have rights superior to existing shareholders, including investors who purchase ADSs in this offering. The price per share at which we sell additional ADSs, ordinary shares or securities convertible into ordinary shares in future transactions may be higher or lower than the price per ADS in this offering.

Sales of a substantial number of our ADSs in the public market could cause our stock price to fall.

We may issue and sell additional ADSs in the public markets, including under this Prospectus Supplement. As a result, a substantial number of our ADSs may be sold in the public market. Sales of a substantial number of our ADSs in the public markets, including during this offering, or the perception that such sales could occur, could depress the market price of our ADSs and impair our ability to raise capital through the sale of additional equity securities.

There has been and may continue to be significant volatility in the volume and price of our ADSs and ordinary shares.

The market price of our ADSs and ordinary shares has been and may continue to be highly volatile. Factors, including timing, progress and results of current and future preclinical studies and clinical trials and our research and development programs; regulatory matters, concerns about our financial position, operations results, litigation, government regulation, developments or disputes relating to agreements, patents or proprietary rights, and the outbreak of the COVID-19 pandemic may have a significant impact on the market volume and price of our stock. Unusual trading volume in our shares occurs from time to time.

Our ADSs and ordinary shares are listed in two markets, and this may result in price variations that could affect the trading price of our ADSs and ordinary shares.

Our ADSs are listed on Nasdaq, and our ordinary shares are listed on the TASE, both under the symbol “BLRX.” Trading in our securities on these markets is made in different currencies (U.S. dollars on Nasdaq and New Israeli Shekels on the TASE), and at different times (due to the different time zones, different trading days and different public holidays in the United States and Israel). The relative trading prices of our securities on these two markets may differ due to these and other factors. Any decrease in the trading price of our securities on one exchange could cause a decrease in the trading price of our securities on the other exchange.

The ADSs offered hereby will be sold in "at-the-market" offerings, and investors who buy ADSs at different times will likely pay different prices.

Investors who purchase ADSs under this Prospectus Supplement at different times will likely pay different prices, and so may experience different outcomes in their investment results. We will have discretion, subject to market demand, to vary the timing, prices, and numbers of ADSs sold, and there is no minimum or maximum sales price. Investors may experience a decline in the value of their ADSs as a result of ADS sales made at prices lower than the prices they paid.

The actual number of ADSs we will issue under the Offering Agreement, at any one time or in total, is uncertain.

Subject to certain limitations in the Offering Agreement and compliance with applicable law, we have the discretion to deliver a sales notice to the Sales Agent at any time throughout the term of the Offering Agreement. The number of ADSs that are sold by the Sales Agent after delivering a sales notice will fluctuate based on the market price of the ADSs during the sales period and limits we set with the Sales Agent. Because the price per ADS of each ADS sold will fluctuate based on the market price of our ADSs during the sales period, it is not possible at this stage to predict the number of ADSs that will be ultimately issued.

USE OF PROCEEDS

We may issue and sell ADSs representing ordinary shares having aggregate sales proceeds of up to $18,951,753 from time to time. The amount of proceeds from this offering will depend upon the number of ADSs sold and the market price at which they are sold. There can be no assurance that we will be able to sell any ADSs under or fully utilize the Offering Agreement with the Sales Agent.

We intend to use the net proceeds from this offering for general corporate purposes, which may include but are not limited to working capital and funding clinical trials. The amounts and timing of our use of the net proceeds will vary depending on a number of factors, including the amount of cash generated or used by our operations, and the rate of growth, if any, of our business. As a result, we will retain broad discretion in the allocation of the net proceeds of this offering.

DILUTION

If you invest in the ADSs, your interest will be diluted immediately to the extent of the difference between the public offering price per ADS and the as adjusted net tangible book value per ADS after this offering.

The net tangible book value of our ADSs as of September 30, 2020 was $3.1 million, or $0.16 per ADS. Net tangible book value per ADS represents the amount of our total tangible assets less total liabilities divided by the total number of our ordinary shares outstanding as of September 30, 2020, multiplied by 15 (i.e., the number of ordinary shares underlying each ADS).

After giving effect to the sale of an aggregate of 7,641,836 ADSs in this offering at an assumed public offering price of $2.48 per ADS, the last reported sale price of our ADSs on Nasdaq on December 29, 2020, for aggregate gross proceeds of $18,951,753, after deducting estimated commissions and estimated offering expenses payable by us, our as adjusted net tangible book value as of September 30, 2020 would have been approximately $21.4 million, or approximately $0.78 per ADS. This represents an immediate increase in net tangible book value of approximately $0.78 per ADS to our existing shareholders and an immediate dilution in net tangible book value of approximately $1.70 per ADS to purchasers of the ADSs in this offering, as illustrated by the following table:

Assumed offering price per ADS		$ 2.48
Net tangible book value per ADS at September 30, 2020	$ 0.16	
Increase in net tangible book value per ADS after this offering	$ 0.62	
As adjusted net tangible book value per ADS as of September 30, 2020 after giving effect to this offering		$ 0.78
Dilution per ADS to investors purchasing the ADSs in this offering		$ 1.70

The above discussion is based on 296,508,550 shares outstanding as of September 30, 2020 and excludes the following:

- 34,904,449 ordinary shares issuable upon the exercise of outstanding warrants, at a weighted average exercise price of $1.14 per share, as of September 30, 2020;
- 18,913,808 ordinary shares issuable upon the exercise of outstanding options, at a weighted average exercise price of $0.77 per share, as of September 30, 2020;
- 77,142,885 ordinary shares represented by 5,142,859 ADSs issuable upon exercise of unregistered warrants issued to the investors in the May 2020 Private Placement at an exercise price of $2.25 per ADS;
- 3,857,145 ordinary shares represented by 257,143 ADSs issuable upon exercise of unregistered warrants issued to the placement agent or its designees as compensation in connection the May 2020 Private Placement, at an exercise price of $2.1875 per ADS;
- 37,654,290 ordinary shares represented by 2,510,286 ADSs issuable upon exercise of unregistered warrants issued to the investors in the June 2020 Private Placement at an exercise price of $2.25 per ADS;
- 1,882,710 ordinary shares represented by 125,514, ADSs issuable upon exercise of unregistered warrants issued to the placement agent or its designees as compensation in connection with the June 2020 Private Placement at an exercise price of $2.1875 per ADS;
- 39,535,995 ordinary shares represented by 2,635,733 ADSs issued in an “at the market” equity offering under the Offering Agreement since September 30, 2020; and
- 13,125,000 ordinary shares represented by 875,000 ADSs issued upon exercise of unregistered warrants issued to investors at an exercise price of $2.25 per ADS since September 30, 2020.

To the extent that any of these outstanding options or warrants are exercised or we issue additional ADSs or ordinary shares under our equity incentive plans, there will be further dilution to new investors. In addition, we may choose to raise additional capital at any time, including during this offering, due to market conditions or strategic considerations even if we believe we have sufficient funds for our current or future operating plans. To the extent that additional capital is raised through the sale of equity or convertible debt securities, the issuance of these securities could result in further dilution to new investors participating in this offering.

DOCUMENTS INCORPORATED BY REFERENCE

The SEC allows us to incorporate by reference our publicly filed reports into this Prospectus Supplement, which means that information included in those reports is considered part of this Prospectus Supplement. Information that we file with the SEC after the date of this Prospectus Supplement will automatically update and supersede the information contained in this Prospectus Supplement.

This Prospectus Supplement incorporates by reference the documents listed below, which have been previously filed with the SEC:

- Our Annual Report on Form 20-F for the year ended December 31, 2019, filed with the SEC on March 12, 2020; and

- Our Report on Forms 6-K filed with the SEC on May 20, 2020, May 26, 2020 (two filings), May 27, 2020, May 28, 2020, June 1, 2020, June 3, 2020, August 6, 2020, August 19, 2020 (two filings), September 24, 2020, September 25, 2020, October 29, 2020, October 30, 2020, November 18, 2020, November 23, 2020 and December 16, 2020 (two filings) (in each case, to the extent expressly incorporated by reference into our effective registration statements filed by us under the Securities Act).

We also incorporate by reference into this Prospectus Supplement additional documents that we may file with the SEC under sections 13(a), 13(c), 14 or 15(d) of the Exchange Act from the date of this Prospectus Supplement until we have sold all of the securities to which this prospectus supplement relates or the offering is otherwise terminated.

The SEC maintains an Internet site at http://www.sec.gov that contains reports, proxy and information statements, and other information regarding issuers like us that file electronically with the SEC.

We will furnish without charge to you, on written or oral request, a copy of any or all of the above documents, other than exhibits to such documents which are not specifically incorporated by reference therein. You should direct any requests for documents to:

BioLineRx Ltd.
Modi'in Technology Park
2 HaMa'ayan Street
Modi'in 7177871, Israel
Attention: Corporate Secretary
Tel.: +972-8-642-9100
e-mail: info@BioLineRx.com

The information relating to us contained in this prospectus is not comprehensive and should be read together with the information contained in the incorporated documents. Descriptions contained in the incorporated documents as to the contents of any contract or other document may not contain all of the information which is of interest to you. You should refer to the copy of such contract or other document filed as an exhibit to our filings.