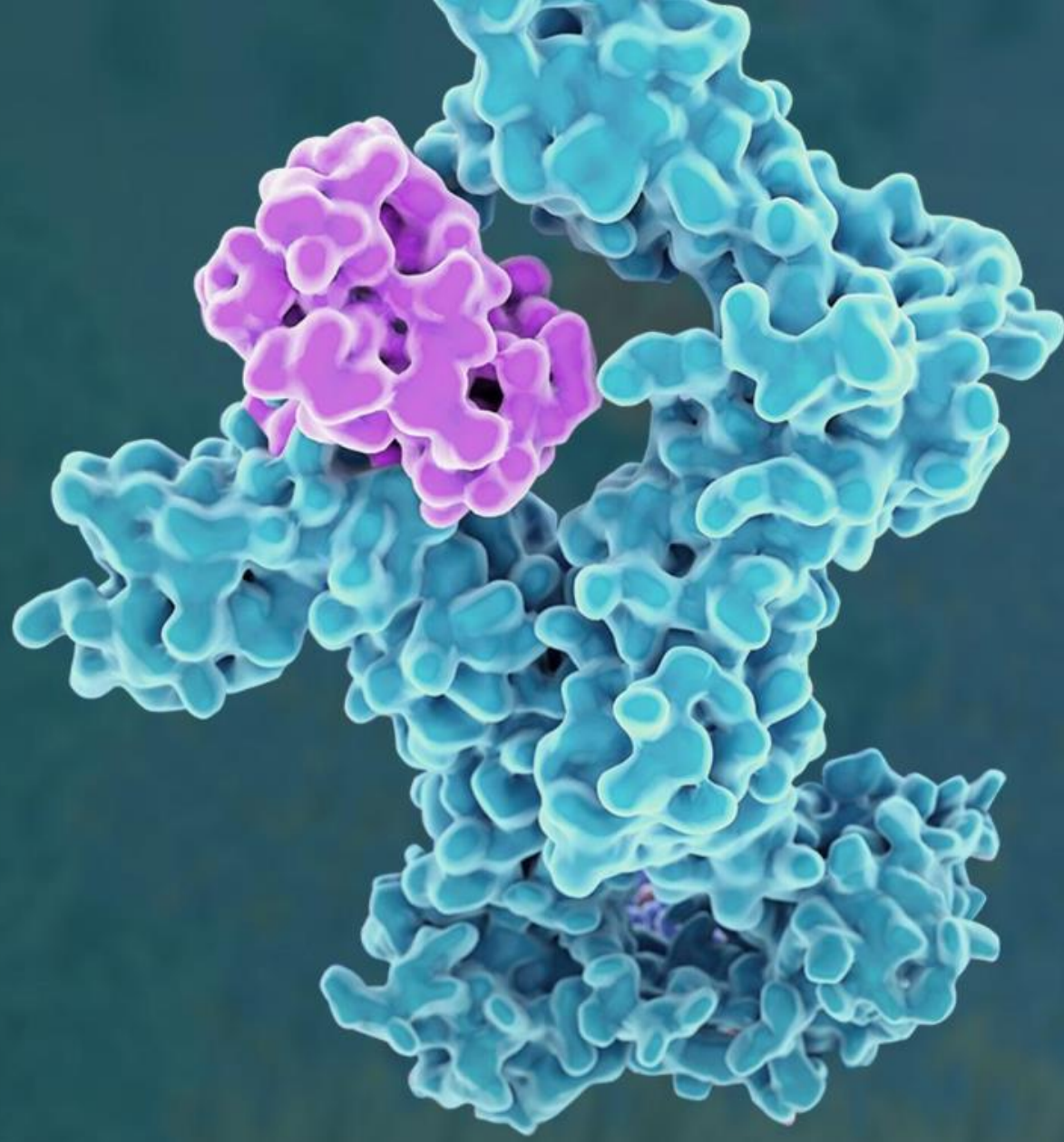
August 9, 2023

MDNA11
IL-2 Super Agonist

ABILITY trial update call

Fahar Merchant, PhD
Arash Yavari, MBBS, DPhil



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Speaker & Agenda

Arash Yavari, MBBS, DPhil

Dr. Arash Yavari is a physician-scientist with over 20 years of broad clinical, scientific and industry drug development experience. He has extensive expertise in early clinical development and scientific strategy across a range of therapeutic areas, including immuno-oncology, hemato-oncology, inflammation, autoimmunity, cardiometabolic and rare disease.

Dr. Yavari holds a Bachelor of Science, and Bachelor of Medicine, Bachelor of Surgery (MBBS) from the University of London, a Doctorate (DPhil) from the University of Oxford and is on the General Medical Council (GMC) Specialist Register. He is a Member of the Royal College of Physicians (MRCP) of the United Kingdom and a Member of the Faculty of Pharmaceutical Medicine (MFPM).

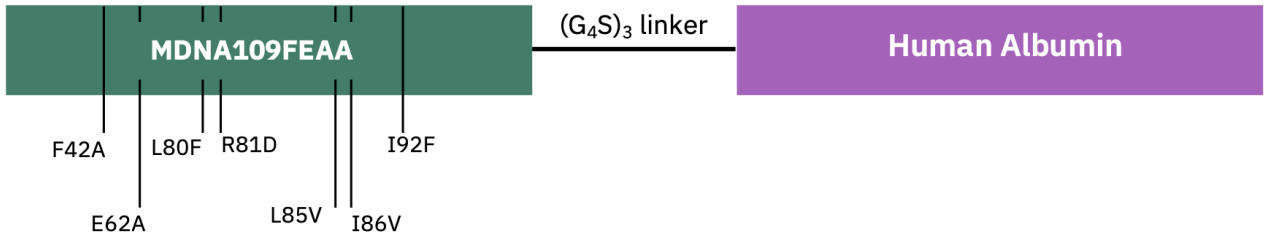
Agenda

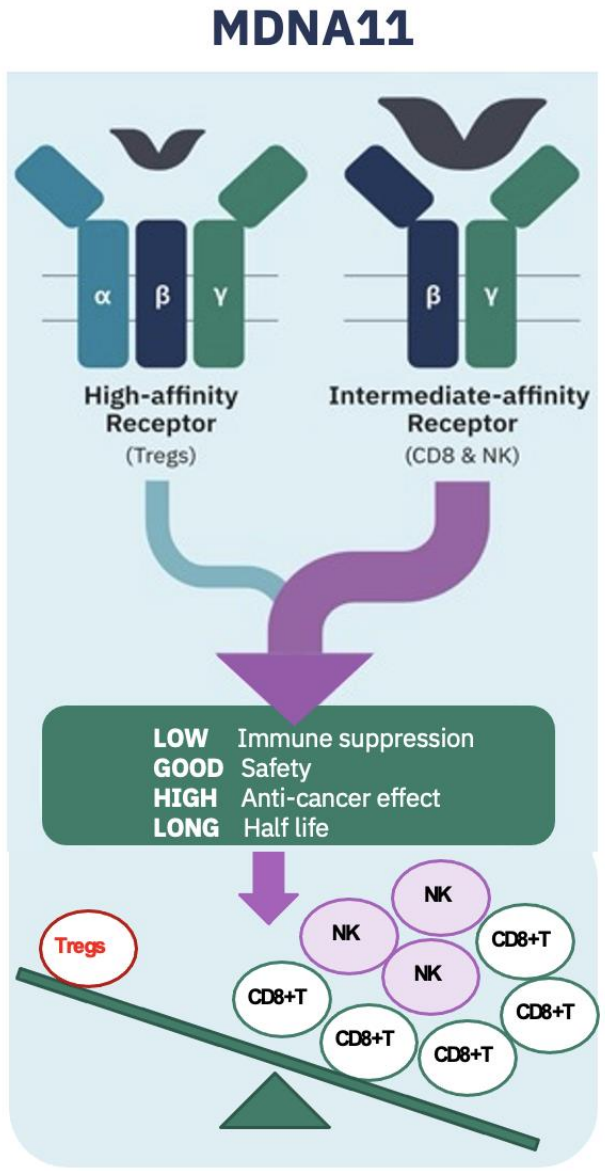
- Introduction
- ABILITY Study – Clinical Update
- Next Milestones & Conclusion
- Questions & Answers

MDNA11: Long-acting IL-2 Superkine Engineered for Optimized Efficacy

Superior anti-cancer response by enhancing selective binding to targets

Increase half-life





- **Designed to overcome key limitations of IL-2 for cancer immunotherapy**

Enhanced β-binding
Potentiates activation of anti-cancer immune cells ($CD8^+$ T & NK)

+

Non-α binder
Reduces stimulation of pro-cancer immune cells (Tregs)

=

Optimized anti-cancer response

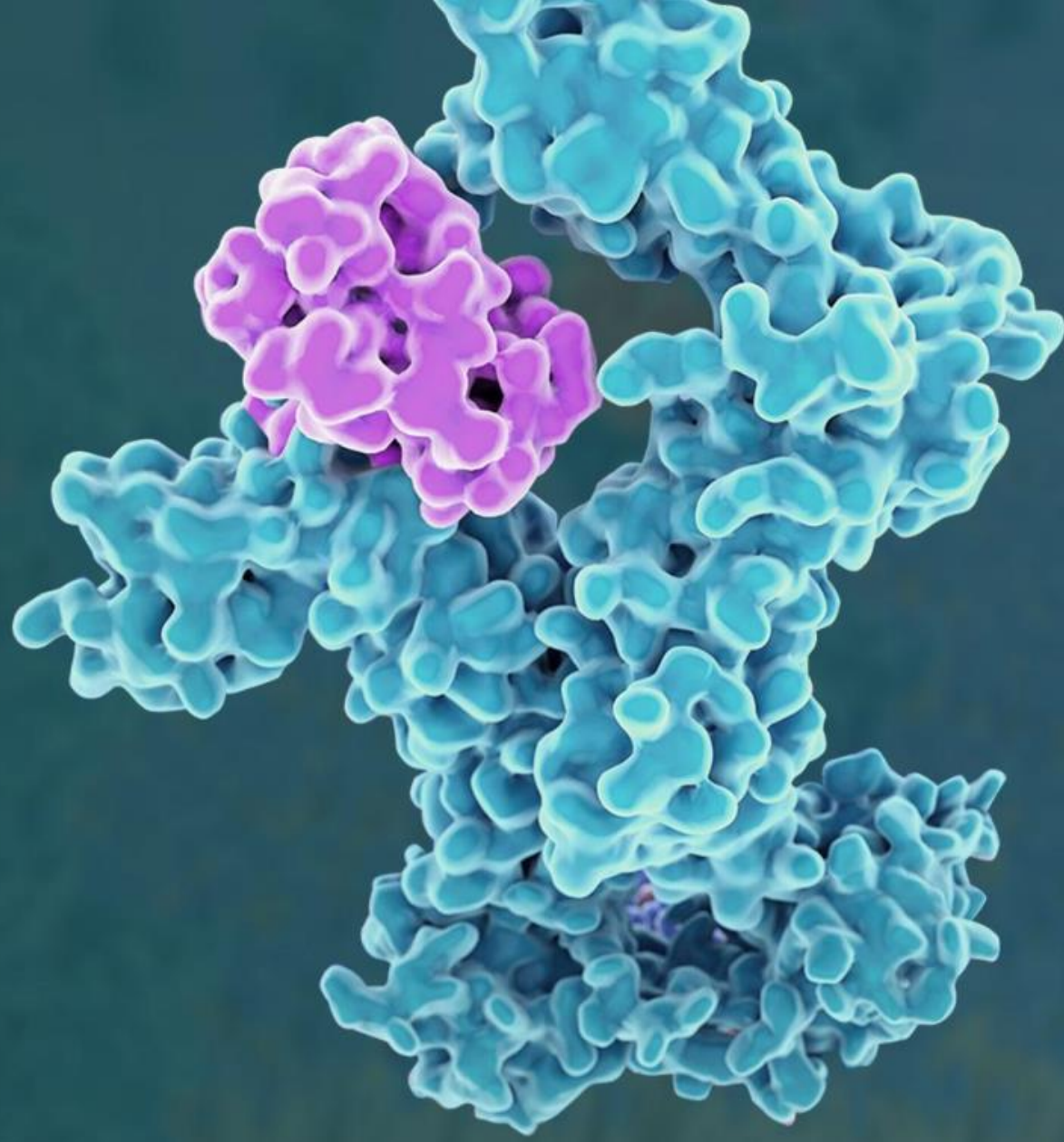
- Fusion to human albumin overcomes the very short half-life of IL-2 and the need for frequent patient dosing: MDNA11 can be given every 2 weeks vs. IL-2 given 3x/day for 5 days
- Albumin fusion also promotes durable MDNA11 accumulation at tumor sites to potentially further enhance efficacy

MDNA11, IL-2 Superkine with Single Agent Clinical Activity

Not Alpha, Beta-Enhanced IL-2 Super Agonist	• Differentiated next-generation IL-2: engineered as a long-acting, enhanced potentiator of $CD8^+$ effector T cells and NK cells with limited Treg cell expansion compared to native IL-2
Albumin-Extended Half-Life and Tumor-Homing	• Albumin scaffold extends half-life via FcRn recycling, lowers kidney clearance, and enhances homing to tumor sites and draining lymph nodes
Desirable Safety Profile in Clinic	• Well-tolerated safety profile with majority of AEs transient and low-grade (1-2). No dose-limiting toxicity or vascular leak syndrome observed
Single Agent Activity in Ongoing Phase 1/2 Study	• Promising clinical activity with deep and durable responses observed during monotherapy dose escalation in patients with treatment-refractory solid tumors and progression on IO
Combination with Checkpoint Inhibitors and Beyond	• Strong memory response as a single or combination IO agent. Desirable safety and PK characteristics allows more combination strategies.

ABILITY STUDY - Clinical Update

Arash Yavari, MBBS, DPhil



ABILITY: Phase 1/2 Dose Escalation & Expansion Study

Monotherapy Dose Escalation

N = 20 patients with advanced, treatment-refractory solid tumors

MDNA11 Q2W IV; cut-off date: June 20, 2023

Modified 3+3 design. Open-label

Assess safety & tolerability of MDNA11 monotherapy

Identify Recommended Dose for Expansion (RDE)

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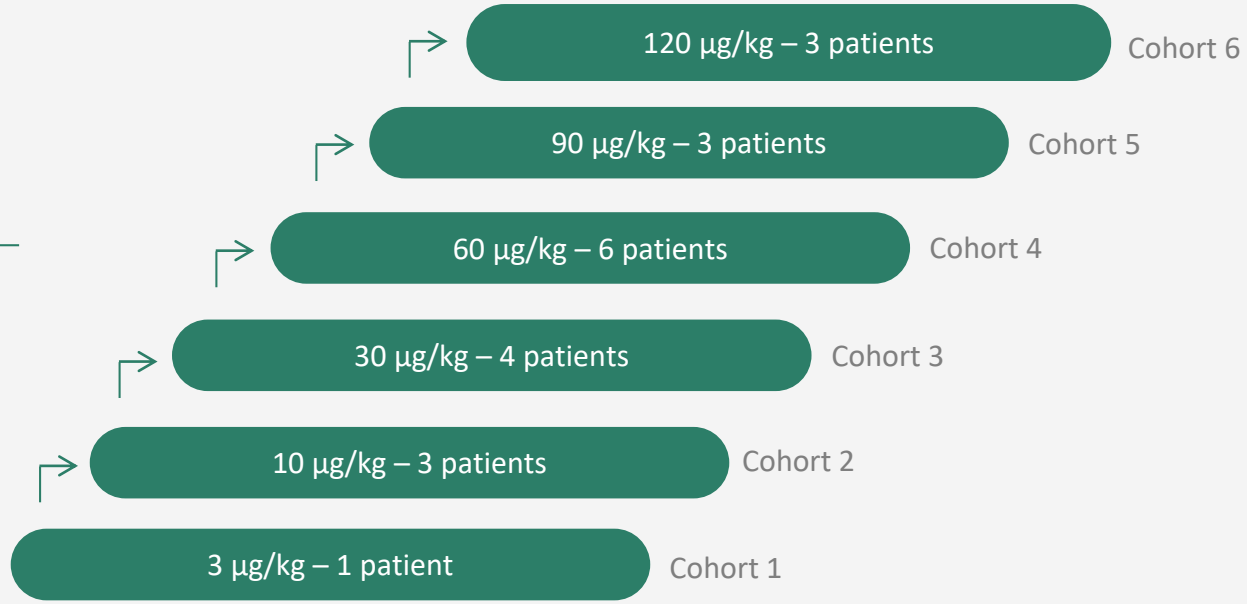


MDNA11 Monotherapy Dose Expansion

N≈40: Melanoma and other selected solid tumors

MDNA11 Q2W IV at RDE

Further evaluate safety and tolerability

Evaluate single-agent anti-tumor activity

MDNA11 + Anti-PD-1 (Pembrolizumab) Dose Expansion

N≈40: Melanoma and other selected solid tumors

MDNA11 + anti-PD-1 (pembrolizumab)

Evaluate safety and tolerability of MDNA11 / anti-PD-1 combination

Evaluate combination anti-tumor activity

ABILITY: Patient Baseline Characteristics in Dose Escalation

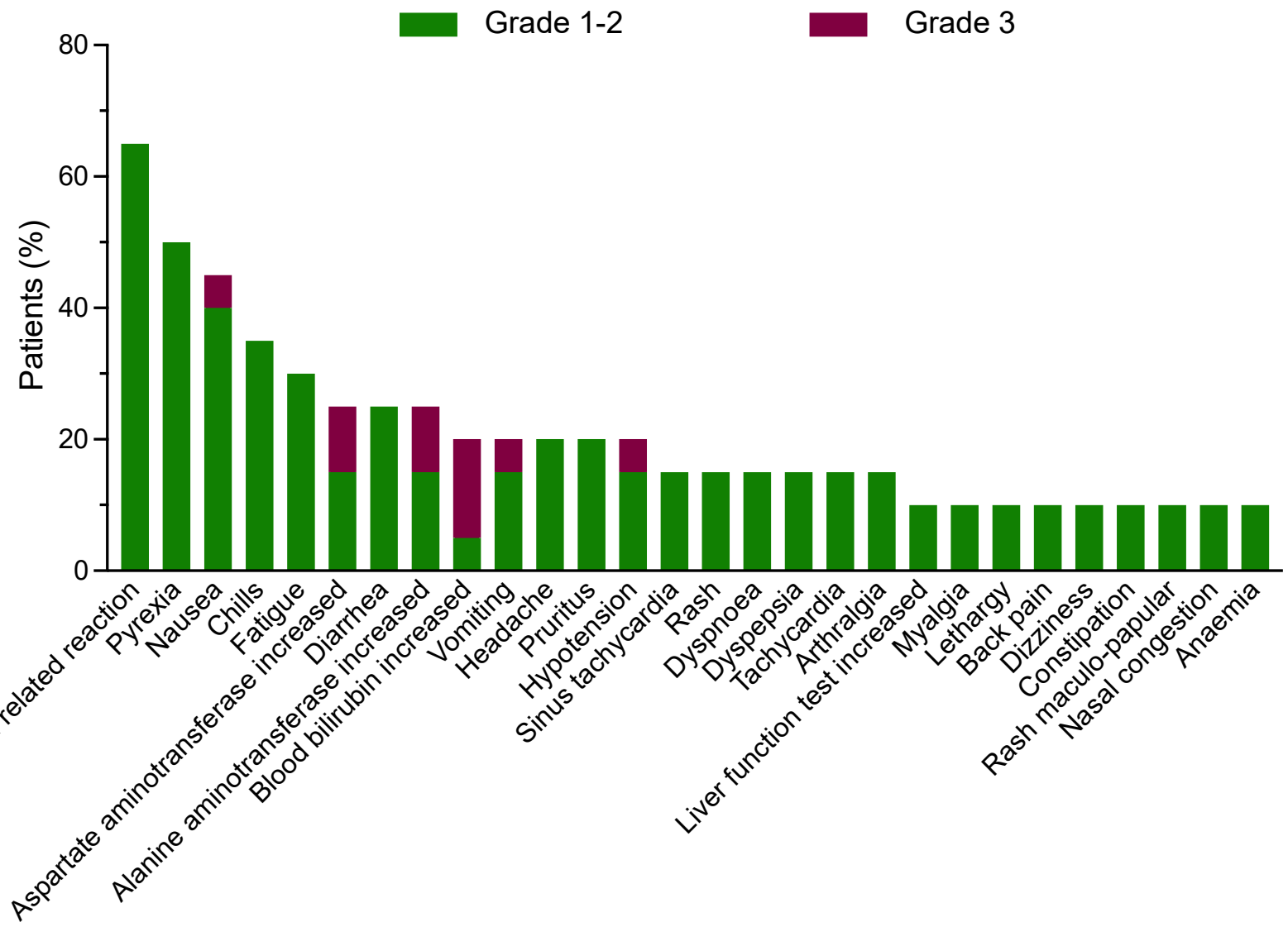
Demographics/Performance	
Median age, years (range)	**61 (27-78)**
Male (%)	**16/20 (80%)**
ECOG 0	**14/20 (70%)**
ECOG 1	**6/20 (30%)**

Prior Systemic Therapies	
Prior Lines of Therapy: 1	**5/20 (25%)**
Prior Lines of Therapy: 2-4	**15/20 (75%)**
Prior Immunotherapy	**15/20 (75%)**
Prior Targeted Therapy	**5/20 (25%)**
Prior Chemotherapy	**9/20 (45%)**

Primary Cancer Diagnosis	
Melanoma	**11/20 (55%)**
Renal Cell Carcinoma (non-clear cell)	**2/20 (10%)**
Pancreatic Ductal Adenocarcinoma (PDAC)	**2/20 (10%)**
Sarcoma	**2/20 (10%)**
Squamous Cell Carcinoma	**1/20 (5%)**
Gastro-esophageal Adenocarcinoma	**1/20 (5%)**
Lung Adenocarcinoma	**1/20 (5%)**

Most patients received multiple prior lines of anti-cancer therapy, including immunotherapy

Single Agent Safety Profile Across all Dose Escalation Cohorts



No DLTs or MTD reached

No Grade 4/5 events

Majority of AEs Grade 1/2 and resolved within 1-2 days

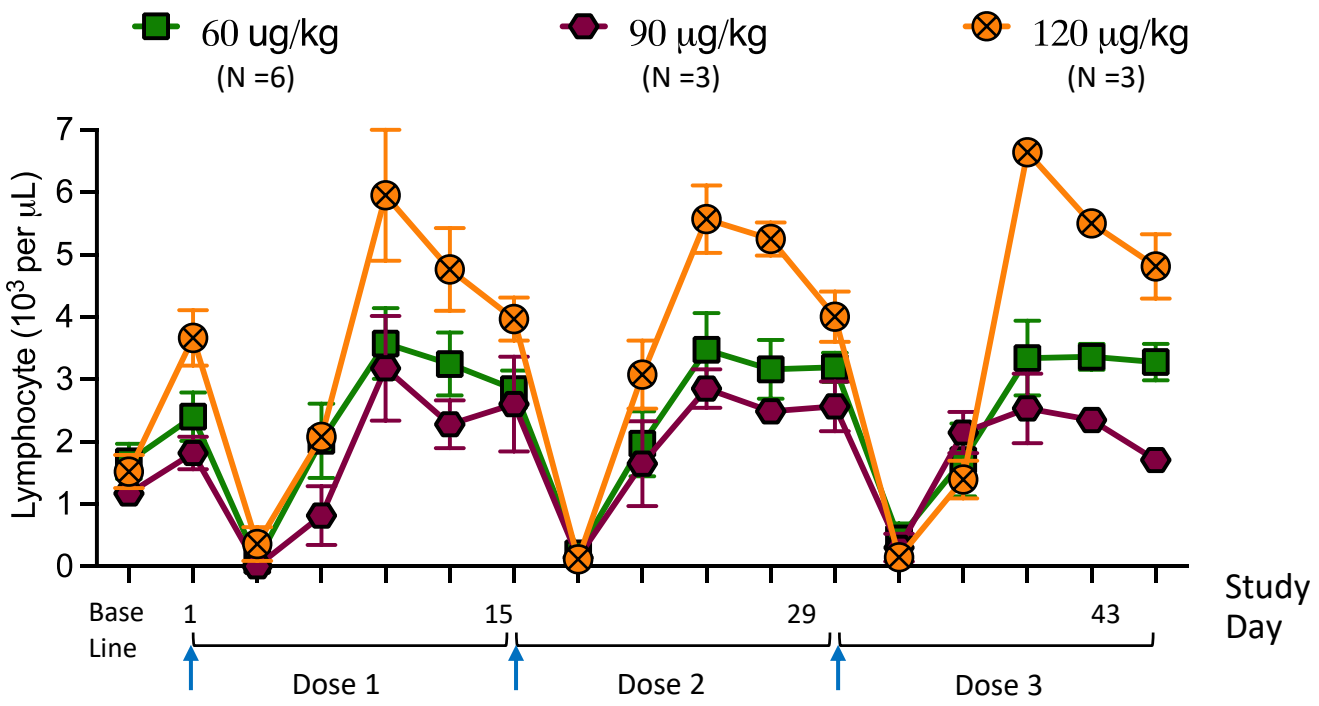
Data cut-off: June 20, 2023

MNDA11 generally well-tolerated across cohorts

Treatment related adverse events (AEs) observed in ≥ 10% of DLT evaluable patients

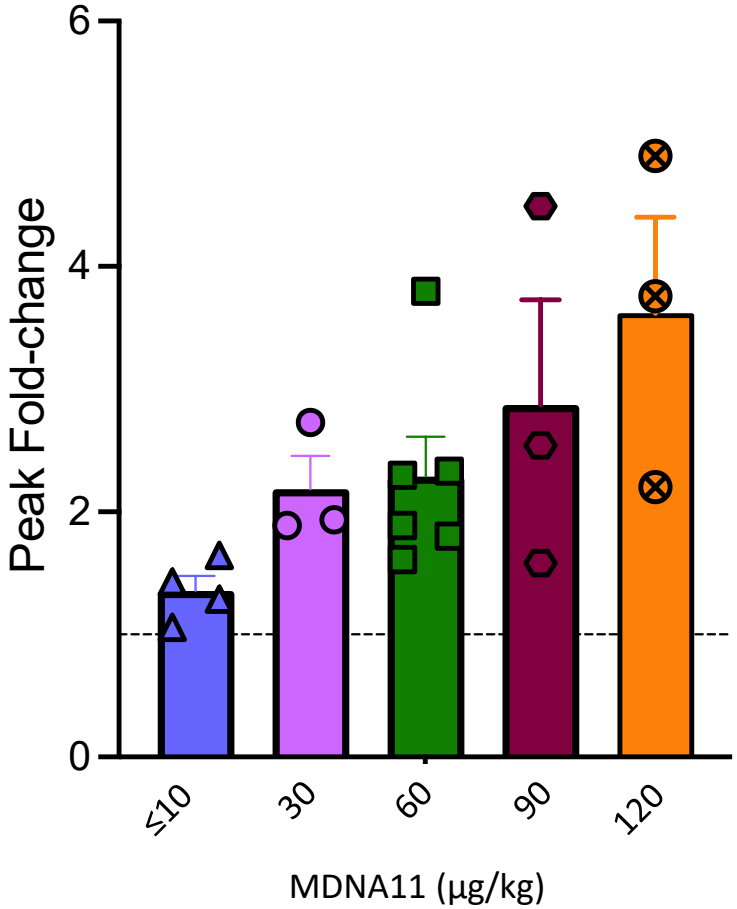
MDNA11-Induced Sustained Lymphocyte Expansion

Expansion of cancer killing immune cells



	60 µg/kg	90 µg/kg	120 µg/kg
Average Baseline Lymphocyte (10^3 per µL)	1.48	1.17	1.52
Median Age, years (Range)	58 (27-78)	74 (73-75)	49 (41-67)

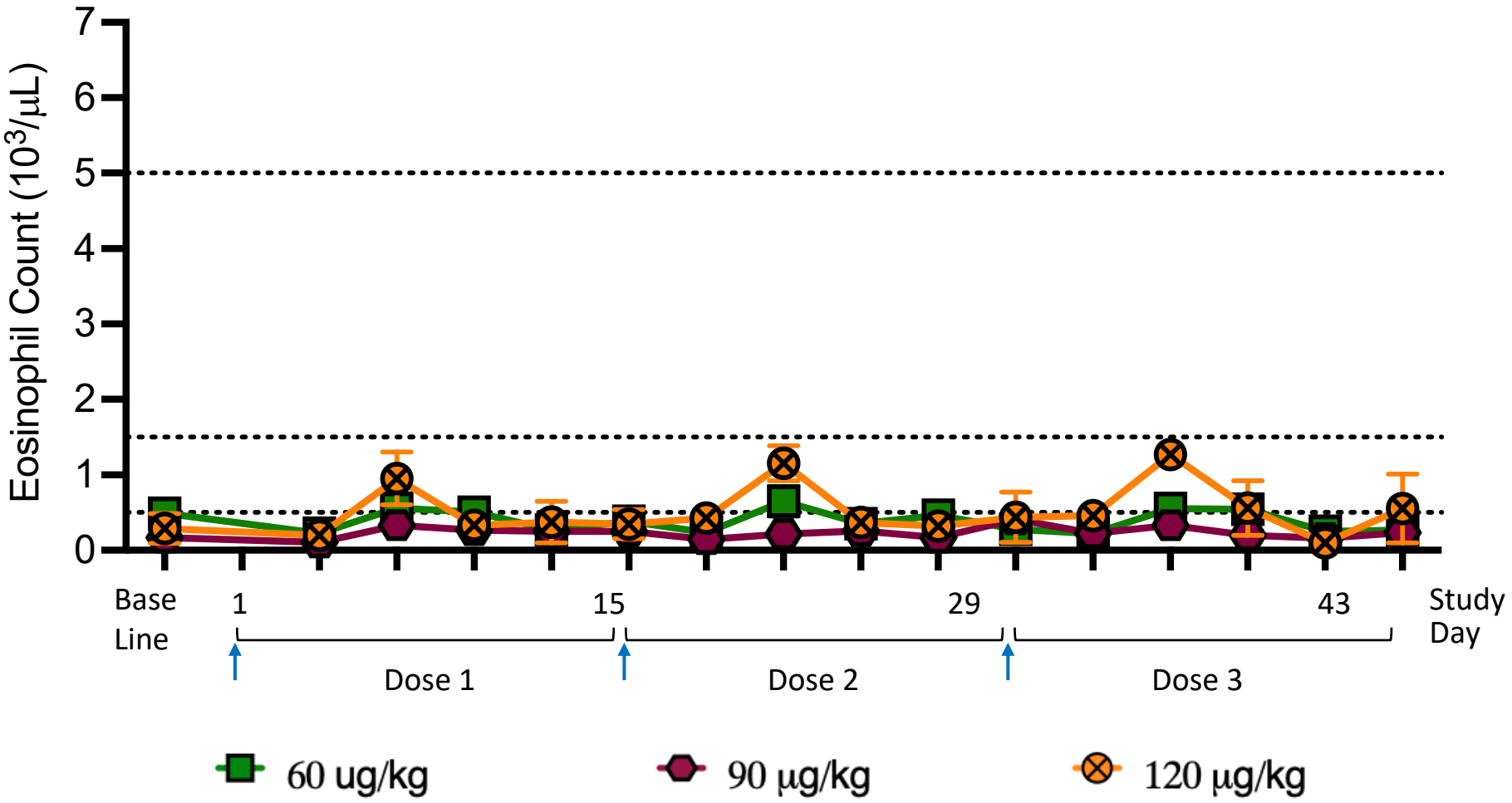
Lymphocyte Peak Fold-Change



Peak fold-change relative to baseline.
Graph shows mean ± SEM
For < 10 µg/kg and 30 µg/kg, peak data for Dose 3
For 60 µg/kg, 90 µg/kg and 120 µg/kg, peak data for Target Dose 1

No Significant Eosinophilia (Associated with VLS)

Vascular Leak Syndrome (VLS) is a hallmark dose-limiting toxicity of IL-2



Severe Eosinophilia

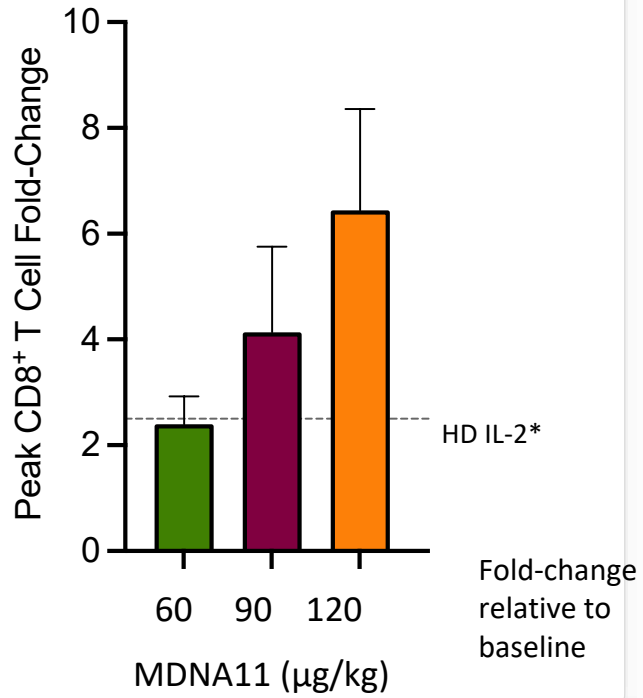
Moderate Eosinophilia

Mild Eosinophilia

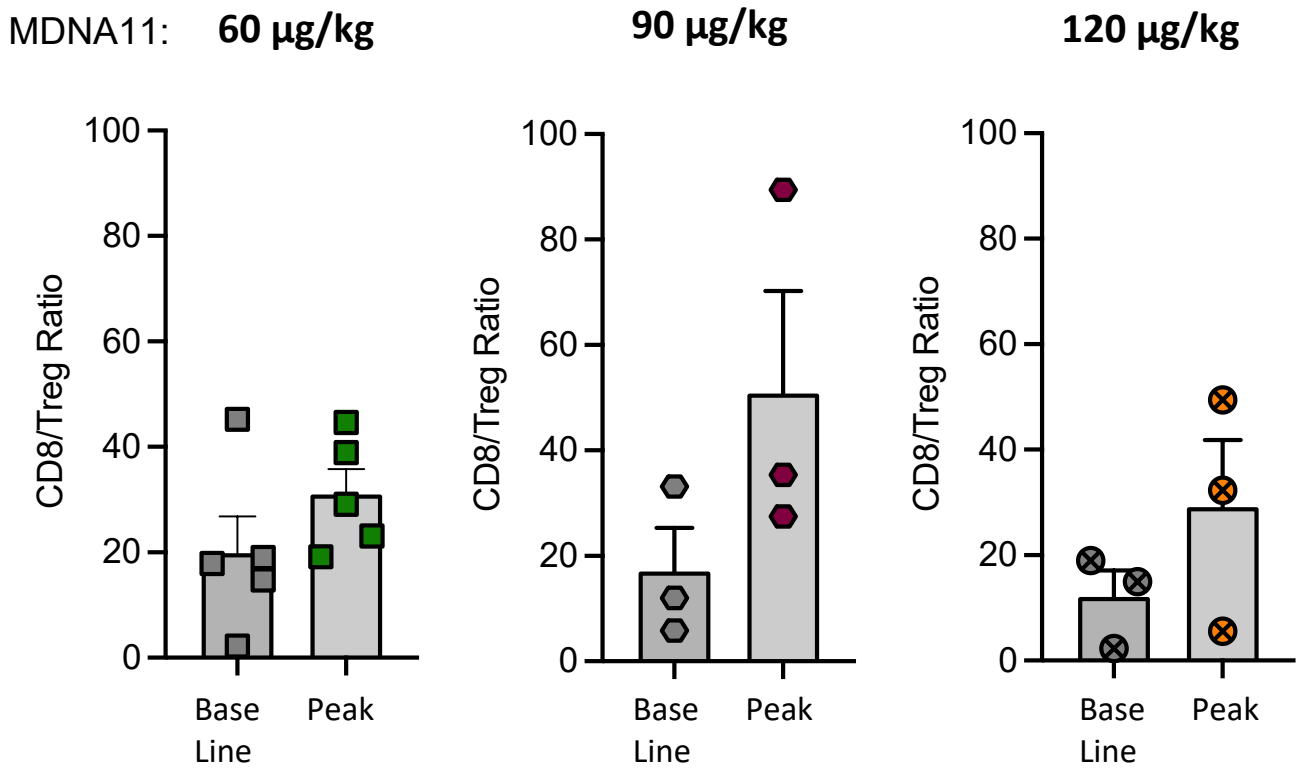
Only for for target doses are shown

MDNA11 Preferentially Induced CD8+ T Cell Expansion Over Tregs

Peak Increase: CD8+ T Cell



Peak Increase: CD8+/Treg Ratio



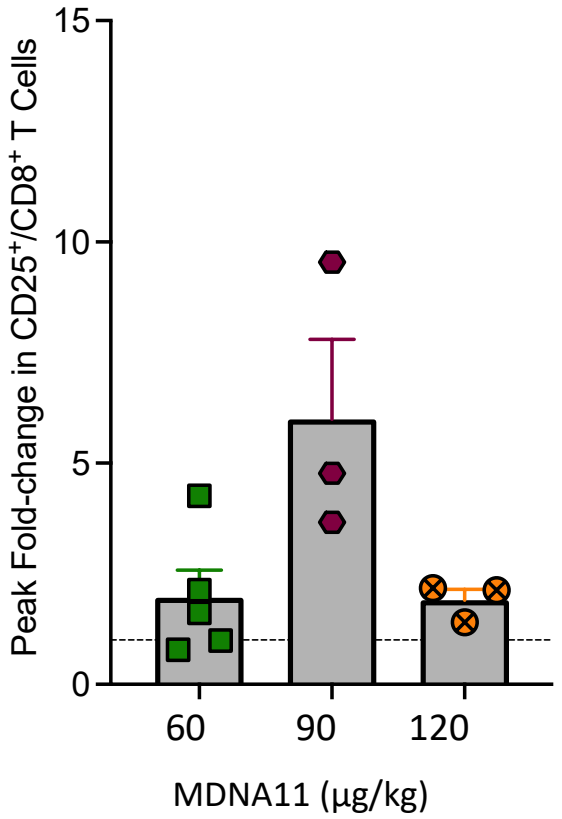
CD8+ T cells are powerful effectors of the anti-cancer immune response

* R. Bhatt et al., Peripheral blood lymphocyte responses in patients with renal cell carcinoma treated with high-dose interleukin-2, presented at SITC 2018

MDNA11 Boosts Population of Potent CD8⁺T Cells But Not Tregs

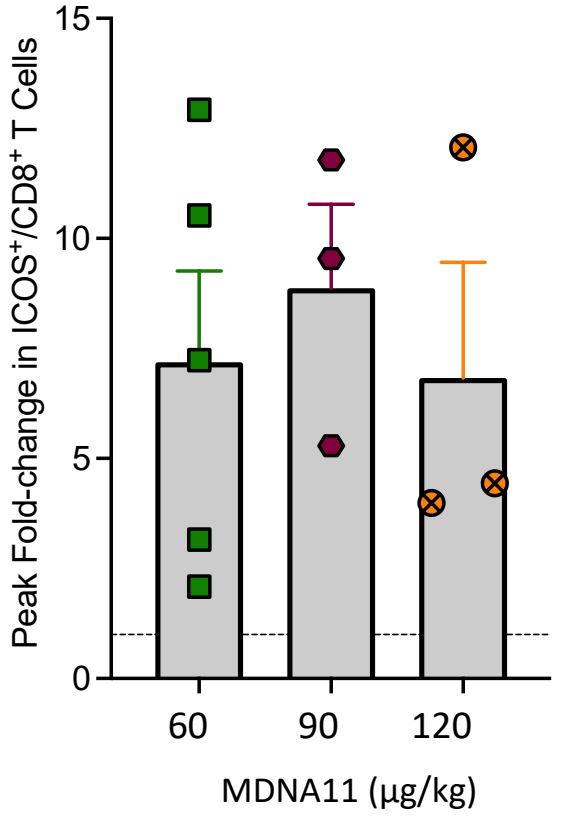
Increased population of activated (CD25⁺) CD8+ T cells (peak @90 µg/kg)

CD25⁺ CD8⁺ T Cells



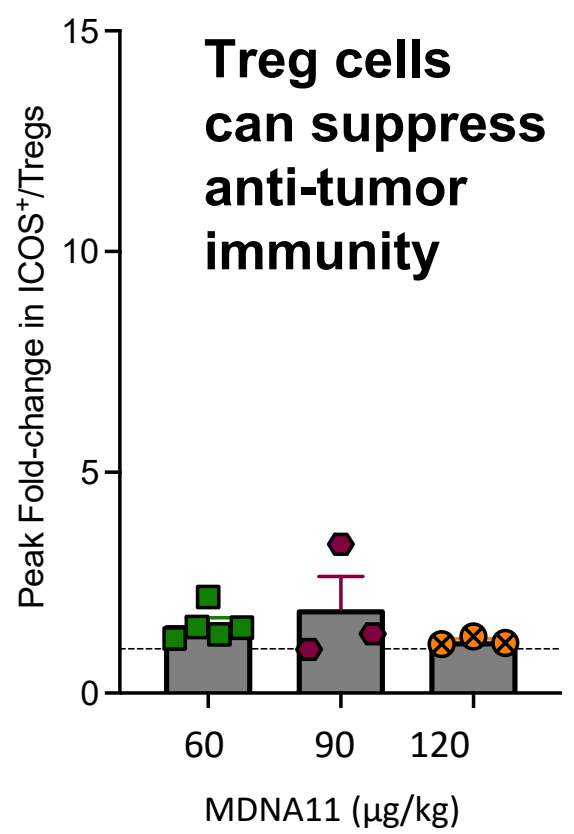
Increased co-stimulation (ICOS⁺) of CD8⁺ T cells (peak @ 90 µg/kg)

ICOS⁺ CD8⁺ T Cells



Limits expansion of highly suppressive ICOS⁺ Tregs

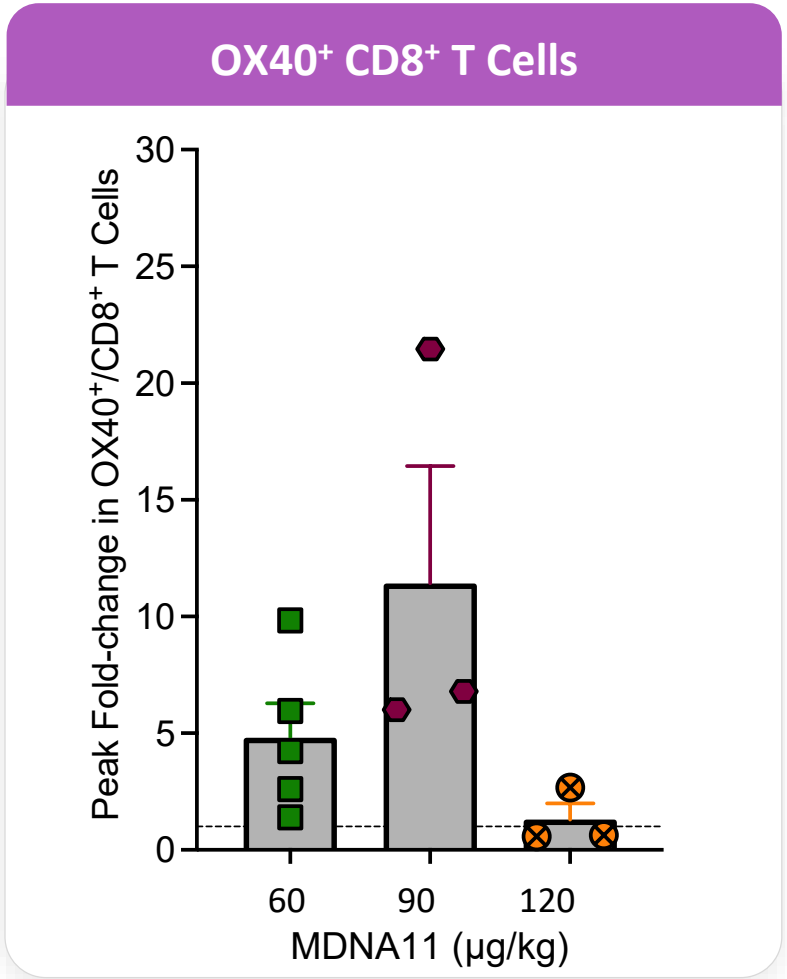
ICOS⁺ Tregs



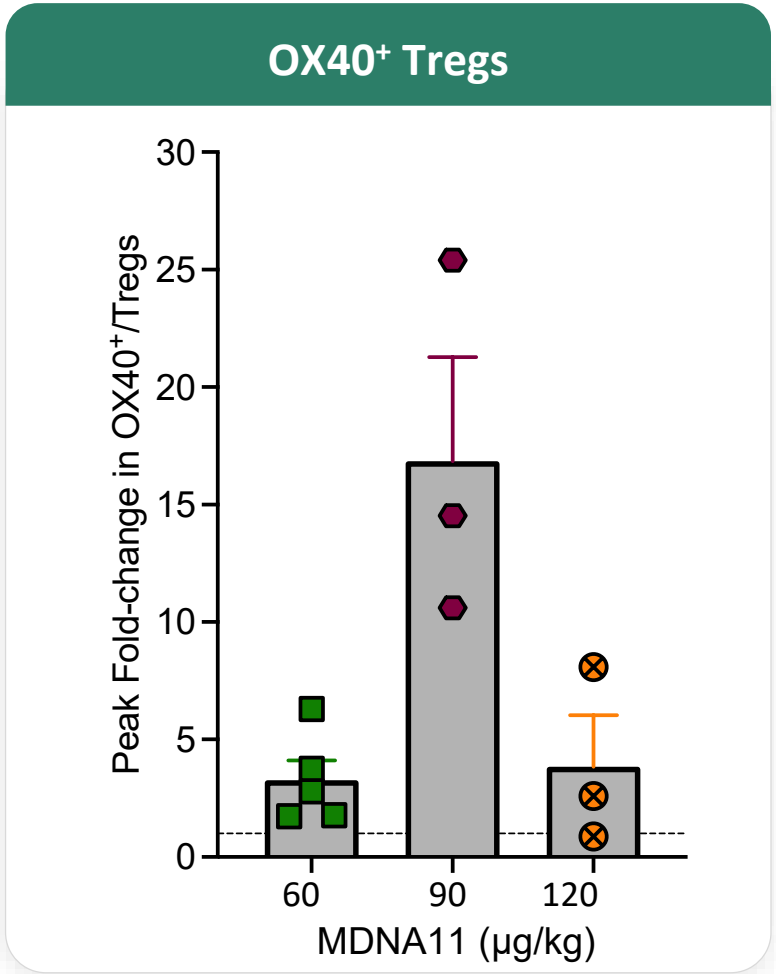
Peak fold-change relative to baseline.
Target dose data are shown

MDNA11 Expands Potent CD8+ T Cells But Weaker Tregs

OX40 promotes CD8+ T cell survival & expansion (peak @ 90 µg/kg)



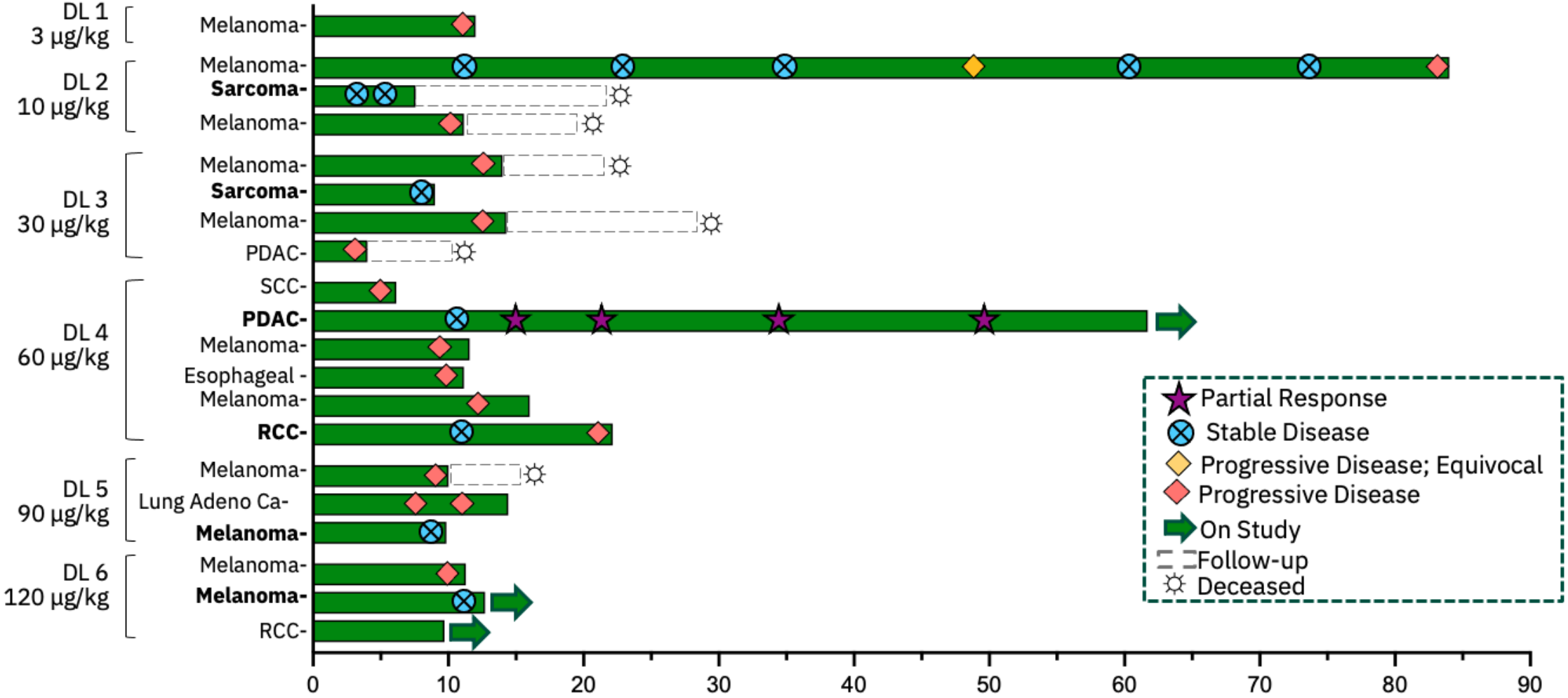
Enhances OX40 in Tregs making them less immunosuppressive (Peak at 90 µg/kg)



Peak fold-change relative to baseline. Target dose data are shown

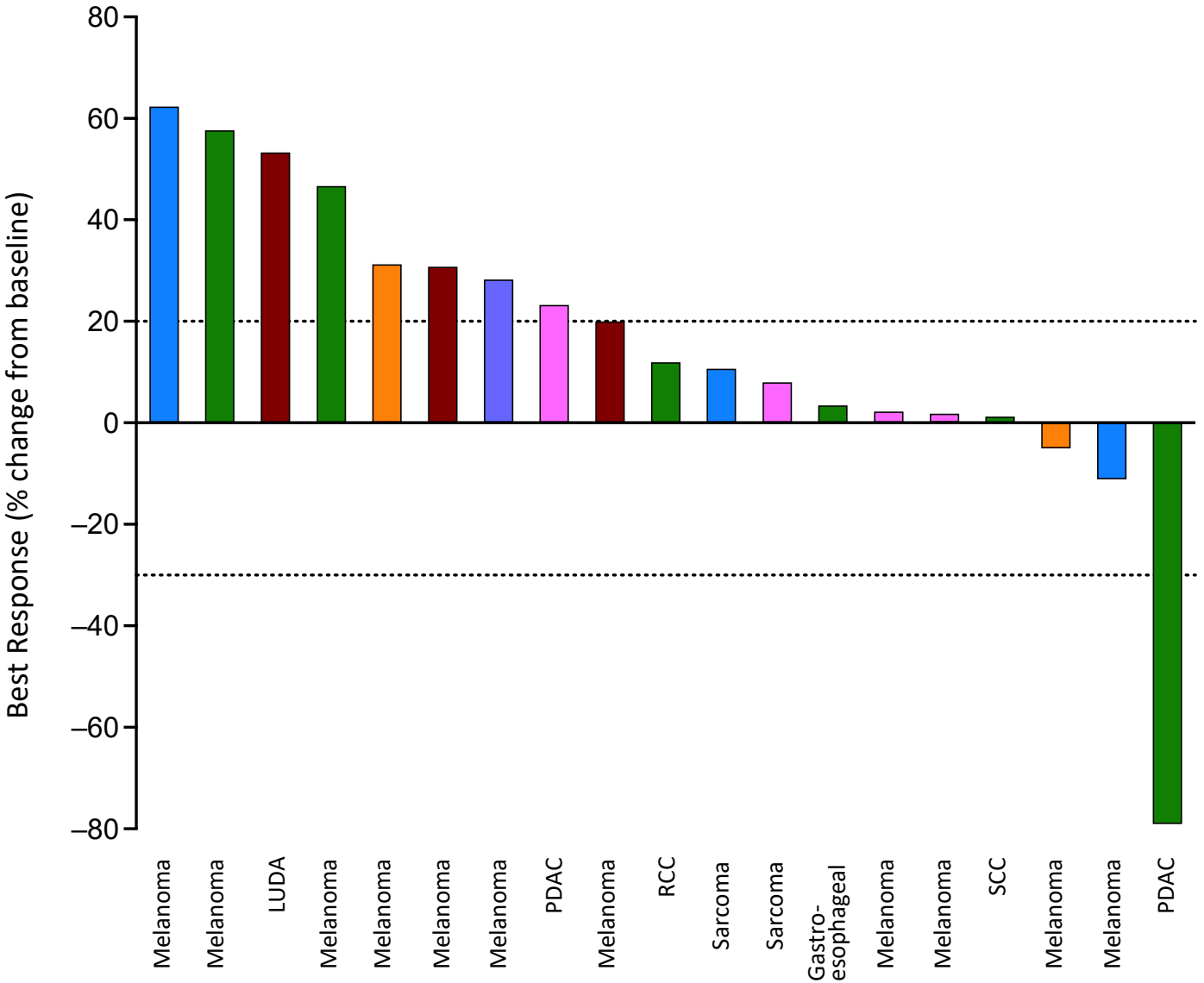
Durable Responses Observed During Dose Escalation

SD lasting ~18 months in 71-year-old patient with metastatic melanoma treated with 2 prior lines of IO



Data cut-off: June 20, 2023

MDNA11 Shows Single Agent Clinical Activity



DL6: 120 µg/kg

DL5: 90 µg/kg

DL4: 60 µg/kg

DL3: 30 µg/kg

DL2: 10 µg/kg

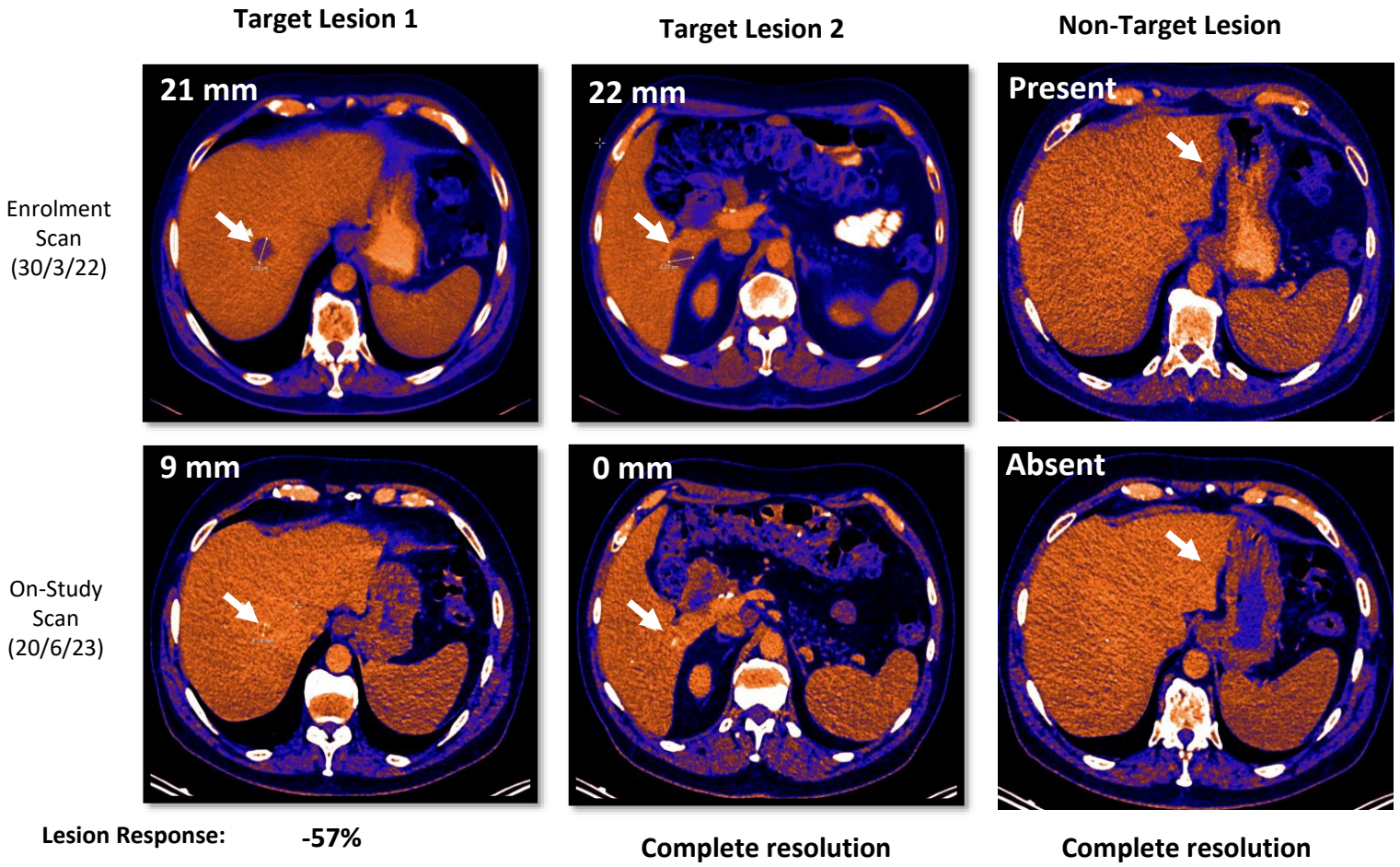
DL1: 3 µg/kg

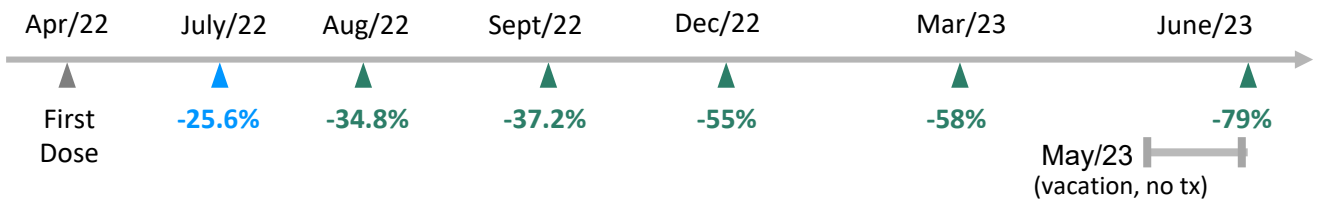
Confirmed partial response (PR) achieved in a 55-year-old patient with metastatic pancreatic cancer treated with MDNA11 at 60 µg/kg IV Q2W

19 of 20 patients with at least one follow-up assessment

Data cut-off: June 20, 2023

Pancreatic Cancer – Durable Partial Response to Single-Agent MDNA11





- Patient with pancreatic ductal adenocarcinoma (PDAC)
- Surgical resection (Whipple's procedure) June 2021
- Adjuvant FOLFIRINOX: Progression
- Abraxane + gemcitabine: Discontinued due to Toxicity
- Pembrolizumab: Progression
- Deepening shrinkage of target lesions on MDNA11
- Complete regression of one target & one non-target lesion

Patient continues on single agent MDNA11 at 60 µg/kg Q2W

ABILITY Study Plan – Dose Expansion & Combination Phase

Global, multi-center, open-label Phase 1/2 study

Monotherapy dose escalation and expansion; combination with Pembrolizumab

A: Monotherapy Dose Escalation

MDNA11 IV (Q2W)
Advanced solid tumors, N = 20;
Pretreated

- 120 µg/kg
- **RDE: 90 µg/kg**
- 60 µg/kg
- 30 µg/kg
- 10 µg/kg
- 3 µg/kg

B: Monotherapy Dose Expansion

MDNA11 IV at 90 µg/kg (Q2W)

Melanoma	Non-melanoma skin cancer	MSI-high MMR-deficient cancer

Objectives: safety and anti-tumor activity

C: Combination Study with Pembrolizumab

MDNA11 IV + Pembrolizumab

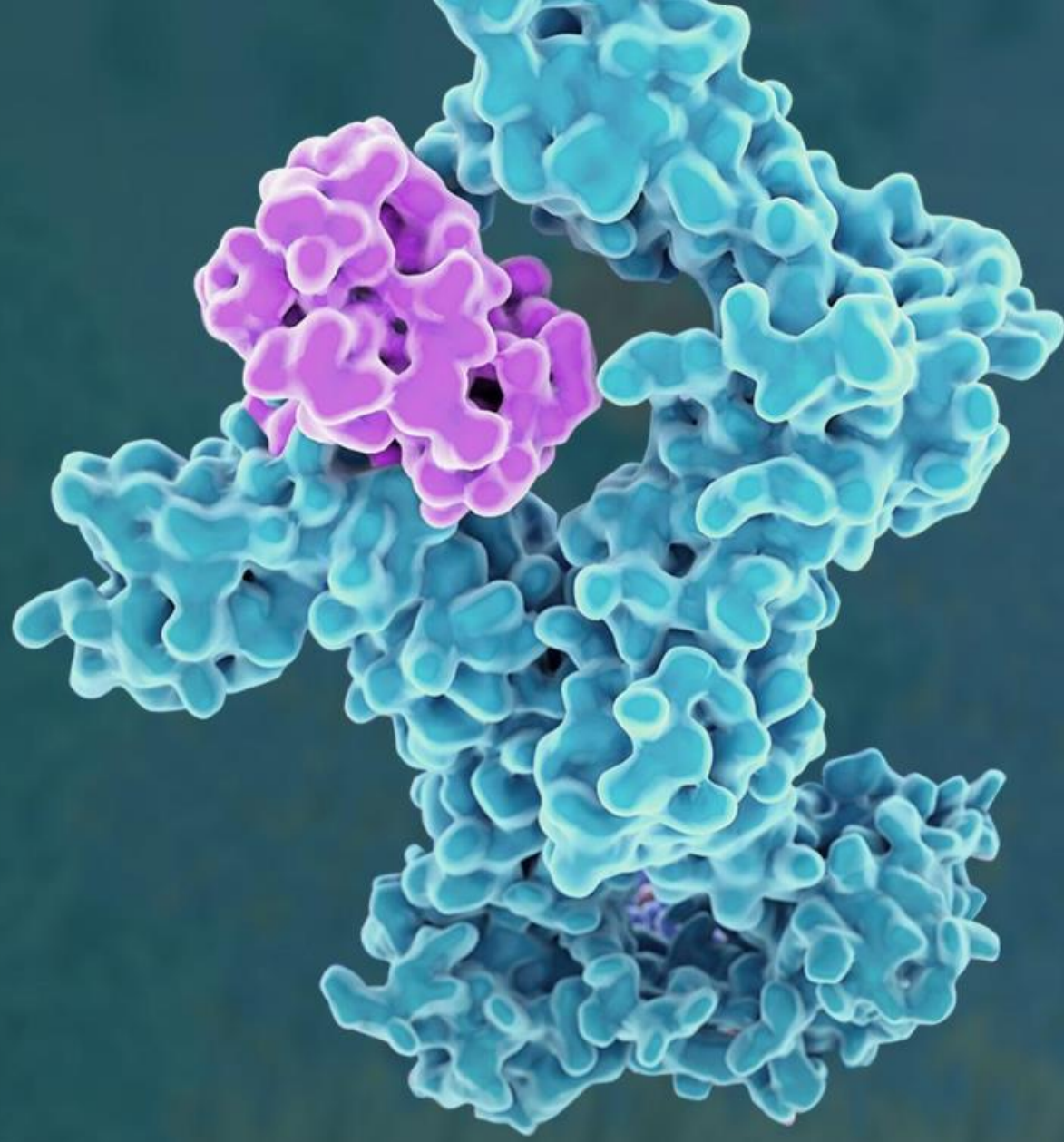
Melanoma	TBD	TBD

Objectives: safety and anti-tumor activity

Conclusion

Fahar Merchant, PhD

CEO of Medicenna Therapeutics



Upcoming Anticipated Milestones & Financial Summary

ABILITY Study Fully Funded – Cash Runway Through Q3 2024

Anticipated Milestones

Start of ABILITY monotherapy expansion	Q3 2023
Update from ABILITY monotherapy expansion	Q4 2023
Commence combination phase of ABILITY with MDNA11 & pembrolizumab	Q4 2023
Update from ABILITY mono- and combination phases	**Q1 2024**

Financial Highlights

Nasdaq/TSX	MDNA
Headquarters	Toronto, CA
Cash	CDN $29.6M *
Debt	$0
Preferred Shares	None
Issued and Outstanding	~70 Million*
Fully Diluted	~92 Million*

* As of June 30, 2023.

Thank you

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