Heating Up Cancer Immunotherapy

September 2021

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Forward Looking Statement

Certain statements in this presentation ("Presentation") that are not statements of historical facts may constitute forward-looking statements within the meaning of the Private Securities Litigation Reform Act of 1995. Examples of such forward-looking statements include those regarding Checkmate Pharmaceuticals, Inc.'s ("Checkmate," the "Company," "we," "our" or "us") product candidate, including its development and therapeutic potential and the advancement of our clinical and preclinical pipeline; expectations regarding the results and analysis of data; expectations regarding the timing, initiation, implementation and success of our planned clinical trials for CMP-001; the benefits and related implications of current and future partnerships and/or collaborations; and future market opportunities, future results of operations and financial position, including potential milestones, our cash runway, business strategy, plans and objectives for future operations. Forward-looking statements use words like "believes," "plans," "expects," "intends," "will," "would," "anticipates," "estimates," or the negative of these terms and similar words or expressions. Although the Company believes that such statements are based on reasonable assumptions within the bounds of its knowledge of its business and operations, forward-looking statements are neither promises nor guarantees and they are necessarily subject to a high degree of uncertainty and risk. You should exercise caution in interpreting and relying on forward-looking statements because they are subject to significant risks, uncertainties and other factors which are, in some cases, beyond the Company's control. These statements are based on current expectations or objectives that are inherently uncertain, especially in the case of an enterprise with limited operating history. In light of these uncertainties, and the assumptions underlying the expectations and other forward-looking statements expressed, the forward-looking events and circumstances discussed in the accompanying materials may not occur and actual results could differ materially and adversely from those anticipated or implied in the forward-looking statements. You should not place undue reliance on any forward-looking statements included in this Presentation.

Actual results or events could differ materially from the plans, intentions and expectations disclosed in the forward-looking statements we make. We undertake no obligation to update or revise any forward-looking statements, whether as a result of new information, the occurrence of certain events or otherwise. As a result of these risks and others, actual results could vary significantly from those anticipated in this Presentation, and our financial condition and results of operations could be materially adversely affected.

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These forward-looking statements are subject to risks and uncertainties, including those related to the development of our product candidate, any delays in our ongoing or planned preclinical or clinical trials, the impact of the ongoing COVID-19 pandemic on our business, operations, clinical supply and plans, the risks inherent in the drug development process, the risks regarding the accuracy of our estimates of expenses and timing of development, our capital requirements and the need for additional financing, and obtaining, maintaining and protecting our intellectual property. Further information concerning the Company, including a number of material risks and uncertainties, are described in the Company's filings with the U.S. Securities and Exchange Commission ("SEC"), including in our most recent quarterly report on Form 10-Q filed with the SEC as well as subsequent filings and reports filed by the Company with the SEC.

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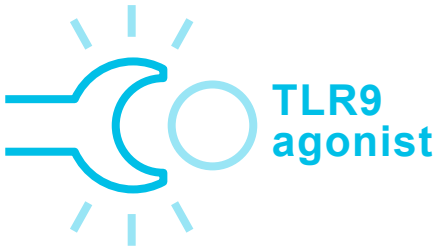
Investment Highlights

Differentiated Therapeutic



- Vidutolimod (CMP-001) is an innate immune modulator with the potential to become a backbone of I/O combinations

Extensive and Consistent Clinical Data

- 28% ORR in PD-1 refractory melanoma[1]; similar magnitude of regression in injected and non-injected lesions
- 70% pathologic response in PD-1 naïve neoadjuvant melanoma and 90% RFS at 1 year[2]
- 17.5% ORR in PD-1 refractory melanoma as monotherapy[3]

Robust Development Strategy

- Targeting approval in front line metastatic and PD-1 refractory melanoma
- Fast Track and Orphan Drug Designation
- Pursuing head & neck and non-melanoma skin cancers

Multiple Value Driving Catalysts

- Melanoma topline data anticipated late 2022/1H 2023
- Head & neck cancer Ph2 data maturing throughout 2022
- Non-melanoma skin cancer interim Ph2 data 2H 2022

[1] Vidutolimod plus pembrolizumab, data cutoff September 30, 2020 (includes post-progression responders); N=98
[2] Davar, SITC 2020, data cutoff October 1, 2020
[3] Vidutolimod monotherapy, data cutoff September 30, 2020; N=40

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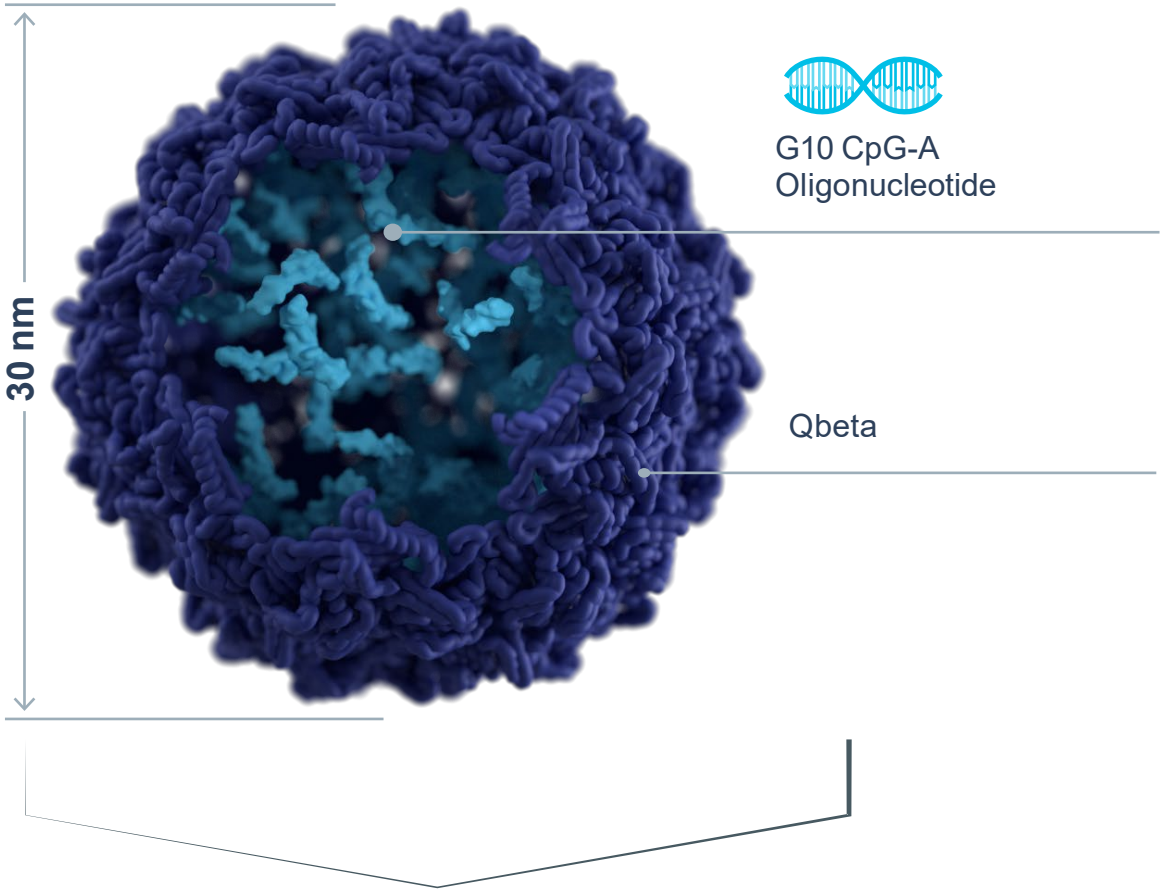
Vidutolimod (CMP-001) can activate a T cell response



Biologic with potential for **12 years** exclusivity in US (if approved)[1]

Potent Type A CpG DNA payload (G10)

- Mimics viral, retroviral DNAs
- Synthesized on native phosphodiester backbone
- Most potent inducer of type I IFN known, drives T cell immune response

Immune stimulating virus-like particle (VLP)

- Stimulates an immune response that causes immune cells to take up the VLP
- *The VLP is not infectious*
- VLP potentiates the systemic activity of G10

[1]United States Biologics Price Competition and Innovation Act (BPCIA) of 2009

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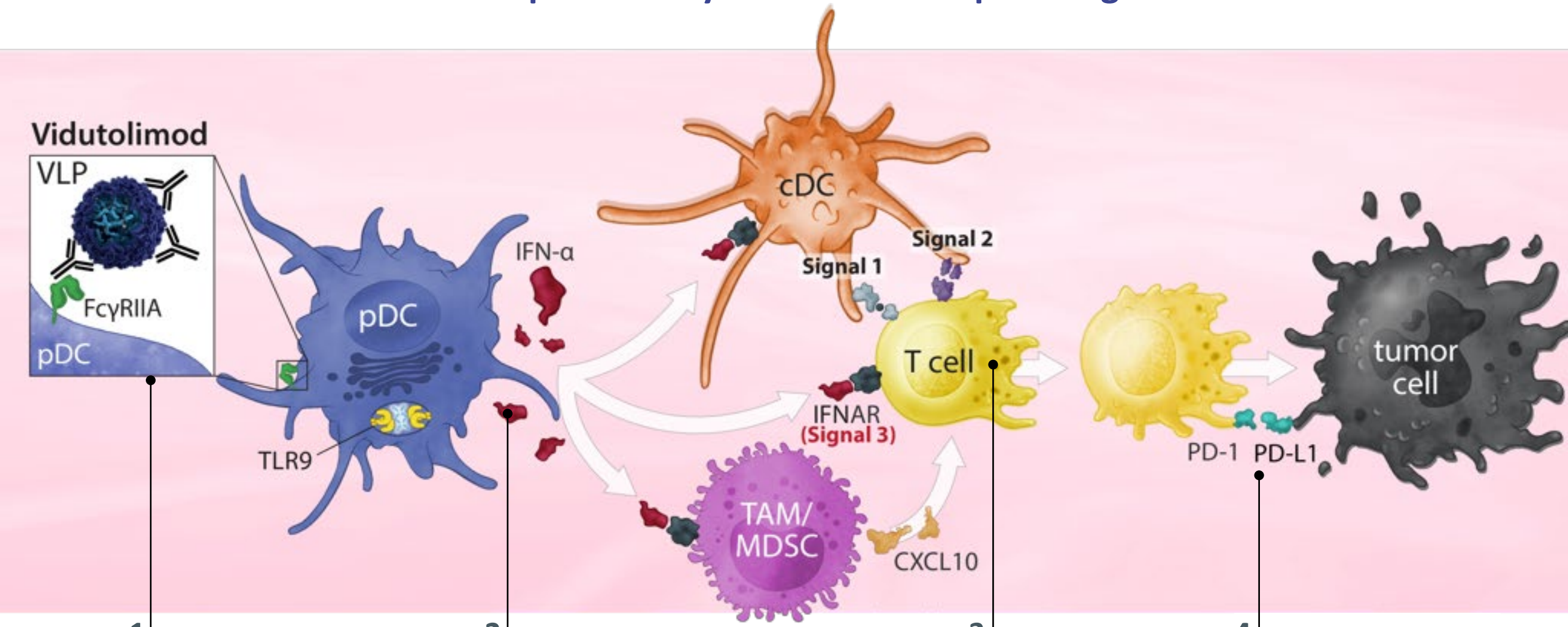
Vidutolimod can stimulate a powerful systemic T cell response against a tumor



1
Antibody-bound vidutolimod is taken up by pDC and activates TLR9

2
Activated pDC recruit and stimulate other immune cells; Type I IFN enhances T cell activation directly and indirectly, e.g., CXCL10 primary PD marker for clinical response

3
Neoantigen-specific T cells mediate systemic tumor regression

4
Blockade of PD-1 improves duration of T cell response; rationale for combo therapy

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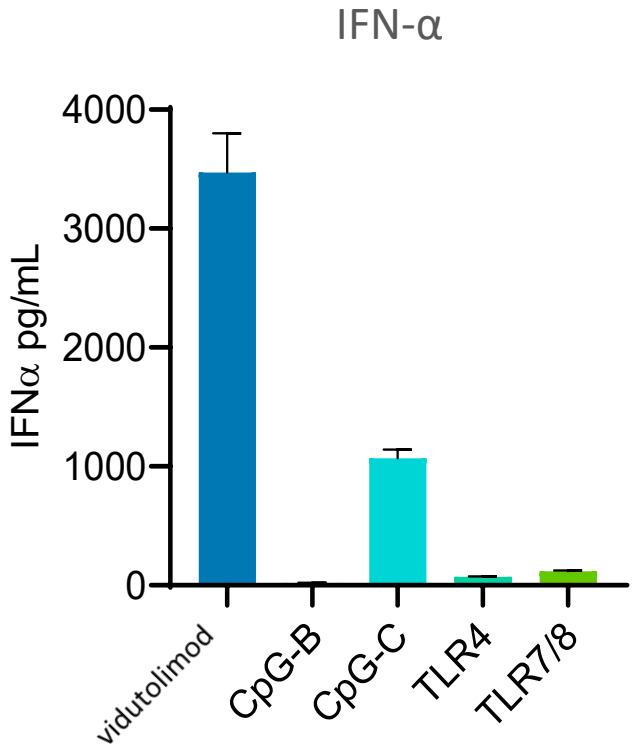
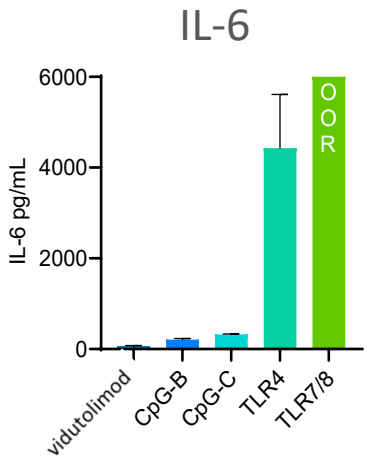
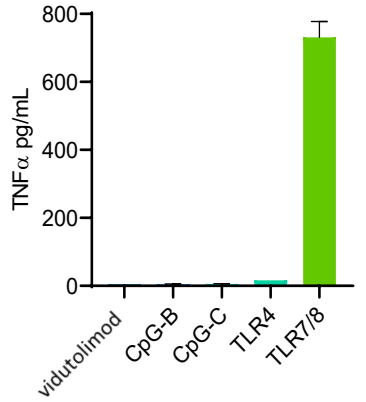
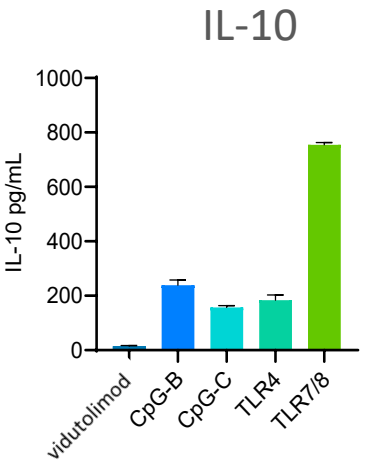
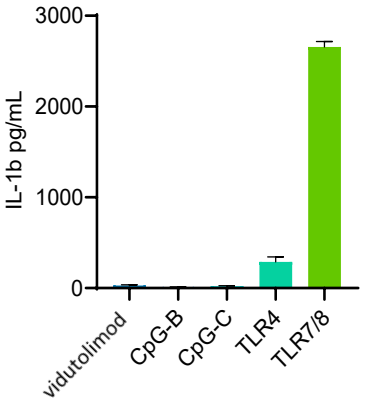
CPG-A Induces the Highest Type I IFN, and Lowest Inflammatory Cytokine











Luminex cytokine/chemokine multiplex of supernatants from normal human PBMC, performed using optimal conditions and concentrations for each agent at the University of Iowa Cancer Center

1OOR = out of range

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Systemic Effect via Local Activation

- Local injection into tumors to trigger an antigen-specific anti-tumor T cell response
- Evidence of systemic effect in non-injected lesions
- Requires a single lesion accessible for injection

  → Cutaneous or subcutaneous lesions, or palpable lymph nodes
- Injections performed in clinic by physicians, physician assistants, nurses, and nurse practitioners

  → Often without the need for any imaging

  → Similar to subcutaneous injection, but directly into tumor

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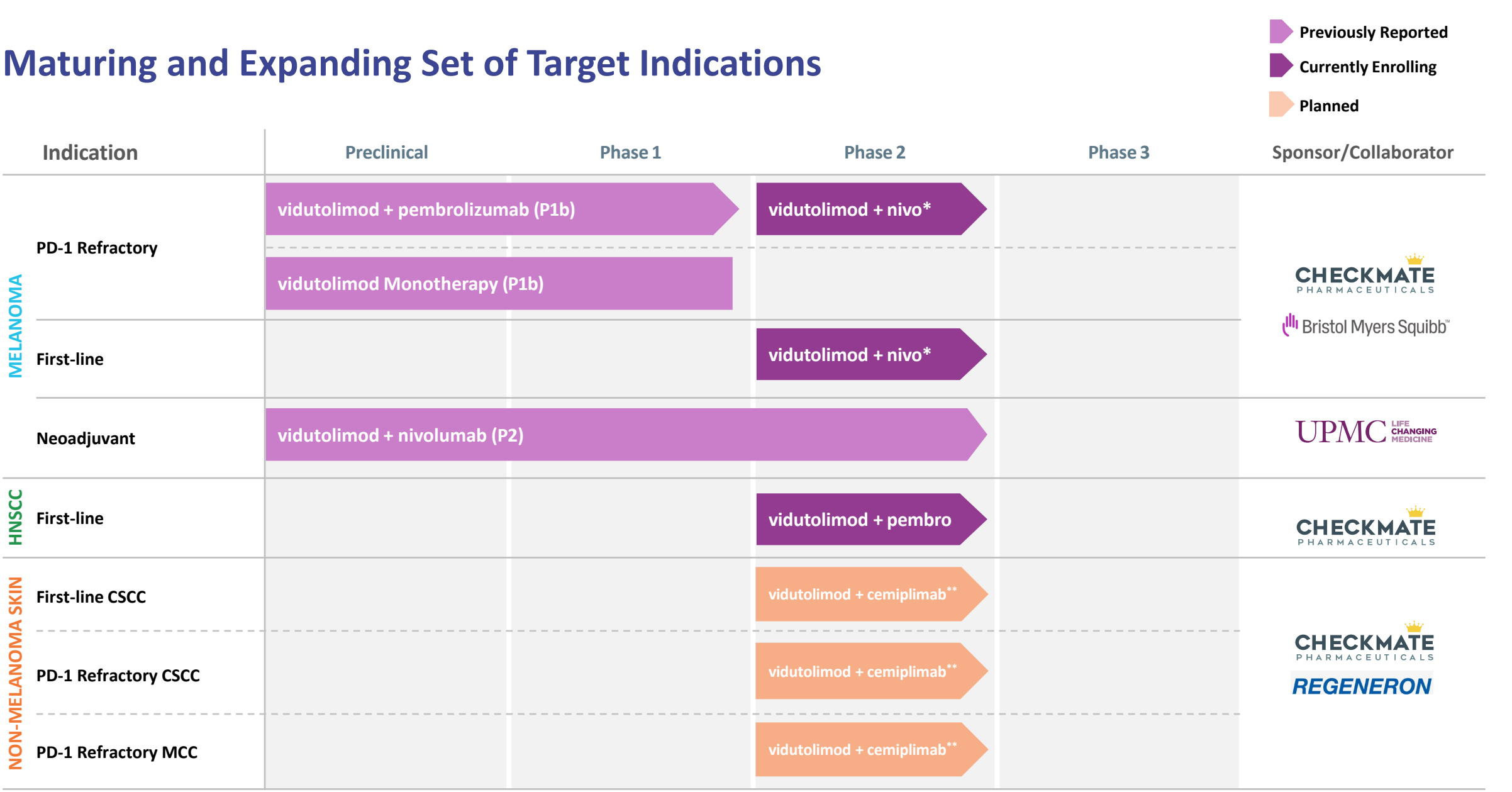
Maturing and Expanding Set of Target Indications



Note: Refractory Melanoma represents Anti PD-1 Refractory Melanoma, 1L Melanoma represents Anti PD-1 Naïve, Metastatic or Unresectable Melanoma, Neoadjuvant Melanoma represents Anti PD-1 Naïve, Neoadjuvant Melanoma, and First Line HNSCC represents Anti PD-1 Naïve, Head and Neck.

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Large and Growing Market Opportunity in Melanoma

US Market[1]

High unmet need in melanoma with continued expected growth

~1.2 M
people living with melanoma of the skin

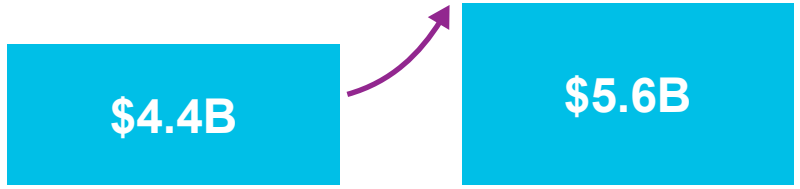
5th
most common cancer in the US

106,110
new diagnoses per year

7,180
deaths per year

Standard of care

Anti PD-1 (pembrolizumab or nivolumab)



Annual Sales in Melanoma[2]

Opportunity

Significant room for improvement vs. single agent anti PD-1 in front-line melanoma

Single agent front-line anti PD-1
34-40% ORR[3]

No approved therapy for patients who have progressed on anti PD-1 therapy

[1]American Cancer Society
[2]Worldwide sales; EvaluatePharma
[3]Keytruda & Opdivo USPI

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Phase 1b Study in PD-1 Refractory Melanoma

Combo
PD-1 Refractory

Key elements of study design

1. Evaluate vidutolimod +/- pembrolizumab

- Vidutolimod + pembrolizumab (N=159)
- Vidutolimod monotherapy (N=40)

2. Evaluate two schedules:

- **weekly** 7 weeks | **q3 weeks**
- **weekly** 2 weeks | **q3 weeks**

3. Evaluate two formulations:

- → Formulation A (N=98)
- → Formulation B (N=61)

Baseline patient characteristics (N =159)

Prior cancer therapies	Any PD-1	100%
	Any ipilimumab	47%
Prior PD-1 best response	CR (complete response)	4%
	PR (partial response)	13%
	SD (stable disease)	31%
	PD (progressive disease)	43%
Prior PD-1 last response	SD (stable disease)	3%
	PD (progressive disease)	93%
Baseline disease locations	Skin only	8%
	Lymph nodes ± skin	19%
	Soft tissue ± skin & lymph nodes	13%
	Bone w/o visceral disease	4%
	Any visceral	55%
LDH	High	42%
Target lesion SLD[1]	Median measurement	6.8 cm
ECOG status	0	65%
	1	35%

Data cutoff September 30, 2020

[1] Luke et al. AACR 2021

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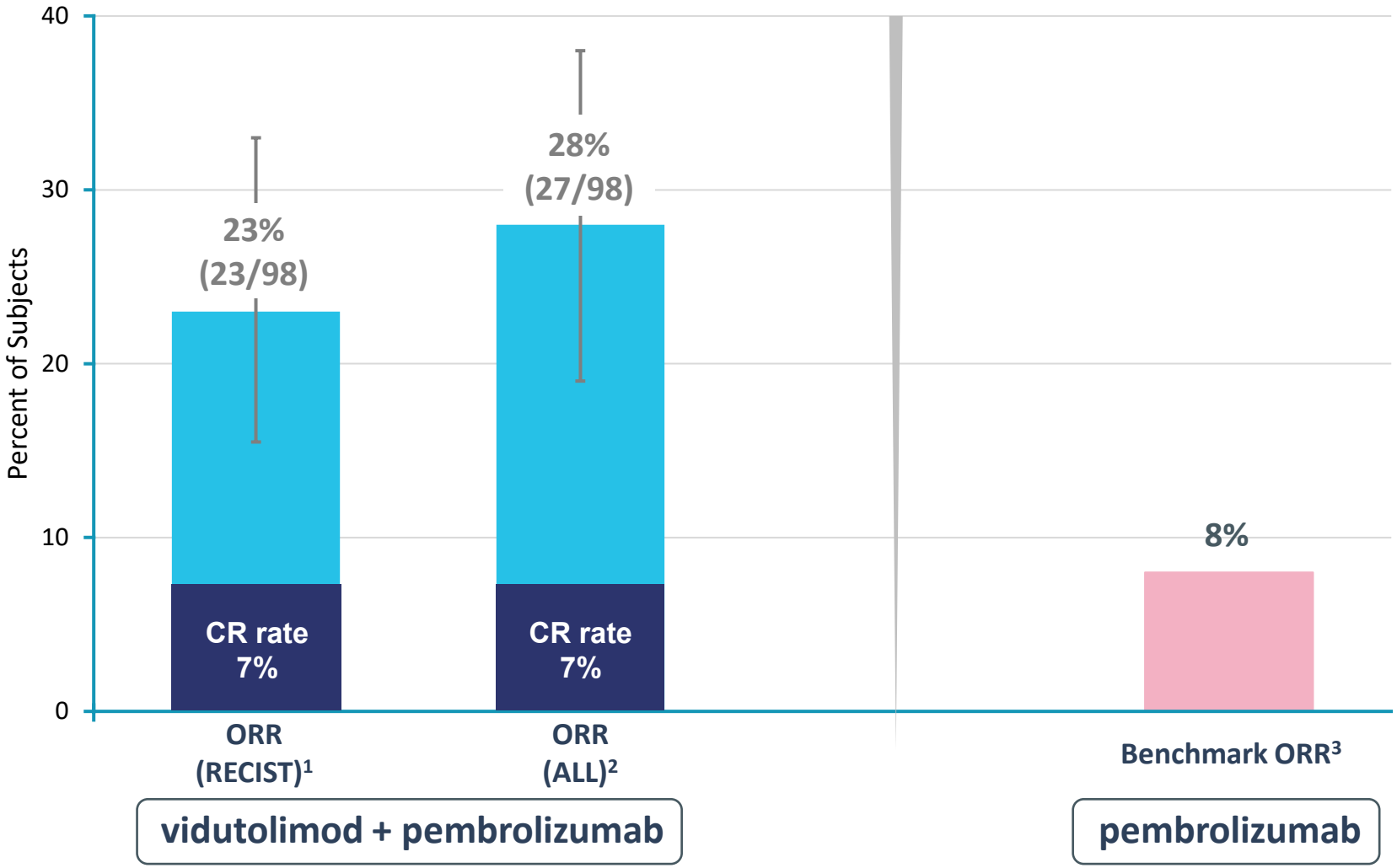
Clinically Meaningful Response in Refractory Patient Population

Combo
PD-1 Refractory



[1]RECISTv1.1, Data cutoff September 30, 2020
[2]RECISTv1.1 plus post-progression responses, Data cutoff September 30, 2020
[3]Response to treatment beyond progression with anti-PD-1. Ahmed, F.S., et al., Eur Radiol, 2020; 6/78 iPR/iCR after intial PD by RECISTv1.1

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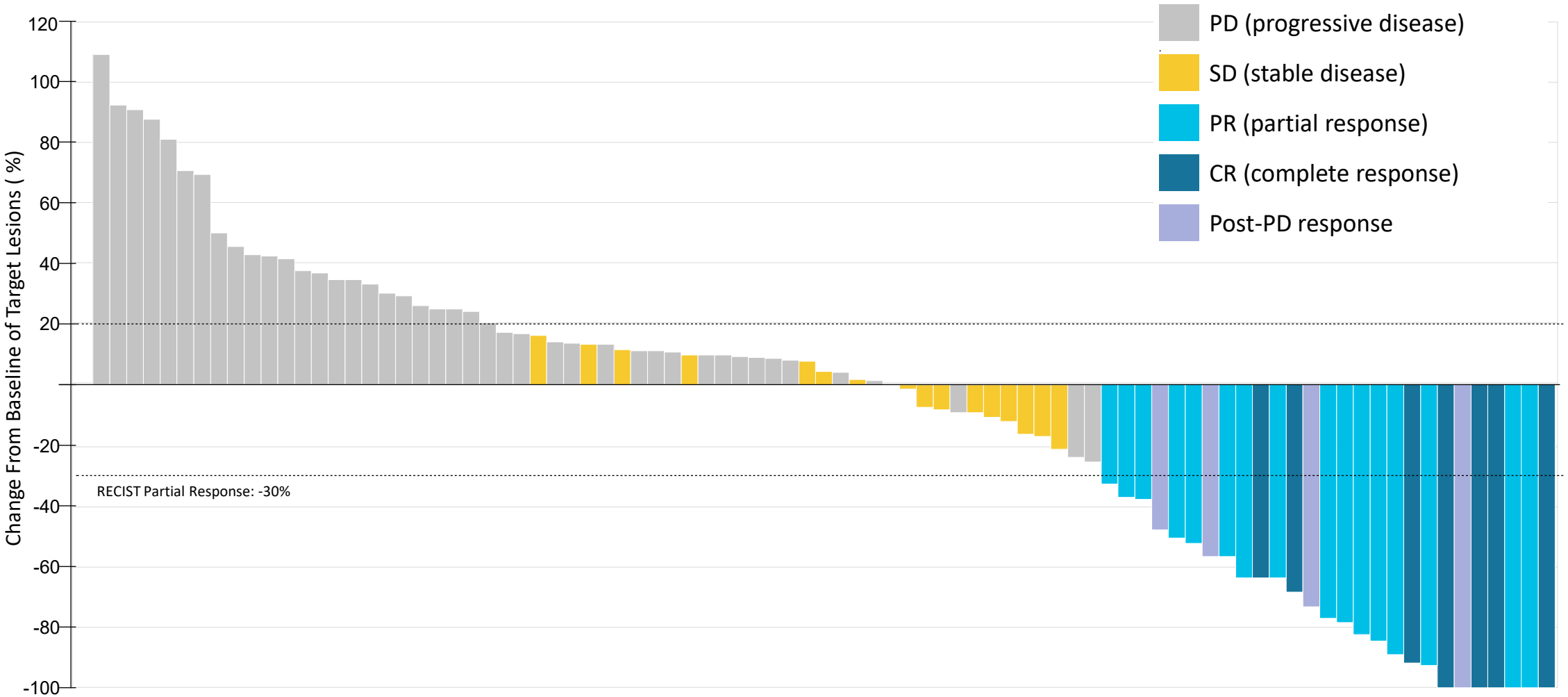
Robust Depth of Response

Combo
PD-1 Refractory



Note: N=98 subjects who received formulation A, includes all patients with follow-up assessments. Data cutoff September 30, 2020

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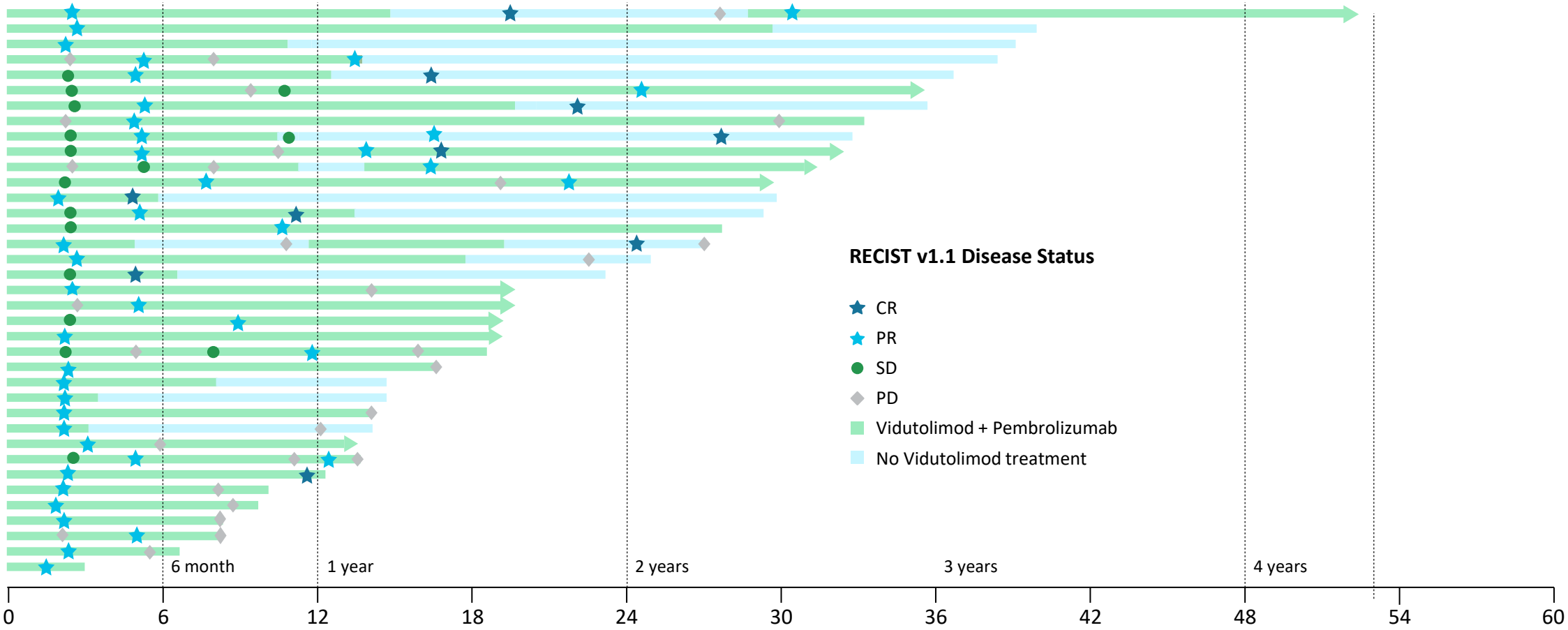
Highly Durable Responses

Combo
PD-1 Refractory

Median duration of response 19.9 months



Note: N=37, RECIST v1.1 responders and Post-progression responders; Data cutoff September 30, 2020

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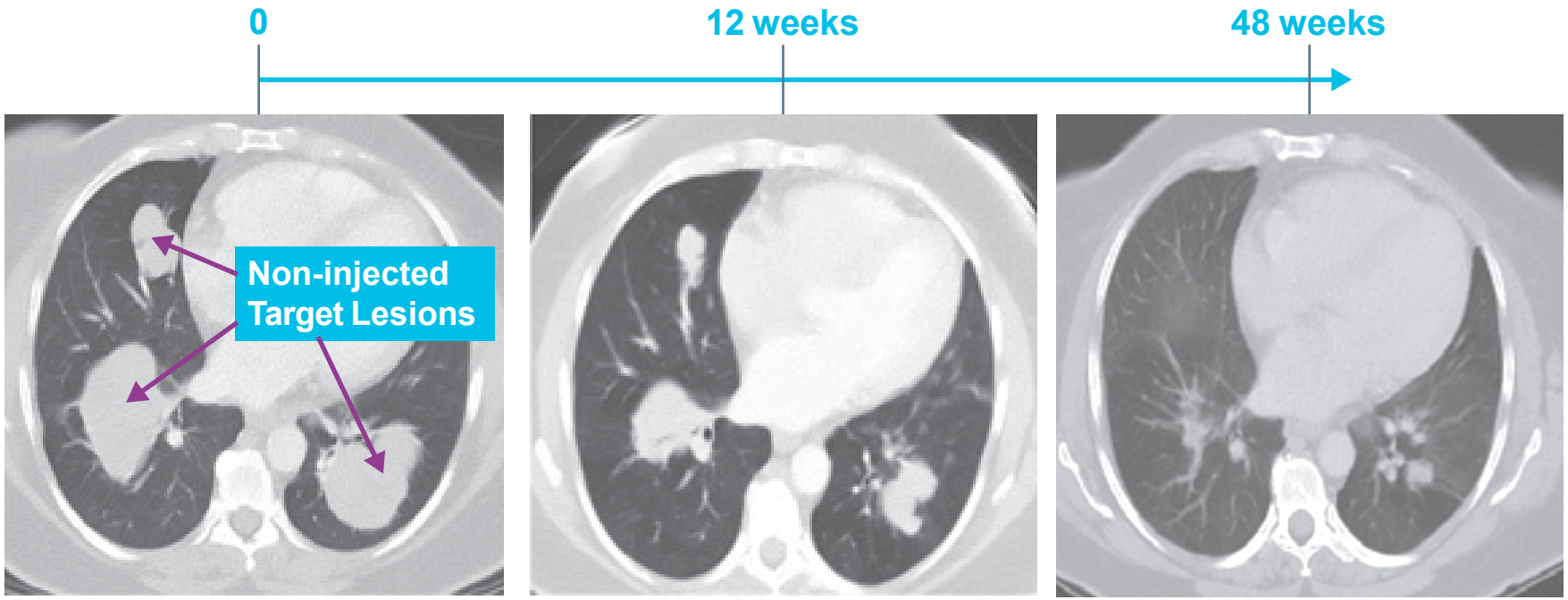
Systemic (Abscopal) Effect Observed in Distant Visceral Lesions

Combo
PD-1 Refractory

- 48-year-old WF with metastatic bilateral lung disease
- Progressed after prior therapies of ipilimumab (adjuvant), interferon (adjuvant), pembrolizumab, IL-2, aflibercept
- Injection site: right inguinal lymph node (groin)



>70% reduction in distant target lesions with response duration >2.5 years

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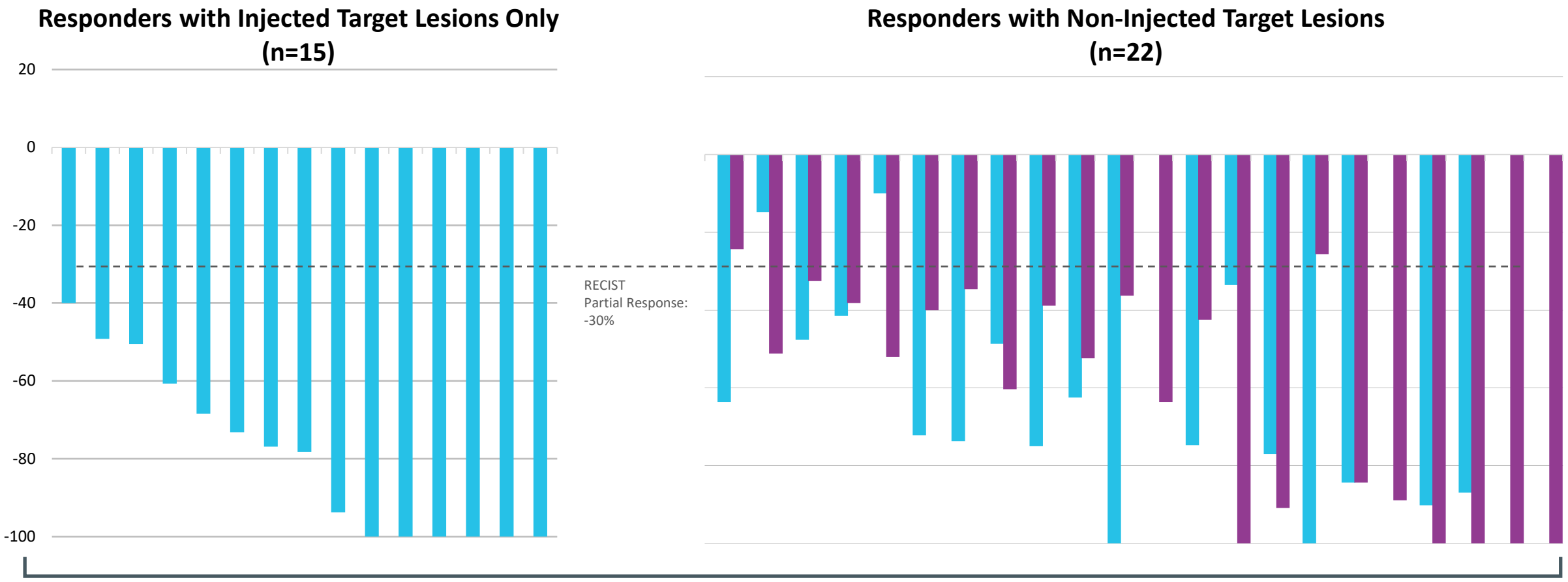
Systemic Effect Observed in Non-Injected Lesions

Combo
PD-1 Refractory



Note: N=37, RECIST v1.1 responders and post-progression responders; Data cutoff September 30, 2020

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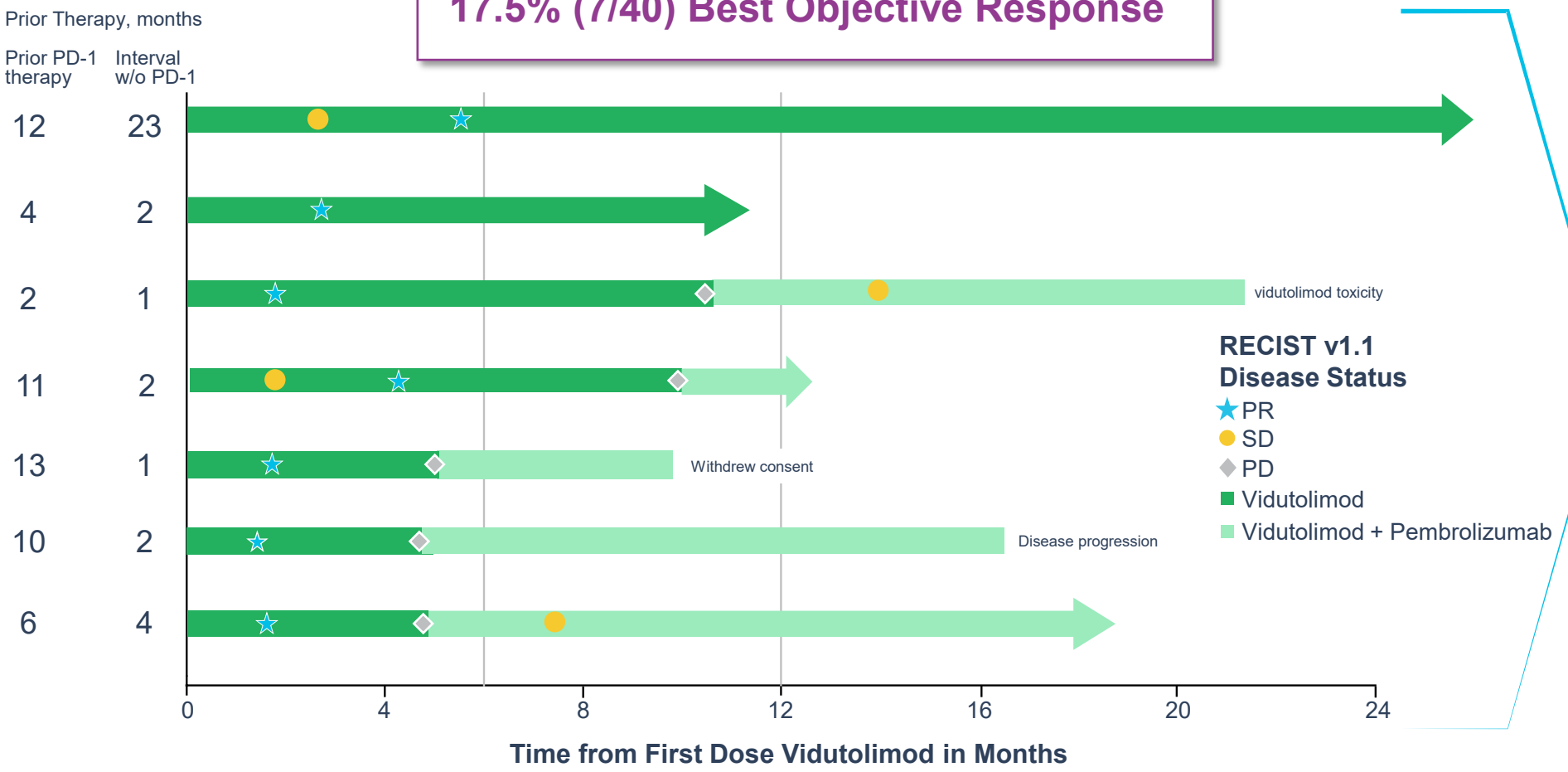
Vidutolimod Monotherapy Activity Supportive of Further Development In Combination

Mono
PD-1 Refractory

17.5% (7/40) Best Objective Response



- Vidutolimod has shown monotherapy activity
- Median duration of response 5.6 months[1]; substantially shorter than combination therapy
- Supportive of further development in combination

Data cutoff September 30, 2020

[1] Milhem et al. SITC 2020

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Treatment-Related Adverse Events Were Generally Manageable

PD-1 Refractory

Treatment-Related Adverse Events

- → Most were Grade 1 or 2, including flu-like symptoms and injection site reactions
- → Severity & frequency decreased over time
- → No apparent exacerbation of anti PD-1 toxicity

Vidutolimod + Pembrolizumab (n=159)

Grade 3 or 4 Treatment-Related Adverse Events

- → 36.5% (58/159) of subjects
- → Most common (≥ 3 subjects): hypotension (n=11, 7%); hypertension (n=8, 5%); chills, back pain (n=5 each, 3%), increased AST, hypoxia, pyrexia (n=4 each, 2.5%); anemia, ALT increased, arthralgia, hypophosphatemia (n=3 each, 2%)

Treatment-Related Serious Adverse Events

- → 17% (27/159) of subjects
- → SAEs in ≥ 3 subjects: hypotension (n=7, 4%)

Vidutolimod monotherapy (n=40)

Grade 3 or 4 Treatment-Related Adverse Events

- → 23% (9/40) of subjects
- → No Grade 4 events
- → Grade 3 AEs in ≥ 2 subjects: hypotension (n=2, 5%)

Treatment-Related Serious Adverse Events

- → 15% (6/40) of subjects
- → SAEs in ≥ 2 subjects: hypotension (n=3, 8%)

No Grade 5 TRAE reported; Data cutoff: September 30, 2020

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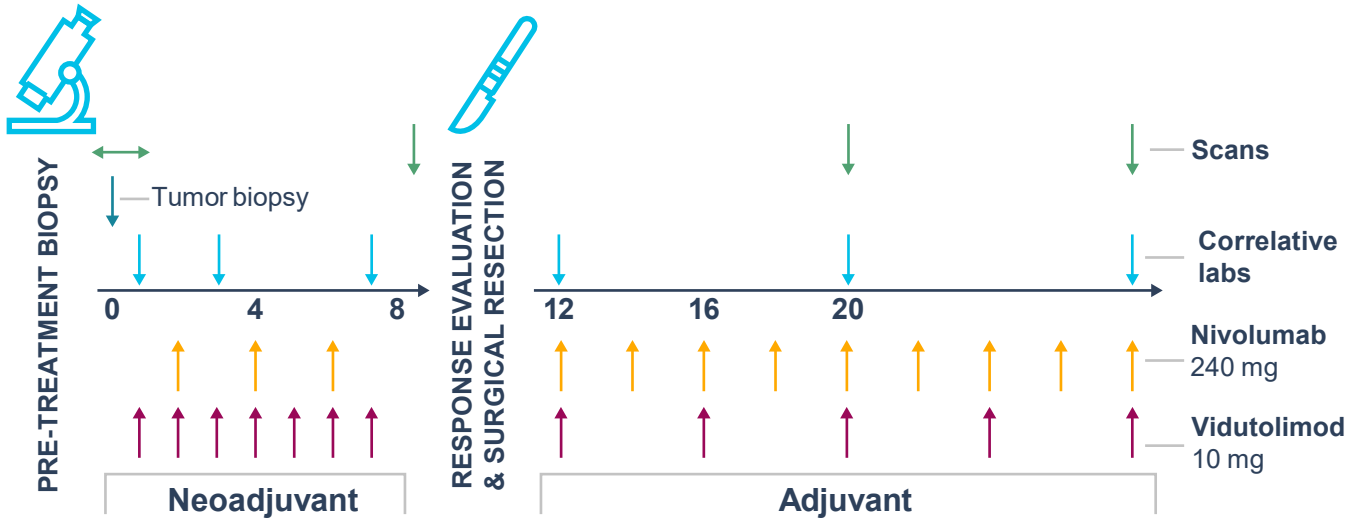
Neoadjuvant Study Design[1]

Combo
PD-1 Naïve

Stage IIIB/C/D melanoma pre- surgery

- No active CNS disease
- Deemed surgically resectable
- Accessible tumor for biopsy
- Accessible tumor for CMP-001 injection
- 30 patients



Primary endpoint:

Major pathological response (MPR) rate by irPRC

Secondary endpoints:

Relapse-free survival and overall survival

Pathologic Response[2]	Residual Viable Tumor	
Complete Response (pCR)	0%	MPR
Major Response (pMR)	≤10%	
Partial Response (pPR)	>10% & <50%	
Non-Response (pNR)	>50%	

[1]Davar et al, SITC 2020; Data cutoff: October 1, 2020
[2]Tetzlaff Ann Oncol 2018, 29 (8): 1861-1868.

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Compelling Pathologic Response and 1 Year Relapse Free Survival

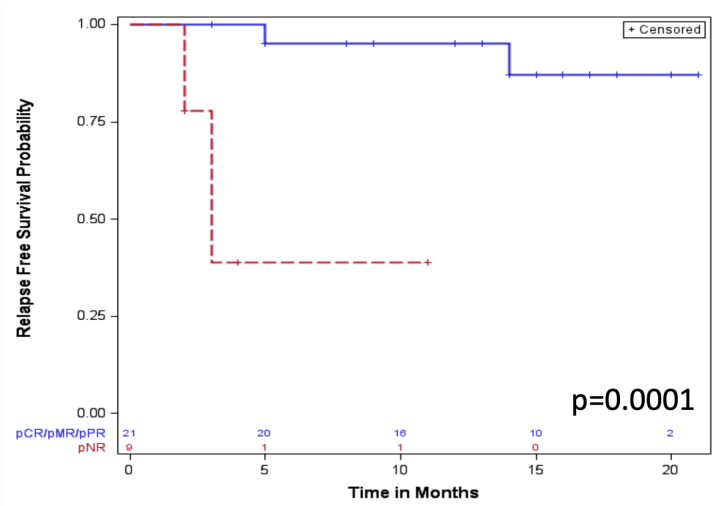
Combo
PD-1 Naïve

Pathologic response[1,2]		%
Complete response (pCR)	15	**50%**
Major response (pMR)	3	**10%**
Partial response (pPR)	3	10%
Non-response (pNR)	9	30%
Total Evaluable	30	

MPR[3] 60%

PR[4] 70%

Pathologic Response is Associated with Improved RFS



1 yr. RFS 90%
pCR/pMR/pPR

1 yr. RFS 44%
pNR

Median RFS not reached

Benchmark[5]: ~25% pCR with single agent anti PD-1 therapy

[1]Davar et al, SITC 2020; Data cutoff: October 1, 2020
[2]Tetzlaff Ann Oncol 2018, 29 (8): 1861-1868. [% Residual Viable Tumor: pCR = 0; pMR <10%; pPR 10 - 50%; pNR >50%]
[3]MPR = major pathologic response
[4]PR = pathologic response
[5]Amaria et al., Lancet Oncology, 2019, 20:e378

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Treatment-Related Adverse Events Were Generally Manageable

Combo
PD-1 Naïve

No delays or surgical complications related to therapy

	Vidutolimod/Nivolumab (N=31)			
AE Term, N (%)	**Grade 1 (n/%)**	**Grade 2 (n/%)**	**Grade 3 (n/%)**	**Grade 4 (n/%)**
Hypophosphatemia	12 (38.7)	12 (38.7)	1 (3.2)	0 (0.0)
Flu-like symptoms	14 (45.2)	8 (25.8)	0 (0.0)	0 (0.0)
Fever	14 (45.2)	5 (16.1)	0 (0.0)	0 (0.0)
Hyponatremia	19 (61.3)	0 (0.0)	0 (0.0)	0 (0.0)
Fatigue	14 (45.2)	3 (9.7)	0 (0.0)	0 (0.0)
Arthalgia, myalgia	7 (22.6)	6 (19.4)	1 (3.2)	0 (0.0)
Injection site reaction	9 (6.5)	4 (12.9)	0 (0.0)	0 (0.0)
Hypertension	2 (6.4)	5 (16.1)	3 (9.7)	0 (0.0)
Anemia	9 (29.0)	1 (3.2)	0 (0.0)	0 (0.0)
Thrombocytopenia	10 (32.3)	0 (0.0)	0 (0.0)	0 (0.0)
Nausea/vomiting	4 (12.9)	5 (16.1)	0 (0.0)	0 (0.0)
Injection site infection	3 (9.7)	3 (9.7)	1 (3.2)	0 (0.0)
CRS-like reaction* (ECI)	2 (6.5)	3 (9.7)	0 (0.0)	0 (0.0)
Colitis	0 (0.0)	0 (0.0)	1 (3.2)	0 (0.0)

Davar et al, SITC 2020; Data cutoff: October 1, 2020; Data is based on preliminary analysis.

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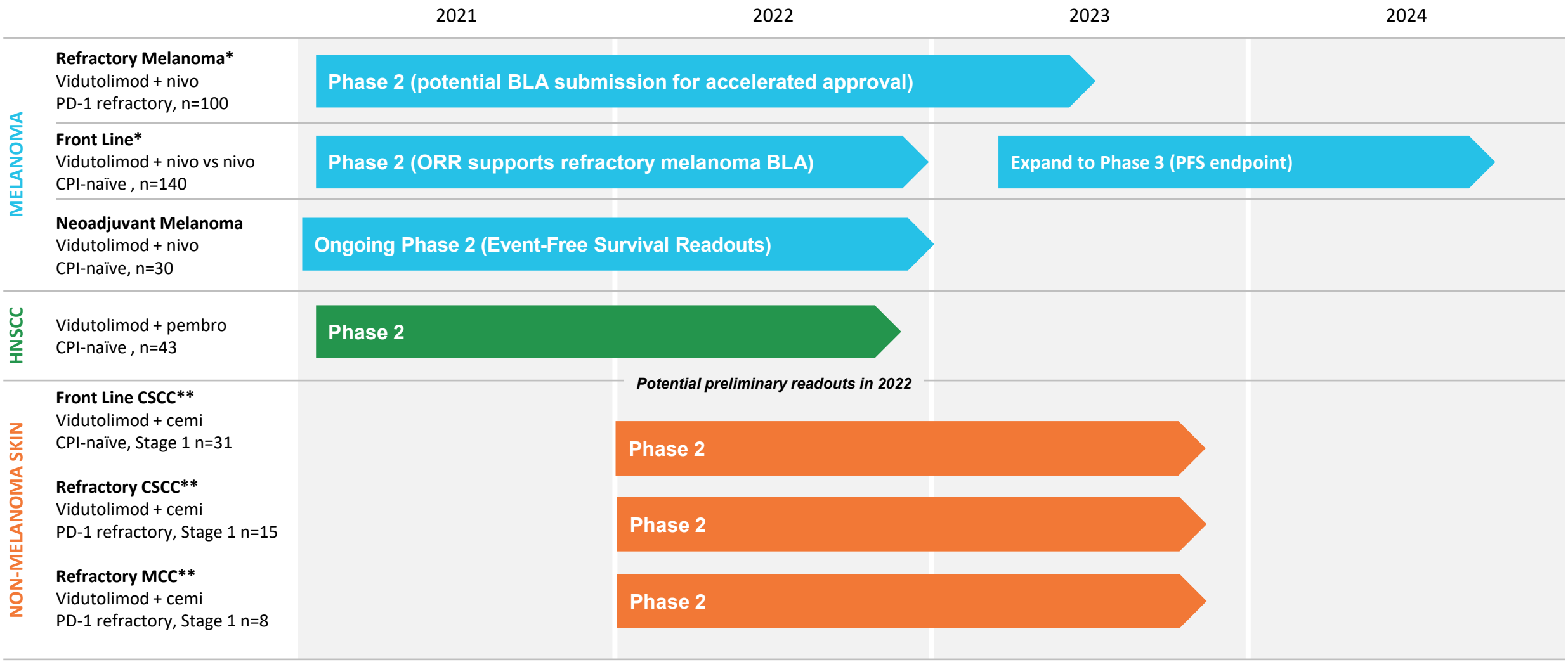
Next Steps for Vidutolimod Development



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Rich Flow of New Data in 2022

- Head and neck cancer potential interim data readouts beginning 1H 2022
- Head and neck cancer anticipated full ORR readout 2H 2022
- Cutaneous squamous cell and Merkel cell carcinomas potential interim data readouts in 2H 2022
- Melanoma registration program topline data readouts expected in late 2022/1H 2023

Multiple Value Generating Milestones in next 6-18 months

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Experienced Management Team

Barry Labinger

Chief Executive Officer

HUMAN GENOME SCIENCES

BIOTHERA pharmaceuticals

Art Krieg, MD

Founder, Chief Scientific Officer

COLEY

Pfizer

Kleem Chaudhary, PhD

Chief Business Officer

Biogen

NOVARTIS

Robert Dolski

Chief Financial Officer

AKCEA THERAPEUTICS

moderna

Katherine Eade

General Counsel

Harvard Bioscience

CORNING

James Wooldridge, MD

Chief Medical Officer

Lilly

aeglea BIOTHERAPEUTICS

Corporate Highlights

- Headquarters in Cambridge, MA
- Completed IPO in August 2020
- As of June 30, 2021
  - → Cash and Cash equivalents of $95.6M
  - → Common stock shares outstanding 21.6 million
  - → No debt
- Cash runway through end of 2022

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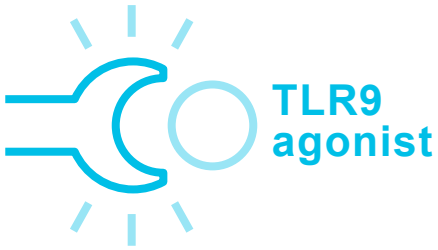

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