# 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): **August 9, 2017**

# 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.) |

| **38 Sidney Street, Suite 200**<br>**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:

- o Written communications pursuant to Rule 425 under the Securities Act (17 CFR 230.425)
- o Soliciting material pursuant to Rule 14a-12 under the Exchange Act (17 CFR 240.14a-12)
- o Pre-commencement communications pursuant to Rule 14d-2(b) under the Exchange Act (17 CFR 240.14d-2(b))
- o 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. ☑

**Item 7.01 Regulation FD Disclosure.**

Blueprint Medicines Corporation (the "Company") from time to time presents and/or distributes to the investment community at various conferences and meetings slide presentations to provide updates and summaries of its business. The Company is posting to the "Investors" portion of its website at http://ir.blueprintmedicines.com/ a copy of its current corporate slide presentation. These slides are attached to this Current Report on Form 8-K as Exhibit 99.1. The Company undertakes no obligation to update, supplement or amend the materials attached hereto as Exhibit 99.1.

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 9.01 Financial Statements and Exhibits.**

(d) Exhibits.

| Exhibit No. | Description |
|---|---|
| 99.1 | Corporate slide presentation of Blueprint Medicines Corporation dated August 9, 2017 |

**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: August 9, 2017

By: /s/ Tracey L. McCain
Tracey L. McCain
Chief Legal Officer

**EXHIBIT INDEX**

| Exhibit No. | Description |
| --- | --- |
| 99.1 | Corporate slide presentation of Blueprint Medicines Corporation dated August 9, 2017 |


blueprint
MEDICINES
A Blueprint for a Healthier Tomorrow
Wednesday, August 9, 2017

# Forward-looking statements

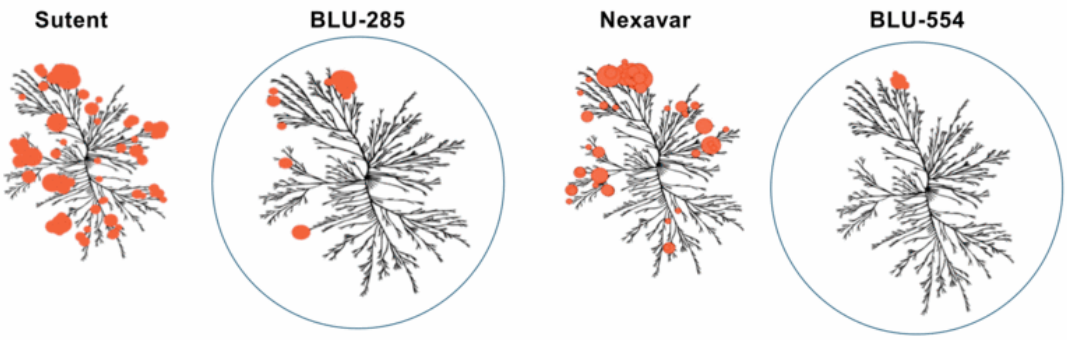
This presentation contains forward-looking statements as defined in the Private Securities Litigation Reform Act of 1995, as amended. The words "may," "will," "could," "would," "should," "expect," "plan," "anticipate," "intend," "believe," "estimate," "predict," "project," "potential," "continue," "target" and similar expressions are intended to identify forward-looking statements, although not all forward-looking statements contain these identifying words.

In this presentation, forward-looking statements include, without limitation, statements about plans and timelines for the clinical development of BLU-285, BLU-554 and BLU-667 and the ability of Blueprint Medicines Corporation (the "Company") to implement those clinical development plans; the potential benefits of the Company's current and future drug candidates in treating patients; plans and timelines for regulatory submissions, filings or discussions; plans and timelines for the development and commercialization of companion diagnostics for the Company's current or future drug candidates; plans and timelines for current or future discovery programs; plans and timelines for any current or future collaborations with strategic partners; expectations regarding the Company's existing cash, cash equivalents and investments or the future financial performance of the Company; expectations regarding potential milestones; and the Company's strategy, business plans and focus. The Company has based these forward-looking statements on management's current expectations, assumptions, estimates and projections. While the Company believes these expectations, assumptions, estimates and projections are reasonable, such forward-looking statements are only predictions and involve known and unknown risks, uncertainties and other important factors, many of which are beyond the Company's control and may cause actual results, performance or achievements to differ materially from those expressed or implied by any forward-looking statements. These risks and uncertainties include, without limitation, risks and uncertainties related to the delay of any current or future clinical trials or the development of the Company's drug candidates, including BLU-285, BLU-554 and BLU-667; the Company's advancement of multiple early-stage efforts; the Company's ability to successfully demonstrate the efficacy and safety of its drug candidates; the preclinical and clinical results for the Company's drug candidates, which may not support further development of such drug candidates; actions or decisions of regulatory agencies or authorities, which may affect the initiation, timing and progress of current or future clinical trials; the Company's ability to obtain, maintain and enforce patent and other intellectual property protection for any drug candidates it is developing; the Company's ability to develop and commercialize companion diagnostics for its current and future drug candidates, including a companion diagnostic for BLU-554 with Ventana Medical Systems, Inc. and a companion diagnostic for BLU-285 with QIAGEN Manchester Limited; and the success of the Company's cancer immunotherapy collaboration with F. Hoffmann-La Roche Ltd and Hoffmann-La Roche Inc.

These and other risks and uncertainties are described in greater detail under "Risk Factors" in the Company's Quarterly Report on Form 10-Q for the quarter ended June 30, 2017, as filed with the Securities and Exchange Commission ("SEC") on August 2, 2017, and any other filings the Company may make with the SEC in the future. The Company cannot guarantee future results, outcomes, levels of activity, performance, developments, or achievements, and there can be no assurance that the Company's expectations, intentions, anticipations, beliefs, or projections will result or be achieved or accomplished. The forward-looking statements in this presentation are made only as of the date hereof, and except as required by law, the Company undertakes no obligation to update any forward-looking statements contained in this presentation as a result of new information, future events or otherwise.

This presentation also contains estimates, projections and other statistical data made by independent parties and by the Company relating to market size and growth and other data about the Company's industry. These data involve a number of assumptions and limitations, and you are cautioned not to give undue weight to such estimates. In addition, projections, assumptions and estimates of the Company's future performance and the future performance of the markets in which the Company operates are necessarily subject to a high degree of uncertainty and risk.

# A new way of looking at kinase medicines




We design and develop **highly targeted kinase medicines** with the goal of improving potency, limiting off-target activity, and increasing probability of clinical success

# A blueprint for a healthier tomorrow

| Genomically defined cancers | Rare diseases | Cancer immunotherapy |
|---|---|---|
| Oncogenic kinases resulting from tumor genetic alterations | Abnormally activated kinases due to rare genetic alterations | Intracellular immunokinases involved in tumor immunity |
| • Gastrointestinal stromal tumors<br>• Hepatocellular carcinoma<br>• RET-altered cancers, including non-small cell lung cancer and medullary thyroid cancer<br>• Fibrolamellar carcinoma | • Systemic mastocytosis<br>• Fibrodysplasia ossificans progressiva* | • Roche collaboration (up to 5 undisclosed targets) |

*Blueprint Medicines plans to evaluate opportunities to advance this discovery program.

# Robust pipeline of diverse clinical and preclinical stage assets

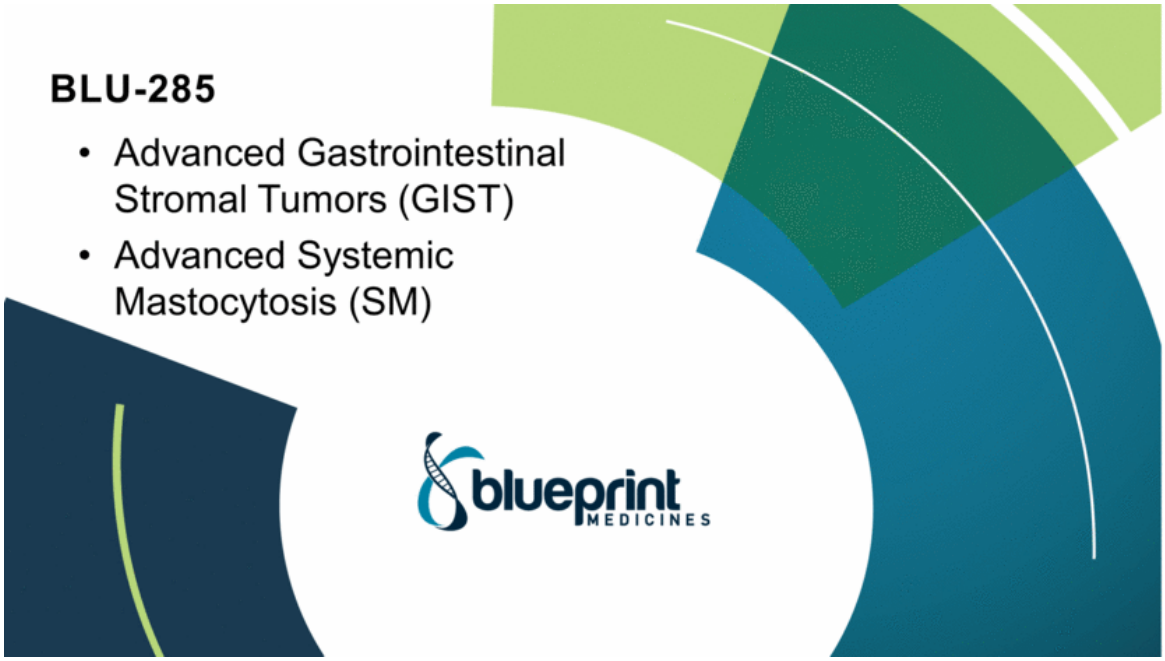
| DRUG CANDIDATE | DISCOVERY | PRECLINICAL | CLINICAL | COMMERCIAL RIGHTS |
|---|---|---|---|---|
| **BLU-285** Inhibitor of KIT, including exon 17 mutations, and PDGFRα, including the D842V mutation | | | REGISTRATION TRIAL – PDGFRα-DRIVEN GIST<br>PHASE 1 – KIT-DRIVEN GIST<br>PHASE 1 – SYSTEMIC MASTOCYTOSIS | |
| **BLU-554** Inhibitor of FGFR4 | | | PHASE 1 – HEPATOCELLULAR CARCINOMA | |
| **BLU-667** Inhibitor of RET fusions, mutations and resistant mutants | | | PHASE 1 – NSCLC, THYROID & OTHER CANCERS* | |
| **PRKACA Fusions** | FLC | | | |
| **ALK2 Mutations** | FOP** | | | |
| **Cancer immunotherapy** Immunokinases | UP TO 5 PROGRAMS, TARGET AND DEVELOPMENT STAGE UNDISCLOSED*** | | | Roche |

FLC, fibrolamellar carcinoma; FOP, fibrodysplasia ossificans progressiva. All Phase 1 clinical trials are in advanced disease. * Phase 1 trial includes a basket cohort that consists of other advanced solid tumors with RET alterations. ** On July 26, 2017, Blueprint Medicines received written notice from Alexion of its election to terminate the FOP collaboration for convenience. The termination will become effective on October 24, 2017, and Blueprint Medicines plans to evaluate opportunities to advance this discovery program. *** Blueprint Medicines has U.S. commercial rights for up to two programs. Roche has worldwide commercialization rights for up to three programs and ex-U.S. commercialization rights for up to two programs.

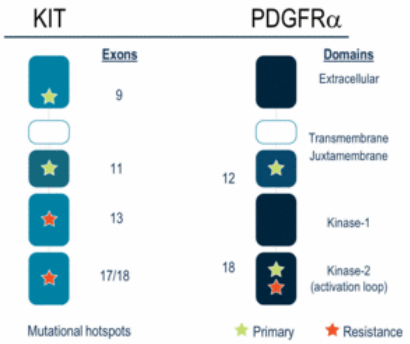
## Key progress achieved year to date

- Initiated Phase 1 trial of BLU-667 in RET-driven cancers
- Completed an April 2017 offering and received ~$215M in net proceeds
- Received Breakthrough Therapy Designation for BLU-285 for the treatment of unresectable or metastatic PDGFRα D842V-driven GIST
- Established plan to pursue expedited path for approval in PDGFRα-driven GIST based on additional data from ongoing Phase 1 trial
- Presented updated Phase 1 data for BLU-285 in advanced GIST at ASCO
- Initiated the expansion portion of Phase 1 trial for BLU-285 in advanced SM

blueprint MEDICINES


BLU-285
• Advanced Gastrointestinal Stromal Tumors (GIST)
• Advanced Systemic Mastocytosis (SM)
blueprint MEDICINES

# Mutant receptor tyrosine kinases are key drivers of disease in GIST

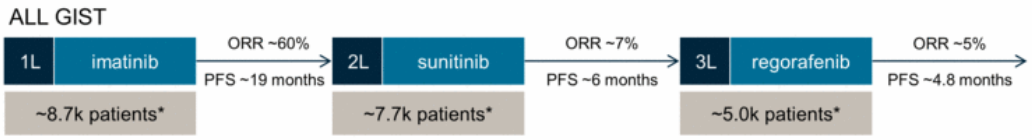


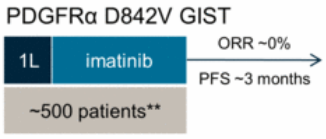

| Mutation | Frequency[1,2] | |
|---|---|---|
| | Primary | Acquired Resistance |
| PDGFRα D842V | ~5–6% | Rare |
| KIT exon 9 or 11 | ~75-80% | N/A |
| KIT exon 17/18 | ~1% | 2L ~23%<br>≥3L ~90% |
| KIT exon 13 | N/A | 2L ~40% |

**BLU-285 has demonstrated biochemical activity across a broad KIT and PDGFRα mutational spectrum[3]**

[1] Corless et al. J Clin Oncol. 2005;23:5357
[2] Barnett and Heinrich. Am Soc Clin Onc Ed Book. 2012;663
[3]Data previously presented in April 2017 at the AACR Annual Meeting.

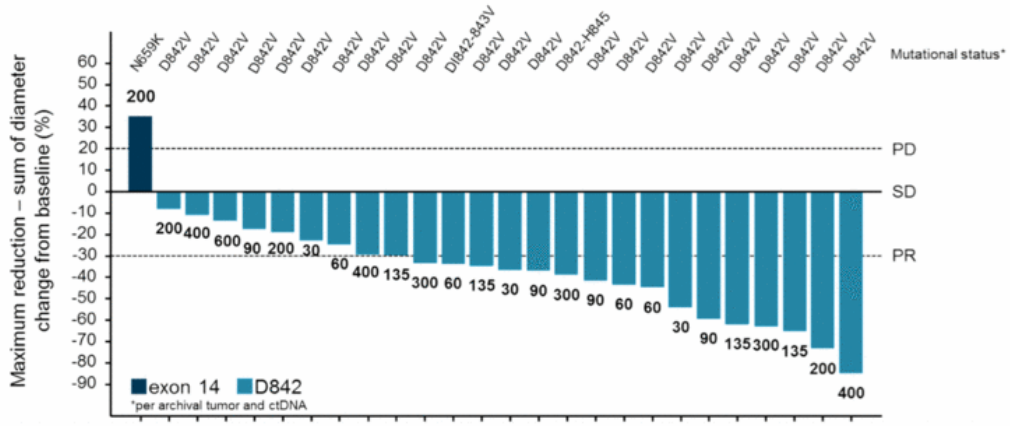
# Beyond imatinib, there are no highly effective treatments




*Represents estimated incidence for GIST patients in major markets (US, EU5 and Japan).
**Represents estimated incidence for all GIST patients with PDGFRα D842V mutation in major markets (US, EU5 and Japan).

# Tumor regression across all dose levels in PDGFRα D842-mutant GIST (central radiographic review)




Data previously presented in June 2017 at the ASCO Annual Meeting. Data cutoff: April 28, 2017.
*Per archival tumor and ctDNA.

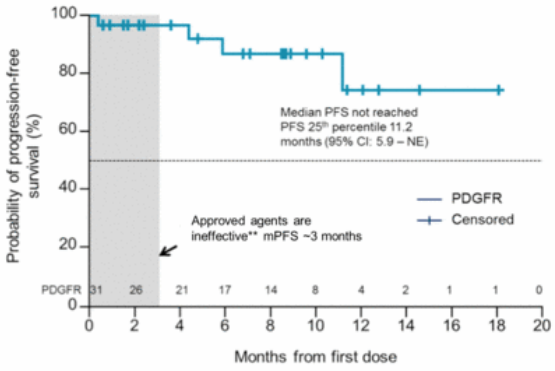
# High response rate and prolonged PFS in PDGFRα D842-mutant GIST

Central radiographic review

| Best response (n=25) | Choi criteria n (%) | RECIST 1.1 n (%) |
|---|---|---|
| PR | 25 (100) | 15* (60) |
| SD | 0 | 10 (40) |
| DCR (PR + SD) | 25 (100) | 25 (100) |
| PD | 0 | 0 |

*12 confirmed, 3 pending confirmation

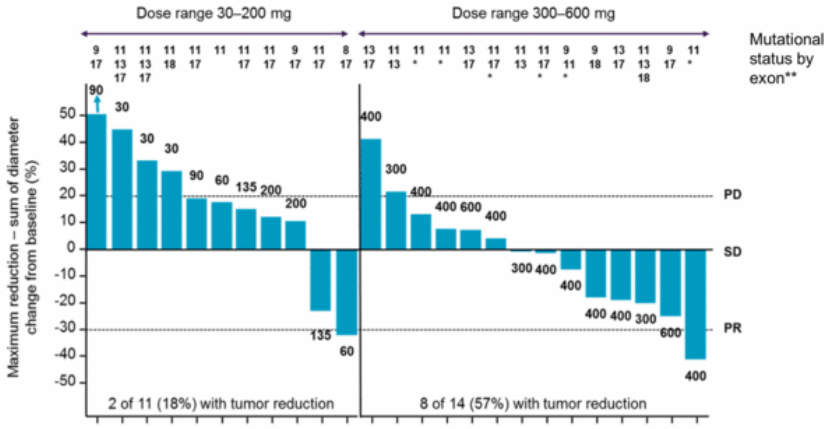
- Approved agents are ineffective**
  - ORR ~ 0%




**9-month PFS is estimated at 87%**

DCR, disease control rate; mPFS, median progression free survival; ORR, objective response rate; PD, progressive disease; PFS, progression free survival; SD, stable disease. Data previously presented in June 2017 at the ASCO Annual Meeting. Data cutoff: April 28, 2017.
**Cassier CCR (2012); Yoo Can Res Treat (2015).

# Dose-dependent tumor reduction across multiple KIT genotypes (central radiographic review)




*ctDNA results pending.
**Per archival tumor and ctDNA.

# Important clinical activity in heavily pre-treated KIT-mutant GIST

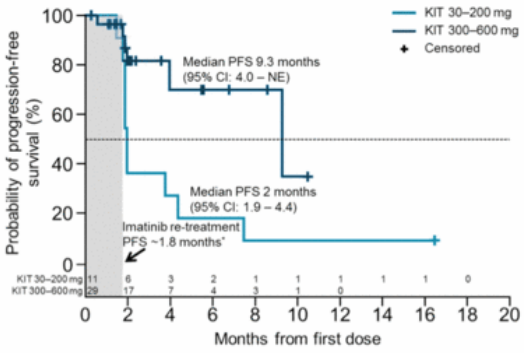
Central radiographic review

| Best response (n=25) | Choi criteria n (%) | RECIST 1.1 n (%) |
|---|---|---|
| PR | 8 (32) | 2* (8) |
| SD | 6 (24) | 12 (48) |
| DCR (PR + SD) | 14 (56) | 14 (56) |
| PD | 11 (44) | 11 (44) |

*1 confirmed, 1 pending confirmation

- Beyond third-line regorafenib, there are no approved therapies
  - 0% ORR for imatinib re-treatment in ≥ third-line GIST**

↑ PFS with BLU-285 ≥300 mg




Data previously presented in June 2017 at the ASCO Annual Meeting. Data cutoff: April 28, 2017.
**Kang et al. Lancet Oncol. 2013; 14(12): 1175-82

## Safety results showed BLU-285 was well tolerated

- Most adverse events were Grade 1 or 2
- Across all grades, the most common adverse events included nausea (60%), fatigue (53%), vomiting (42%), periorbital edema (36%), diarrhea (33%), and peripheral edema (31%)
- Investigators reported treatment-related Grade ≥3 adverse events in 18 patients (25%)
- Two patients experienced dose-limiting toxicities at 600 mg QD, leading to the determination of 400 mg QD as the maximum tolerated dose
- Only one patient discontinued treatment with BLU-285 due to a drug-related toxicity (Grade 3 hyperbilirubinemia)

QD, once daily.
Data previously presented in June 2017 at the ASCO Annual Meeting. Data cutoff: April 28, 2017.

# BLU-285 proposed registration paths in GIST

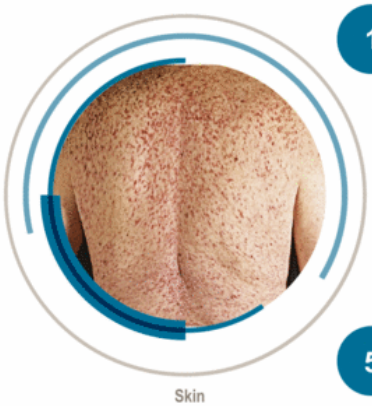
**PDGFRα D842V-driven GIST**

- Breakthrough Therapy Designation granted in June 2017
- FDA open to considering additional Phase 1 data as basis for a New Drug Application
- Estimate expansion cohort enrollment complete by mid-year 2018

**KIT-driven GIST**

- Plan to initiate randomized Phase 3 trial versus regorafenib in 3L GIST in 1H 2018

# BLU-285 in advanced systemic mastocytosis



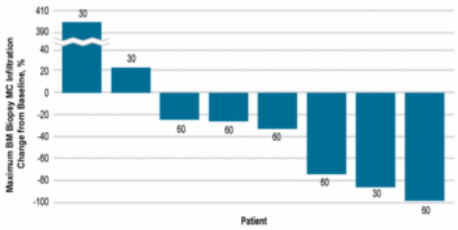
Skin
urticaria pigmentosa

1. Advanced SM is a severe, rare disease and published natural history data show only ~3-5 years overall survival
2. KIT D816V mutation is a key driver in ~90-95% of patients[1]
3. BLU-285 is a highly selective inhibitor of KIT D816V
4. Proof-of-concept data for BLU-285 showed decreased bone marrow mast cell burden and decreased serum tryptase
5. Advanced SM (including smoldering) = ~4,400 patients[2]
   Indolent SM = ~16,100 patients[2]

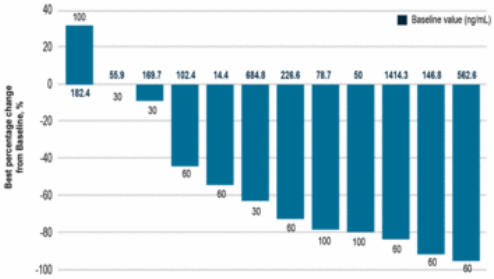
Image from: Hartmann K et al, 2015.
[1]Garcia-Montero AC et al, 2006. [2]Represents estimated prevalence of advanced SM or indolent SM patients in major markets (US, EU5 and Japan).

# Encouraging early clinical activity with objective decreases in mast cell burden

## Decreased bone marrow mast cells in 6 of 8 patients




## Decreased serum tryptase in 10 of 12 patients




**SAFETY:**

- Most adverse events were Grade 1 or 2
- No Grade 4 or 5 treatment-related events and no dose reductions required for toxicity
- 1 DLT: Grade 3 alkaline phosphatase elevation

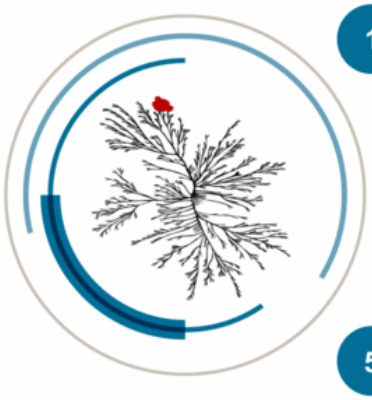
**NEXT STEPS:**

- Enrolling dose expansion portion at the recommended dose of 300 mg once daily
- Plan to provide updated data from this clinical trial by the end of 2017

The values above/below the bars denote the dose level (mg) QD received by each patient.
Data previously presented in December 2016 at the American Society of Hematology Annual Meeting. Data cutoff: November 11, 2016.


BLU-554 for Advanced
Hepatocellular Carcinoma
(HCC)
blueprint
MEDICINES

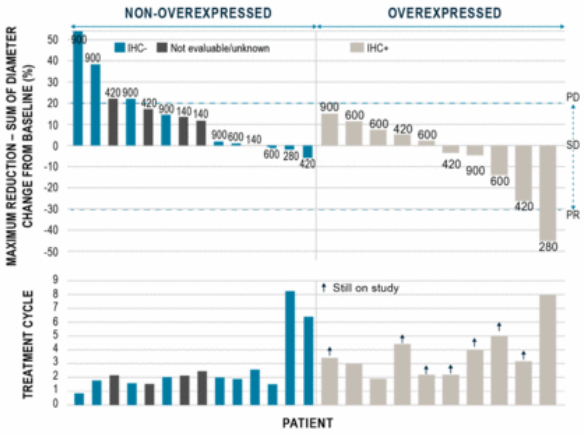
# BLU-554 in advanced HCC



1. Sorafenib used first line with ~2% response rate; median time to progression 3-6 months
2. Abnormally activated FGFR4 pathway in ~30% of patients enables biomarker-driven patient selection
3. BLU-554 is a selective inhibitor of FGFR4 with encouraging early single agent activity in heavily pre-treated patients in ongoing P1 trial
4. Proof-of-concept data for BLU-554 showed radiographic tumor shrinkage in FGF19 IHC+ patients
5. 1L with FGFR4 activation = ~18,900 patients*
   2L with FGFR4 activation = ~8,000 patients*

Kinome illustration reproduced courtesy of CSTI (cellsignal.com). The foregoing website is maintained by CSTI, and Blueprint Medicines is not responsible for its content.
*Represents estimated incidence of HCC patients with aberrantly activated FGFR4 signaling in major markets (US, EU5 and Japan).

# Proof-of-concept established for BLU-554 in advanced HCC

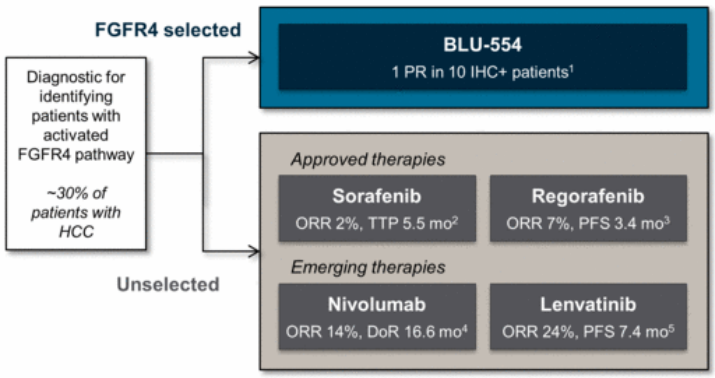



Phase 1 dose escalation summary:

- Achieved proof-of-concept in dose escalation portion of trial
- BLU-554 is preferentially active in biomarker positive patients
- MTD determined to be 600 mg QD
- 2 (8%) patients discontinued BLU-554 due to treatment-related toxicity

IHC, immunohistochemistry.
Data previously presented in November 2016 at the EORTC-NCI-AACR Molecular Targets and Cancer Therapeutics Symposium. Data cutoff: November 7, 2016.

# Opportunities for BLU-554 in the evolving HCC landscape




**Regulatory path for approved therapies**

- Overall survival in randomized Phase 3 trial

**Potential opportunities for BLU-554**

- Phase 3 head-to-head versus sorafenib
- Phase 2-3 combination with nivolumab
- Single arm study
- Optimized patient selection

**Next steps**

- Interim Phase 1 data to be presented at ESMO on September 10, 2017 and ILCA on September 17, 2017

DoR, duration of response; ESMO, European Society for Medical Oncology; ILCA, International Liver Cancer Association; TTP, time to progression.
[1] Data previously presented in November 2016 at the EORTC-NCI-AACR Molecular Targets and Cancer Therapeutics Symposium. Data cutoff: November 7, 2016. [2] Sorafenib prescribing information. [3] Regorafenib prescribing information. [4] Crocenzi, et al. J Clin Oncol 2017:35 (suppl; abstract 4013); data from sorafenib experienced expansion cohort, n=145. [5] Cheng A-L et al. J Clin Oncol 2017:35 (suppl; abstract 4001).


BLU-667
RET Inhibitor
blueprint
MEDICINES

# BLU-667 is designed as a targeted inhibitor to achieve better RET inhibition

1

**ACTIVATING RET KINASE FUSIONS AND MUTATIONS ARE IMPORTANT DISEASE DRIVERS IN A VARIETY OF CANCERS**

- Estimate ~10,000 patients with RET-driven NSCLC and ~600 patients with RET-driven medullary thyroid cancer in major markets*

2

**BLU-667: DIFFERENTIATED PRODUCT PROFILE WITH ROBUST PRECLINICAL ACTIVITY**

- Potently inhibits RET wild-type fusions in *in vivo* models of NSCLC & other cancers
- Potently inhibits oncogenic RET mutants in *in vivo* models of thyroid cancer
- Inhibits primary resistance mutations and prevents acquired resistance
- Spares VEGFR-2 in a kinome-selective manner

3

**PROGRESSING IN THE CLINIC**

- Phase 1 trial in NSCLC, MTC and other advanced RET-driven solid tumors initiated with first patient enrolled in March 2017

blueprint MEDICINES

*Represents estimated prevalence for MTC patients with RET mutations and estimated incidence for NSCLC patients with RET fusions in major markets (US, EU5 and Japan).

## Cash to fund operating expenses and capital expenditures into 2H 2019*

| SHARES OUTSTANDING *as of 6/30/17* | OUTSTANDING DEBT *as of 6/30/17* | CASH, CASH EQUIVALENTS AND INVESTMENTS *as of 6/30/17* |
|---|---|---|
| ***39.1 million (basic)<br>42.5 million (fully diluted)*** | ***$2.7 million*** | ***$421.0 million*** |

*Cash guidance excludes any potential option fees and milestone payments under the existing collaboration with Roche.

## Potential 2H 2017 milestones

| | |
|---|---|
| **BLU-285 GIST** | • Expand development plan to include opportunities for earlier lines of therapy or combinations |
| **BLU-285 SM** | • Update data from Phase 1 study in advanced SM<br>• Expand clinical development plan to include indolent SM |
| **BLU-554 HCC** | • Update data from Phase 1 study in advanced HCC at ESMO in September 2017<br>• Enroll expansion stage of Phase 1 study |
| **Corporate** | • Explore potential strategic collaborations<br>• Evaluate potential opportunities to advance FOP program and determine next steps<br>• Advance discovery pipeline with the internal nomination of at least one new program |

blueprint MEDICINES


blueprint
MEDICINES
Thank you