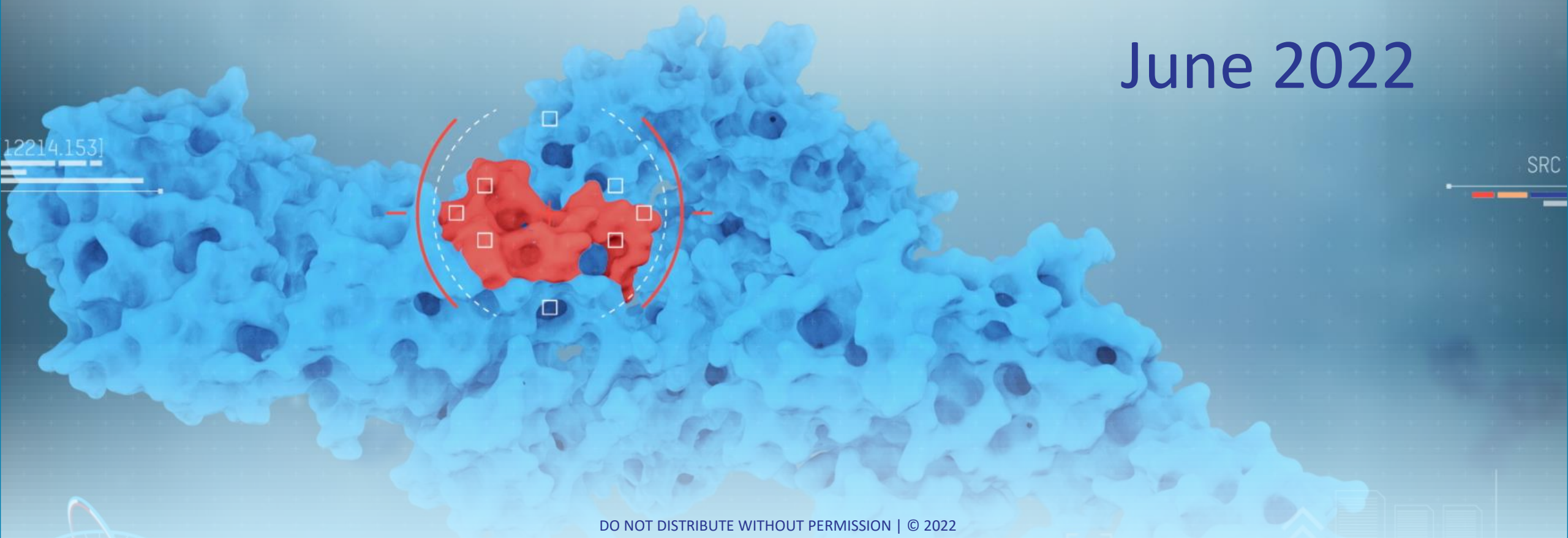
Compass Therapeutics Presentation

June 2022



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This presentation includes forward-looking statements regarding our drug candidates, the timing of the start and conclusion of ongoing or planned clinical trials, including the potential impact of the ongoing COVID-19 pandemic on our business, the timing and outcome of regulatory decisions, future availability of clinical trial data, our collaborations for our product candidates and the maintenance of those collaborations, business and results from operations, and other matters. Actual results could differ materially from those contained in any forward-looking statements as a result of various factors, including without limitation: that our drug candidates do not advance in development or result in approved products on a timely or cost effective basis or at all; the cost, timing and results of clinical trials; our ability to manage and mitigate the impact of the ongoing COVID-19 pandemic; that many drug candidates that have completed early-stage trials do not become approved drugs on a timely or cost effective basis or at all; the ability to enroll patients in clinical trials; possible safety and efficacy concerns; regulatory developments; our ability to protect our intellectual property rights, and unexpected costs, charges or expenses that reduce cash runway. Our pipeline programs are in various stages of pre-clinical and clinical development, and the process by which such pre-clinical or clinical therapeutic candidates could potentially lead to an approved therapeutic is long and subject to significant risks and uncertainties. These and other risks and uncertainties that we face are described in our most recent Annual Report on Form 10-K, and in other filings that we make with the Securities and Exchange Commission from time to time. We undertake no obligation to update forward-looking statements as a result of new information or otherwise.

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This presentation concerns drugs that are under clinical investigation, and which have not yet been approved for marketing by the U.S. Food and Drug Administration (FDA). It is currently limited by Federal law to investigational use, and no representation is made as to its safety or effectiveness for the purposes for which it is being investigated.

Company Overview

We are a clinical stage biotech company developing antibody therapeutics for cancer & autoimmune diseases

CORE SCIENCE

- StitchMabs™ platform designed to identify synergistic bispecific antibodies
- Common Light Chain technology enables multi-specificity and manufacturability
- Our understanding of Cancer Biology informs the design of our proprietary drug candidates

FOCUS

- Next Generation novel antibody therapeutics
- Key programs: CTX-009, CTX-471 and CTX-8371
- Let the science guide the therapeutic format: monoclonal vs. multispecific

RESOURCES

- ~25 FTEs, based in Boston, MA
- Capable of rapidly advancing candidates from idea to clinical proof-of-concept
- Funded by leading life-science investors

Seasoned Leadership Team

Senior Executive Team

Thomas J. Schuetz, MD, PhD
Co-Founder, CEO and Director

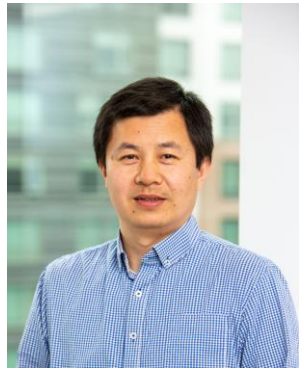
Vered Bisker-Leib, PhD, MBA
President and COO

Susan Kalled, PhD
CSO

Peter Moesta
Interim Head of CMC

Vice Presidents

Jon Anderman
VP, Head of Legal



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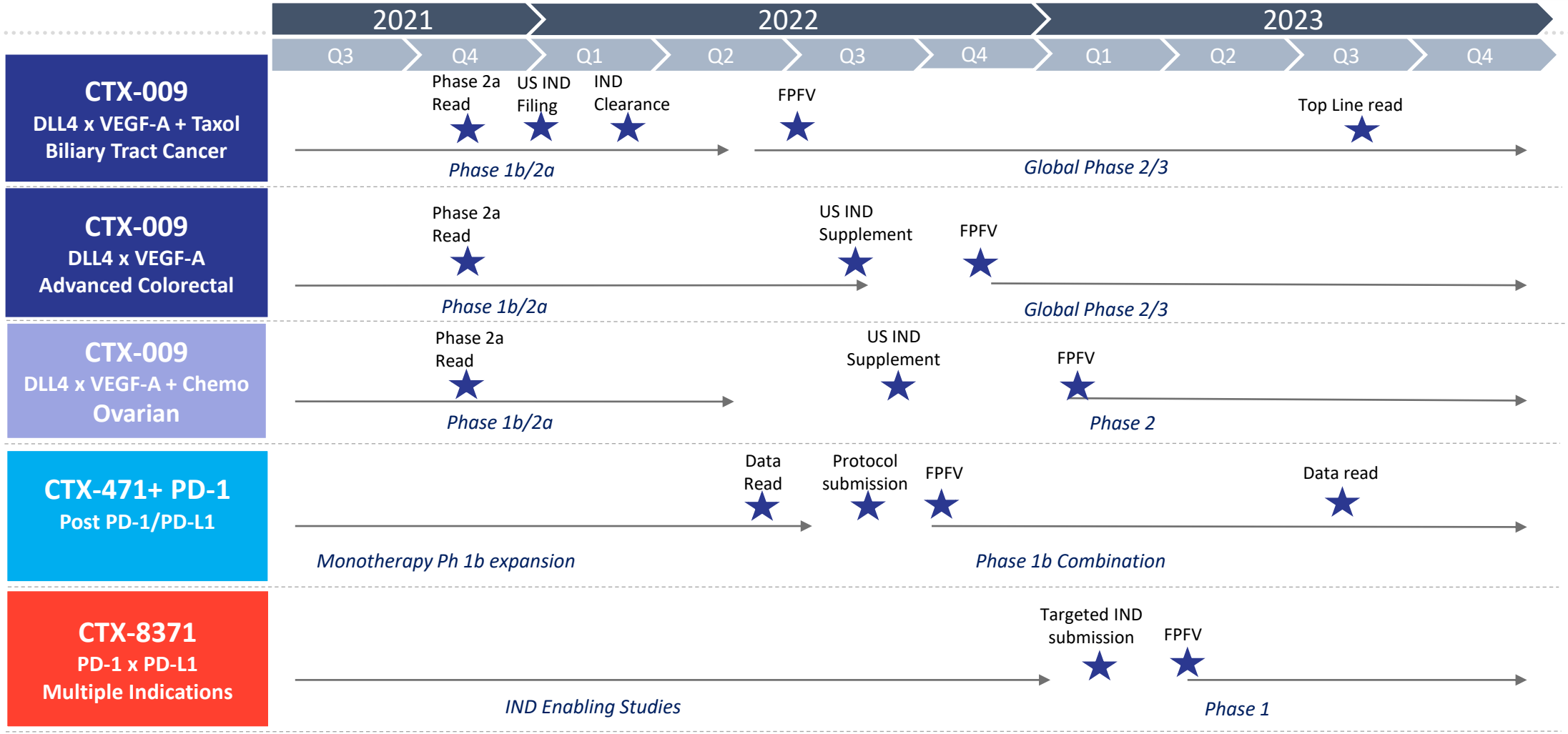
Compass Pipeline

monotherapy combination bispecific

Program	Indication	Discovery	Lead Optimization	IND Enabling Studies	Phase 1b	Phase 2	Phase 3
CTX-009 / DLL4 x VEGF-A	BTC						
CTX-009 / DLL4 x VEGF-A	Colorectal						
CTX-009 / DLL4 x VEGF-A	Ovarian						
CTX-471 / CD137 agonist	Oncology						
CTX-471 / CD137 + PD-1	Oncology						
CTX-8371 / PD-1 x PD-L1	Oncology						
Undisclosed	Autoimmune						

Key Events Expected in the Next 24 Months



Targeted Therapy

CTX-009 – DLL4 X VEGF-A bispecific antibody

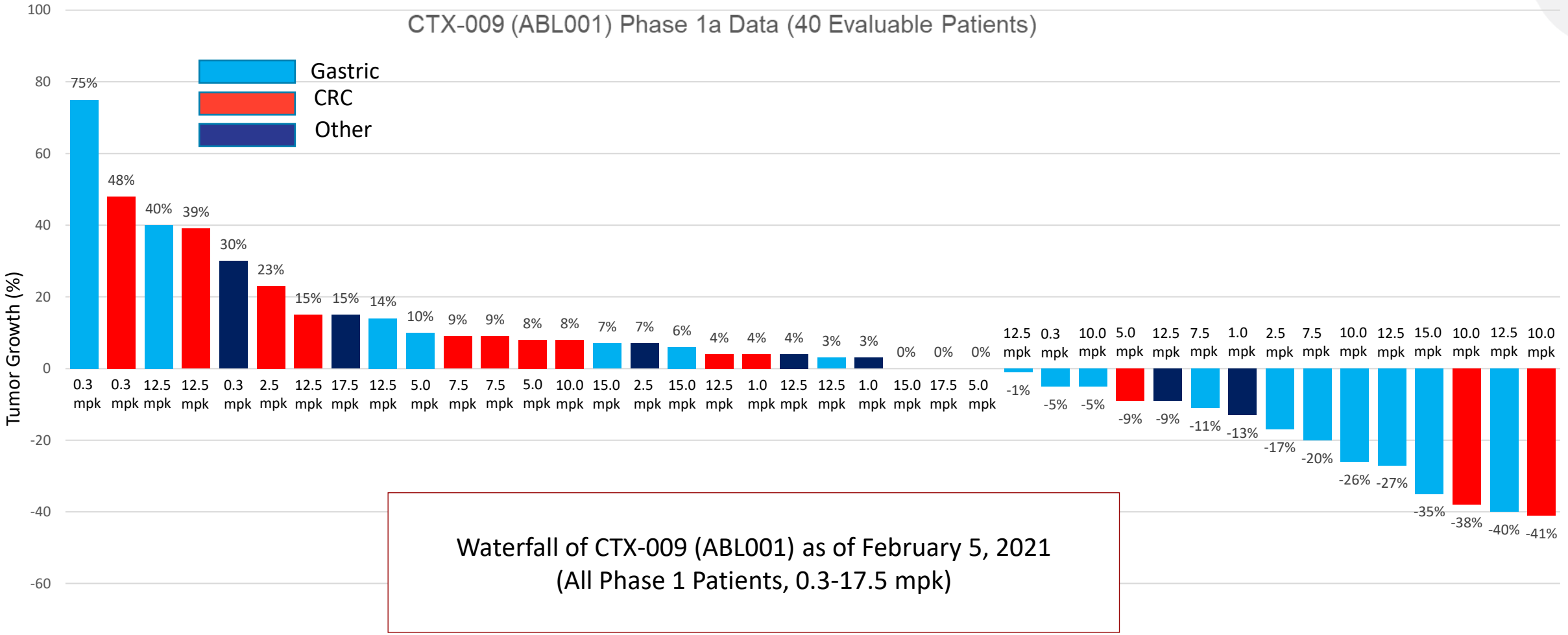
CTX-009: Vision and Potential

- **Best-in-class DLL4 x VEGF-A bispecific**
  - Phase 2/3 ready, with parallel active development in S. Korea and China – potential to turn studies into global studies
- **Oncology**:
  - Has demonstrated compelling activity in the 3rd line and 4th line settings in Cholangiocarcinoma, Colorectal Cancer, Gastric Cancer and Pancreatic Cancer
  - Ovarian Cancer – strong potential based on DLL4 expression and other agents
  - Could become front line therapy in multiple solid tumors
  - Other indications based on DLL4 expression
- **Ophthalmology:**
  - Potential to address AMD and DME based on mechanism
  - Consideration for partnership

CTX-009 - Phase 1 Clinical Summary

- Two Phase 1 Studies (S. Korea)
  - Ph 1a dose-escalation monotherapy, including cohort expansion at projected RP2Ds
  - Ph 1b combination study with irinotecan and paclitaxel
- Safety: well-tolerated; MTD has not been determined
- Activity: 8 PRs, 6 confirmed by RECIST in 33 advanced solid tumor patients treated at the therapeutic doses
- Responses as a monotherapy: colorectal and gastric cancers
- Responses in combination with chemotherapy: cholangiocarcinoma, pancreatic
  - Cholangio ORR= 50%; Clinical benefit rate = 75% with a median duration of response of 9.7 months

Phase 1a Monotherapy Waterfall Plot (all doses)



Waterfall of CTX-009 (ABL001) as of February 5, 2021
(All Phase 1 Patients, 0.3-17.5 mpk)

Phase 1a Monotherapy Safety Data (n=45)

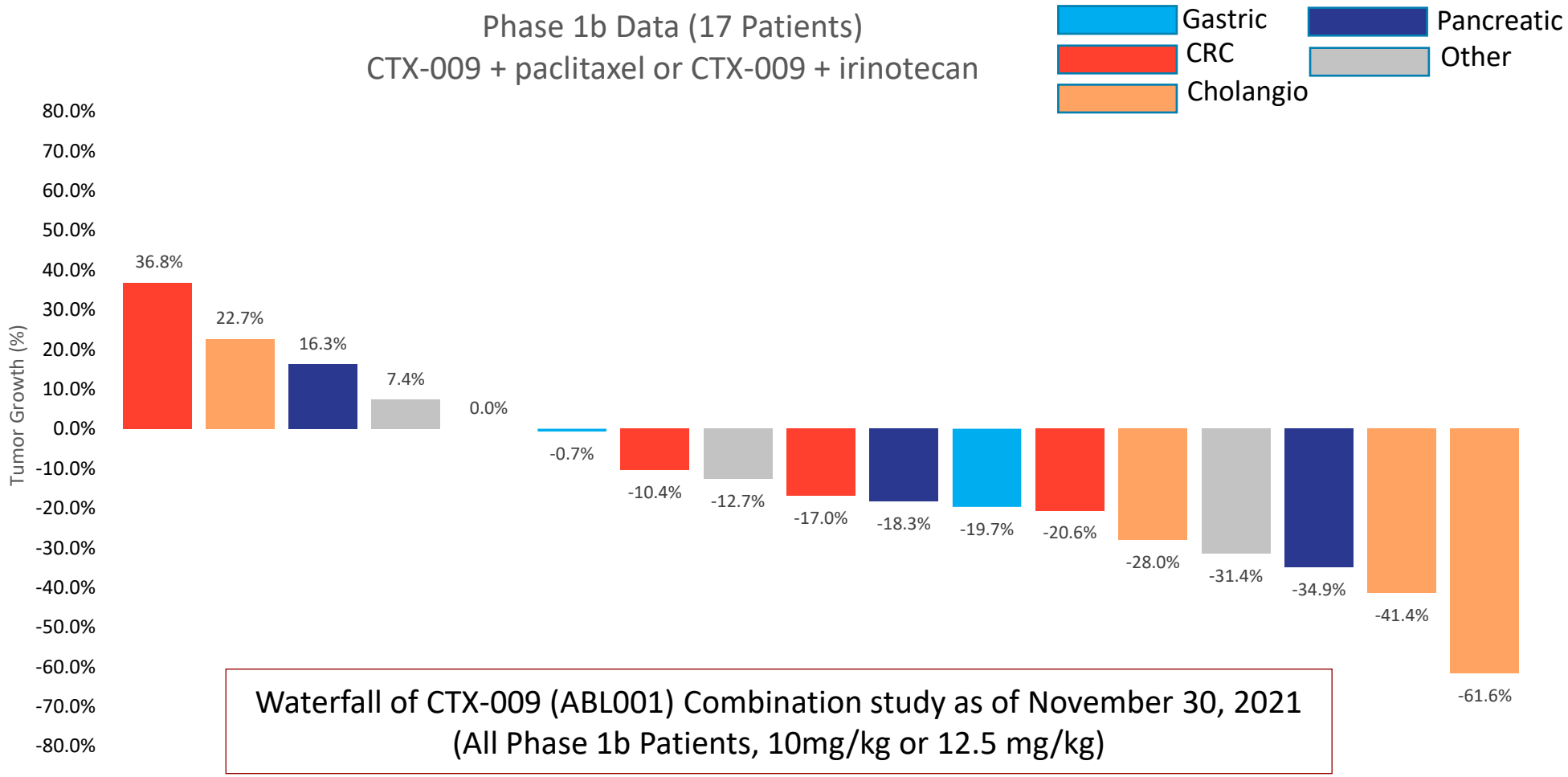
Drug-related adverse events observed in > 5% of patients	Total (n)	Total (%)	Grade 3 (n)	Grade 3 (%)
Hypertension*	17	37.8	7	15.6
General disorders (fatigue, fever, asthenia, edema, etc.)	7	15.6	1	2.2
Nervous system disorders (headache, dizziness)	7	15.6	1	2.2
Gastrointestinal disorders (nausea, vomiting, etc.)	6	13.3	2	4.4
Pulmonary hypertension	4	8.9	0	0
Proteinuria	3	6.7	0	0

* In clinical trials of bevacizumab, incidence of Grade 3-4 hypertension ranged between 5%-18% (Avastin label). It is typically managed by anti-hypertensive drugs

Phase 1b Combination Study

- Phase 1b: combination study with chemotherapy (N= 17)
  - 4 arms:
    - 10.0 and 12.5 mg/kg CTX-009
    - Irinotecan or paclitaxel
  - Activity:
    - 4 PRs, 3 confirmed, including a confirmed PR in pancreatic cancer; PR rate: 23.5%
    - 9 SD; SD rate: 52.9%
  - Overall Response Rate (ORR): 23.5%
  - Clinical Benefit Rate (CBR): 76.5%
  - Phase 2a combination study in BTC has began

Phase 1b Combination Study Waterfall Plot



Waterfall of CTX-009 (ABL001) Combination study as of November 30, 2021
(All Phase 1b Patients, 10mg/kg or 12.5 mg/kg)

CTX-009 - Phase 1 Studies Clinical Summary

Overall Response Rate at the Efficacious Dose (10-12.5 mg/kg):

- **Monotherapy: 18.8% ORR (3/16)**
- **Combination: 23.5% ORR (4/17)**

Clinical Benefit Rate at the Efficacious Dose (10-12.5 mg/kg):

- **Monotherapy: 68.8% (11/16)**
- **Combination: 76.5% (13/17)**

Phase 2 Combination Study: CTX-009 Plus Paclitaxel

Phase 2 Study Design:

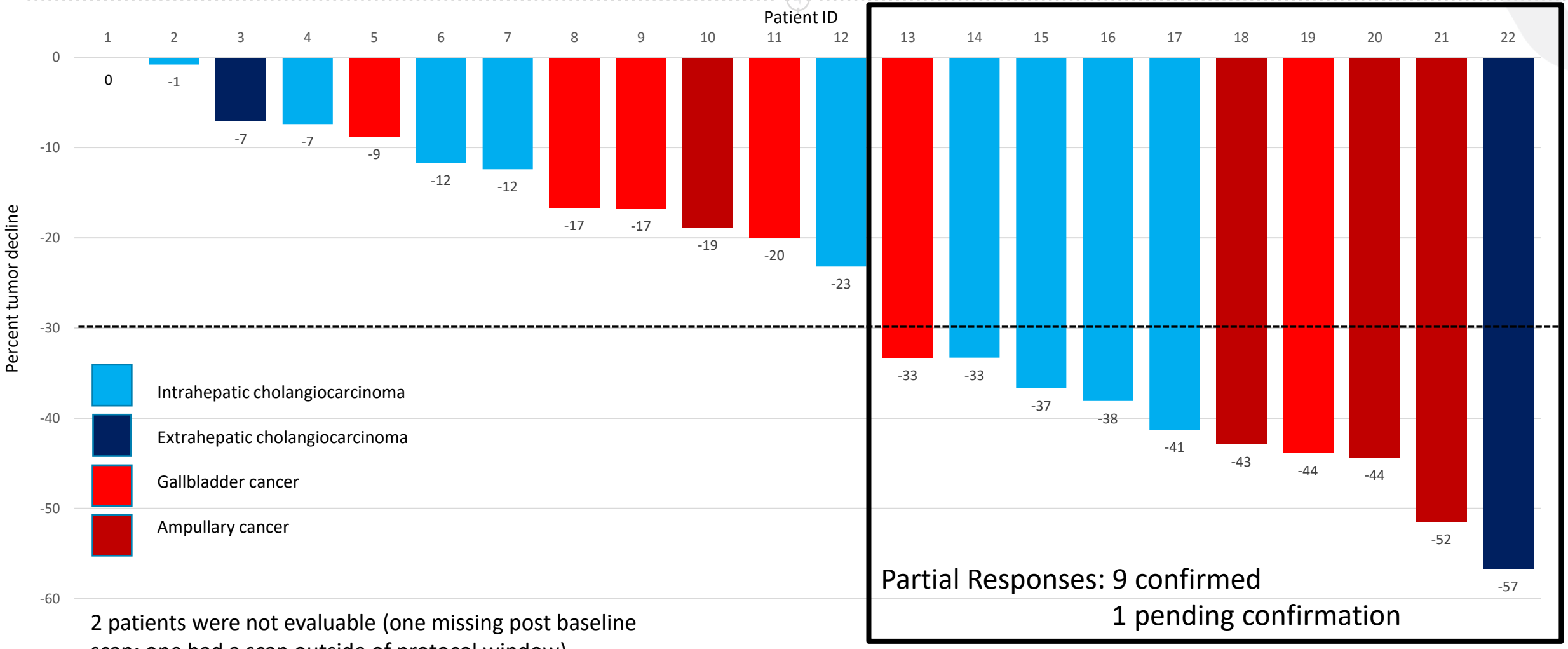
- Patients with biliary tract cancers after one or two prior therapies
- CTX-009 at 10 mg/kg biweekly plus paclitaxel 80 mg/m^2 weekly 3 of 4 weeks
- Simon 2 Stage adaptive design:
  - Stage 1: 21 patients → ORR
  - Stage 2: if 3 or more PRs → Stage 2: 45 additional patients

Phase 2: Patient Baseline and Demographics

	24 Total Patients
Age	
Median (years)	61.5
Gender, n(%)	
Male	14 (58%)
Female	10 (42%)
ECOG performance status, n(%)	
0	13 (54%)
1	11 (46%)

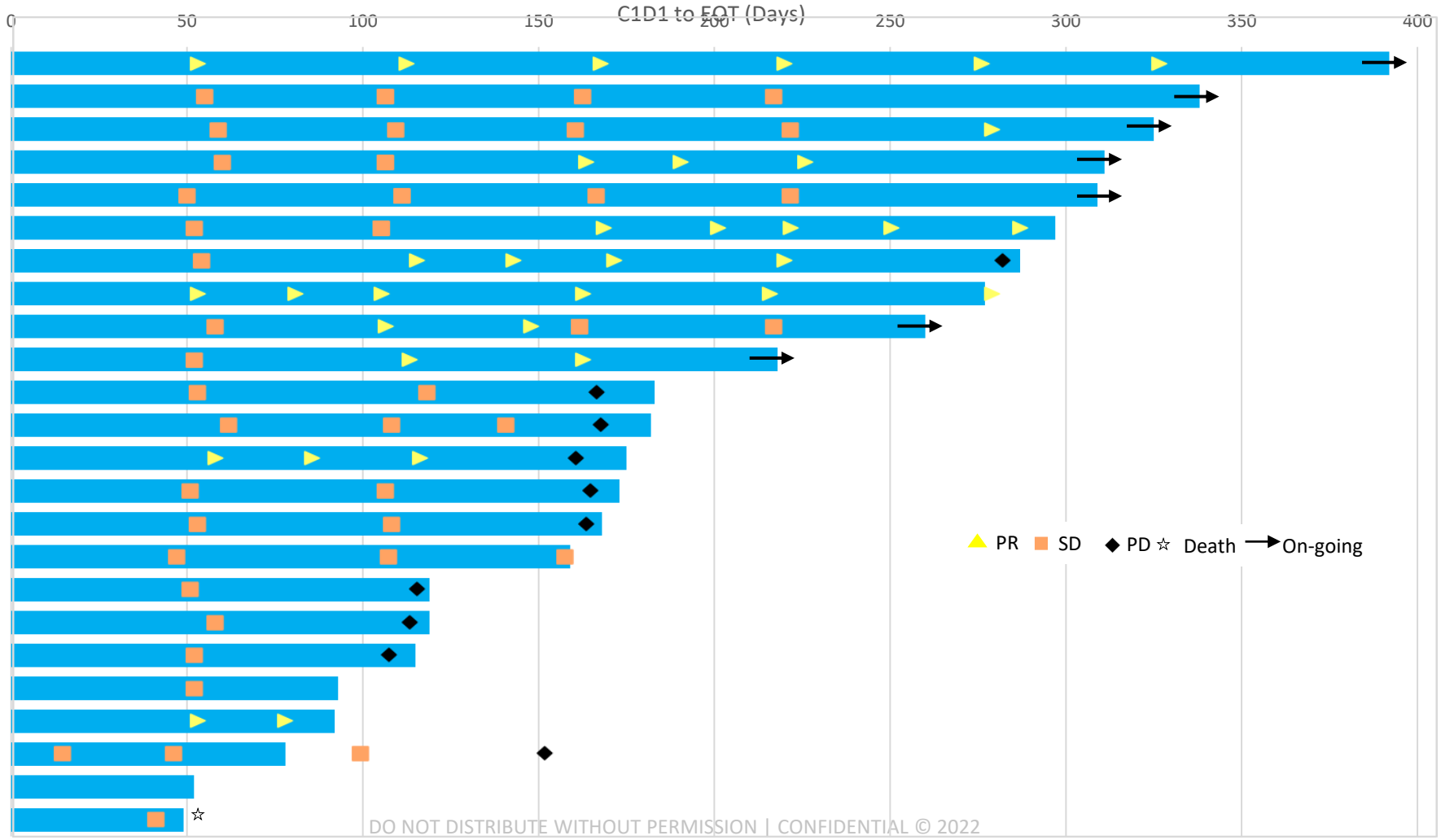
	24 Total Patients
Prior systemic therapies, n(%)	
1	11 (46%)
2	13 (54%)
Prior Gem/Cis regimen	23 (96%)
BTC subtype, n (%)	
Intrahepatic cholangiocarcinoma	9 (38%)
Extrahepatic cholangiocarcinoma	3 (13%)
Gallbladder cancer	7 (29%)
Ampullary cancer	5 (21%)

Phase 2 Waterfall: ORR = 42%; CBR = 92%



2 patients were not evaluable (one missing post baseline scan; one had a scan outside of protocol window)

Swimmer Plot: Median Time on Study ~ 6 Months



Safety Data: Treatment-Related ≥ Grade 3 Adverse Events

Phase 2 BTC study of CTX-009 plus paclitaxel

Event	24 total Patients N (%)
Neutropenia	12 (50.0%)
Hypertension	4 (16.7%)
Anemia	3 (12.5%)
Thrombocytopenia	2 (8.3%)
Additional events observed in 1 patient: Intestinal perforation, Asthenia, Catheter site hemorrhage, Fatigue, Cholangitis, Abdominal infection, Bacterial gastritis, Pneumonia (fatal), Post-procedure hemorrhage, Decreased appetite, Cerebral hemorrhage, Proteinuria, Embolism	

Avastin and paclitaxel label information

Event	Avastin (label)	Paclitaxel (label)
Neutropenia		52%
Hypertension	5-18%	
Anemia		16%
Thrombocytopenia		7%
	Additional events: GI perforation, wound healing complications, Proteinuria, hemorrhage	Additional events: Hypersensitivity reactions, infections, bleeding, neuropathy

CTX-009: Interim Phase 2 Study Summary and Next Steps

- 10 partial responses (PRs) for a **42% ORR** in patients treated in the second- and third-line settings
- Median time on study approximately 6 months, with 7 patients ongoing
- Adverse event profile similar to Phase 1
- Other regimens in BTC:
  - FOLFOX (NCCN guidelines): 5% ORR in the second-line setting
  - TOPAZ-1 (Phase 3 development): 26.7% ORR for Gem/Cis/Durvalumab (anti-PD-L1) in the first-line setting
- Initiate Stage 2 of the Phase 2 BTC study in the US in early Q3
- Initiate Phase 2/3 study in patients with colorectal cancer in the third line setting in the US in Q4 2022

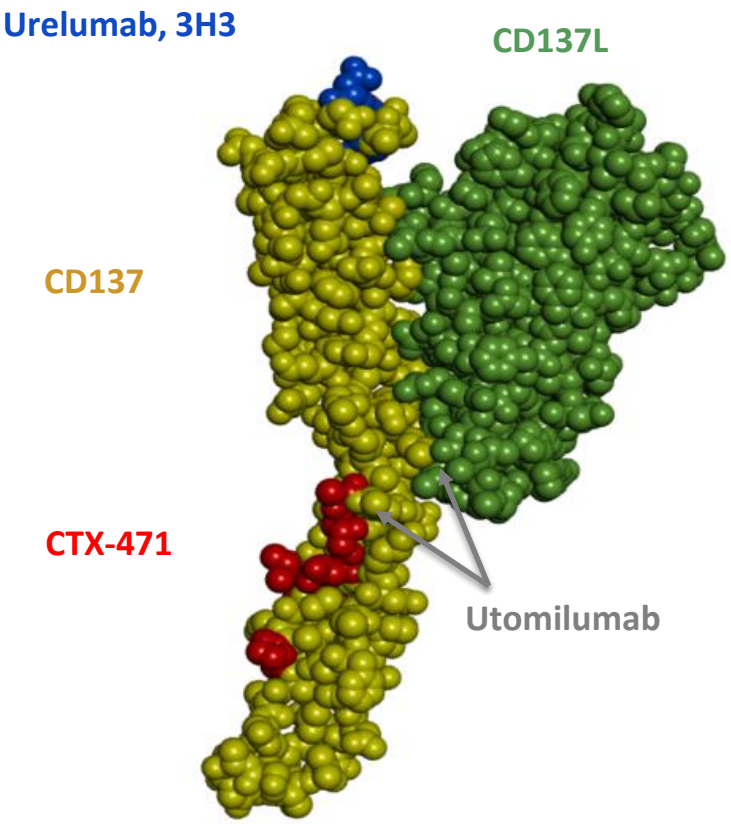
T Cell and NK Cell Agonist

CTX-471 – CD137 monoclonal antibody

CTX-471: Potential Best-in-Class CD137 Agonist

NOVEL EPITOPE WITH DIFFERENTIATED ACTIVITY OBSERVED IN EXTENSIVE PRECLINICAL DATA*

- CTX-471: next generation CD137 agonist
  - Fully human, IgG4, optimized affinity for agonistic antibody
  - Unique epitope: non-ligand blocking
- Phase 1 Study Update
  - Monotherapy in the post checkpoint inhibitor patients
  - Monotherapy Phase 1a multiple ascending dose study completed
    - Near PR in a patient with mucosal melanoma
    - Prolonged stable disease in two patients with NSCLC
    - MTD defined by immune thrombocytopenia
  - Monotherapy Phase 1b dose expansion study nearing completion
    - 3 PRs observed so far: small cell lung cancer, mucosal melanoma and metastatic melanoma

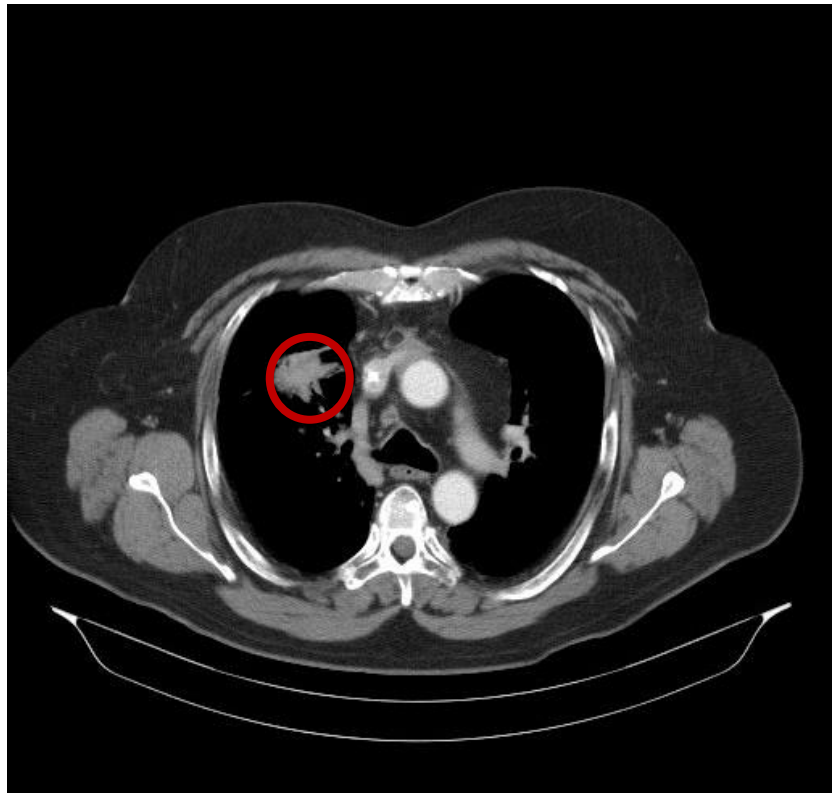


*Eskiocak, et al. *JCI Insight*. 2020;5(5):e133647

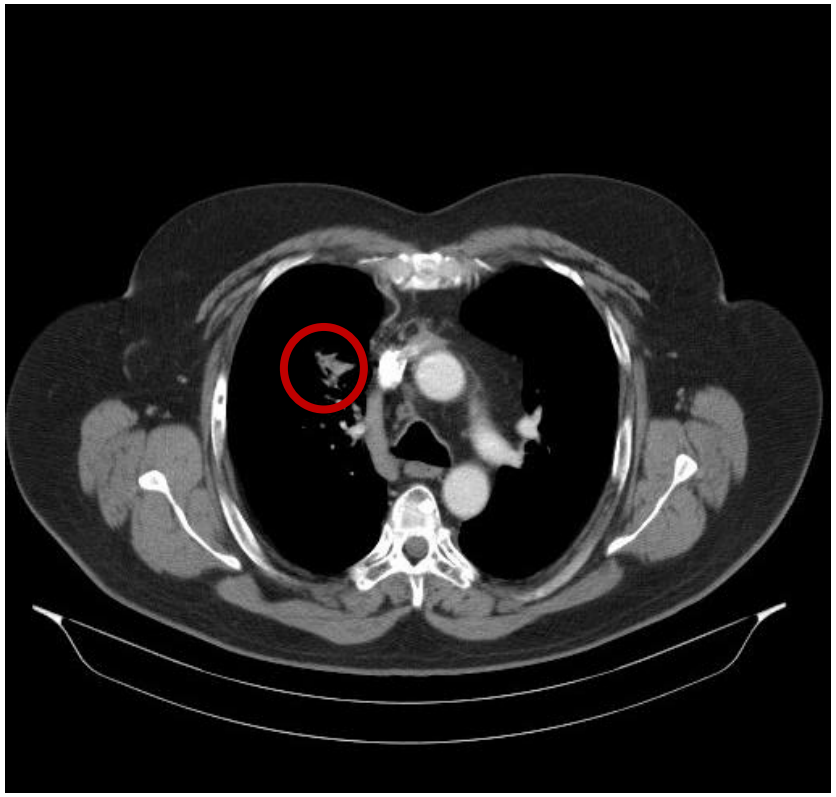
Partial Response in a Patient with Small Cell Lung Cancer after Progression on Atezolizumab/Chemo and Nivolumab

- 66 y.o. man with advanced SCLC: Carboplatin/etoposide plus atezolizumab first line; nivolumab second line
- Multiple metastases: Largest mass (RUL Lung) shown below, ~ 4 cm at baseline → 40% total decline
- Confirmed and durable PR at Month 18

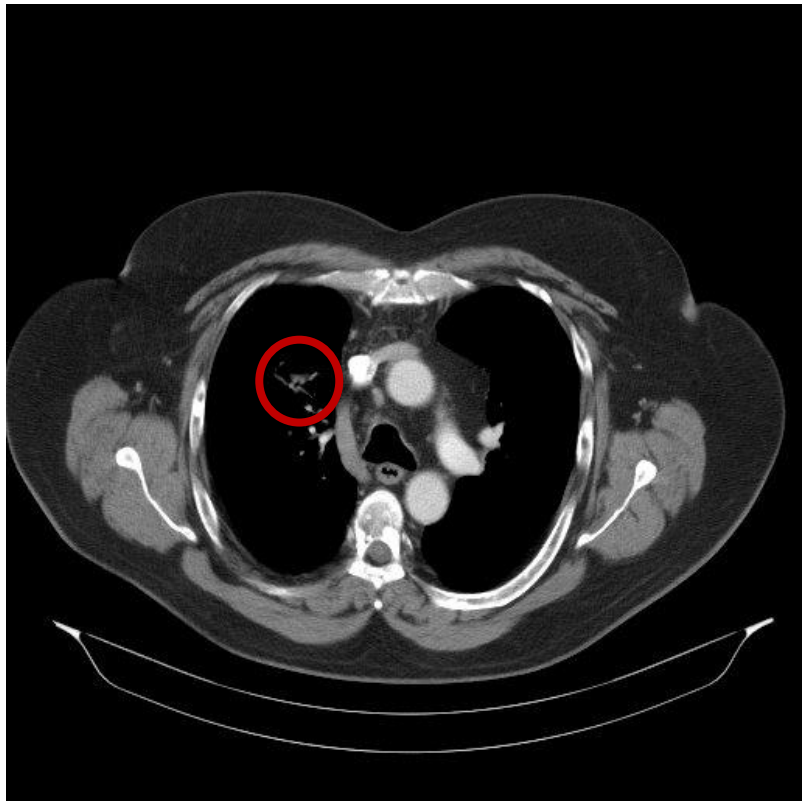
Baseline



Month 4



Month 8



CTX-471: Clinical Development Plans

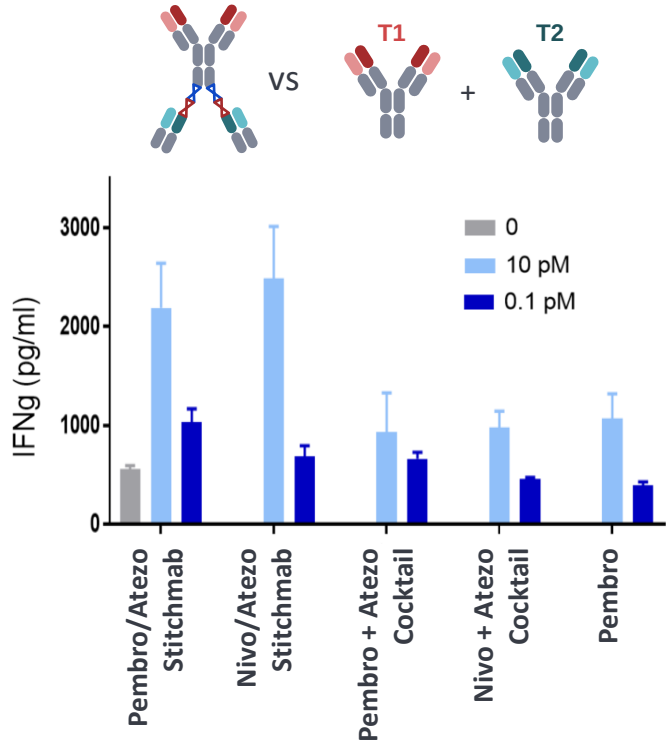
- Phase 1b study nearing completion
  - Well tolerated
  - Three partial responses as a monotherapy agent in the post PD-1/PD-L1 patient population
    - Small cell lung cancer and melanoma (two patients)
- Initiate a Phase 1b combination study with a PD-1 inhibitor
  - Abbreviated CTX-471 dose escalation into the PD-1 regimen, followed by a cohort expansion
- Post PD-1/PD-L1 Salvage Study
  - Progression on a labeled PD-1/PD-L1 regimen
  - Followed by PD-1 salvage plus CTX-471

Bispecific Checkpoint Blocker

CTX-8371 – PD-1 x PD-L1 bispecific antibody

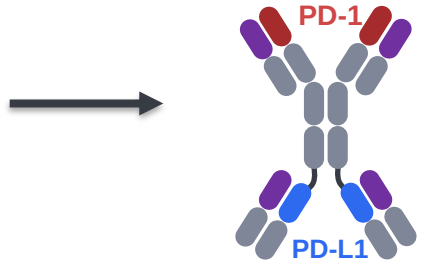
StitchMabs™ Platform was Utilized to Identify CTX-8371:

Unexpected synergistic activity of PD-1/PD-L1 combination in bispecific Stitchmab format



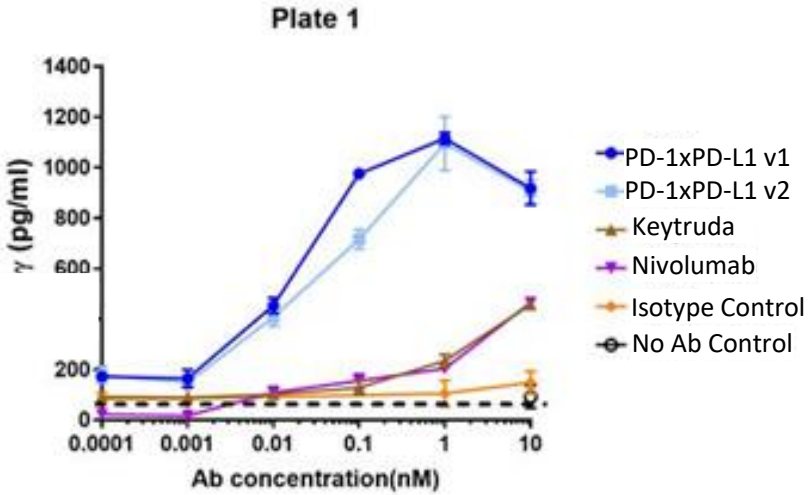
Mixed lymphocyte reaction (MLR) assay

Common Light Chain bispecifics were generated to test therapeutic hypothesis

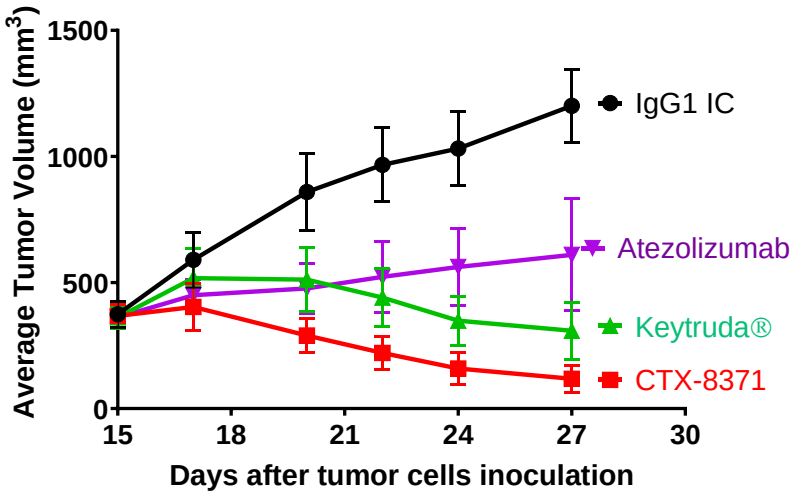


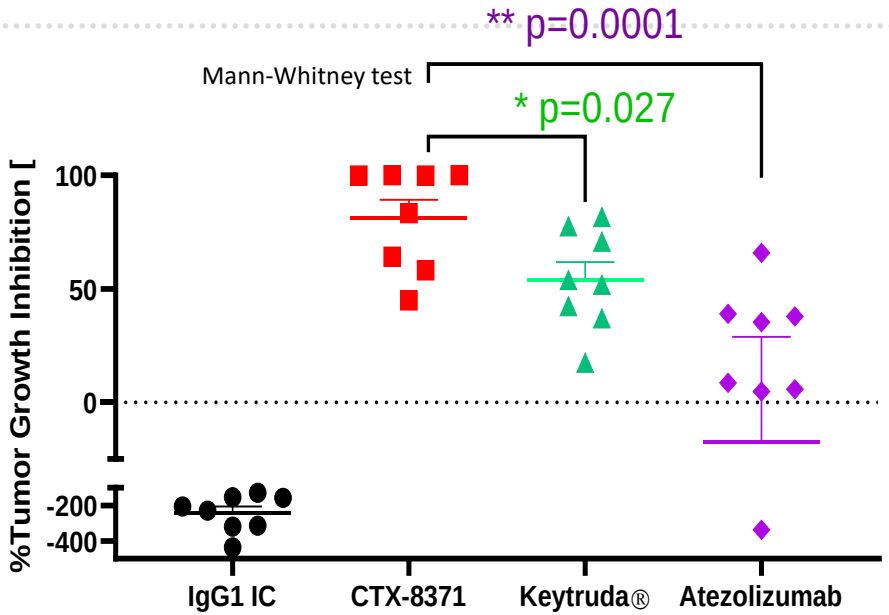
CTX-8371

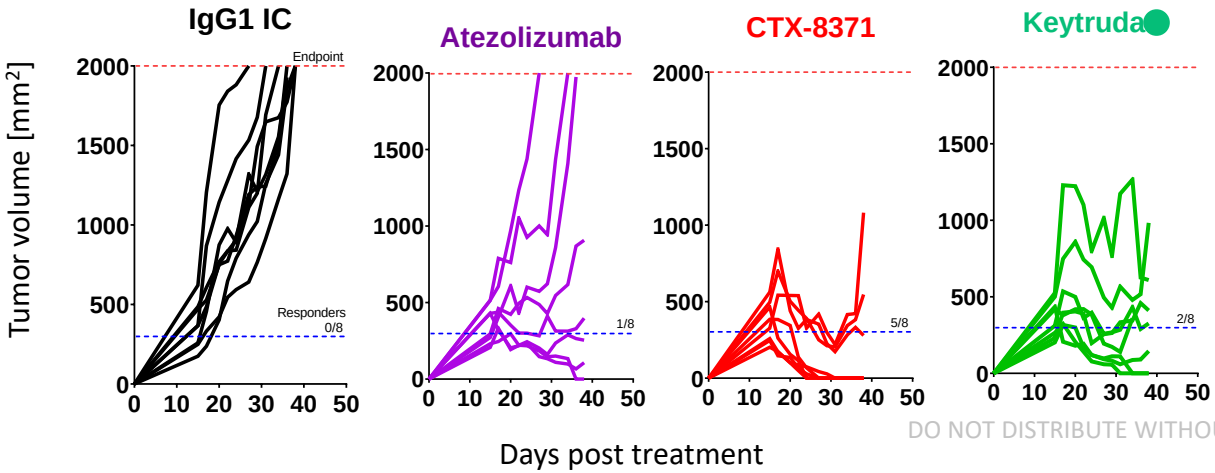
Our PD-1xPD-L1 bispecifics observed to outperform PD-1 blockers in T-cell activation assay



CTX-8371 Activity in MC38-hPD-L1 Model Implanted in hPD-1/hPD-L1 Transgenic Mice







Group	% Cured	Tumor free / total
IgG1 IC	0	0/8
Atezolizumab	12.5	1/8
CTX-8371	62.5	5/8
Keytruda	25	2/8

CTX-8371: Development Status

- IND enabling studies underway
  - Primate dose range finding study completed → PD-1 shedding confirmed in vivo
  - Manufacturing initiated
  - Pre-IND meeting completed
- Phase 1 study planning
  - Multiple ascending dose dose-escalation study
  - 5 doses planned: 0.1, 0.3, 1.0, 3.0, and 10 mg/kg
  - Post PD-1 or PD-L1 patient population
  - PD-1 shedding on peripheral T cells as a pharmacodynamic marker
- IND submission targeted for Q1 2023
- Potential for proprietary combination regimens with CTX-009 and CTX-471

Key Milestones Expected Across Our Portfolio in 2022

- ✓ Completed CTX-009 Phase 1b Study (H2 2021)
- ✓ CTX-009 US IND clearance (Q1 2022)
- ★ Initiate CTX-009 US BTC Phase 2/3 Study (Q3 2022)
- ★ Complete CTX-471 Phase 1b monotherapy study (Q2 2022)
- ★ Complete CTX-8371 GMP Manufacturing (H1 2022)
- ★ Protocol submission for CTX-009 CRC Study (H2 2022)
- ★ Protocol Submission for CTX-471 plus PD-1 Study (H2 2022)
- ★ Initiate CTX-471 plus PD-1 Study (H2 2022)

✓ **Completed** ★ **In progress**