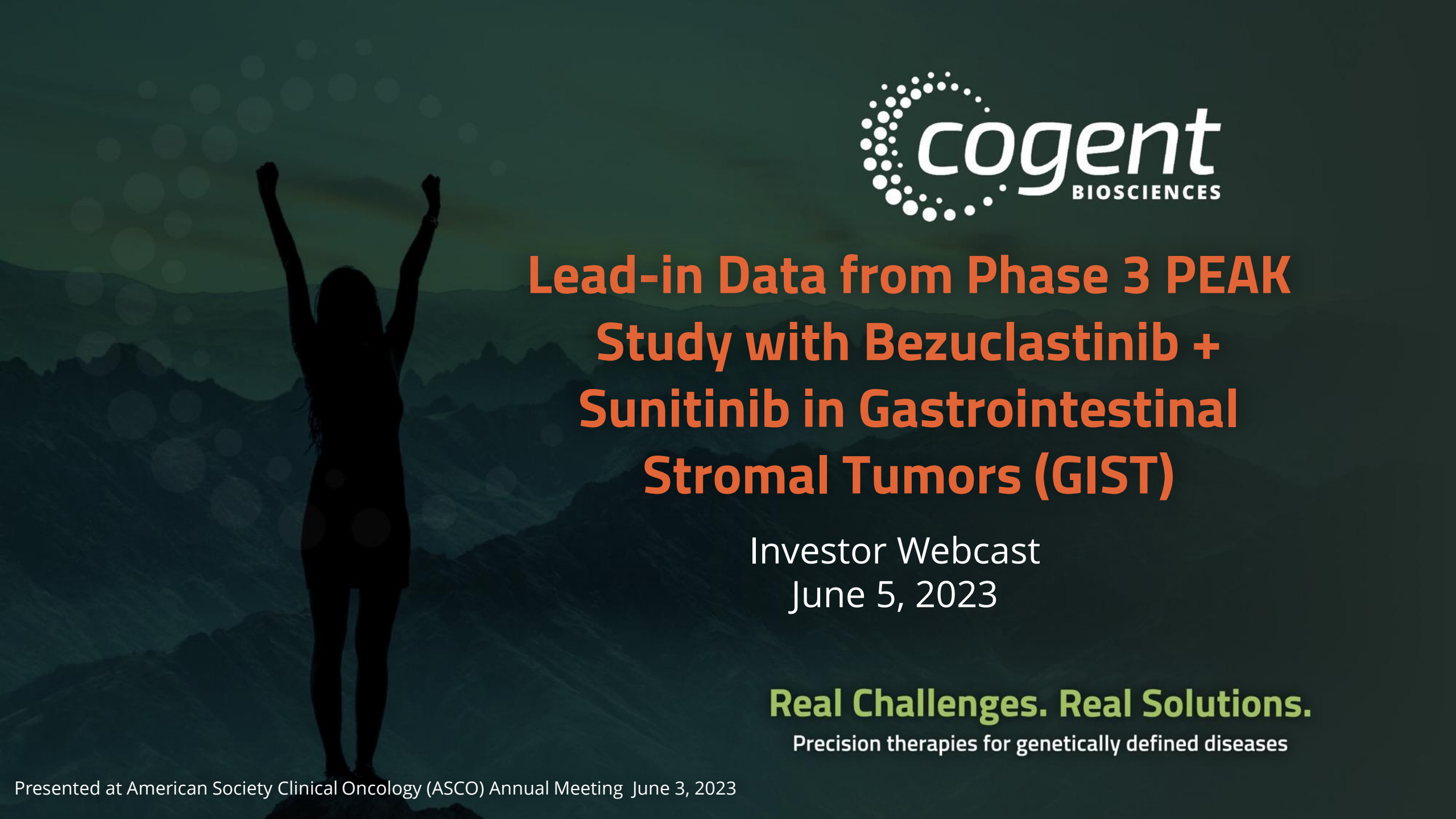

Lead-in Data from Phase 3 PEAK Study with Bezuclastinib + Sunitinib in Gastrointestinal Stromal Tumors (GIST)

Investor Webcast
June 5, 2023

Real Challenges. Real Solutions.

Precision therapies for genetically defined diseases

Presented at American Society Clinical Oncology (ASCO) Annual Meeting June 3, 2023

Forward-Looking Statements and Risk Factors

This presentation and the accompanying oral commentary contain forward-looking statements that involve risks, uncertainties and assumptions. If the risks or uncertainties ever materialize or the assumptions prove incorrect, our results may differ materially from those expressed or implied by such forward looking statements. All statements other than statements of historical fact could be deemed forward-looking, including, but not limited to, any statements of the plans, strategies, and objectives of management for future operations, including our clinical development and commercialization plans; any projections of financial information; any statement about historical results that may suggest trends for our business; any statement of expectation or belief regarding future events; potential markets or market size, technology developments, our clinical product pipeline, clinical and pre-clinical data or the implications thereof, enforceability of our intellectual property rights, competitive strengths or our position within the industry; any statements regarding the anticipated benefits of our collaborations or other strategic transactions; and any statements of assumptions underlying any of the items mentioned.

These statements are based on estimates and information available to us at the time of this presentation and are not guarantees of future performance. Actual results could differ materially from our current expectations as a result of many risks and uncertainties, including but not limited to, risks associated with: the potential impacts of raising additional capital, including dilution to our existing stockholders, restrictions on our operations or requirements that we relinquish rights to our technologies or product candidates; business interruptions resulting from the coronavirus disease outbreak or similar public health crises, which could cause a disruption of the development of our product candidates and adversely impact our business; the success, cost, and timing of our product development activities and clinical trials; the timing of our planned regulatory submissions to the FDA for our product candidate bezuclastinib and feedback from the FDA as to our plans; our ability to obtain and maintain regulatory approval for our bezuclastinib product candidate and any other product candidates we may develop, and any related restrictions, limitations, and/or warnings in the label of an approved product candidate; the potential for our identified research priorities to advance our bezuclastinib product candidate; the ability to license additional intellectual property relating to our product candidates from third parties and to comply with our existing license agreements and collaboration agreements; the ability and willingness of our third-party research institution collaborators to continue research and development activities relating to our product candidates; our ability to commercialize our products in light of the intellectual property rights of others; our ability to obtain funding for our operations, including funding necessary to complete further development and commercialization of our product candidates; the scalability and commercial viability of our manufacturing methods and processes; the commercialization of our product candidates, if approved; our plans to research, develop, and commercialize our product candidates; our ability to attract collaborators with development, regulatory, and commercialization expertise; our expectations regarding our ability to obtain and maintain intellectual property protection for our product candidates; and the fact that interim clinical data may not be indicative of future results, among others. For a further description of the risks and uncertainties that could cause actual results to differ from those expressed in these forward-looking statements, as well as risks relating to our business in general, see our periodic filings filed from time to time with the Securities and Exchange Commission. Unless as required by law, we assume no obligation and do not intend to update these forward-looking statements or to conform these statements to actual results or to changes in our expectations.

All of Cogent Biosciences, Inc. (“Cogent”) product candidates are investigational product candidates and their safety and efficacy have not yet been established. Cogent has not obtained marketing approval for any product, and there is no certainty that any marketing approvals will be obtained or as to the timelines on which they will be obtained.

Any data pertaining to Cogent product candidates is interim data and may include investigator-reported interim data for which Cogent has not yet independently reviewed the source data. The interim data may not be representative of the final results that may be obtained in the corresponding trials and results from earlier trials may not be representative of results obtained in later trial or pivotal trials.

Agenda and Speakers

Andrew Robbins
President and Chief Executive Officer

Andrew Wagner, M.D., Ph.D.
Dana-Farber Cancer Institute

Jessica Sachs, M.D.
Chief Medical Officer

Introduction & Corporate Overview	**Andrew Robbins**
PEAK Data with Bezuclastinib + Sunitinib in Patients with Gastrointestinal Stromal Tumors (GIST)	**Dr. Andrew Wagner**
Summary and Q&A	**Andrew Robbins** **Dr. Jessica Sachs** **Dr. Andrew Wagner**

Multiple Clinical and Preclinical Programs with Upcoming Catalysts

Program	Indication	Early Stage Development	Late Stage Development	Regulatory Submission	Approval
Clinical Programs					
Bezuclastinib (KIT inhibitor)	Advanced Systemic Mastocytosis	Apex			
	Nonadvanced Systemic Mastocytosis	Summit			
	Gastrointestinal Stromal Tumors	Peak			

- **Now enrolling APEX Part 2 (Registration enabling)**
- **Initial clinical data on track 2H 2023**
- **Now enrolling PEAK Part 2 (Global Phase 3 trial)**

Research Programs

Indication	Hit ID	Lead Generation	Lead Optimization	GLP	IND Submission
ErbB2 mut					
FGFR2					
Target 3					
Target 4					
Target 5					
Target 6					

Expected cash runway into 2025; $220.3 million as of March 31, 2023

Gastrointestinal Stromal Tumor (GIST)

- Most common mesenchymal tumor of the gastrointestinal tract, with about 4,000-6,000 new cases/year in the United States.[1]
- Activating mutations in KIT are found in 80% of tumors, most commonly in exon 11 or exon 9.
- These mutations are inhibited by the tyrosine kinase inhibitor (TKI) imatinib, but in the metastatic setting resistance arises in 60% of patients within 2 years.[1,2]
- Resistance to imatinib is driven by additional mutations in KIT exons 13/14 (ATP binding domain) or exons 17/18 (activation loop).[3,4] Mutations may be present in both exons 13/14 and 17/18 in the same patient.
- Additional FDA-approved sequential lines of therapy include the TKIs sunitinib, regorafenib, and ripretinib.
  - However, each TKI is only effective against a subset of resistance mutations and disease progression results from clonal heterogeneity.
- Bezuclastinib (CGT9486, formerly PLX9486) is an investigational TKI that inhibits mutations in KIT exons 9, 11, 17, and 18.[5]

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[1]Gramza AW, Corless CL, Heinrich MC. 2009. [2]Arshad JCO Precis Oncol, 2020. [3]Casali. JCO, 2017. [4]Serrano. CCR, 2020.
[5]Wagner AJ, et al. JAMA Oncol. 2021;7(9): 1343-1350.

Rationale for Treatment of GIST with Bezuclastinib in Combination with Sunitinib

- Broad KIT inhibition drives tumor regression in mutationally heterogeneous GIST patient-derived xenograft models.[6]
- While no single TKI inhibits all mutations, the combination of bezuclastinib (targeting exons 9, 11, 17, and 18) and sunitinib (targeting exons 9, 11, 13, and 14) targets the full spectrum of primary and secondary mutations.[6]
- In preclinical studies, bezuclastinib demonstrated no significant activity against closely related kinases (Table 1), inhibition of which has been linked to toxicities.[7,8]

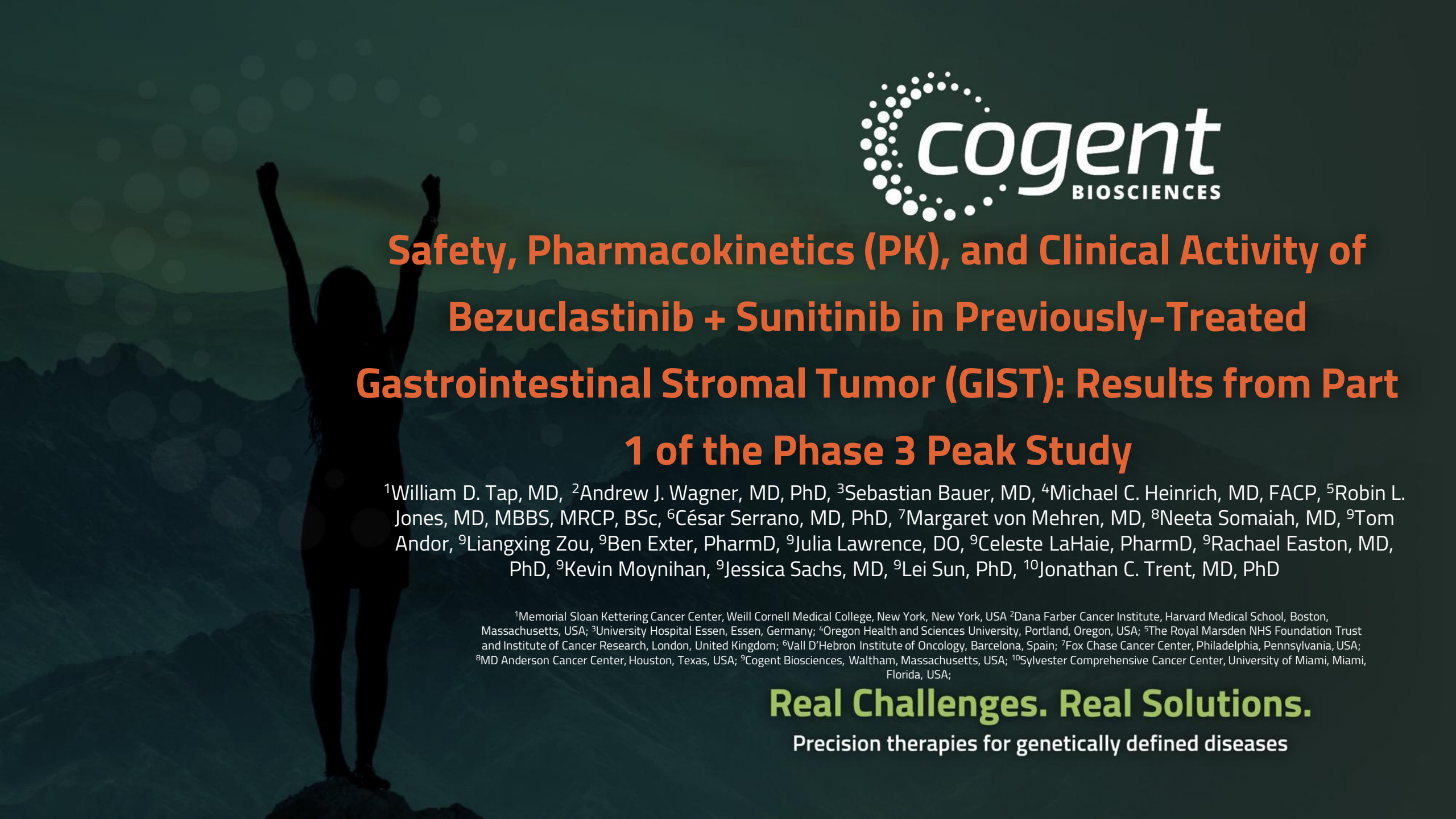
Activity Against Closely Related Kinases

	Cell IC_{50}(nM)*				
Compound	**PDGFRα**	**PDGFRß**	**CSF1R**	**FLT3**	**VEGFR2**
Bezuclastinib	**>10,000**	**>10,000**	**>10,000**	**>1000**	**>1000**
Imatinib	75	247	1027	>1000	>1000
Sunitinib	23	14	313	1	4
Regorafenib	138	1180	473	237	101
Avapritinib	53	10	249	305	>1000
Ripretinib	20	34	312	534	110

- In a Phase 1/2 clinical study, pts with relapsed and/or refractory GIST and a median of 3 prior lines of therapy treated with bezuclastinib and sunitinib (n=15) experienced clinical benefit and an acceptable safety profile, warranting further evaluation in a randomized trial.[5]
- Prior to study initiation, an optimized formulation of bezuclastinib was developed to improve bioavailability and reduce pill burden.

* Off-target assays were performed using phospho ELISAs (R&D Systems). The following cell lines were used for analysis: H1703 (PDGFRa), NIH3T3 (PDGFRb), HEK293 engineered lines (CSF1R, FLT3, and VEGFR2).

[5]Wagner AJ, et al. *JAMA Oncol.* 2021;7(9): 1343-1350. [6]Wagner et al. [abstract 1251848] 2022. In: CTOS 2022: 1251848. [7]Giles FJ et al, Leukemia. 2009;23(10):1698-1707. [8]Liu S, Kurzrock R. Seminars in Oncology. 2015;42(6):863-875.



Safety, Pharmacokinetics (PK), and Clinical Activity of Bezuclastinib + Sunitinib in Previously-Treated Gastrointestinal Stromal Tumor (GIST): Results from Part 1 of the Phase 3 Peak Study

[1]William D. Tap, MD, [2]Andrew J. Wagner, MD, PhD, [3]Sebastian Bauer, MD, [4]Michael C. Heinrich, MD, FACP, [5]Robin L. Jones, MD, MBBS, MRCP, BSc, [6]César Serrano, MD, PhD, [7]Margaret von Mehren, MD, [8]Neeta Somaiah, MD, [9]Tom Andor, [9]Liangxing Zou, [9]Ben Exter, PharmD, [9]Julia Lawrence, DO, [9]Celeste LaHaie, PharmD, [9]Rachael Easton, MD, PhD, [9]Kevin Moynihan, [9]Jessica Sachs, MD, [9]Lei Sun, PhD, [10]Jonathan C. Trent, MD, PhD

[1]Memorial Sloan Kettering Cancer Center, Weill Cornell Medical College, New York, New York, USA [2]Dana Farber Cancer Institute, Harvard Medical School, Boston, Massachusetts, USA; [3]University Hospital Essen, Essen, Germany; [4]Oregon Health and Sciences University, Portland, Oregon, USA; [5]The Royal Marsden NHS Foundation Trust and Institute of Cancer Research, London, United Kingdom; [6]Vall D'Hebron Institute of Oncology, Barcelona, Spain; [7]Fox Chase Cancer Center, Philadelphia, Pennsylvania, USA; [8]MD Anderson Cancer Center, Houston, Texas, USA; [9]Cogent Biosciences, Waltham, Massachusetts, USA; [10]Sylvester Comprehensive Cancer Center, University of Miami, Miami, Florida, USA;

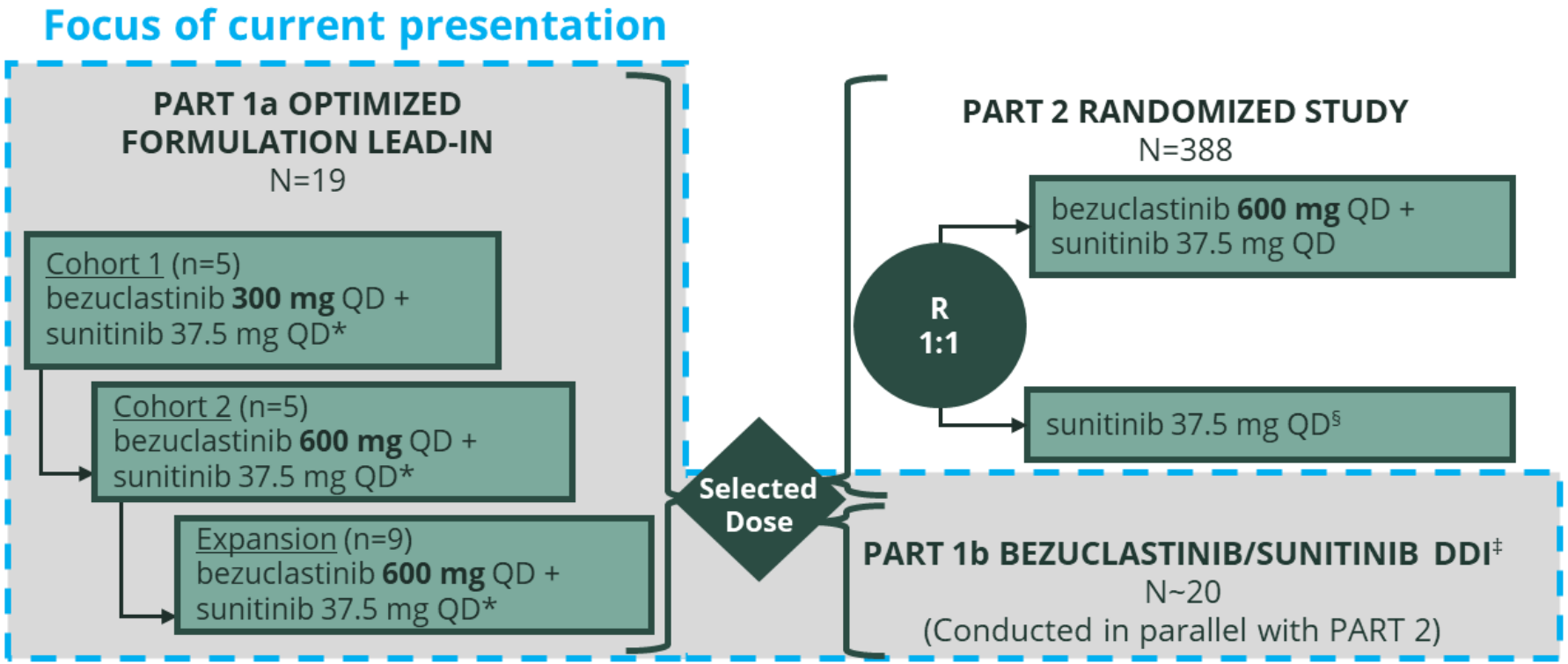
Real Challenges. Real Solutions.

Precision therapies for genetically defined diseases

Study Design for the Global Phase 3 Randomized Peak Study (NCT05208047)

KEY ENTRY CRITERIA

- Histologically confirmed Gastrointestinal Stromal Tumors (GIST) w/at least 1 measurable lesion per mRECIST v1.1
- Locally advanced, unresectable or metastatic
- Documented disease progression on or intolerance to imatinib
- ECOG Performance Status 0-2
- PART 1a: at least 1 prior line of therapy
- PART 1b: at least 2 prior TKIs
- PART 2: prior imatinib only



*Sunitinib treatment begins on Day 2
§Sunitinib monotherapy patients who progress may be eligible for cross-over
‡Patients receive either bezuclastinib or sunitinib as single agent for 2 weeks, followed by bezuclastinib and sunitinib

Objectives, Endpoints, and Enrollment Status

Study Part	Objective	Primary Endpoint	Current Enrollment Status
1a	Identify a dose of an optimized formulation of bezuclastinib to be administered in combination with sunitinib that achieves target drug exposures defined based on previous Phase 1/2 clinical data with bezuclastinib and sunitinib in patients with GIST	PK of bezuclastinib	**Enrollment complete**
1b	To characterize the potential drug-drug interaction between bezuclastinib and sunitinib	PK of bezuclastinib, sunitinib, and the primary active metabolite of sunitinib	**Enrollment complete**
2	To determine the efficacy of bezuclastinib and sunitinib vs sunitinib in patients with GIST and prior imatinib only	PFS per mRECIST v1.1	**Now enrolling**

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Part 1 Patient Disposition

Part 1a[€]
19 pts

5 patients received a starting dose of 300 mg QD bezuclastinib (3 of these patients elected to increase to 600 mg QD bezuclastinib as of data-cut).

14 patients received a starting dose of 600 mg QD bezuclastinib.

Part 1b[€]
20 pts

Patients randomized 1:1 to receive 600 mg QD bezuclastinib or 37.5 mg QD sunitinib as a single agent for 2 weeks, followed by combination therapy.

Part 1
39 pts

Of 39 patients treated in Part 1, 25 remain on study treatment.

As of 29-Mar-2023 Data-cut
[€]Enrollment complete. Part 1b enrolled a total of 23 patients as of April 2023.

Demographic and Baseline Characteristics

- 39 patients enrolled in Part 1; median age 58 years (range: 33-77)

Baseline Characteristics	Part 1a N=19 (%)	Part 1b N=20 (%)	Total N=39 (%)
Male, n (%)	13 (68.4)	18 (90.0)	**31 (79.5)**
ECOG Performance Status (baseline)			
0	12 (63.2)	10 (50.0)	**22 (56.4)**
1	6 (31.6)	10 (50.0)	**16 (41.0)**
2	1 (5.3)	0 (0)	**1 (2.6)**
Total number of prior TKI therapies			
0	0 (0)	0 (0)	**0 (0)**
1	7 (36.8)	0 (0)	**7 (17.9)**
2	7 (36.8)	4 (20.0)	**11 (28.2)**
≥3	5 (26.3)	16 (80.0)	**21 (53.8)**

As of 29-Mar-2023 Data-cut
Safety Analysis Set: All treated pts

Baseline Characteristics	Part 1a N=19 (%)	Part 1b N=20 (%)	Total N=39 (%)
Primary Tumor Location at Diagnosis			
Stomach	4 (21.1)	4 (20.0)	**8 (20.5)**
Small Intestine	8 (42.1)	14 (70.0)	**22 (56.4)**
Other abdominal locations	7 (36.8)	2 (10.0)	**9 (23.1)**
Primary Mutation‡			
Exon 9^	2 (10.5)	7 (35.0)	**9 (23.1)**
Exon 11^	13 (68.4)	14 (70.0)	**27 (69.2)**
Other/unknown	4 (21.1)	0	**4 (10.3)**
Prior Radiotherapy	4 (21.1)	5 (25.0)	**9 (23.1)**
Prior anti-cancer surgery	15 (78.9)	19 (95.0)	**34 (87.2)**

‡Per archival samples taken any time from primary diagnosis to screening
^One patient in Part 1b with both exon 9 and exon 11 appears twice in the Part 1b and Total column

Safety and Tolerability of Bezuclastinib + Sunitinib

Treatment Emergent Adverse Events ≥15% of Patients All Causality

	Part 1a N=19 (%)		Part 1b N=20 (%)		Total N=39 (%)
Preferred Term	All Grades	Grade ≥3	All Grades	Grade ≥3	All Grades
TEAEs					
Diarrhea	11 (58)	2(11)	6 (30)	-	**17 (44)**
Fatigue	10 (53)	-	6 (30)	-	**16 (41)**
Nausea	9 (47)	-	4 (20)	-	**13 (33)**
Hair color changes	8 (42)	-	1 (5)	-	**9 (23)**
Hypertension	5 (26)	2 (11)	3 (15)	2 (10)	**8 (21)**
Taste disorder^	3 (16)	-	5 (25)	-	**8 (21)**
GERD	3 (16)	-	4 (20)	-	**7 (18)**
Abdominal pain	3 (16)	-	3 (15)	-	**6 (15)**
Headache	3 (16)	-	3 (15)	-	**6 (15)**
Rash#	3 (16)	-	3 (15)	-	**6 (15)**

	Part 1a N=19 (%)		Part 1b N=20 (%)		Total N=39 (%)
Preferred Term	All Grades	Grade ≥3	All Grades	Grade ≥3	All Grades
Laboratory TEAEs					
Neutropenia∫	9 (47)	-	6 (30)	2 (10)	**15 (39)**
AST increased	9 (47)	1(5)	6 (30)	-	**15 (39)**
ALT increased	8 (42)	-	6 (30)	1 (5)	**14 (36)**
WBC count decreased	7 (37)	-	7 (35)	1 (5)	**14 (36)**
Anemia	5 (26)	1 (5)	3 (15)	-	**8 (21)**
Hypophosphatemia	4 (21)	-	3 (15)	-	**7 (18)**
Blood creatinine increased	4 (21)	-	2 (10)	-	**6 (15)**
Hyponatremia	5 (26)	-	1 (5)	-	**6 (15)**
Thrombocytopenia*	5 (26)	1 (5)	1 (5)	-	**6 (15)**

∫Includes pooled PTs of Neutropenia, Neutrophil Count Decreased
^Includes pooled PTs of Taste disorder, Dysgeusia, Ageusia
*Includes pooled PTs of Thrombocytopenia and Platelet Count Decreased
#Includes pooled PTs of Rash, Rash maculo-papular

As of 29-Mar-2023 Data-cut
Safety Analysis Set: All treated pts

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Safety and Tolerability of Bezuclastinib + Sunitinib

Combination therapy with bezuclastinib and sunitinib in Part 1 was well-tolerated and does not appear to add to the frequency or severity of adverse events associated with single agent sunitinib.

- Majority of TEAEs were of low CTCAE grade and reversible.
- Low rate of Grade 3+ events.
- Limited 9/39 (23%) dose reductions of any study medications due to TEAEs.
- Infrequent (n=2) discontinuations due to TEAEs (1 patient with Grade 2 Rash, 1 patient with Gr 1 abdominal pain and Gr 3 diarrhea).
- Only two patients experienced serious adverse events possibly associated with study medications.
  - One patient with Grade 2 neutrophil count decrease and pyrexia, and Grade 3 platelet count decrease.
  - One patient with Grade 2 bacterial peritonitis and Grade 3 febrile neutropenia.

Clinical Pharmacokinetics of Bezuclastinib

- Steady state exposure of bezuclastinib increased in an approximately dose proportional manner from 300 mg to 600 mg following once daily (QD) administration of bezuclastinib and 37. 5 mg sunitinib.[6]
- Part 1a data supports the selection of 600 mg bezuclastinib and 37.5 mg sunitinib as the dose for Part 1b and Part 2 of the Peak study.

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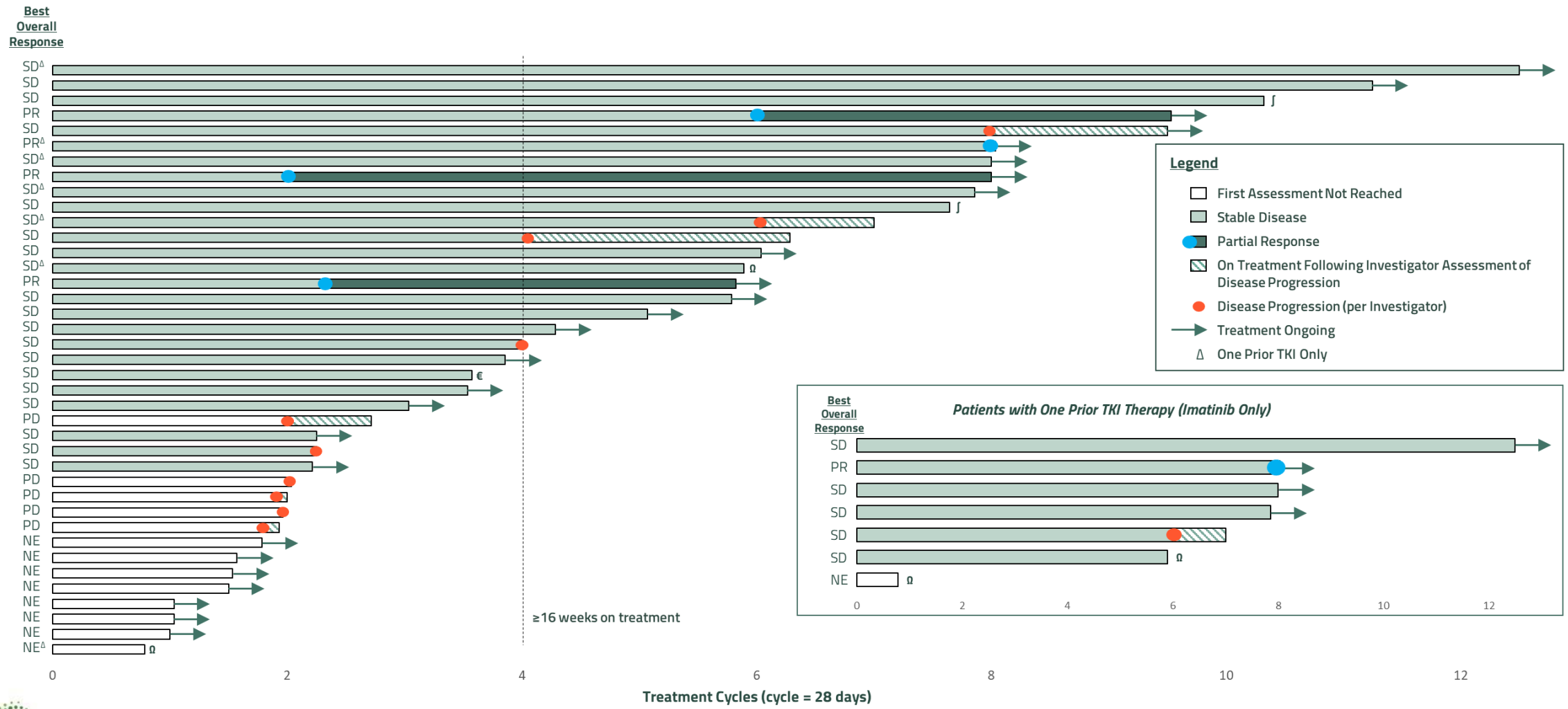
Tap WD,. et al. American Society of Clinical Oncology (ASCO) Annual Meeting; Chicago, IL, 3 June 2023: Abstract Number: 11537
[6]Wagner et al. [abstract 1251848] 2022. In: CTOS 2022: 1251848.

Treatment Duration and Disease Assessment in Part 1a/b



ΔOne prior TKI only; ʃ Clinical disease progression; Ω Adverse event; € Enrolled in another therapeutic study

As of 29-Mar-2023 Data-cut
Safety Analysis Set: All treated pts

Early Responses Observed Per Investigator Assessment

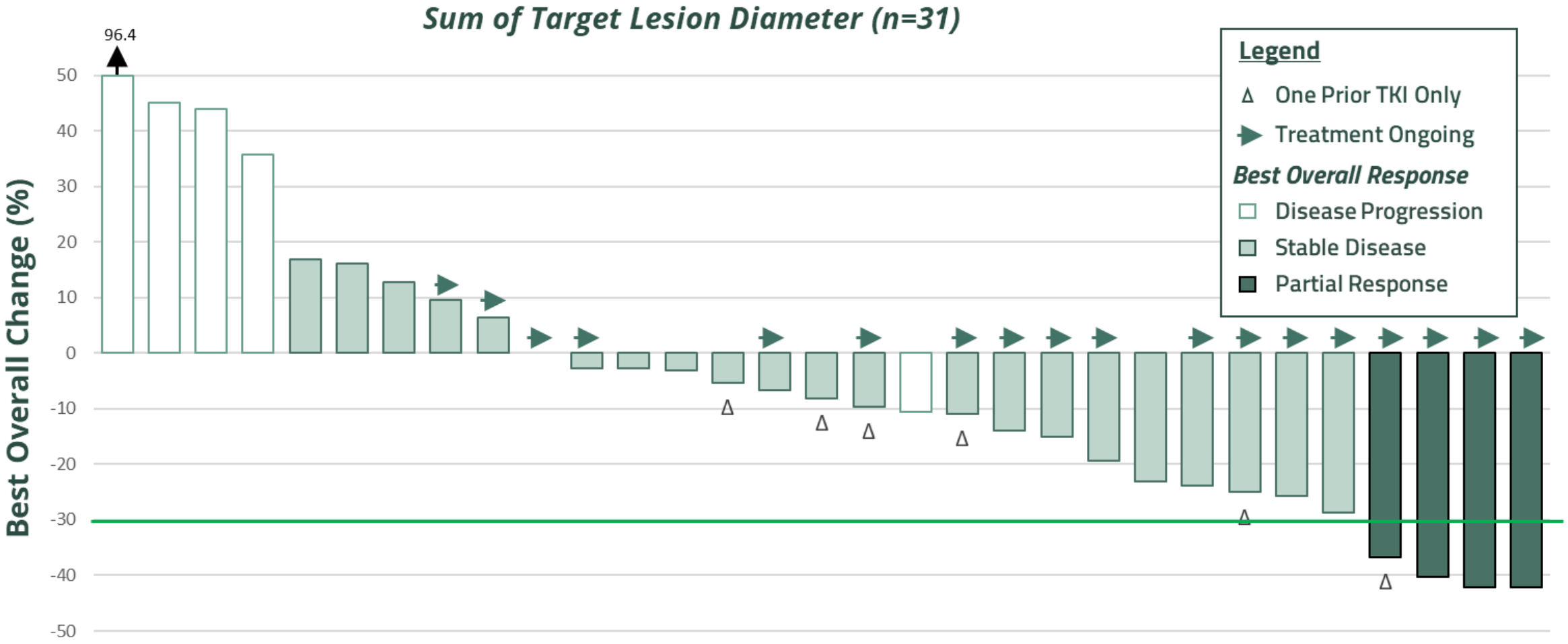
	One Prior TKI Therapy (imatinib treatment only)	2+ Prior TKI Therapies	Total
Part 1a + 1b, n	6	25	**31**
Disease Control Rate*, n (%)	6 (100.0)	11 (44.0)	**17 (54.8)**
Best Overall Response, n (%)			
Partial Response (PR)	1 (16.7)‡	3 (12.0)	**4 (12.9)**
Stable Disease (SD)	5 (83.3)	17 (68.0)	**22 (71.0)**
Progressive Disease (PD)	0	5 (20.0)	**5 (16.1)**

*Disease Control Rate = CR + PR + durable SD [16 weeks]; EE analysis set includes patients who have not yet been on study for 16 weeks
‡Unconfirmed response

As of 29-Mar-2023 Data-cut
Efficacy Evaluable Analysis Set: All treated pts with ≥1 postbaseline tumor assessment

- Median time to response was 4.2 cycles (range: 2.0 to 8.0 cycles).
- Data are immature to estimate median PFS.

Best Overall Change (%) in Sum of Target Lesion Diameter



As of 29-Mar-2023 Data-cut
Efficacy Evaluable Analysis Set: All treated pts with ≥1 postbaseline tumor assessment

Case 1: Ongoing Partial Response in Patient with Prior Imatinib Treatment

56-year-old man diagnosed with GIST (KIT Exon 9 mutation)

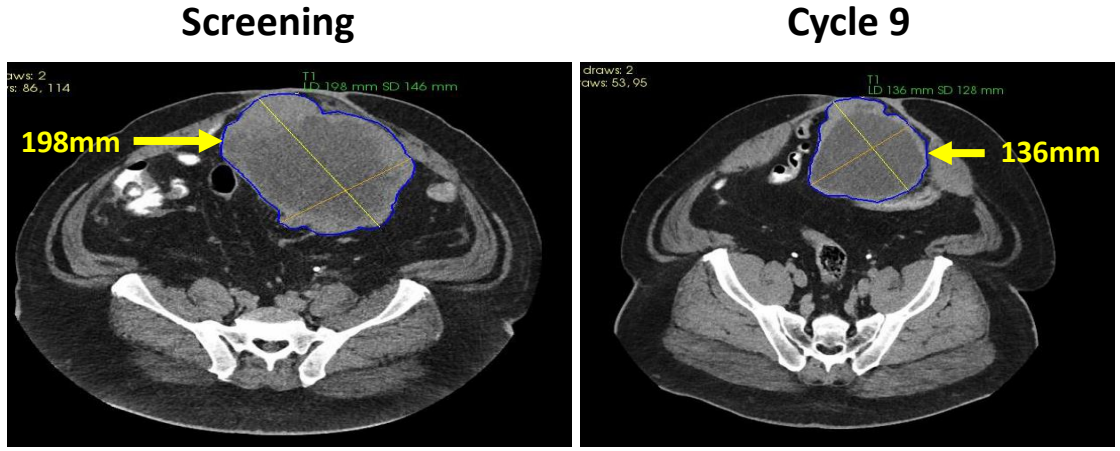
Prior treatment:

- Resection of intestinal and mesenteric masses
- **Imatinib** 400mg QD for remaining peritoneal metastases

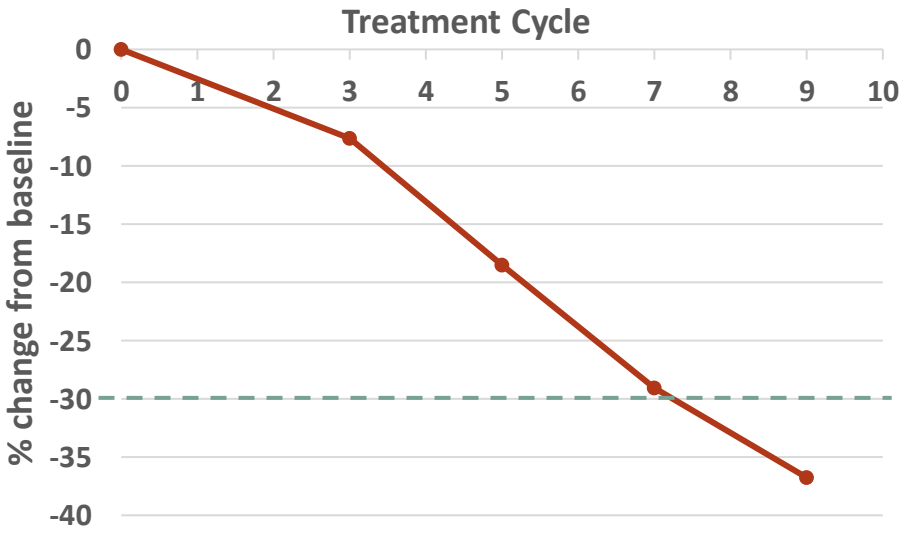
Progression with recurrent intestinal, mesenteric, and peritoneal disease

Started on bezuclastinib 600mg + sunitinib 37.5mg QD

- No SAEs or dose modifications
- Sum of tumor diameters continuing to decrease over time with 37% reduction at Cycle 9.
- **Currently receiving Cycle 11**



Images and measurements from 1 independent central radiologist's review of target lesion 1.



Case 2: Ongoing Partial Response in Patient with Prior Imatinib and Ripretinib Treatment

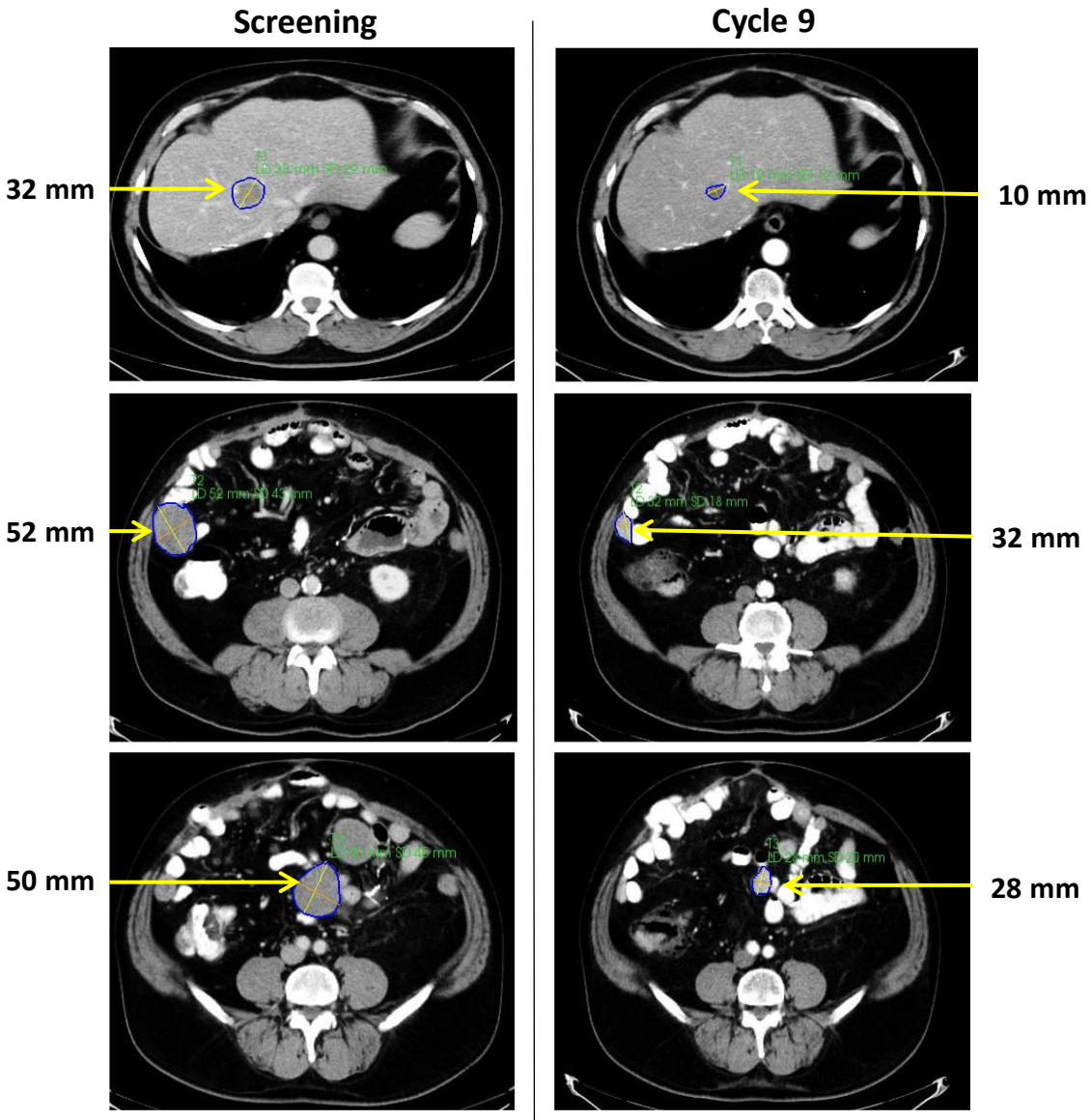
54-year-old man diagnosed with GIST (KIT Exon 11 mutation)

Prior treatment:

- Surgical resection followed by **adjuvant imatinib 400mg QD**
- **Ripretinib 150mg QD** x 17 months
  - **Best response: SD**
- Upon disease progression, ctDNA demonstrated KIT mutations **in exons 11, 13, and 18**

Started on bezuclastinib 600mg + sunitinib 37.5mg QD

- Disease in the mesentery, peritoneum and liver at screening
- No SAEs or dose modifications for either study drug; PR starting at Cycle 3
- **Currently receiving Cycle 11**



Images and measurements from 1 independent central radiologist's review.

Case 3: Tumor Reduction Nearing Partial Response in Patient with Multiple Prior Lines of Treatment

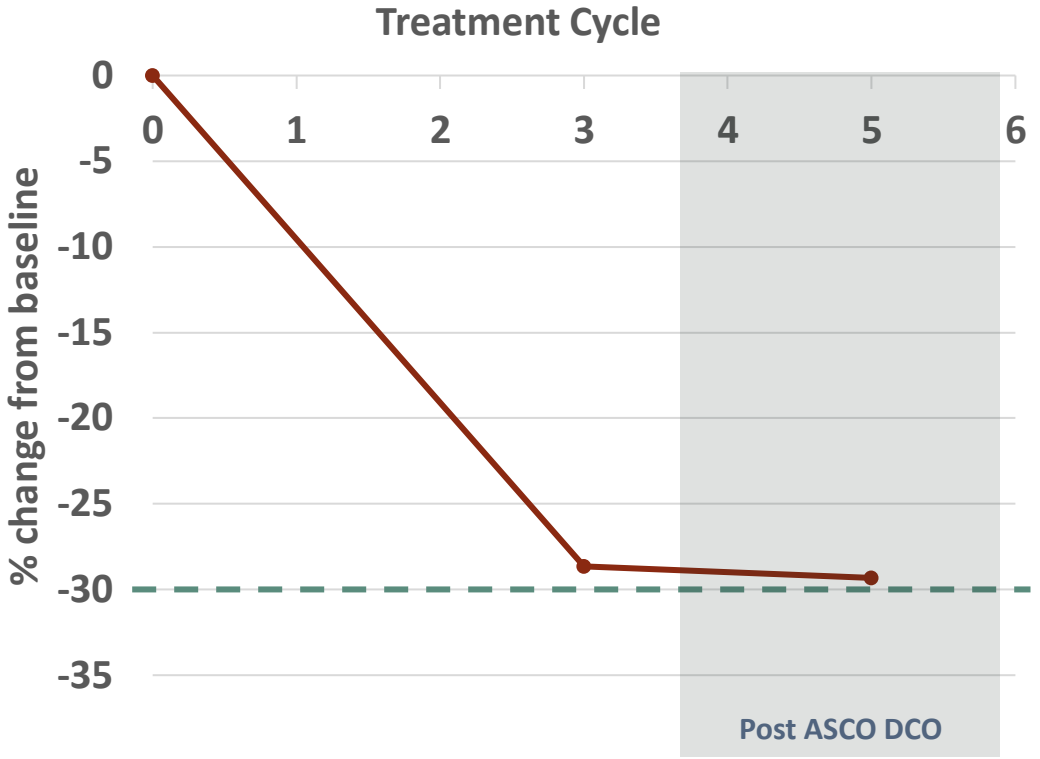
43-year-old woman diagnosed with GIST (KIT Exon 9 mutation)

Prior treatment:

- Resection of small intestinal tumor
- **Adjuvant imatinib** x 6 months
- Resection of abdominal and pelvic tumor
- **Sunitinib** x 17 months (best response: PR)
- **Ripretinib** x 3.5 months (best response: SD)
- **Avapritinib** x 2 months (best response: PD)

Treatment with bezuclastinib 600mg + sunitinib 37.5mg QD

- No SAEs or dose modifications
- Cycle 5 tumor assessment (post ASCO data cut) nearing PR
- **Currently receiving Cycle 6**



ASCO Data Cut-Off (DCO): 29 MAR 2023

Conclusions

- **Encouraging safety, tolerability, and clinical activity in Part 1, consistent with previously reported clinical data (Ph 1/2 PLX121-01 trial).**
  - Majority of adverse events were Grade 1-2 and reversible with a low rate of Grade 3 events reported.
  - Combination was well-tolerated with limited dose reductions and discontinuations due to adverse events.
  - Combination therapy does not appear to be adding to the frequency or severity of adverse events associated with single agent sunitinib.
- **Clinical activity supports potential for durable disease control in imatinib-resistant GIST patients, including heavily pretreated patients.**
  - 4 patients with partial responses at early stage of the trial.
  - Responses developing at later timepoints suggest response rate may continue to increase over time.
  - Data are immature to estimate median PFS.
- **Part 2 is enrolling patients who have progressed on or are intolerant to imatinib only at the selected starting dose of 600 mg bezuclastinib QD and 37.5 mg sunitinib QD.**

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Multiple Clinical and Preclinical Programs with Upcoming Catalysts

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	Nonadvanced Systemic Mastocytosis	Summit			
	Gastrointestinal Stromal Tumors	Peak			

- **Now enrolling APEX Part 2 (Registration enabling)**
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ErbB2 mut					
FGFR2					
Target 3					
Target 4					
Target 5					
Target 6					

Expected cash runway into 2025; $220.3 million as of March 31, 2023

Q&A

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Precision therapies for genetically defined diseases