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): January 13, 2020

DECIPHERA PHARMACEUTICALS, INC.
(Exact name of registrant as specified in its charter)

Delaware	**001-38219**	**30-1003521**
(State or other jurisdiction of Incorporation)	**(Commission File Number)**	**(IRS Employer Identification Number)**

200 Smith Street **Waltham, MA**	**02451**
(Address of registrant's principal executive office)	**(Zip code)**

(781) 209-6400
(Registrant's telephone number, including area code)

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 203.425)

☐ 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))

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

Title of each class	Trading Symbol	Name of exchange on which registered
Common Stock, $0.01 Par Value	**DCPH**	**The Nasdaq Global Select Market**

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

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.

On January 13, 2020, Deciphera Pharmaceuticals, Inc., or the Company, issued the press release attached hereto as Exhibit 99.1. In addition, spokespersons of the Company plan to present the information in the presentation slides attached hereto as Exhibit 99.2.

The furnishing of the attached press release and presentation is not an admission as to the materiality of any information therein. The information contained in the press release and presentation is summary information that is intended to be considered in the context of more complete information included in the Company's filings with the U.S. Securities and Exchange Commission, or the SEC, and other public announcements that the Company has made and may make from time to time by press release or otherwise. The Company undertakes no duty or obligation to update or revise the information contained in this report, although it may do so from time to time as its management believes is appropriate. Any such updating may be made through the filing of other reports or documents with the SEC, through press releases or through other public disclosures. For important information about forward looking statements, see the "Cautionary Note Regarding Forward-Looking Statements" section of the press release in Exhibit 99.1 attached hereto and the "Forward-Looking Statements" section of the presentation in Exhibit 99.2 attached hereto.

The information in this Item 7.01 of this Current Report on Form 8-K and Exhibit 99.1 and Exhibit 99.2 attached hereto shall not be deemed "filed" for purposes of Section 18 of the Securities Exchange Act of 1934, as amended, or otherwise subject to the liabilities of that section or Sections 11 and 12(a)(2) of the Securities Act of 1933, as amended. The information contained in this Item 7.01 and in the press release attached as Exhibit 99.1 to this Current Report and the presentation attached as Exhibit 99.2 to this Current Report shall not be incorporated by reference into any filing with the SEC made by the Company, whether made before or after the date hereof, regardless of any general incorporation language in such filing, 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	Press release, furnished herewith.
99.2	Presentation, furnished herewith.

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.

Date: January 13, 2020

DECIPHERA PHARMACEUTICALS, INC.

By: /s/ Steven L. Hoerter
Steven L. Hoerter
President and Chief Executive Officer

Deciphera Pharmaceuticals Provides Corporate Update and Highlights Key 2020 Milestones

- Ripretinib Marketing Applications Submitted to Health Canada and Australia's Therapeutic Goods Administration for Patients with Advanced GIST via the U.S. FDA's Project Orbis Pilot Program -

- Commercial Preparations Underway to Support Potential Approval and Launch of Ripretinib in the U.S. for Patients with Advanced GIST -

- INTRIGUE Pivotal Phase 3 Study of Ripretinib in 2nd line GIST Expected to Complete Enrollment in the Second Half of 2020 -

- Additional Pipeline Development Milestones Expected in Second Half of 2020 -

Waltham, MA– January 13, 2020 – Deciphera Pharmaceuticals, Inc. (NASDAQ:DCPH) today provided a corporate update and highlighted key 2020 milestones in conjunction with its presentation at the 38th Annual J.P. Morgan Healthcare Conference in San Francisco. The Company will webcast its presentation today at 11:00 a.m. PT (2:00 p.m. ET) at https://investors.deciphera.com/news-events/events-presentations.

"2019 was a year of many exciting accomplishments for Deciphera as we submitted our first New Drug Application (NDA) to the FDA for ripretinib in advanced gastrointestinal stromal tumors (GIST) based on positive results from the INVICTUS pivotal Phase 3 study and advanced our portfolio of wholly-owned product candidates," said Steve Hoerter, President and Chief Executive Officer of Deciphera. "We are preparing for a potential commercial launch in the U.S. and working to bring ripretinib to other parts of the world."

The Company announced today that two additional marketing applications have been submitted for ripretinib as part of the U.S. Food and Drug Administration's (FDA) Project Orbis pilot program. The marketing applications of ripretinib for advanced GIST in Canada and Australia have both received priority review designations. The Project Orbis pilot program, an initiative of the FDA Oncology Center of Excellence, is designed to provide a framework for concurrent submission and review of oncology products among international partners. Additional information about Project Orbis can be found at: https://www.fda.gov/about-fda/oncology-center-excellence/project-orbis.

Mr. Hoerter continued, "In parallel with these efforts, we have laid the groundwork for further expansion across our pipeline of novel agents. We continued to activate sites and enroll patients in the INTRIGUE Phase 3 study in the 2nd line GIST patient population, advanced the DCC-3014 and rebastinib clinical development programs, and added a new internally-discovered candidate, DCC-3116, to our pipeline. We look forward to building on our momentum in 2020 as we work with the FDA towards a potential approval of ripretinib in advanced GIST and rapidly advance our additional programs."

In 2020, the Company seeks to achieve the following milestones:

Ripretinib

- Potential FDA approval and commercial launch of ripretinib in advanced GIST.
- Submit marketing authorization application to European Medicines Agency.
- Complete enrollment of INTRIGUE Phase 3 study in 2nd line GIST.

- Present Phase 1 study expansion data.

DCC- 3014

- Select Phase 2 dose for tenosynovial giant cell tumor (TGCT) patients and open expansion cohort.
- Provide update on Phase 1 data in TGCT patients.

Rebastinib

- Selected Phase 2 dose of 100 mg BID of rebastinib and activated Part 2 of Phase 1b/2 study in combination with carboplatin. (Completed January 2020)
- Present Phase 1b/2 data in combination with carboplatin.
- Present Phase 1b/2 data in combination with paclitaxel.

DCC-3116

- Submit an Investigational New Drug (IND) application to FDA.

Presentation at 38th Annual J.P. Morgan Healthcare Conference

Deciphera will webcast its corporate presentation from the 38th Annual J.P. Morgan Healthcare Conference in San Francisco on Monday, January 13, 2020 at 11:00 a.m. PT (2:00 p.m. ET). A live webcast of the presentation can be accessed under "Events & Presentations" in the Investors section of the Company's website at deciphera.com. A replay of the webcast will be archived on the Deciphera website for at least two weeks following the presentation. In conjunction with the conference, the Company has also updated its corporate presentation which can be found here: https://investors.deciphera.com/news-events/events-presentations.

About Deciphera Pharmaceuticals

Deciphera Pharmaceuticals is a clinical-stage biopharmaceutical company focused on improving the lives of cancer patients by addressing key mechanisms of drug resistance that limit the rate and/or durability of response to existing cancer therapies. Our small molecule product candidates are directed against an important family of enzymes called kinases, known to be directly involved in the growth and spread of many cancers. We use our deep understanding of kinase biology together with a proprietary chemistry library to purposefully design compounds that maintain kinases in a "switched off" or inactivated conformation. These investigational therapies comprise tumor-targeted agents designed to address therapeutic resistance causing mutations and immuno-targeted agents designed to control the activation of immunokinases that suppress critical immune system regulators, and agents designed to inhibit reprogramming of cancer cell metabolism. We have used our platform to develop a diverse pipeline of tumor-targeted, immuno-targeted, and metabolism-targeted product candidates designed to improve outcomes for patients with cancer by improving the quality, rate and/or durability of their responses to treatment.

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 our expectations regarding our goal of bringing ripretinib to patients with advanced GIST, the potential for ripretinib to serve as an important new treatment option for people with advanced GIST, working with the FDA through its review of our NDA application via the FDA's Real-Time Oncology Review pilot program, working with the FDA, Health Canada and the Therapeutic Goods Administration on our

Canadian and Australian regulatory approval filings under the Project Orbis pilot program, and the possible benefits of those pilot programs and breakthrough therapy designation, receipt of priority review, preparing for the potential launch of ripretinib in the United States, if approved, and corporate guidance for 2020, including related to our expectations and timing for an MAA submission to the EMA for ripretinib in advanced GIST patients, presentation of additional Phase 1 ripretinib expansion data, completion of enrollment in the INTRIGUE Phase 3 study, selection of a recommended Phase 2 dose for DCC-3014 and opening a TGCT expansion cohort in such trial, the timing of and our expectations regarding our product candidates, including data for DCC-3014 from TGCT patients, data updates for rebastinib and submitting an IND for DCC-3116. 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. 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 delay of any current or planned clinical studies or the development of our product candidates, including ripretinib, our ability to successfully demonstrate the efficacy and safety of our product candidates including in later-stage studies, the preclinical and clinical results for our product candidates, which may not support further development of such product candidates, the possibility that results experienced in early, preliminary, top-line or initial data may not be indicative of the results experienced in final data, our ability to work with the FDA under its RTOR pilot program and our ability to work with the FDA, Health Canada and the TGA under the Project Orbis pilot program and timely respond to information requests or requirements in connection with our recently-filed NDAs and marketing approval applications in Canada and Australia for ripretinib in advanced GIST, that acceptance into the RTOR and Project Orbis pilot programs does not guarantee or influence approvability of our NDAs for ripretinib in advanced GIST, which are subject to the standard benefit-risk evaluation by FDA, Health Canada and the TGA, and that we may not derive any benefit from inclusion in the RTOR or Orbis pilot programs, including, but not limited to, a more efficient review process compared to investigational drugs evaluated without these pilot programs or under standard FDA, Health Canada or TGA procedures, the fact that these pilot programs are being tested by FDA, are not formal regulatory pathways with regulatory process, regulations or procedures, and may be suspended or halted at any time, including, without limitation, because FDA decides not to continue these pilots, or because FDA determines that our application no longer meets its criteria for inclusion in one or both of these pilot programs, the fact that receipt of a breakthrough therapy designation for a product candidate, such as ripretinib, may not result in us receiving any of the benefits of such designation such as a faster development process, review or approval compared to drugs considered for approval under conventional FDA procedures, the fact such designation does not assure ultimate approval by FDA and is subject to the risk FDA may later decide that the products no longer meet the conditions for qualification or decide that the time period for FDA review or approval will not be shortened, the fact that any priority review received may not result in any more efficient review or other benefits, our ability to manage and our reliance on sole-source third parties such as our third party drug substance and drug product contract manufacturers, actions of regulatory agencies, our ability to plan for potential commercialization of our product candidates, such as ripretinib, and if approved execute on our marketing plans, the inherent uncertainty in estimates of patient populations and incidence and prevalence estimates, competition from other products, our ability to obtain and maintain reimbursement for any approved product and the extent to which patient assistance programs are utilized, our ability to comply with healthcare regulations and laws, our ability to obtain, maintain and enforce our intellectual property rights, any or all of which may affect the initiation, timing and progress of clinical studies and the timing of and our ability to obtain regulatory approval, if at all, and make our investigational drugs, including ripretinib, available to patients, and, once commercial, to derive revenue from product sales, and other risks identified in our SEC filings, including our Quarterly Report on Form 10-Q for the quarter

ended September 30, 2019, and subsequent filings with the SEC. We caution you not to place undue reliance on any forward-looking statements, which speak only as of the date they are made. We disclaim any obligation to publicly update or revise any such statements to reflect any change in expectations or in events, conditions or circumstances on which any such statements may be based, or that may affect the likelihood that actual results will differ from those set forth in the forward-looking statements. Any forward-looking statements contained in this press release represent our views only as of the date hereof and should not be relied upon as representing its views as of any subsequent date. We explicitly disclaim any obligation to update any forward-looking statements.

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Exhibit 99.2

DEFEATING CANCER: The Challenge. Our Mission.

January 2020

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Disclaimer

This presentation has been prepared by Deciphera Pharmaceuticals, Inc. for informational purposes only and not for any other purpose. Nothing contained in this presentation is, or should be construed as, a recommendation, promise or representation by Deciphera Pharmaceuticals, Inc. or any director, employee, agent, or adviser of Deciphera Pharmaceuticals, Inc. This presentation does not purport to be all-inclusive or to contain all of the information you may desire.

Certain information contained in this presentation relates to or is based on studies, publications, surveys and other data obtained from third-party sources and Deciphera Pharmaceuticals, Inc.'s own internal estimates and research. While Deciphera Pharmaceuticals, Inc. believes these third-party sources to be reliable as of the date of this presentation, it has not independently verified, and makes no representation as to the adequacy, fairness, accuracy or completeness of, any information obtained from third-party sources. While Deciphera Pharmaceuticals, Inc. believes its internal research is reliable, such research has not been verified by any independent source.

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Forward-Looking Statements

This presentation may contain forward-looking statements that are based on our current expectations, estimates and projections about our industry as well as management's beliefs and assumptions. Words such as "anticipates," "expects," "intends," "plans," "believes," "seeks," "estimates," "may," "will," and variations of these words or similar expressions are intended to identify forward-looking statements. These statements include statements regarding our business strategy, prospective products, clinical trial results, NDA filings, IND filing expectations, product approvals and regulatory pathways, breakthrough therapy designation (BTD), Real-Time Oncology Review (RTOR) and Project Orbis pilot programs, timing and likelihood of success, plans and objectives of management for future operations, expectation regarding future clinical candidates, future results of anticipated products, commercial readiness planning and our readiness for commercial launch, expectations on estimated patient populations, the market opportunity for our drug candidates and business guidance, including discovery, clinical, regulatory and commercial planned milestones, as well as cash guidance, and speak only at the time this presentation was prepared. Such statements are based upon the information available to us now and are subject to change. We will not necessarily inform you of such changes. These statements are not guarantees of future performance and are subject to certain risks, uncertainties and assumptions that are difficult to predict. Therefore, actual results could differ materially and adversely from those expressed in any forward-looking statements as a result of various factors. Factors which could cause actual results to differ materially from those in the forward-looking statements include, among others, our history of significant losses since inception, our ability to obtain necessary capital when needed on acceptable terms, the timing and results from ongoing or future clinical and non-clinical studies and trials, the possibility preliminary, top-line or initial data may not be indicative of the results of final data, unexpected adverse events, our ability to obtain regulatory approval or clearance of our drug candidates, our ability to manage third party drug substance and drug product contract manufacturers, actions of regulatory agencies, our ability to obtain and maintain reimbursement for any approved products and the extent to which patient assistance programs are utilized, any or all of which may affect the initiation, timing and progress of clinical studies and the timing of and our ability to obtain regulatory approval, if at all, and make our investigational drugs, including ripretinib, available to patients, the fact we may not receive the benefits of designations like BTD or of the RTOR or Orbis pilot programs, our ability to plan for potential commercialization of our product candidates, such as ripretinib, and, if approved, execute on our marketing plans, the inherent uncertainty in estimates of patient populations and incidence and prevalence estimates, our ability to comply with healthcare regulations and laws, competition from other products or procedures, our reliance on third-parties to conduct our clinical and non-clinical trials, our reliance on single-source third-party suppliers to manufacture clinical, non-clinical and any future commercial supplies of our drug substance and drug product candidates and our ability to obtain, maintain and enforce our intellectual property rights for our drug candidates. New risk factors and uncertainties may emerge from time to time, and it is not possible to predict all risk factors and uncertainties. There can be no assurance that the opportunity will meet your investment objectives, that you will receive a return of all or part of such investment. Investment results may vary significantly over any given time period. The appropriateness of a particular investment or strategy will depend on an investor's individual circumstances and objectives. Deciphera recommends that investors independently evaluate specific investments and strategies. For further information regarding these risks, uncertainties and other factors, you should read the “Risk Factors” section of Deciphera’s Quarterly Report on Form 10-Q for the quarter ended September 30, 2019 filed with the Securities and Exchange Commission (the "SEC"), and Deciphera’s other SEC filings.

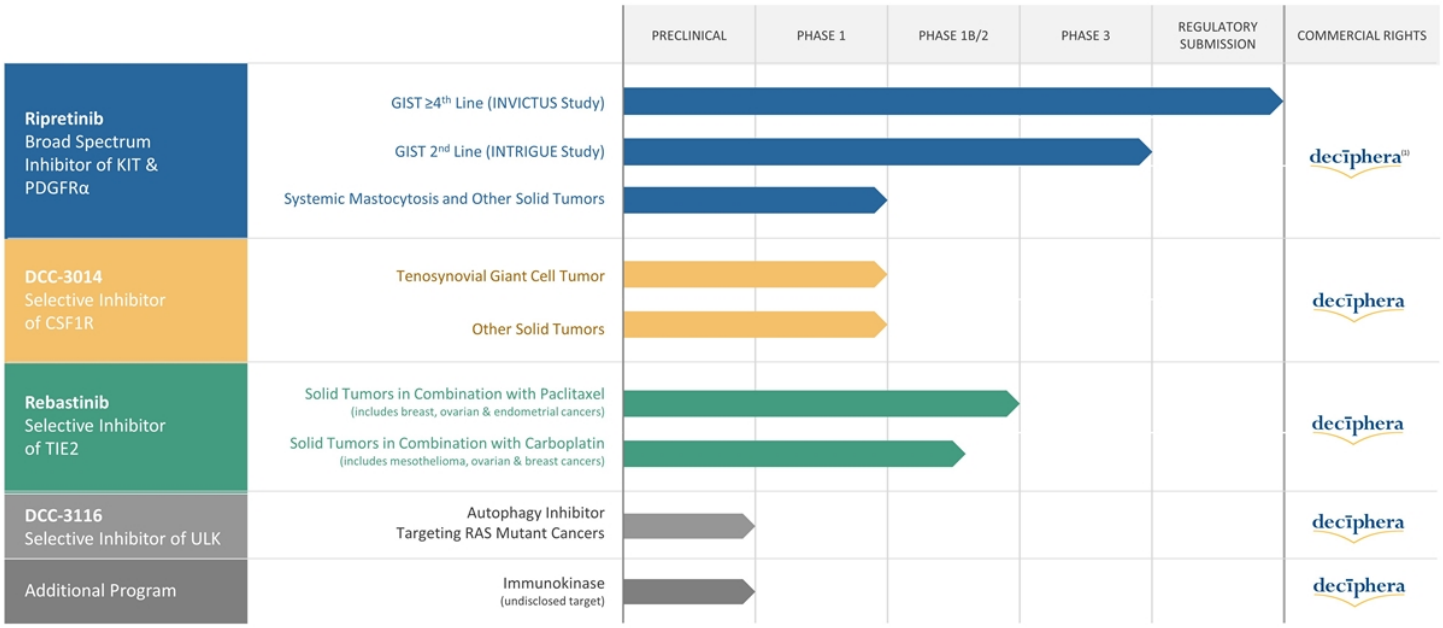
Executing on Our Mission

At Deciphera, we are focused on discovering, developing, and bringing important new medicines to patients for the treatment of cancer.

- Ripretinib: **Positive results** from INVICTUS Phase 3 study in ≥4th line GIST
- Ripretinib: **NDA submitted** and preparing for potential U.S. launch
- **Rapidly advancing wholly-owned** clinical-stage portfolio[(1)]
- Novel switch control kinase inhibitor discovery platform **fuels the pipeline**

Notes: GIST=gastrointestinal stromal tumor; NDA=new drug application; (1) Exclusive development and commercialization license for ripretinib with Zai Lab in Greater China.

Robust Clinical Stage Oncology Pipeline of Novel Kinase Inhibitors



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Notes: KIT=KIT proto-oncogene receptor tyrosine kinase; PDGFRα=platelet-derived growth factor receptor α; CSF1R=colony stimulating factor 1 receptor; TIE2=TEK tyrosine kinase; (1) Development and commercialization exclusive license with Zai Lab in Greater China.

2020 Expected Milestones for the Year Ahead

Ripretinib

- Potential FDA approval and commercial launch in advanced GIST
- Submit EU marketing authorization application to EMA
- Complete enrollment in the INTRIGUE Phase 3 study in 2nd line GIST
- Present Phase 1 study expansion data

DCC-3014

- Select Phase 2 dose for tenosynovial giant cell tumor (TGCT) and open expansion cohort
- Update Phase 1 data in TGCT patients

Rebastinib

- Select Phase 2 dose and activate Part 2 of Phase 1b/2 study in combination with carboplatin
- Present Phase 1b/2 data in combination with carboplatin
- Present Phase 1b/2 data in combination with paclitaxel

DCC-3116

- Submit IND application to FDA

Notes: FDA=U.S. Food and Drug Administration; EMA=European Medicines Agency; IND=Investigational New Drug.

Ripretinib: Potential to Change Practice in Advanced GIST

Novel TKI designed to inhibit broad range of mutations in KIT and PDGFRα

Strong efficacy and safety data from randomized Phase 3 INVICTUS study

NDA submitted to FDA for advanced GIST

- Breakthrough Therapy Designation for advanced GIST
- NDA being reviewed under FDA Real-Time Oncology Review (pilot program)

Marketing applications submitted to Health Canada and Australian Therapeutic Goods Administration for advanced GIST and are being reviewed under FDA Project Orbis (pilot program)

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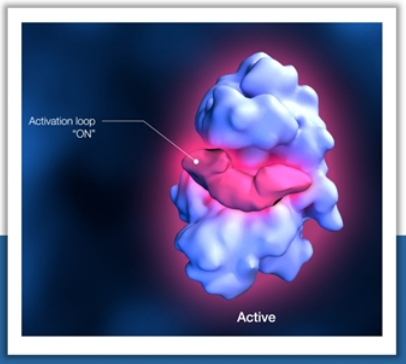
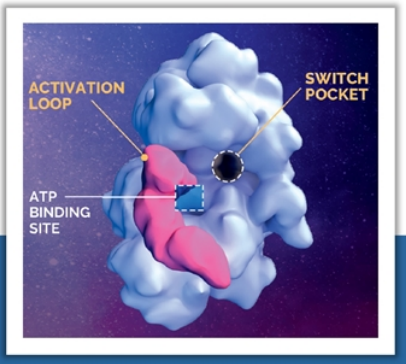
Notes: TKI=tyrosine kinase inhibitor.

Ripretinib: A Novel Kinase Switch Control Inhibitor

Switched on: Kinase active



Switched off: Kinase inactive



Achieving switch control may prevent downstream signaling and cell proliferation to potentially overcome the mechanisms of resistance associated with progressing GIST

A unique dual mechanism of action that regulates the kinase switch pocket and activation loop

- Prevents the activation loop from binding to the switch pocket
- Locks the kinase in the inactive ("off") state

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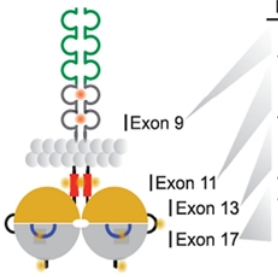
Notes: ATP=adenosine triphosphate.

Ripretinib: Designed to Address a Broad Range of Mutations in GIST

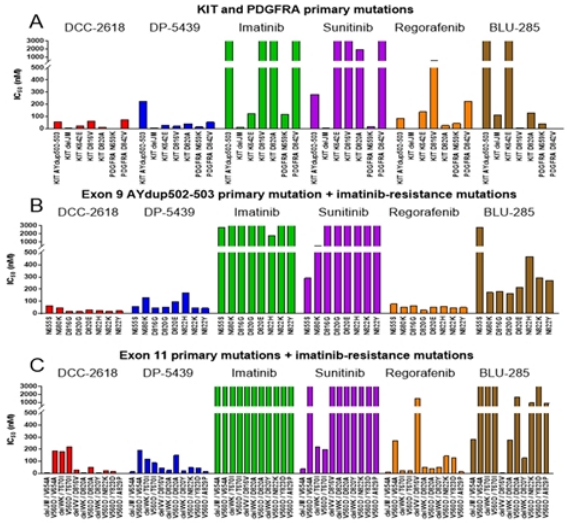
KIT Mutations Drive ~80% of GIST



Domain	Gene	1° Mutation Frequency	2° Mutation Frequency
D5	*KIT*	10%	
JM	*KIT*	67	
	PDGFRA	1	
TK1	*KIT*	1	56
	PDGFRA	1	
A-Loop	*KIT*	1	41
	PDGFRA D842V	5	
	PDGFRA	1	3

Source: Hemming M et al. Translational insights into gastrointestinal stromal tumors and current clinical advances. Annals of Oncology; 29: 2037-2045, 2018.

Ripretinib: Broad Mutational Coverage in KIT and PDGFRα



Source: AACR 2018
Notes: (A) GIST primary mutations; or imatinib-resistant KIT mutations with (B) exon 9 or (C) exon 11 primary mutations.

Significant Unmet Medical Need Post-Imatinib

Estimated Incidence of GIST: **U.S. 4,000-6,000**[1]

1L — 1st Line Treatment: **Imatinib***
- mPFS: 18.9 months[2]
- mOS: 46.8 months[3]

2L — 2nd Line Treatment: **Sunitinib***
- mPFS: 5.6 months[4]
- mOS: 17.0 months[4]

~2,000 U.S. incident patients eligible for treatment[6]

3L — 3rd Line Treatment: **Regorafenib***
- mPFS: 4.8 months[5]
- mOS: 17.4 months[5]

~70-80% eligible patients from prior line[7]

4L — 4th Line Treatment: **No Approved Treatment***

~70-80% eligible patients from prior line[7]

**As of January 9, 2020, avapritinib is approved in the U.S. for GIST patients with PDGFRA exon 18 mutations only, which mutations are harbored by an estimated ~6% of patients with newly diagnosed GIST.*

Notes: mPFS=median progression free survival; mOS=median overall survival; (1) American Cancer Society, Key Statistics for Gastrointestinal Stromal Tumors, Accessed December 13, 2019; (2) Gleevec [package insert]. Stein, Switzerland: Novartis; 2008; (3) Casali PG, et al. *J Clin Oncol*. 2017;35:1713-1720; (4) Sutent [package insert]. New York, NY: Pfizer; 2011, mPFS and mOS converted from weeks to months; (5) Stivarga [package insert]. Germany: Bayer Healthcare; 2013; (6) Internal Deciphera estimate of annual new treatment-eligible 2nd line patients of approximately 2,000 is based on recent analyses of U.S. claims data. For reference, estimated annual prevalence of treated GIST patients in the 2nd line is approximately 2,600 based on recent Deciphera analyses of U.S. claims data; (7) Eligible patients for the 3rd and 4th lines exclude the estimated proportion of patients that die, discontinue oncology treatment, or enter clinical trial and, therefore, are not eligible for treatment. These estimates are based on recent Deciphera analyses of U.S. claims data. Estimates are inherently uncertain.

invictus 〉 Global Pivotal Phase 3 Study in ≥4th Line GIST

35 Sites
13 Countries

3+ Prior Lines of Therapy(1)

Ripretinib
150 mg QD

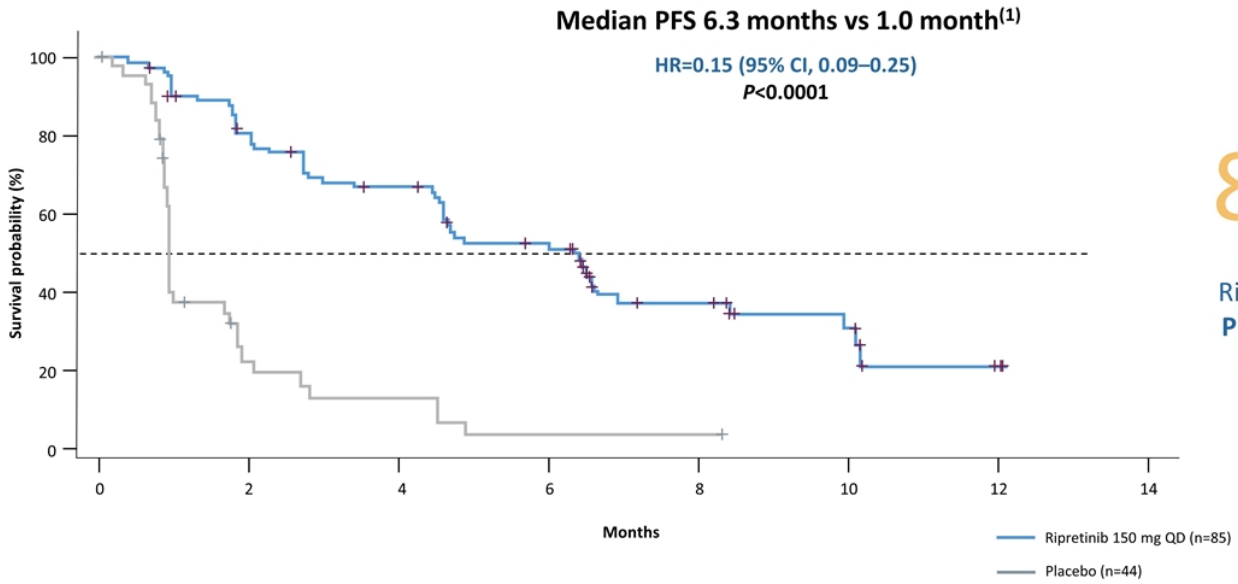
2:1 Randomization
Double Blind
n=129

Placebo

PRIMARY ENDPOINT =
Progression Free Survival(2)

Notes: QD=daily; (1) Phase 3 pivotal study in patients with ≥4th line GIST who previously received at least imatinib, sunitinib, and regorafenib; (2) Following progression: (a) placebo patients can crossover to ripretinib and (b) ripretinib patients can continue on treatment or escalate to 150 mg BID, or twice daily.

invictus 〉 Progression-Free Survival (PFS) Benefit



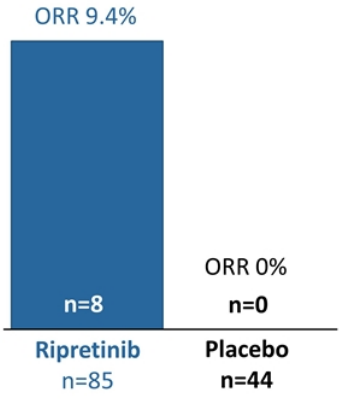
85%

Reduction in Risk of **Disease Progression or Death** Versus Placebo

Notes: Data presented at European Society for Medical Oncology (ESMO) Congress 2019; (1) Double-blind period.

invictus 〉 Durable Response with Ripretinib

Confirmed ORR



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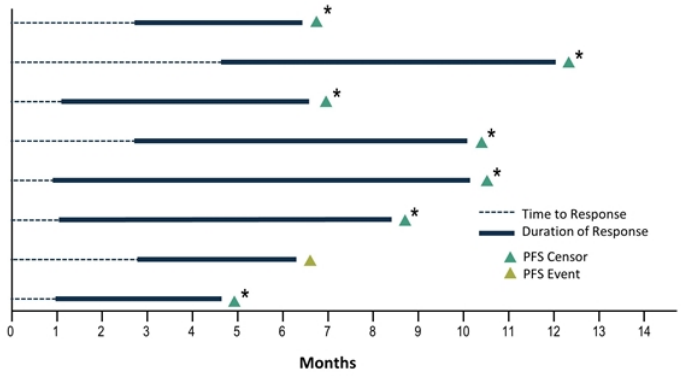
Patients Who Responded (n=8)



- Median duration of response has not been reached yet
- *7 of 8 ripretinib responders are still responding as of data cutoff
- All responders had partial responses

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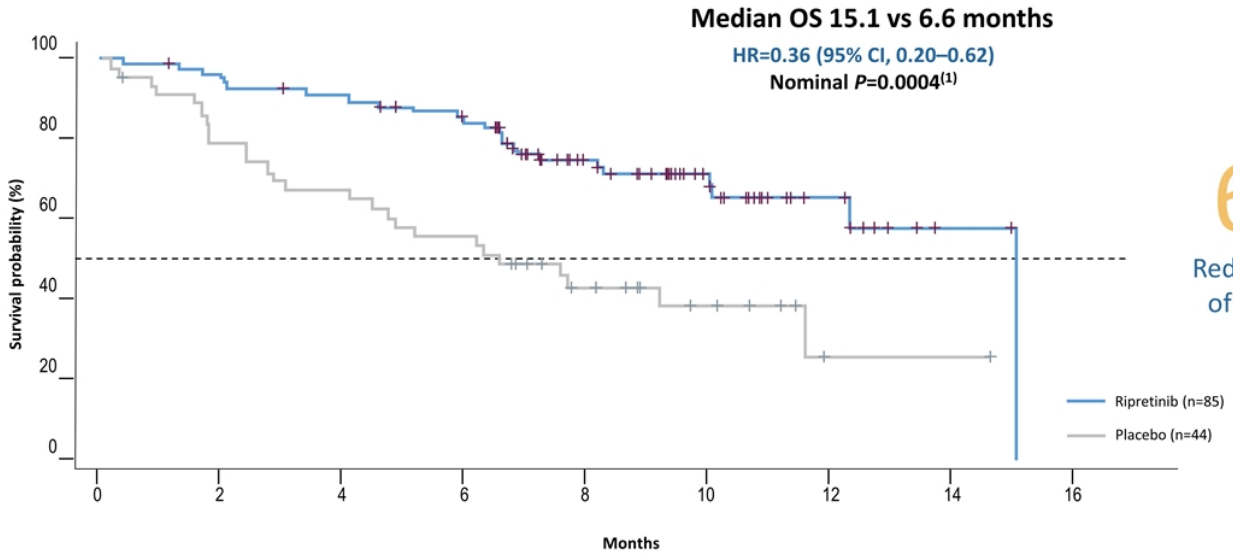
Notes: Data presented at ESMO Congress 2019; ORR=Objective response rate; ORR was not statistically significant.

invictus 〉 Overall Survival (OS) Benefit



64%

Reduction in Risk of **Death** Versus Placebo

Notes: Data presented at ESMO Congress 2019; Data includes all time periods, including dose escalations. Placebo arm includes patients taking placebo who, following progression, were crossed-over to ripretinib treatment; (1) Due to hierarchical testing procedures of the end points, the OS end point could not be formally tested because the ORR was not statistically significant.

invictus 〉 **Ripretinib** Was Generally Well Tolerated

TEAEs in >20% of patients Preferred Term	RIPRETINIB		PLACEBO	
	Any Grade (n=85)	Grade 3/4 (n=85)[1]	Any Grade (n=43)[2]	Grade 3/4 (n=43)[1],[2]
Any TEAE or grade 3/4 TEAE[3]	84 (99%)	42 (49%)	42 (98%)	19 (44%)
Alopecia	44 (52%)	0	2 (5%)	0
Fatigue	36 (42%)	3 (4%)	10 (23%)	1 (2%)
Nausea	33 (39%)	3 (4%)	5 (12%)	0
Abdominal pain	31 (37%)	6 (7%)	13 (30%)	2 (5%)
Constipation	29 (34%)	1 (1%)	8 (19%)	0
Myalgia	27 (32%)	1 (1%)	5 (12%)	0
Diarrhea	24 (28%)	1 (1%)	6 (14%)	1 (2%)
Decreased appetite	23 (27%)	1 (1%)	9 (21%)	1 (2%)
PPE syndrome	18 (21%)	0	0	0
Vomiting	18 (21%)	3 (4%)	3 (7%)	0

Any TEAE leading to…	RIPRETINIB (n=85)	PLACEBO (n=43)[2]
Dose reduction	6 (7%)	1 (2%)
Dose interruption	20 (24%)	9 (21%)
Treatment discontinuation	7 (8%)	5 (12%)
Death[4]	5 (6%)	10 (23%)

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Notes: Data presented at ESMO Congress 2019; TEAE=treatment emergent adverse events; PPE=palmar-plantar erythrodysesthesia syndrome; (1) Corresponding grade 3/4 TEAEs to TEAEs in >20% of patients receiving ripretinib; (2) 44 patients were randomized to placebo, but 1 patient did not receive treatment; (3) Regardless of causality; (4) One patient in each arm considered possibly related to blinded study drug.

Ripretinib: A Potential Best-In-Class Treatment for Advanced GIST

Ripretinib significantly improved **progression free survival** vs. placebo**,** reducing the risk of progression or death by **85%**

(median PFS of 6.3 months vs. 1.0 month; HR=0.15, 95% CI (0.09-0.25), *P*<0.0001)

Ripretinib showed a clinically meaningful improvement in **overall survival** vs. placebo, reducing the risk of death by **64%**

(median OS of 15.1 months vs. 6.6 months; HR=0.36, 95% CI (0.20-0.63), Nominal *P*=0.0004)

Ripretinib was associated with a favorable safety profile

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Notes: Data presented at ESMO Congress 2019.

Ripretinib: Phase 1 GIST Cohorts
Positive Updated Results Across All Lines of Treatment

Line of Therapy[1]	2nd Line (n=31)	3rd Line (n=28)	≥4th Line (n=83)
Median Progression Free Survival	46 weeks	36 weeks	24 weeks
Objective Response Rate (confirmed responses only)	19%	14%	7%
Median Duration of Response	80 weeks	NE	76 weeks
Mean Treatment Duration[2]	56 weeks	58 weeks	45 weeks

Ripretinib 150 mg QD (n=142)

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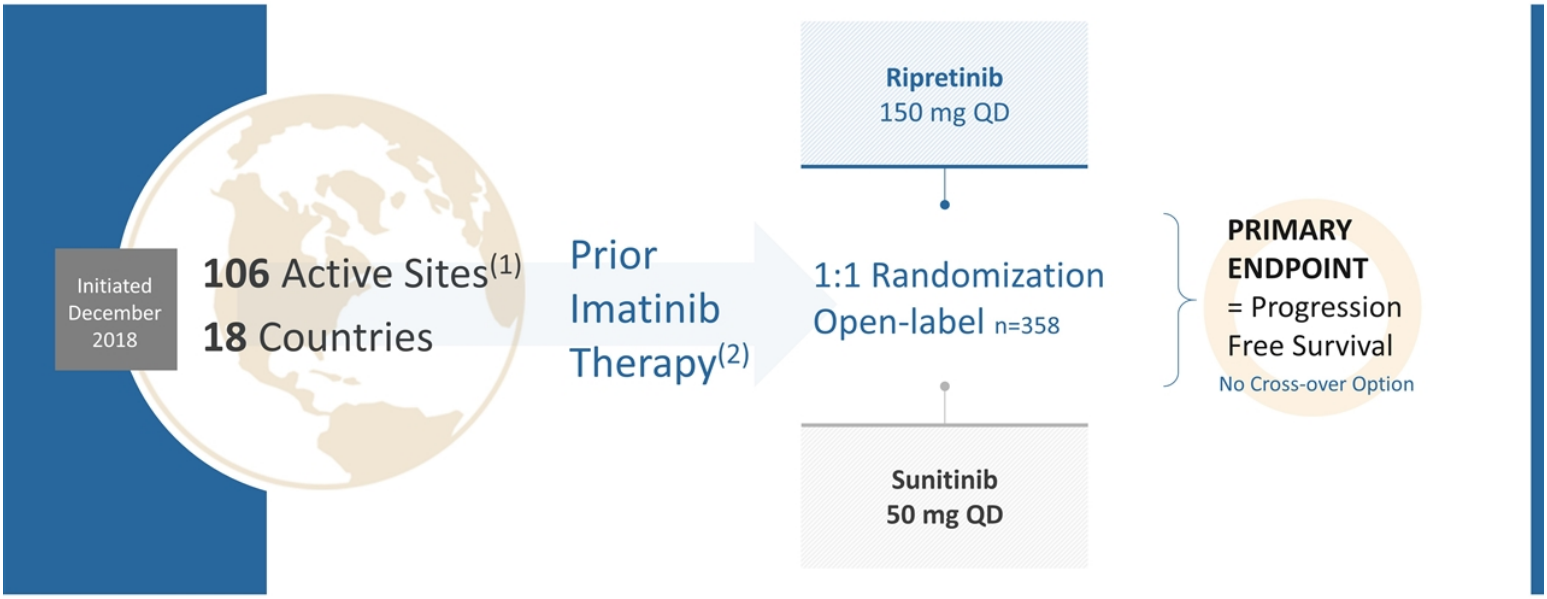
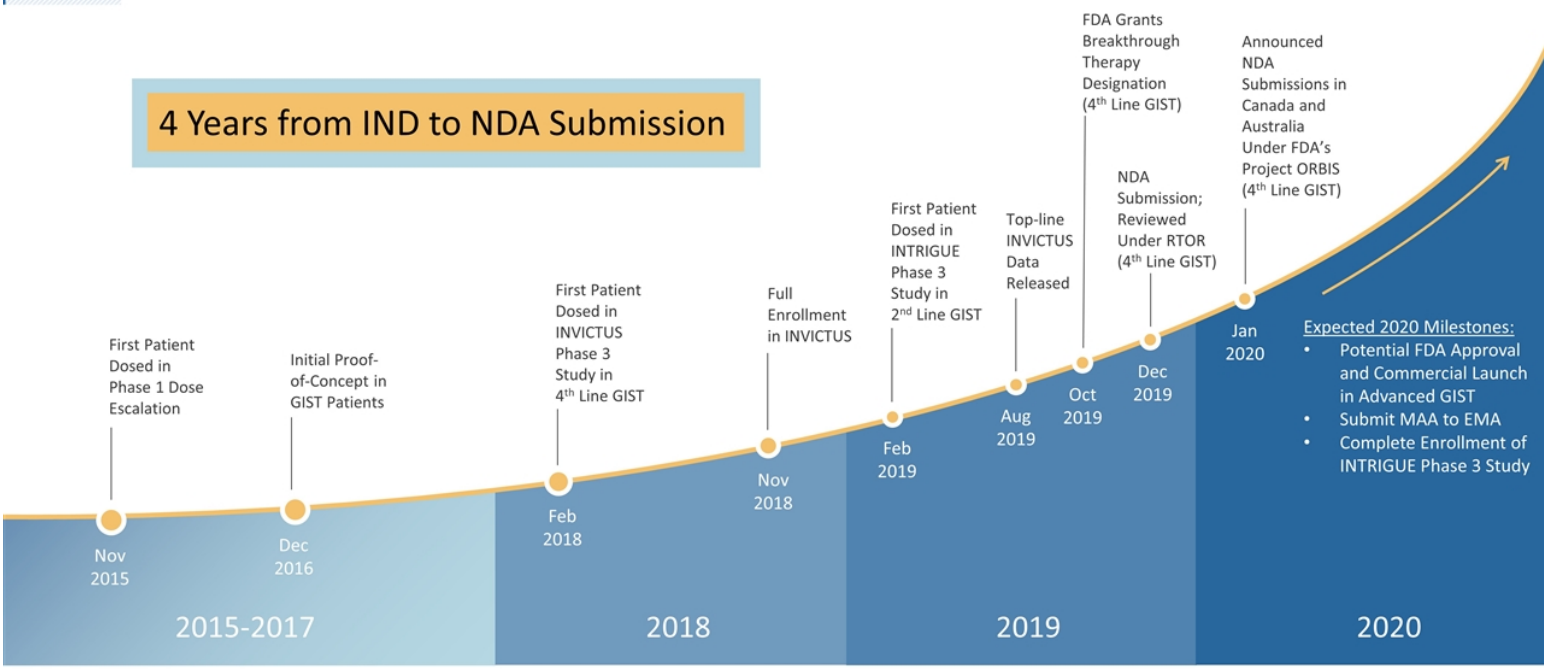
Notes: Data presented at AACR-NCI-EORTC International Conference on Molecular Targets and Cancer Therapeutics 2019; data cut-off of August 10, 2019; NE=not estimatible; (1) Data for ripretinib 150 mg QD in 142 patients and based on investigator assessment as determined by RECIST v1.1; (2) Includes 64 patients who elected for intra-patient dose escalation from 150 mg QD to 150 mg BID.

intrigue 〉 Ongoing Global Pivotal Phase 3 Study in 2nd Line GIST



Notes: (1) Number of open sites current as of January 3, 2020; (2) Phase 3 pivotal study in 2nd line patients who previously received imatinib.

Ripretinib: Rapid Clinical Development



Notes: MAA=marketing authorization application.

Commercial Preparations are on Track for Potential 2020 Launch

MEDICAL AFFAIRS

- ✓ MSL team built and engaging with KOLs
- ✓ Publication plan implemented
- ✓ Medical information build on track

MARKETING

- ✓ Marketing teams in place (HCP and patient)
- ✓ Go-to-market strategies defined
- ✓ Active and appropriate KOL engagement ongoing
- ✓ Disease education program launched

MARKET ACCESS

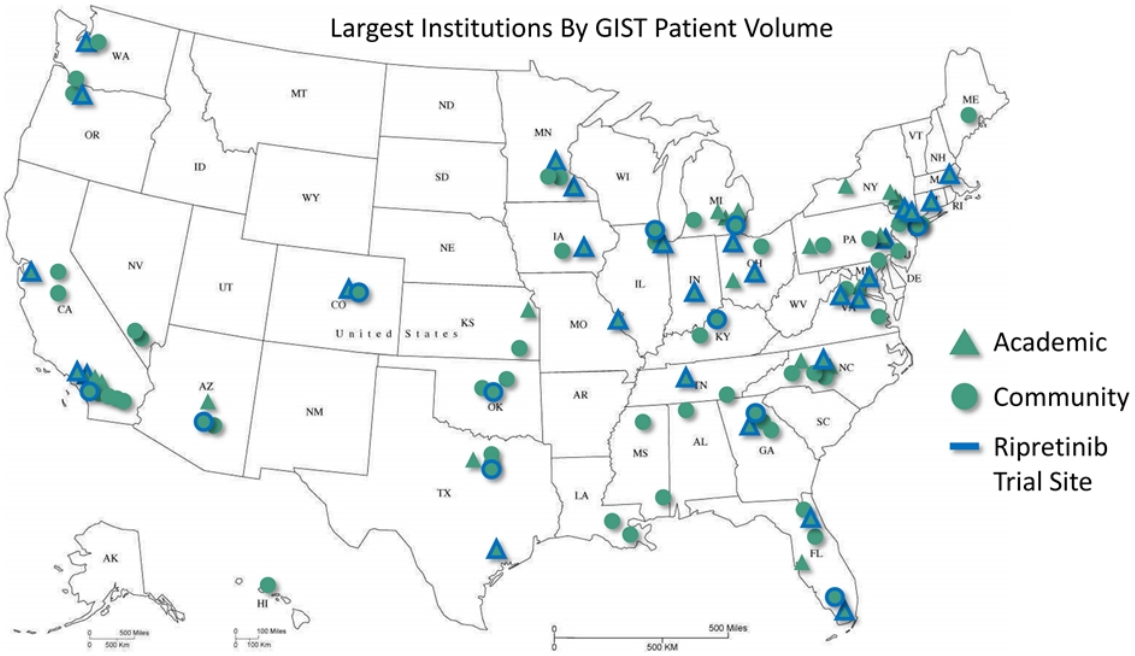
- ✓ Market access leadership in place
- ✓ Market access field team recruiting on track
- ✓ Distribution and patient support/assistance strategies defined and build on track

SALES

- ✓ VP of sales in place
- ✓ Customer segmentation & targeting complete
- ✓ Selling model defined
- ✓ Sales force recruiting on track

Notes: MSL=medical science liaison; KOL=key opinion leader; HCP=healthcare professional; VP=vice president.

GIST Treatment Occurs in Both Academic (~30%) and Community (~70%) Institutions; Many Leading Institutions Have Participated in Ripretinib Trials



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Notes: Deciphera internal analysis of claims data, 2019.

In Deciphera Market Research, Oncologists Highlight Key Areas of Unmet Need

Market Research Verbatims

*"We have a **very effective front-line treatment** available... which is very rewarding."*

*"The toxicity [of post-imatinib therapies] is higher, so the cost in terms of **quality of life is worse** than when we are using imatinib."*

*"...the transition to [post-imatinib therapy] is **difficult** emotionally as well as clinically."*

Commonly Cited Unmet Needs

- Need for more effective and tolerable **treatment options** after front-line imatinib
- Need for therapies that address **mutational heterogeneity** across and within GIST patients
- Need for **novel mechanism of action** to overcome resistance

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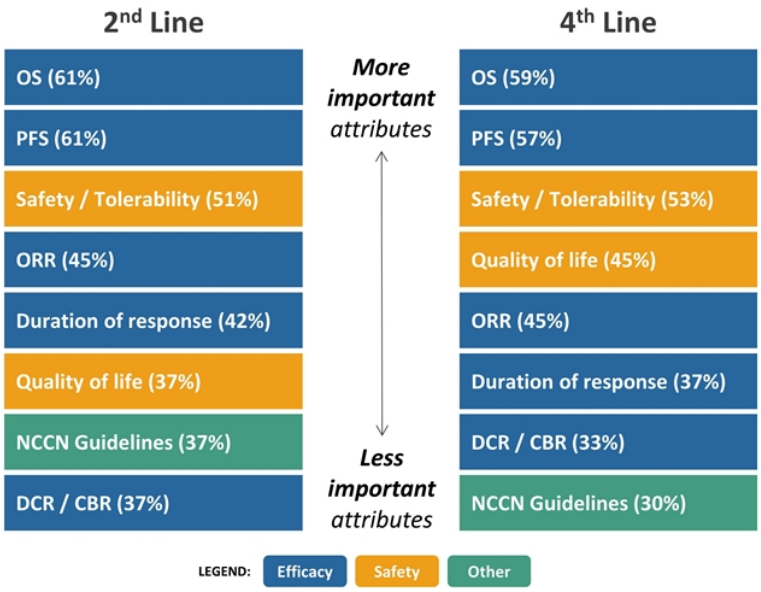
Notes: Deciphera internal market research, 2019.

Deciphera Market Research Shows the Importance of OS, PFS, and Tolerability in GIST and High Interest in Ripretinib Product Profile

Ranking of endpoints by level of importance[1, 2]



97% of oncologists surveyed would consider using a product like ripretinib in advanced GIST[2]

Frequently cited reasons:

- ✓ Overall survival benefit
- ✓ Progression free survival benefit
- ✓ Duration of response
- ✓ Safety / tolerability profile
- ✓ Objective response rate

Notes: NCCN=National Comprehensive Cancer Network; DCR=disease control rate; CBR=clinical benefit rate; (1) Percent of respondents selecting as one of the most important endpoints; (2) Deciphera quantitative demand market research, n=251 GIST treating oncologists, October 2019.

Deciphera's Vision for Ripretinib in GIST is to be the Standard of Care Across All Approved Indications

Leverage ripretinib's differentiated mechanism of action and currently known clinical profile to address unmet medical needs

Fast-to-market strategy designed to fulfill urgent unmet need in 4th line GIST

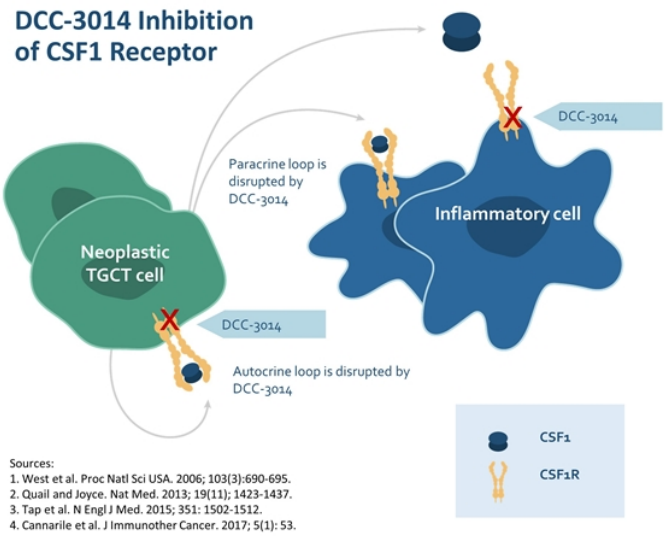
Expansion strategy in 2nd line GIST designed to address need for more effective and tolerable options post-imatinib

LCM strategies to explore additional uses and indications

- Front-line opportunities
- Potential combination strategies

Notes: LCM=life cycle management.

DCC-3014: A Highly Selective and Potent CSF1R Inhibitor



Sources:
1. West et al. Proc Natl Sci USA. 2006; 103(3):690-695.
2. Quail and Joyce. Nat Med. 2013; 19(11); 1423-1437.
3. Tap et al. N Engl J Med. 2015; 351: 1502-1512.
4. Cannarile et al. J Immunother Cancer. 2017; 5(1): 53.

- Phase 1 dose escalation study ongoing
- Generally well tolerated at doses of up to 50 mg in patients receiving three-day loading, followed by 20 mg QD maintenance regimen
- Initial proof-of-concept in three patients with diffuse-type tenosynovial giant cell tumor (TGCT) with preliminary anti-tumor activity
  - Potential for favorable tolerability profile when considering challenges of existing approved therapy

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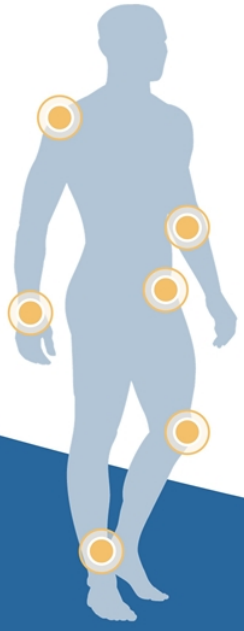
Notes: Data presented at Connective Tissue Oncology Society (CTOS) Annual Meeting 2019.

Unmet Medical Need in Tenosynovial Giant Cell Tumor (TGCT)



Symptoms

- Rare, locally aggressive tumors
- Genetic translocation causes overproduction of CSF-1, triggering migration of inflammatory cells to tumor sites

Two Types of TGCT

1. **Localized TGCT**
   - Affects fingers, toes, knee, wrist and ankle
   - Annual incidence of new cases in the U.S.: ~13,000[(1)]
2. **Diffuse TGCT**
   - Most commonly affects the knee, as well as hip, ankle, elbow and shoulder
   - Annual incidence of new cases in the U.S.: ~1,300[(1)]

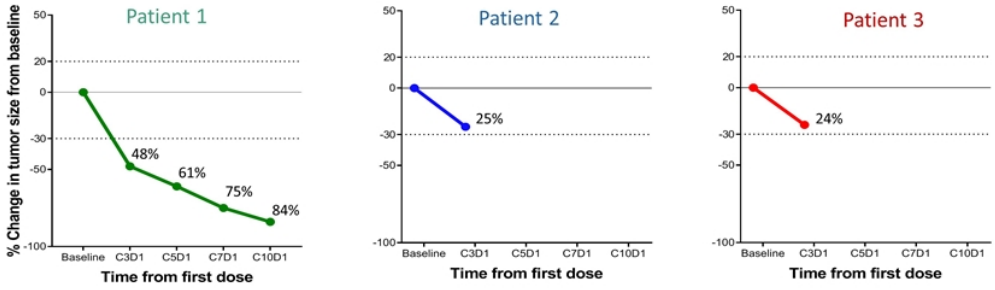
Unmet Medical Need

- Surgical resection is standard treatment
- High rate of recurrence in diffuse TGCT
- CSF1R inhibition has demonstrated clinical benefit in diffuse TGCT
- Pexidartinib received FDA approval in August 2019
  - REMS and intensive monitoring required due to hepatotoxicity concerns (off-target)
- Unmet medical need for effective CSF1R inhibitor with favorable safety/tolerability profile for TGCT patients

Notes: CSF-1=colony-stimulating factor 1; REMS=Risk Evaluation and Mitigation Strategies;
(1) Mastboom et al. *Acta Orthopaedica*. 2017;88(6):688-694.

DCC-3014: Preliminary Phase 1 Data in Initial TGCT Patients

Clinical Proof-of-Concept in TGCT Patients



Changes from baseline in tumor size assessed by investigator per RECIST version 1.1

DCC-3014 was generally well tolerated in initial three patients with diffuse-type TGCT

No grade ≥3 TEAEs observed

Preliminary anti-tumor activity and symptomatic improvement

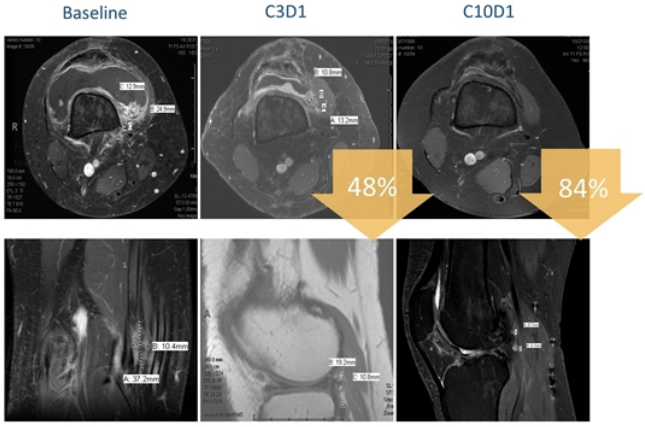
Symptomatic improvements in mobility and reduced pain were observed in all three patients based on investigator notes

Dose-escalation evaluation is ongoing to determine the recommended Phase 2 dose

Notes: Data presented at CTOS Annual Meeting 2019; dashed lines denote 30% decrease and 20% increase in tumor size threshold for partial response and progressive disease, respectively, per RECIST version 1.1; C=cycle; D=day; RECIST=response evaluation criteria in solid tumors; two patients remained on study and one patient discontinued in Cycle 4 due to relocation to outside of U.S.

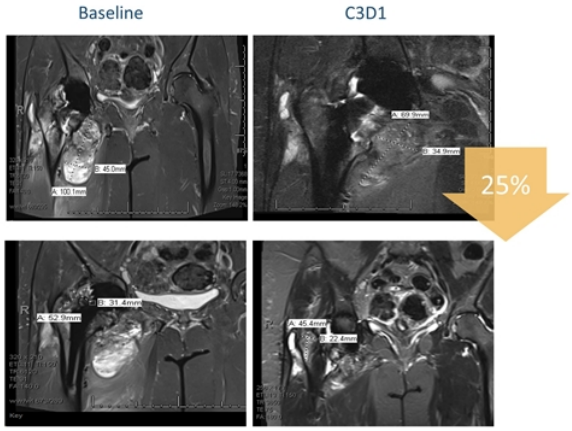
DCC-3014: TGCT Case Studies from the Phase 1

Patient 1



- 24-year-old female patient diagnosed with diffuse-type TGCT (right posterior knee) in June 2016, three prior surgeries, and recurrence/progression on MRI by December 2018
- Active in Cycle 10 as of data cut-off

Patient 2



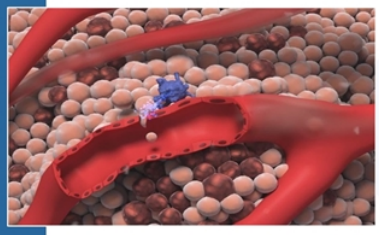
- 57-year-old female patient diagnosed with diffuse-type TGCT (right hip) in 2014, six prior surgeries, and recurrent disease on MRI by February 2019
- Active in Cycle 5 as of data cut-off

Notes: Data presented at CTOS Annual Meeting 2019.

Rebastinib: A Highly Potent and Selective TIE2 Inhibitor

Potential Benefits in Combination with Chemotherapy

- Chemotherapy leads to recruitment of pro-tumoral M2 macrophages from the bone marrow
- M2 macrophages serve as pumps for tumor cell intravasation and metastasis
- Rebastinib is designed to inhibit chemotherapy-induced recruitment of M2 macrophages to tumors
- Rebastinib is designed to block rebound angiogenesis and inhibit M2 macrophages

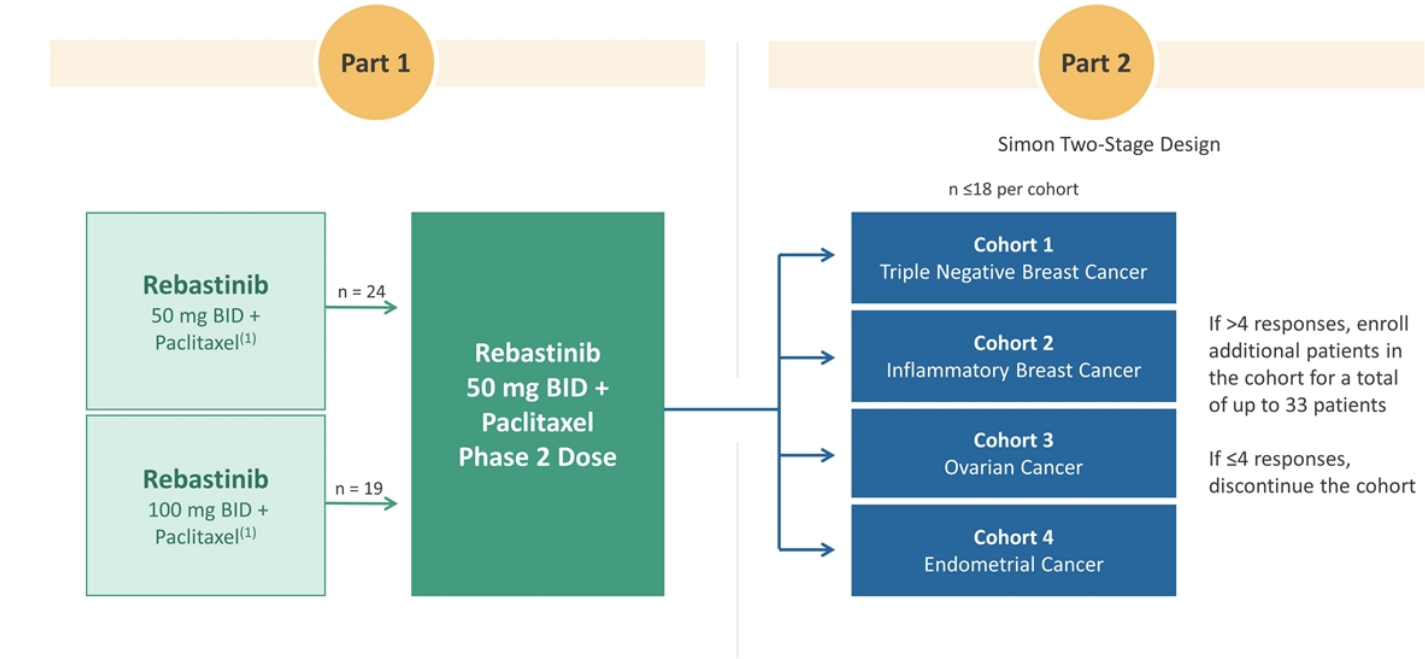


- Potent, small molecule inhibitor of TIE2
- Targets TIE2 expressing macrophages (TEMs) and endothelial cells in tumor environment
- Combination of rebastinib with chemotherapy may increase tumor killing through multiple mechanisms
  - Tumor vascularization, dissemination, metastasis, immunotolerance

Development status

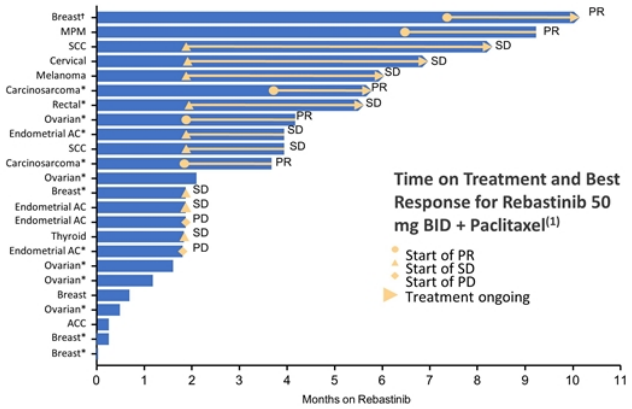
- Two ongoing studies in combination with paclitaxel or carboplatin
- Encouraging preliminary results from Part 1 of the Phase 1b/2 study in combination with paclitaxel presented in October 2019
- Selected Phase 2 dose and activated Part 2 of the Phase 1b/2 study in combination with carboplatin in January 2020

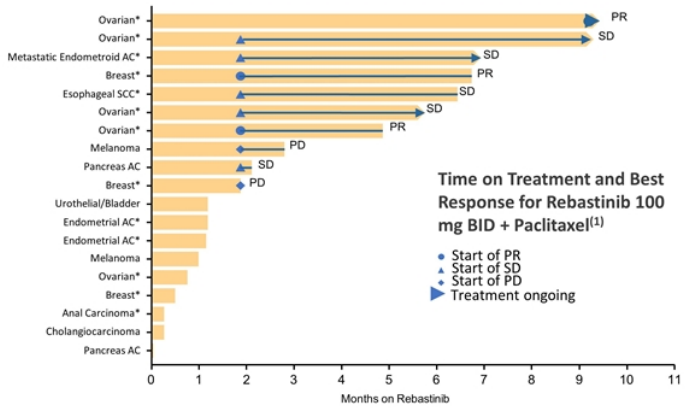
Rebastinib: Phase 1b/2 Study in Combination with Paclitaxel

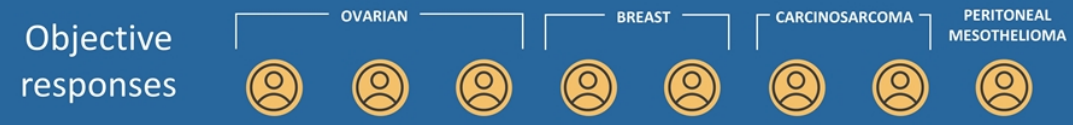


Notes: (1) 80 mg/m² 60 minute IV infusion.

Rebastinib: Part 1 of Phase 1b/2 Study in Combination with Paclitaxel Shows Encouraging Preliminary Anti-tumor Activity







Notes: Data presented at AACR-NCI-EORTC International Conference on Molecular Targets and Cancer Therapeutics 2019; AC=adenocarcinoma; ACC=adrenocortical carcinoma; MPM=malignant peritoneal mesothelioma; PD=progressive disease; PR=partial response; SCC=squamous cell carcinoma; SD=stable disease; (1) Tumor responses were evaluated by the investigator according to Response Evaluation Criteria in Solid Tumors 1.1 criteria; as per study protocol, includes confirmed and unconfirmed responses; *prior paclitaxel therapy; †patient did not receive prior paclitaxel, but did receive prior docetaxel.

Rebastinib: Part 1 Data of the Phase 1b/2 Study Showed the Combination with Paclitaxel Was Generally Well Tolerated

TEAEs ≥ 10% regardless of relatedness

	50 mg BID (n=24)		100 mg BID (n= 19)		Total (n=43)	
Preferred Term	Any grade	Grade ≥ 3	Any grade	Grade ≥ 3	Any grade	Grade ≥ 3
Fatigue	8 (33%)	1 (4%)	5 (26%)	0	13 (30%)	1 (2%)
Constipation	3 (13%)	0	6 (32%)	0	9 (21%)	0
Diarrhea	2 (8%)	0	7 (37%)	0	9 (21%)	0
Dry mouth	6 (25%)	0	3 (16%)	0	9 (21%)	0
Alopecia	4 (17%)	0	4 (21%)	0	8 (19%)	0
Anemia	4 (17%)	2 (8%)	4 (21%)	2 (11%)	8 (19%)	4 (9%)
Dyspnea	4 (17%)	0	4 (21%)	0	8 (19%)	0
Nausea	6 (25%)	1 (4%)	2 (11%)	0	8 (19%)	1 (2%)
Peripheral sensory neuropathy	2 (8%)	0	6 (32%)	0	8 (19%)	0
Dizziness	3 (13%)	0	4 (21%)	0	7 (16%)	0
Hypokalemia	4 (17%)	1 (4%)	3 (16%)	0	7 (16%)	1 (2%)
Urinary tract infection	3 (13%)	1 (4%)	4 (21%)	0	7 (16%)	1 (2%)
Hypomagnesemia	3 (13%)	0	3 (16%)	0	6 (14%)	0
Onychomadesis	3 (13%)	0	3 (16%)	0	6 (14%)	0
Sepsis	2 (8%)	2 (8%)	4 (21%)	4 (21%)	6 (14%)	6 (14%)
ALT increased	5 (21%)	0	0	0	5 (12%)	0
Decreased appetite	3 (13%)	0	2 (11%)	0	5 (12%)	0
Dysgeusia	3 (13%)	0	2 (11%)	0	5 (12%)	0
Headache	1 (4%)	1 (4%)	4 (21%)	0	5 (12%)	1 (2%)
Rash	3 (13%)	0	2 (11%)	0	5 (12%)	0
Stomatitis	4 (17%)	1 (4%)	1 (5%)	0	5 (12%)	1 (2%)
Vomiting	4 (17%)	1 (4%)	1 (5%)	0	5 (12%)	1 (2%)

- Frequencies of TEAEs were similar between 50 mg and 100 mg BID
- One patient experienced a rebastinib-related SAE (grade 2 muscular weakness) and 4 patients had an SAE related to paclitaxel and rebastinib (5 events: grade 3 pneumonia [n=2], grade 3 nausea [n=1], grade 3 vomiting [n=1], and grade 2 myocardial ischemia [n=1])
- Two patients experienced muscular weakness (one grade 1 at 50 mg BID and remains on treatment, and one grade 2 at 100 mg BID and discontinued treatment)

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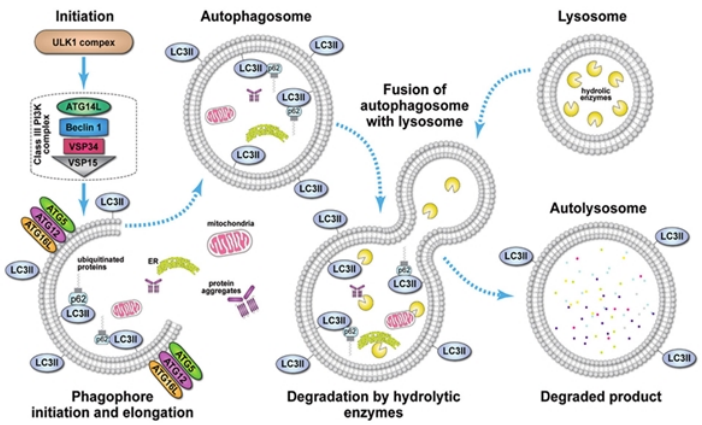
Notes: Data presented at AACR-NCI-EORTC International Conference on Molecular Targets and Cancer Therapeutics 2019.

DCC-3116 is a Potent & Selective ULK Inhibitor Designed to Inhibit Autophagy

ULK: Initiating Factor for Autophagy



Adapted from: Ndoye A and Weeraratna AT. Autophagy- An emerging target for melanoma therapy [version 1]. F1000Research 2016, 5:1888.

First-in-class opportunity for new therapeutic in RAS mutant cancers

- RAS mutant cancers have high basal levels of autophagy
- DCC-3116 observed preclinically to durably and potently inhibit autophagy in RAS mutant cancer cell lines through the inhibition of ULK kinase
- Combination of DCC-3116 and MAPK pathway inhibitors have been observed to synergize to block RAS mutant cancers *in vivo*

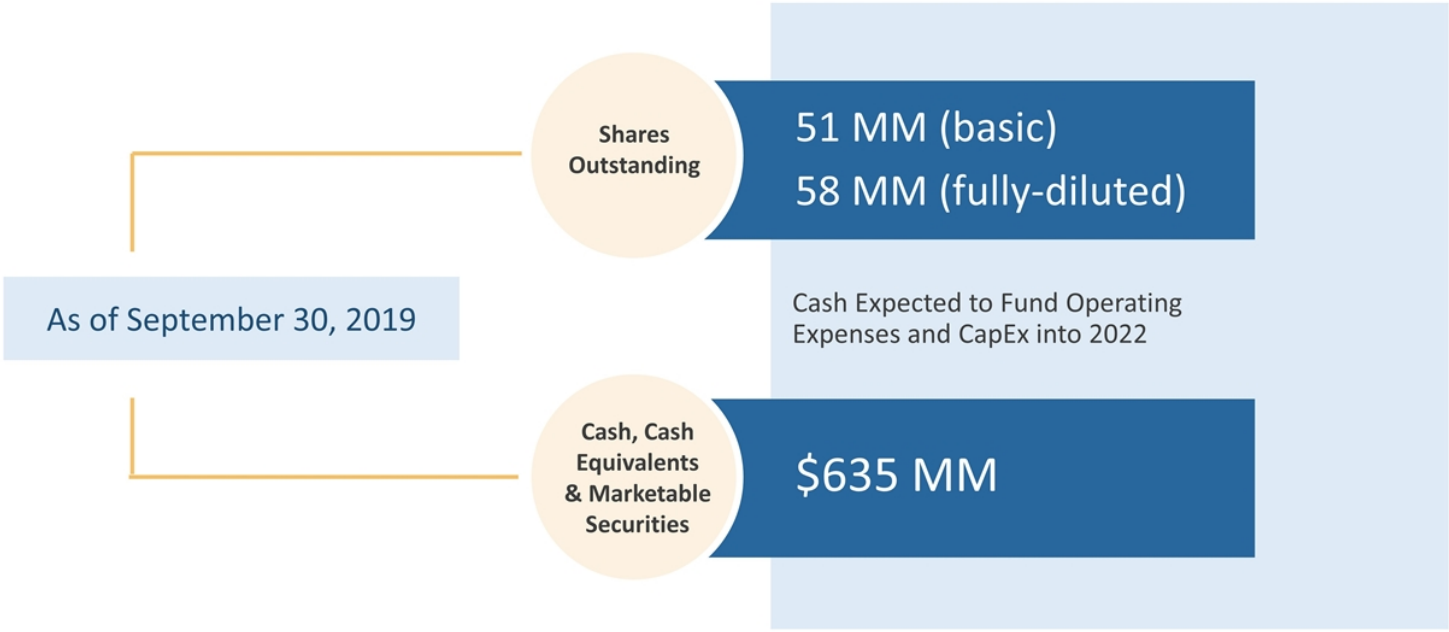
Highly potent and selective (IC_{50} at 1 mM ATP)

- ULK1 4.7 nM and ULK2 35 nM
- No off-target kinases within 30-fold of ULK1/ 5 kinases within 100-fold of ULK1

Designed to avoid CNS exposure

IND submission expected in 2H 2020

Financial Highlights



Significant Expected 2020 Milestones Across the Pipeline

Ripretinib	○ Potential FDA approval and commercial launch in advanced GIST ○ Submit EU marketing authorization application to EMA (2H20) ○ Complete enrollment in the INTRIGUE Phase 3 study in 2nd line GIST (2H20) ○ Present Phase 1 study expansion data (2H20)
DCC-3014	○ Select Phase 2 dose for TGCT and open expansion cohort (2H20) ○ Update Phase 1 data in TGCT patients (2H20)
Rebastinib	✓ Select Phase 2 dose and activate Part 2 of Phase 1b/2 study in combination with carboplatin (1H20) ○ Present Phase 1b/2 data in combination with carboplatin (2H20) ○ Present Phase 1b/2 data in combination with paclitaxel (2H20)
DCC-3116	○ Submit IND application to FDA (2H20)

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