UNITED STATES
SECURITIES AND EXCHANGE COMMISSION

Washington, D.C. 20549

FORM 8-K

CURRENT REPORT
Pursuant to Section 13 or 15(d)
of the Securities Exchange Act of 1934

Date of Report (Date of Earliest Event Reported): **September 22, 2020**

Blueprint Medicines Corporation

(Exact name of registrant as specified in its charter)

Delaware	**001-37359**	**26-3632015**
(State or other jurisdiction of incorporation)	(Commission File Number)	(I.R.S. Employer Identification No.)

45 Sidney Street **Cambridge, Massachusetts**	**02139**
(Address of principal executive offices)	(Zip Code)

Registrant's telephone number, including area code: **(617) 374-7580**

(Former name or former address, if changed since last report)

Check the appropriate box below if the Form 8-K filing is intended to simultaneously satisfy the filing obligation of the registrant under any of the following provisions:

☐ Written communications pursuant to Rule 425 under the Securities Act (17 CFR 230.425)
☐ Soliciting material pursuant to Rule 14a-12 under the Exchange Act (17 CFR 240.14a-12)
☐ Pre-commencement communications pursuant to Rule 14d-2(b) under the Exchange Act (17 CFR 240.14d-2(b))
☐ Pre-commencement communications pursuant to Rule 13e-4(c) under the Exchange Act (17 CFR 240.13e-4(c))

Indicate by check mark whether the registrant is an emerging growth company as defined in Rule 405 of the Securities Act of 1933 (§230.405 of this chapter) or Rule 12b-2 of the Securities Exchange Act of 1934 (§240.12b-2 of this chapter).

Emerging growth company ☐

If an emerging growth company, indicate by check mark if the registrant has elected not to use the extended transition period for complying with any new or revised financial accounting standards provided pursuant to Section 13(a) of the Exchange Act. ☐

Securities registered pursuant to Section 12(b) of the Exchange Act:

Title of each class	Trading symbol(s)	Name of each exchange on which registered
Common stock, par value $0.001 per share	BPMC	Nasdaq Global Select Market

Item 7.01 Regulation FD Disclosure.

On September 22, 2020, Blueprint Medicines Corporation (the "Company") is hosting an investor conference call and webcast to report top-line data from its Phase 1 EXPLORER and Phase 2 PATHFINDER clinical trials of AYVAKIT™ (avapritinib) in patients with advanced systemic mastocytosis. A copy of the presentation from the investor conference call and webcast is furnished as Exhibit 99.1 to this Current Report on Form 8-K.

The information in Item 7.01 of this Current Report on Form 8-K, including Exhibit 99.1 attached hereto, is intended to be furnished and shall not be deemed "filed" for purposes of Section 18 of the Securities Exchange Act of 1934, as amended (the "Exchange Act"), or otherwise subject to the liabilities of that section, nor shall it be deemed incorporated by reference in any filing under the Securities Act of 1933, as amended, or the Exchange Act, except as expressly set forth by specific reference in such filing.

Item 8.01 Other Events.

On September 22, 2020, the Company issued a press release announcing top-line data from its Phase 1 EXPLORER and Phase 2 PATHFINDER clinical trials of AYVAKIT in patients with advanced systemic mastocytosis. A copy of the press release is filed herewith as Exhibit 99.2 to this Current Report on Form 8-K and incorporated herein by reference.

Item 9.01 Financial Statements and Exhibits.

(d) Exhibits.

Exhibit No.	Description
99.1	Corporate slide presentation of Blueprint Medicines Corporation dated September 22, 2020
99.2	Press release issued by Blueprint Medicines Corporation on September 22, 2020
104	Cover Page Interactive Data File (embedded within the Inline XBRL document and incorporated as Exhibit 101)

SIGNATURES

Pursuant to the requirements of the Securities Exchange Act of 1934, the registrant has duly caused this report to be signed on its behalf by the undersigned hereunto duly authorized.

BLUEPRINT MEDICINES CORPORATION

Date: September 22, 2020

By: /s/ Jeffrey W. Albers
Jeffrey W. Albers
Chief Executive Officer

Blueprint Medicines Announces Positive Top-line Results from EXPLORER and PATHFINDER Trials of AYVAKIT™ (avapritinib) in Patients with Advanced Systemic Mastocytosis

-- 76% confirmed ORR in EXPLORER, with a median duration of response of 38.3 months --

-- 75% confirmed ORR in PATHFINDER, with a median duration of response not reached --

-- AYVAKIT safety profile reinforced at 200 mg QD dose in advanced SM --

-- Plan to submit supplemental new drug application to FDA for advanced SM in fourth quarter of 2020 --

-- Blueprint Medicines to host investor conference call today at 8:30 a.m. ET --

CAMBRIDGE, Mass., September 22, 2020 – Blueprint Medicines Corporation (NASDAQ: BPMC), a precision therapy company focused on genomically defined cancers, rare diseases and cancer immunotherapy, today announced positive top-line results from the Phase 1 EXPLORER and Phase 2 PATHFINDER clinical trials of AYVAKIT™ (avapritinib) in patients with advanced systemic mastocytosis (SM). Consistent with previously reported EXPLORER trial results, the registrational data for AYVAKIT showed profound reductions in mast cell burden, high overall response and complete remission rates, and durable clinical benefit, including prolonged median overall survival (OS). AYVAKIT was generally well-tolerated, with an improved safety profile at the 200 mg once daily (QD) dose. Based on these data, Blueprint Medicines plans to submit a supplemental new drug application (sNDA) to the U.S. Food and Drug Administration (FDA) for AYVAKIT for the treatment of advanced SM in the fourth quarter of 2020.

SM is a rare, debilitating disease driven by the KIT D816V mutation in nearly all patients. Uncontrolled mast cell proliferation and activation may lead to life-threatening complications across the SM patient population. In advanced SM subtypes, the median OS is approximately 3.5 years in aggressive SM (ASM), approximately two years in SM with an associated hematologic neoplasm (SM-AHN) and less than six months in mast cell leukemia (MCL). AYVAKIT, an investigational precision therapy for the treatment of SM, is the only highly potent KIT D816V inhibitor that has been clinically validated in SM.

“New treatment options are urgently needed to address mast cell infiltration associated with advanced systemic mastocytosis, which often leads to extensive organ damage and poor survival despite existing therapeutic interventions,” said Andy Boral, M.D., Ph.D., Chief Medical Officer at Blueprint Medicines. “These top-line data underscore the transformative impact shown by AYVAKIT, with patients achieving profound reductions in mast cell burden, durable responses that deepen over time and prolonged overall survival relative to historical outcomes. Based on these positive results, we aim to rapidly bring this promising treatment to patients, with the goal of improving and extending their lives beyond what is possible with currently available therapy.”

Top-line EXPLORER and PATHFINDER Trial Data

Across both trials, 85 patients were evaluable for response per the modified IWG-MRT-ECNM criteria (IWG criteria), including 44 patients treated with a starting dose of 200 mg QD. Top-line results are being reported as of a data cutoff date of May 27, 2020 in the EXPLORER trial and a data cutoff date of June 23, 2020 in the PATHFINDER trial,
with response assessments per central review completed in September 2020. Registrational endpoints are overall response rate (ORR) and duration of response (DOR), based on central review. ORR was defined as complete remission with full or partial recovery of peripheral blood counts (CR/CRh), partial remission or clinical improvement. All reported clinical responses were confirmed.

In the EXPLORER trial, 53 patients were response evaluable, with a median follow-up of 27.3 months. In EXPLORER, the ORR was 76 percent (95% CI: 62%, 86%), and 36 percent of patients had a CR/CRh. The median DOR was 38.3 months (95% CI: 21.7 months, not estimable). The median OS was not estimable (95% CI: 46.9 months, not estimable).

In a pre-specified interim analysis from the PATHFINDER trial, 32 patients were response evaluable, with a median follow-up of 10.4 months. The ORR was 75 percent (95% CI: 57%, 89%), and 19 percent of patients had a CR/CRh. In addition, the data showed that responses are continuing to deepen over time, at a rate consistent with the

EXPLORER trial. The median DOR was not estimable (95% CI: not estimable, not estimable), and OS was not assessed due to the length of time patients have been enrolled in PATHFINDER. The top-line PATHFINDER results were based on a pre-planned analysis designed to assess the superiority of AYVAKIT versus the ORR per IWG criteria previously reported for the multi-kinase inhibitor midostaurin. The interim analysis achieved its primary endpoint with a p-value of p=0.0000000016.

In a pooled efficacy analysis from the 200 mg QD dose group, 44 patients were response evaluable, with a median follow-up of 10.4 months. In this group, the ORR was 68 percent, and 18 percent of patients had a CR/CRh.

Safety data were consistent with previously reported results, and no new signals were observed. AYVAKIT was generally well-tolerated with most adverse events (AEs) reported as Grade 1 or 2. In the EXPLORER and PATHFINDER trials, AYVAKIT demonstrated improved tolerability at a starting dose of 200 mg QD, compared to all doses. Across both trials, 8.1 percent of patients discontinued AYVAKIT due to treatment-related AEs.

Previously reported results from the EXPLORER trial showed that pre-existing severe thrombocytopenia, which occurs in approximately 10 to 15 percent of advanced SM patients based on Blueprint Medicines estimates, and starting doses of 300 mg QD or higher were risk factors for intracranial bleeding (ICB). Based on these data, Blueprint Medicines implemented treatment management guidelines in the EXPLORER and PATHFINDER trials, including exclusion criteria for pre-existing severe thrombocytopenia, routine platelet monitoring and dose interruption guidelines for emergent severe thrombocytopenia. In 76 EXPLORER and PATHFINDER trial patients without pre-existing severe thrombocytopenia treated at the 200 mg QD dose, two patients (2.6 percent) had ICB events. Both AEs were Grade 1 and asymptomatic. These safety data validate the clinical impact of the treatment management guidelines.

Blueprint Medicines plans to present detailed results from the EXPLORER and PATHFINDER trials at a future medical meeting.

Conference Call Information

Blueprint Medicines will host a live webcast today beginning at 8:30 a.m. ET to discuss the top-line results of AYVAKIT in advanced SM. To access the live call, please dial (855) 728-4793 (domestic) or (503) 343-6666 (international) and refer to conference ID 5338896. A webcast of the conference call will be available under “Events and Presentations” in the Investors & Media section of Blueprint Medicines’ website at http://ir.blueprintmedicines.com. The archived webcast will be available on Blueprint Medicines’ website approximately two hours after the conference call and will be available for 30 days following the call.

About SM

SM is a rare disease driven by the KIT D816V mutation. Uncontrolled proliferation and activation of mast cells result in chronic, severe and often unpredictable symptoms for patients across the spectrum of SM. The vast majority of those affected have non-advanced (indolent or smoldering) SM, with debilitating symptoms that lead to a profound, negative impact on quality of life. A minority of patients have advanced SM, which encompasses a group of high-risk SM subtypes including ASM, SM-AHN and MCL. In addition to mast cell activation symptoms, advanced SM is associated with organ damage due to mast cell infiltration and poor OS.

Debilitating symptoms associated with SM, including anaphylaxis, maculopapular rash, pruritis, brain fog, fatigue and bone pain, often persist despite treatment with a number of symptomatic therapies. Patients often live in fear of attacks, have limited ability to work or perform daily activities, or isolate themselves to protect against unpredictable triggers.

Currently, there are no approved therapies that selectively inhibit D816V mutant KIT. A multi-kinase inhibitor, midostaurin, is approved for the treatment of advanced SM and has shown an ORR of 28 percent per IWG criteria, with ORR defined as complete remission, partial remission or clinical improvement.

About AYVAKIT (avapritinib)

AYVAKIT (avapritinib) is a kinase inhibitor approved by the FDA for the treatment of adults with unresectable or metastatic gastrointestinal stromal tumor (GIST) harboring a PDGFRA exon 18 mutation, including PDGFRA D842V mutations. For more information, visit www.AYVAKIT.com.

AYVAKIT is not approved for the treatment of any other indication, including SM, in the U.S. by the FDA or for any indication in any other jurisdiction by any other health authority.

Blueprint Medicines is developing AYVAKIT globally for the treatment of advanced and indolent SM. The FDA granted breakthrough therapy designation to AYVAKIT for the treatment of advanced SM, including the subtypes of ASM, SM-AHN and MCL.

Blueprint Medicines has an exclusive collaboration and license agreement with CStone Pharmaceuticals for the development and commercialization of AYVAKIT in Mainland China, Hong Kong, Macau and Taiwan. Blueprint Medicines retains development and commercial rights for AYVAKIT in the rest of the world.

About the Clinical Development Program for AYVAKIT in Advanced SM

AYVAKIT is currently being evaluated in two ongoing, registrational clinical trials for advanced SM: the EXPLORER trial (ClinicalTrials.gov Identifier: NCT02561988) and the PATHFINDER trial (ClinicalTrials.gov Identifier: NCT03580655).

The EXPLORER trial is an open-label, single-arm trial designed to identify the recommended Phase 2 dose and demonstrate proof-of-concept in patients with advanced SM. Key trial endpoints include ORR, DOR, quantitative measures of mast cell burden, patient-reported outcomes and safety. The EXPLORER trial has completed patient enrollment.

The PATHFINDER trial is an open-label, single-arm registration-enabling trial designed to confirm the clinical activity of AYVAKIT in patients with advanced SM. Key trial endpoints include ORR, DOR, quantitative measures of mast cell burden, patient-reported outcomes and safety. Patient enrollment is ongoing in the PATHFINDER trial.

Patients and physicians interested in SM clinical trials can contact the Blueprint Medicines study director at medinfo@blueprintmedicines.com or 1-888-BLU-PRNT (1-888-258-7768) in the U.S., or medinfoeurope@blueprintmedicines.com or +31 85 064 4001 in Europe. Additional information is available at www.BlueprintClinicalTrials.com and www.clinicaltrials.gov.

About Blueprint Medicines

Blueprint Medicines is a precision therapy company striving to improve human health. With a focus on genomically defined cancers, rare diseases and cancer immunotherapy, we are developing transformational medicines rooted in our leading expertise in protein kinases, which are proven drivers of disease. Our uniquely targeted, scalable approach empowers the rapid design and development of new treatments and increases the likelihood of clinical success. We have two FDA-approved precision therapies and are currently advancing multiple investigational medicines in clinical development, along with a number of research programs. For more information, visit www.BlueprintMedicines.com and follow us on Twitter (@BlueprintMeds) and LinkedIn.

Cautionary Note Regarding Forward-Looking Statements

This press release contains forward-looking statements within the meaning of the Private Securities Litigation Reform Act of 1995, as amended, including, without limitation, statements regarding plans, timelines and expectations for interactions with the FDA and other regulatory authorities; plans and timelines for submitting an

sNDA to the FDA for AYVAKIT for the treatment of advanced SM; expectations regarding the potential benefits of AYVAKIT in treating patients with SM; and Blueprint Medicines' strategy, goals and anticipated milestones, business plans and focus. The words "aim," "may," "will," "could," "would," "should," "expect," "plan," "anticipate," "intend," "believe," "estimate," "predict," "project," "potential," "continue," "target" and similar expressions are intended to identify forward-looking statements, although not all forward-looking statements contain these identifying words. Any forward-looking statements in this press release are based on management's current expectations and beliefs and are subject to a number of risks, uncertainties and important factors that may cause actual events or results to differ materially from those expressed or implied by any forward-looking statements contained in this press release, including, without limitation, risks and uncertainties related to the impact of the COVID-19 pandemic to Blueprint Medicines' business, operations, strategy, goals and anticipated milestones, including Blueprint Medicines' ongoing and planned research and discovery activities, ability to conduct ongoing and planned clinical trials, clinical supply of current or future drug candidates, commercial supply of current or future approved products, and launching, marketing and selling current or future approved products; Blueprint Medicines' ability and plans in establishing a commercial infrastructure, and successfully launching, marketing and selling current or future approved products, including AYVAKIT and GAVRETO™ (pralsetinib); Blueprint Medicines' ability to successfully expand the approved indications for AYVAKIT and GAVRETO or obtain marketing approval for AYVAKIT and GAVRETO in additional geographies in the future; the delay of any current or planned clinical trials or the development of Blueprint Medicines' current or future drug candidates; Blueprint Medicines' advancement of multiple early-stage efforts; Blueprint Medicines' ability to successfully demonstrate the safety and efficacy of its drug candidates and gain approval of its drug candidates on a timely basis, if at all; the preclinical and clinical results for Blueprint Medicines' drug candidates, which may not support further development of such drug candidates; actions of regulatory agencies, which may affect the initiation, timing and progress of clinical trials; Blueprint Medicines' ability to develop and commercialize companion diagnostic tests for its current and future drug candidates; and the success of Blueprint Medicines' current and future collaborations, partnerships or licensing arrangements, including Blueprint Medicines' global collaboration with Roche for the development and commercialization of GAVRETO. These and other risks and uncertainties are described in greater detail in the section entitled "Risk Factors" in Blueprint Medicines' filings with the Securities and Exchange Commission (SEC), including Blueprint Medicines' most recent Annual Report on Form 10-K, as supplemented by its most recent Quarterly Report on Form 10-Q and any other filings that Blueprint Medicines has made or may make with the SEC in the future. Any forward-looking statements contained in this press release represent Blueprint Medicines' views only as of the date hereof and should not be relied upon as representing its views as of any subsequent date. Except as required by law, Blueprint Medicines explicitly disclaims any obligation to update any forward-looking statements.

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