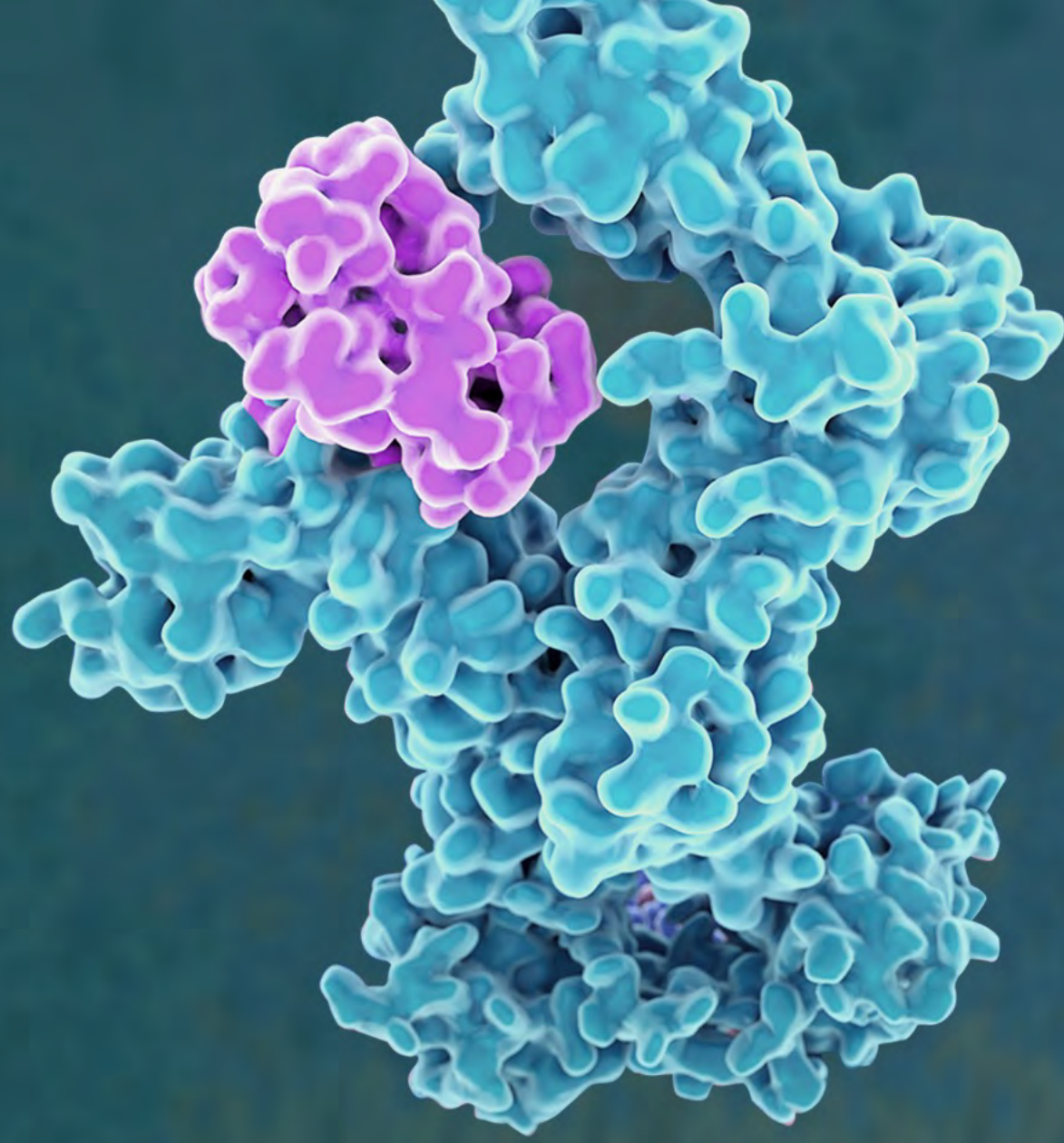
Q2, 2021

Evolutionary Cytokines Revolutionary Medicines



MEDICENNA

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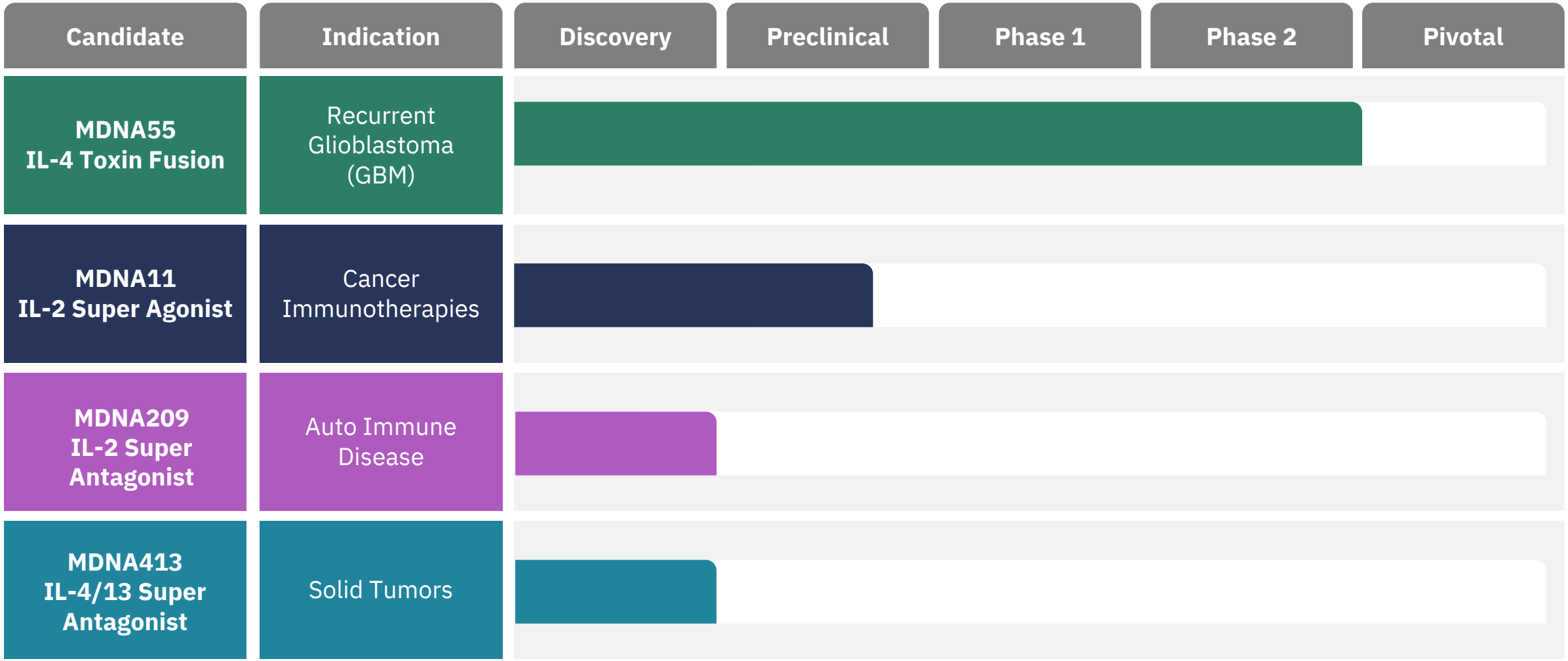
Expanding Pipeline Anchored by MDNA55 and MDNA11



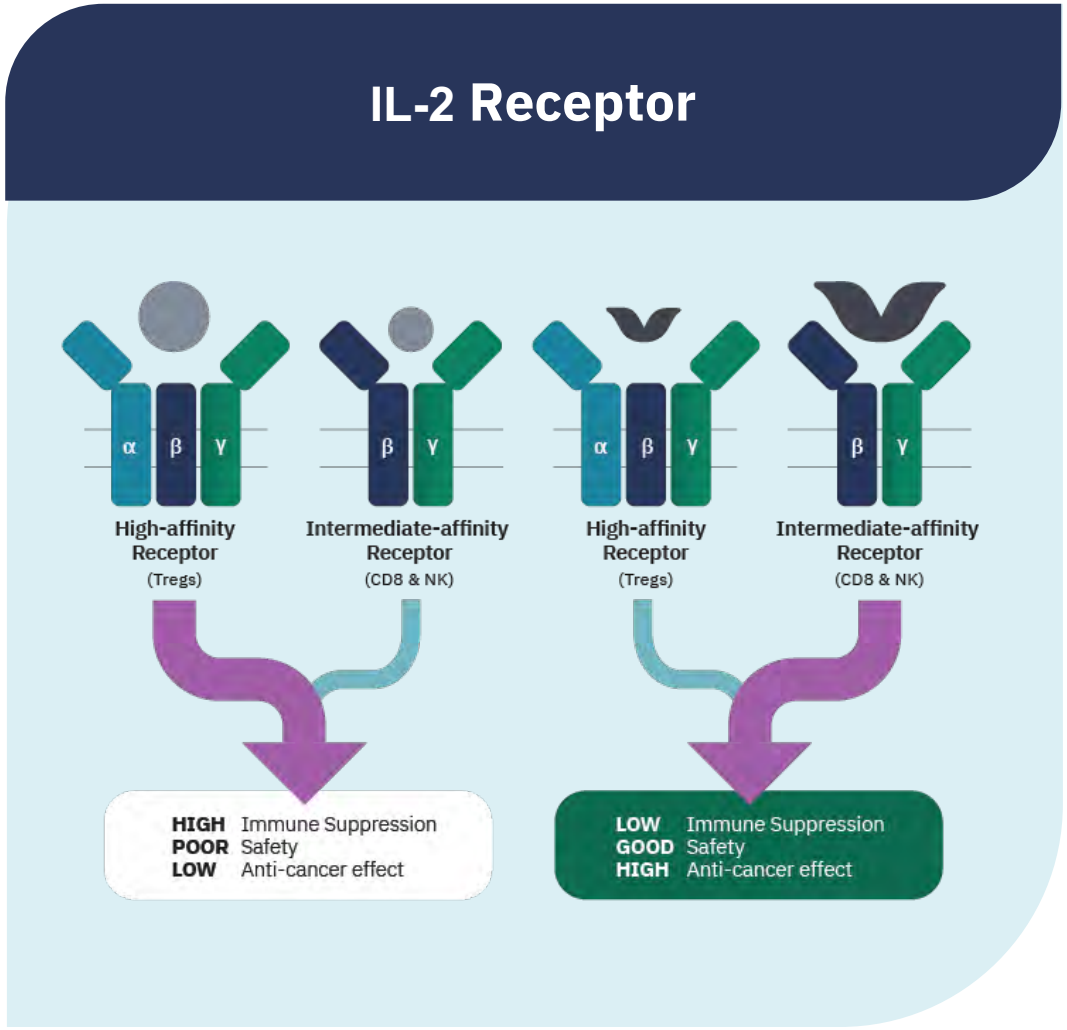
Multiple Near-Term Value Inflection Milestones

	H1 2021	H2 2021
MDNA11 MDNA11 to be Phase 1 Ready	**Submit application to initiate Phase 1/2a monotherapy study**	**MDNA11 Top-line safety, PK/PD and biomarker results**
Next Generation Superkines	**Ongoing optimization and data generation**	**Identify new lead candidate**
Corporate	**Pursue MDNA55 Partnership Opportunities** **Strengthen Management and Advisory Team**	**Pursue pipeline collaboration opportunities**

MDNA11

IL-2 Super Agonist for Cancer Immunotherapy

Targeting IL-2 Receptor Subunits in Cancer Therapy



The IL-2 receptor (IL-2R) consists of three subunits

- CD25 (IL-2Rα)
- CD122 (IL-2Rβ)
- CD132 (IL-2Rγ)

Stimulation of CD122

- Key for the activation of cancer killing immune cells such as CD8+ T cells, naïve T cells, and NK cells.

Stimulation of CD25

- Leads to activation of immunosuppressive Tregs, which abrogate the anti-tumor response
- Causes extreme toxicity

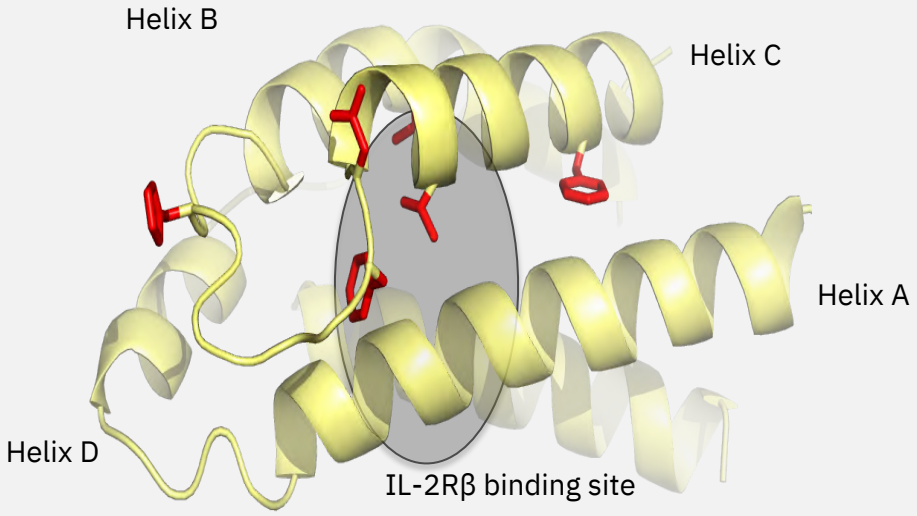
Proleukin (recombinant human [rh] IL-2), which selectively stimulates CD25, is approved for the treatment of metastatic melanoma and renal cell carcinoma

Superkines: First-Generation IL-2 Variants

LETTER

nature

Exploiting a natural conformational switch to engineer an interleukin–2 'superkine'

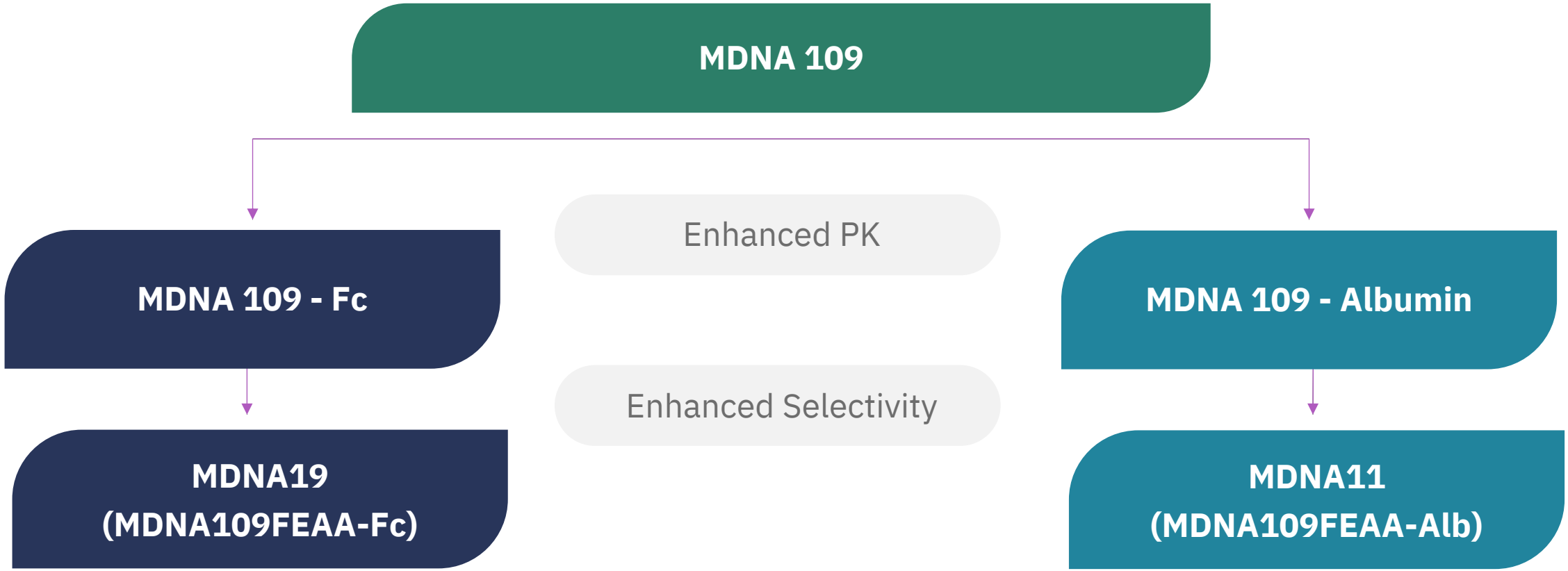


Levin, Bates, and Ring et. al, Nature, 2012

Medicenna's MDNA109 platform produced first generation IL-2 variants with 200-fold higher affinity for CD122 (IL-2Rβ), which is key for the activation of immune cells responsible for cancer killing (CD8+ T cells, naïve T cells, NK cells), yet similar affinity to CD25

	Similar affinity to CD25	**200X increased affinity to CD122**
SPR data (nM)	CD25	CD122
IL-2	6.6	280
MDNA109	**6.6**	**1.4**

MDNA11: Next-Generation IL-2 Superkine

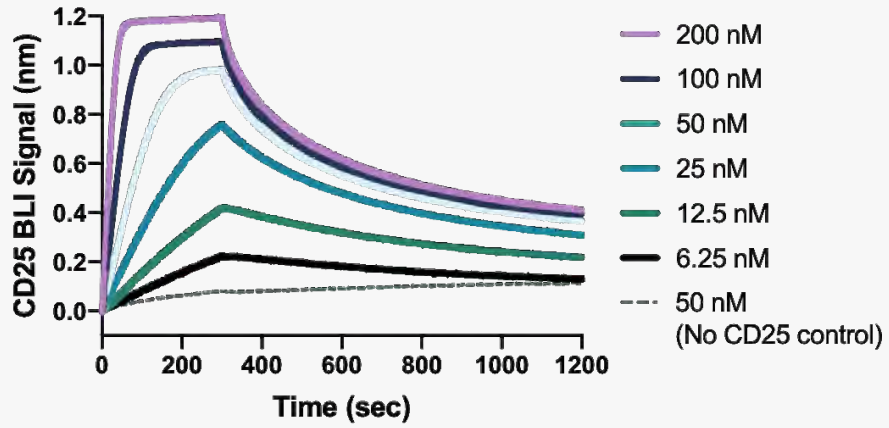


MDNA11 is a next-generation IL-2 superkine with superior CD122 binding without CD25 affinity, thereby preferentially stimulating cancer killing effector T cells and NK cells when compared to competing IL-2 programs.

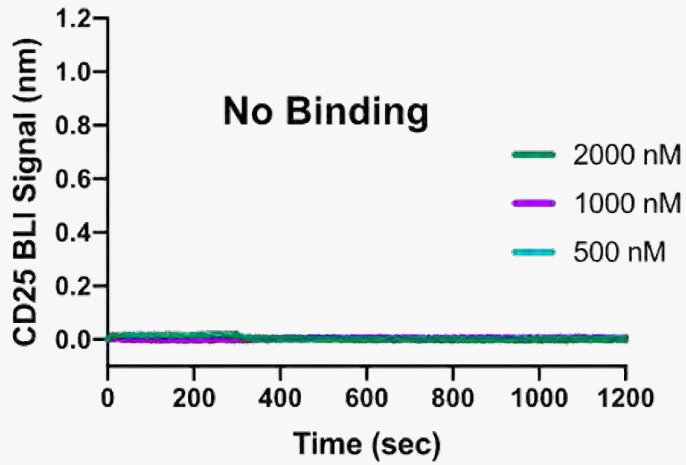
MDNA11

No CD25 Binding and Enhanced Affinity and Selectivity for CD122 Compared to rhIL-2

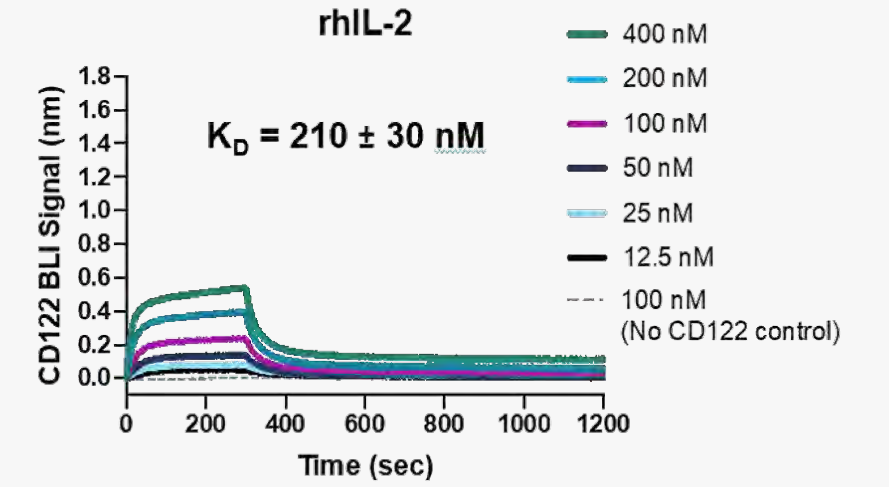
rhIL-2 – CD25 Binding



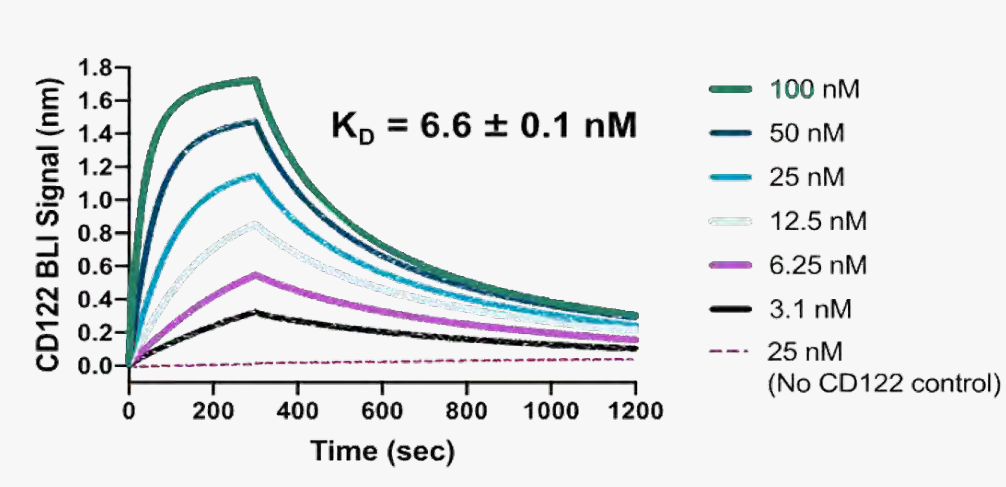
MDNA11 – CD25 Binding



rhIL-2 – CD122 Binding



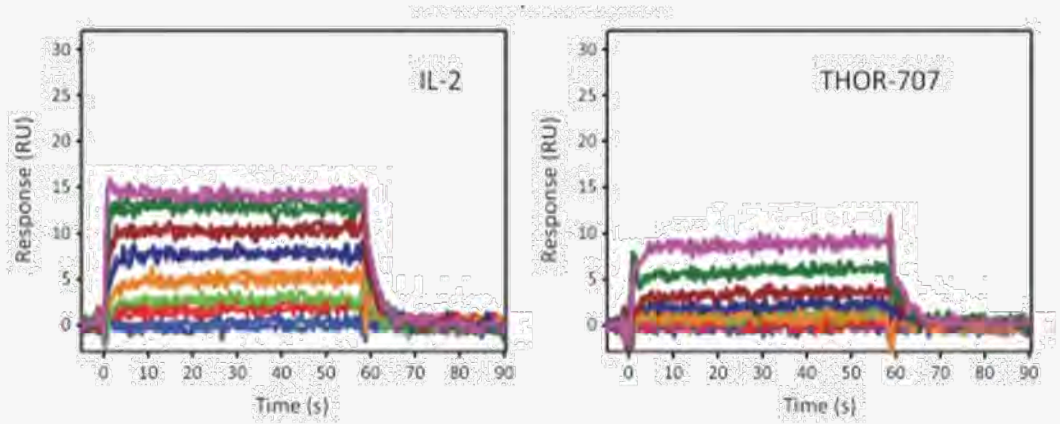
MDNA11 – CD122 Binding



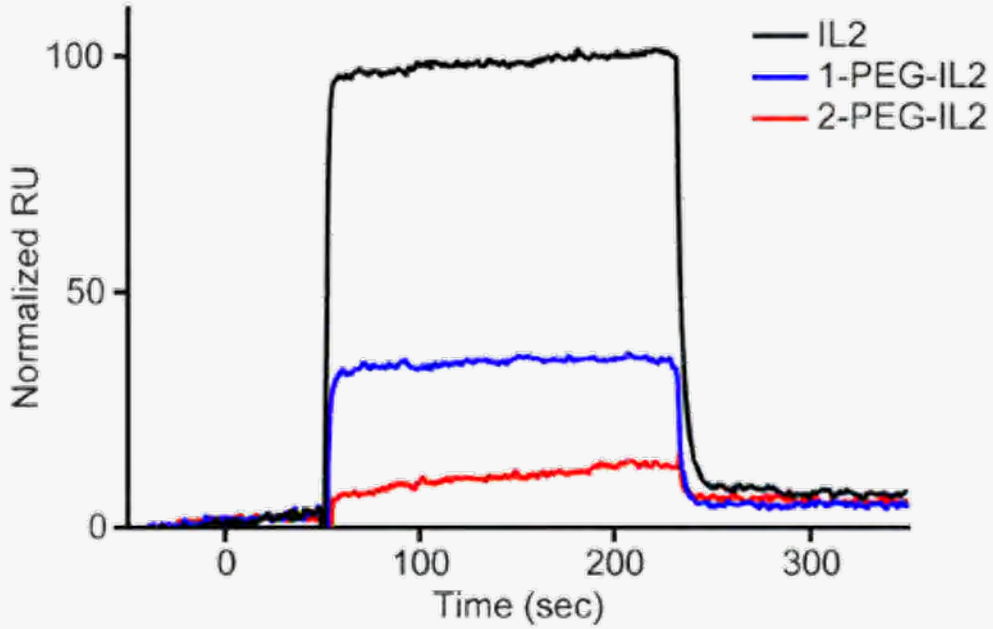
Competing IL-2 Variants are Weak CD122 Binders

THOR-707: Reduced Binding to IL2Rβ (CD122)

IL2Rβ (CD122)



1-PEG-IL2 (Most Active Form of NKTR-214) is a Weak IL2Rβ (CD122) Binder



MDNA11: Enhanced Selectivity & Potency to Immune Cells

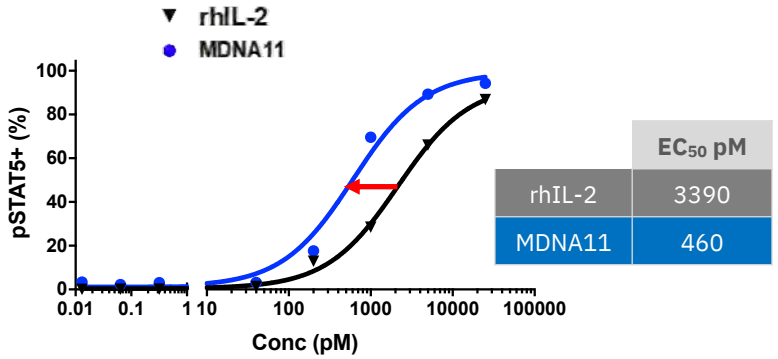
Compared to WT IL-2 (proleukin) MDNA11 exhibits both:

Enhanced potency toward anti-tumor CD8+ T-cells

Reduced potency toward pro-tumor Treg cells

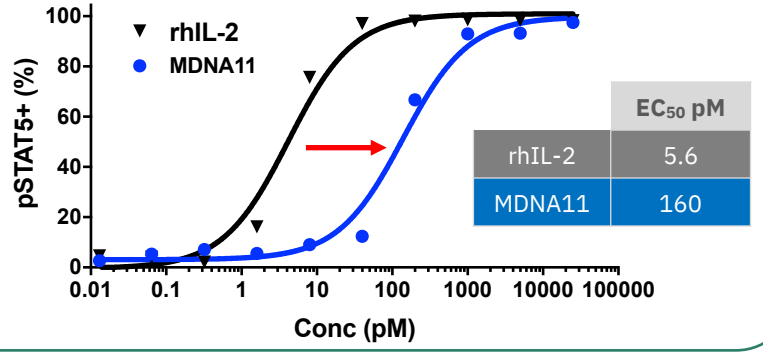
MDNA11

Naïve CD8+T-cells



	EC_{50} pM
rhIL-2	3390
MDNA11	460

Tregs



	EC_{50} pM
rhIL-2	5.6
MDNA11	160

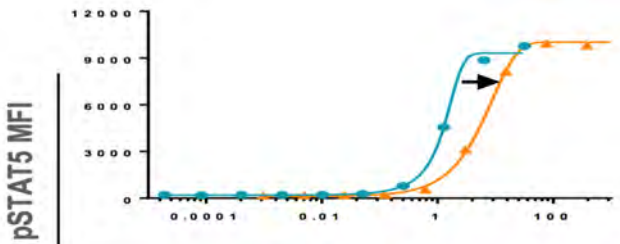
Compared to WT IL-2 (proleukin) THOR-707 has:

Reduced potency toward anti-tumor CD8+ T-cells

Reduced potency toward pro-tumor Treg cells

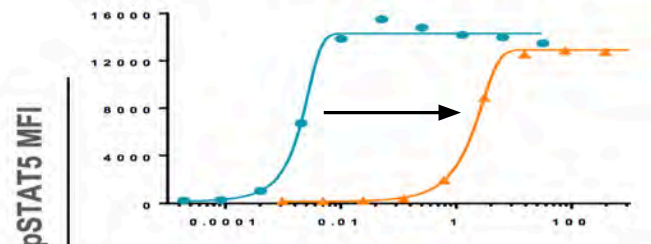
THOR-707

Naïve CD8+T-cells



Protein	EC_{50} nM
IL-2	1.47
THOR-707	5.71

Tregs

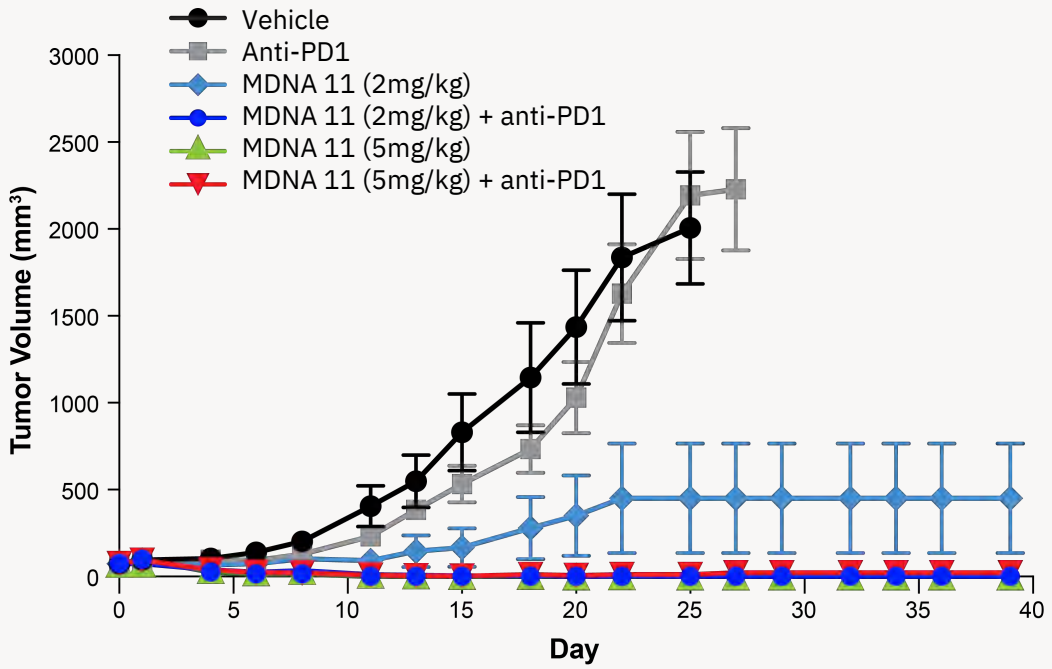


Protein	EC_{50} nM
IL-2	0.0022
THOR-707	1.95

Strong Monotherapy and Anti-PD1 Combo Effect

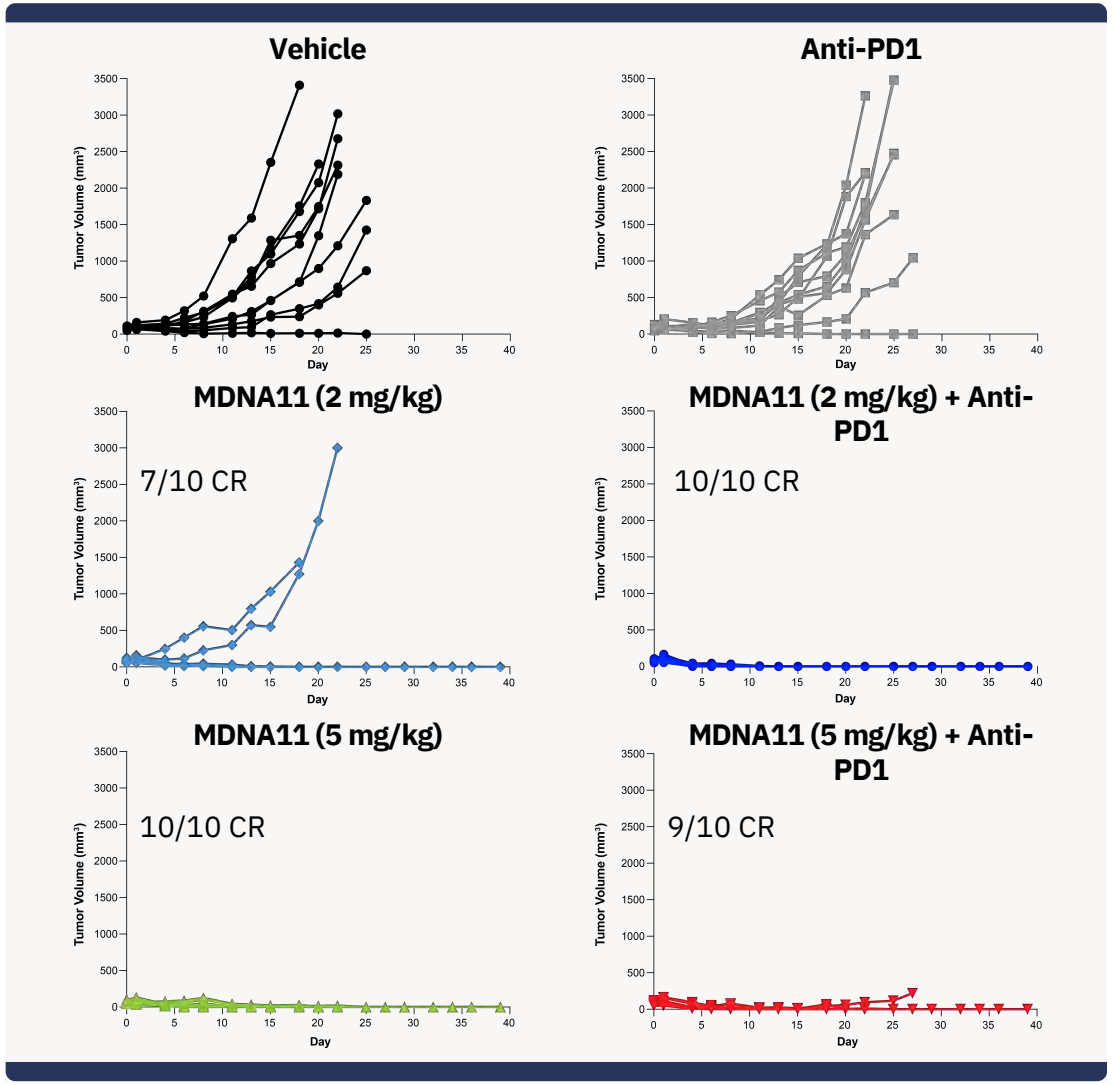
Anti-Tumor Efficacy & Combination Effect with Anti-PD1 in MC38 Tumor Model

MC38 Tumor Model



MDNA11: IP Q7Dx2
Anti-PD1 (RMP1-14; 10 mg/kg): IP BIWx3
Average size at initiation of dosing ~ 75 mm^3
Study in C57Bl/6 mice.

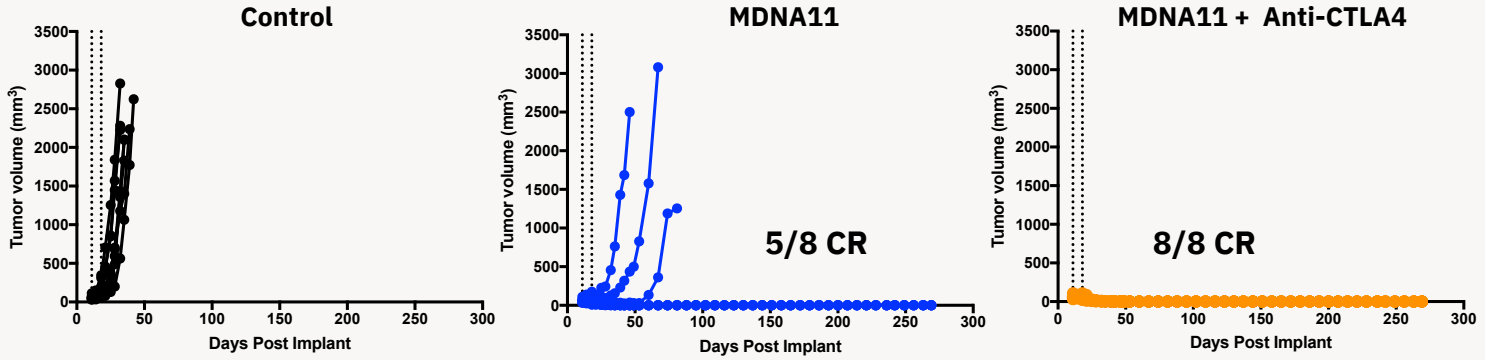
CR: Tumor volume = 0
Re-challenge study on-going



MDNA11 + αCTLA4

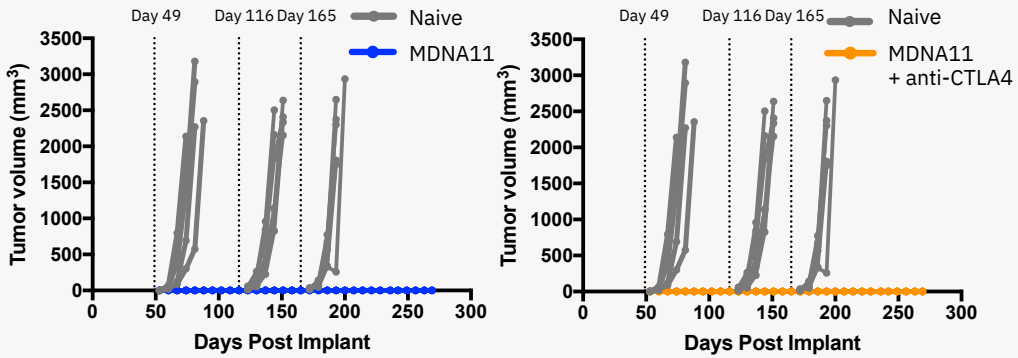
Inhibits Tumor Growth and Induces Memory Response

Primary Tumors (CT26 in Balb/c Mice)



Re-challenges

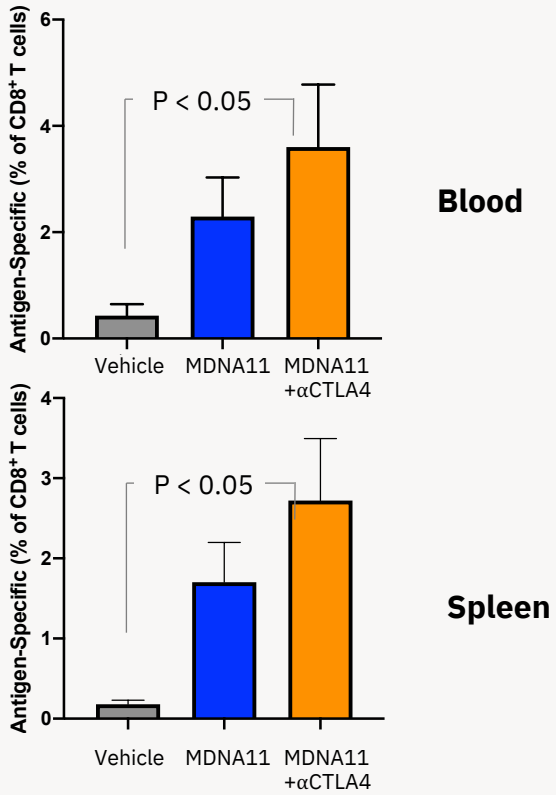
Mice re-challenged with CT26 tumor cells at different sites on their flanks



- Avg. tumor size in the treatment group at time of dosing: ~60 mm^3
- MDNA11 (5 mg/kg, IP, Q.W x 2wks); Anti-CTLA4 (9D9; 200 µg, IP, Q2W x 2wks)

Antigen-specific CD8 T-cells on Day 270

(MDNA11 treatment on Day 11 & 18)

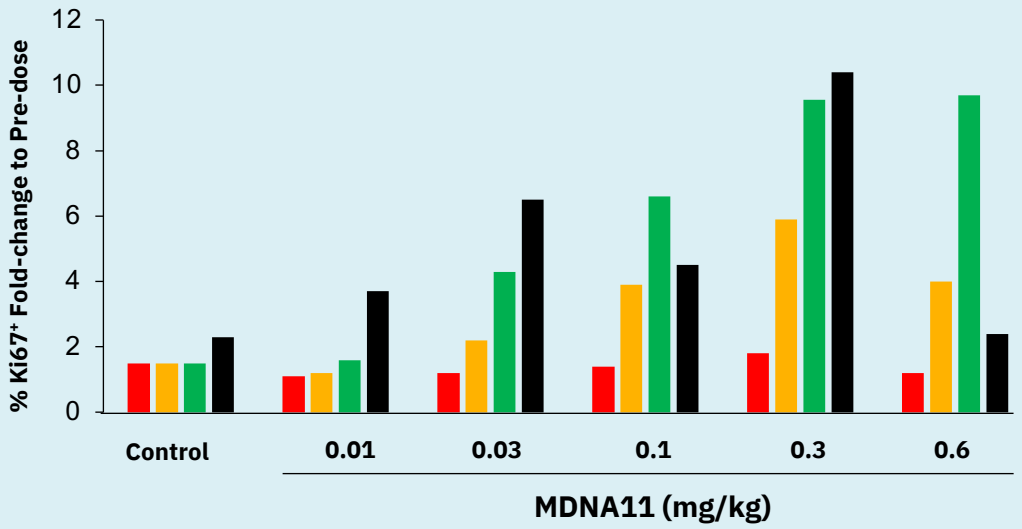


- Antigen-specific CD8T cells detected by anti-CD8 (KT15) and H-2Ld MuLV gp70 Tetramer
- All mice boosted with CT26 cells 5 days prior to analysis

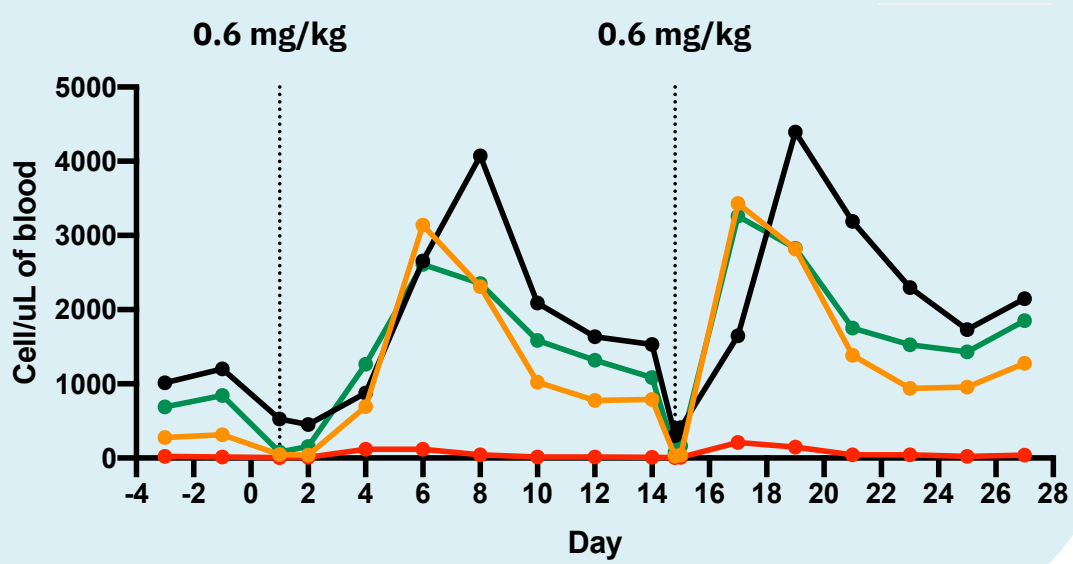
Non-Human Primates – Increased Immune Cells but Not Tregs

MDNA11 induced up to 10-fold expansion in cancer-fighting immune cells (CD4+ T, CD8+ T, and NK Cells) in non-human primate study without: (a) Treg expansion, (b) generating anti-drug antibodies, (c) causing hypotension associated with vascular leak syndrome, (d) cytokine storms, or (e) other undesirable immune mediated side effects.

Percent Ki67⁺ Cell Fold Change



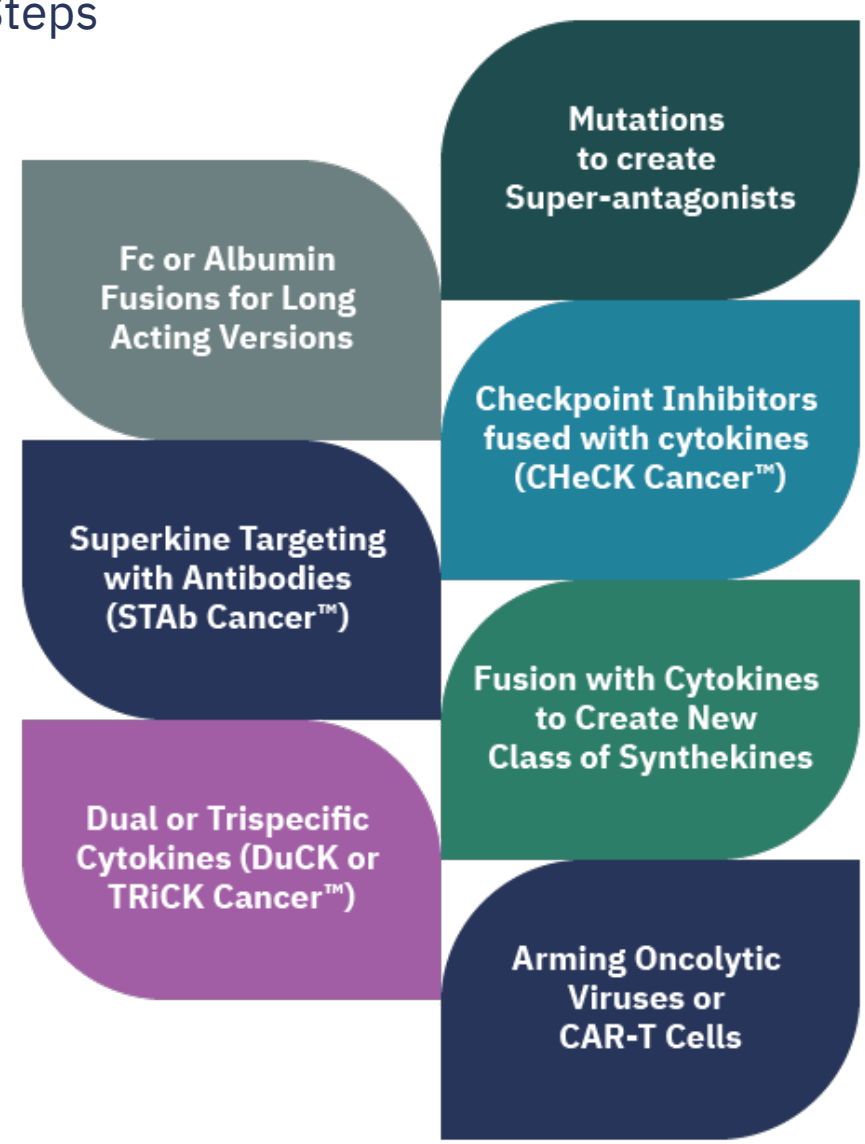
Immune Cell Counts



Tregs CD4⁺ T Cell CD8⁺ T Cell NK Cell

IL-2 Superkine Program

Next Steps



MDNA11 Next Steps

- Initiate Phase 1/2a clinical trial **(Mid 2021)**
- Report top-line Safety, PK/PD and Biomarker Results from Phase 1/2a monotherapy study **(End 2021)**
- Phase 1/2a Efficacy Data **(2022)**

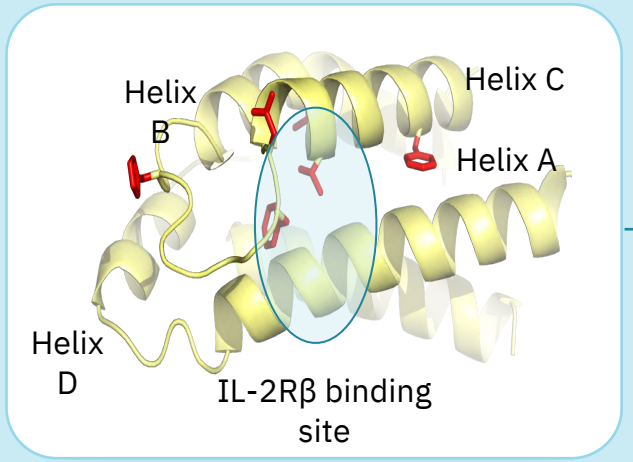
Bifunctional Superkines for Immunotherapy (BiSKITs)

Superkine Targeted with Antibody (STAb™)

Enhances accumulation in tumors

nature COMMUNICATIONS

Sun et. Al., Nat comm, 2019



+FA **SumIL-2** (MDNA109FA)

sumIL-2-Fc (MDNA109FA-Fc)

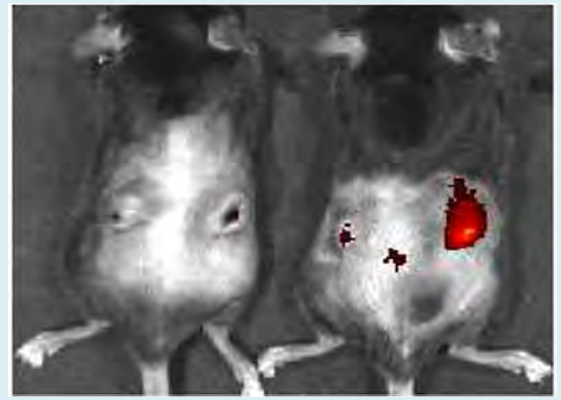
+FEAA **MDNA19**

MDNA19 (MDNA109FEAA-Fc)

Medicenna Therapeutics

Tumor Accumulation

Control αEGFR-MDNA109FA



Left tumor: MC38
Right tumor: MC38-EGFR5

Fluorescence images of MC38 (left) and MC38-EGFR5 (right) tumor-bearing mice treated with a single dose of PBS or αEGFR-MDNA109FA (25 μg, IV)

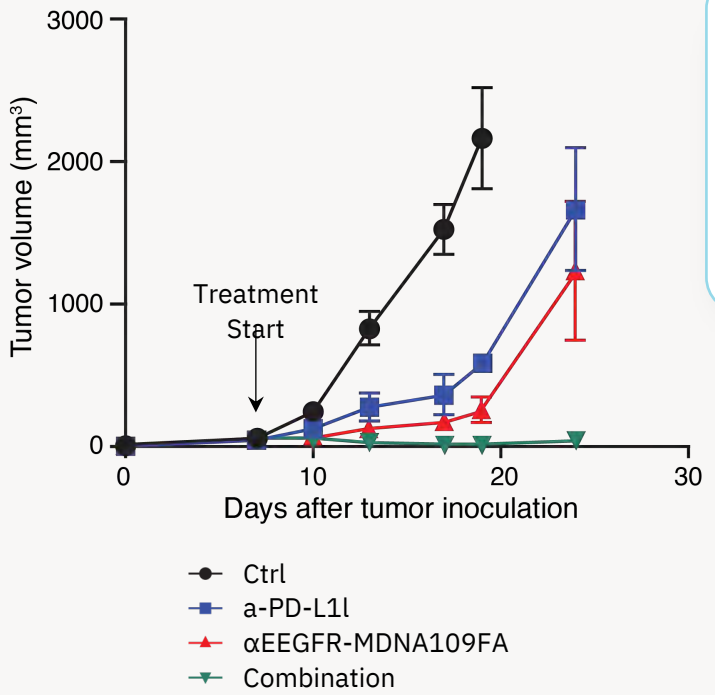
Sun et al., Nature Communications, 2019

STAb™ Overcomes Checkpoint Resistance and 'Cold' Tumors

Overcoming Checkpoint Resistance

nature COMMUNICATIONS

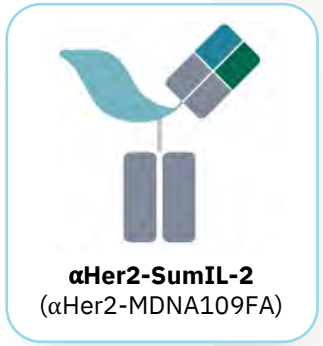
B16F10-EGFR5 Tumors



αEGFR-SumIL-2
(αEGFR-MDNA109FA)

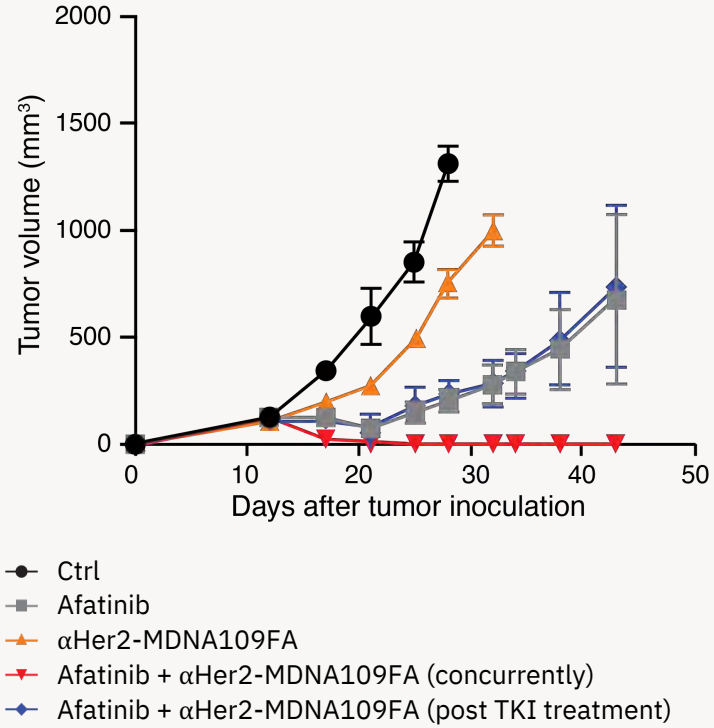
IP treated with 25 μg of αEGFR-MDNA109FA-Fc. Intratumorally treated with 50 μg of anti-PD-L1 on days 8, 11, and 14.

Synergy with TKI to Tackle Immunological 'Cold' Tumors



αHer2-SumIL-2
(αHer2-MDNA109FA)

TUBO Tumors (overexpress Her2)

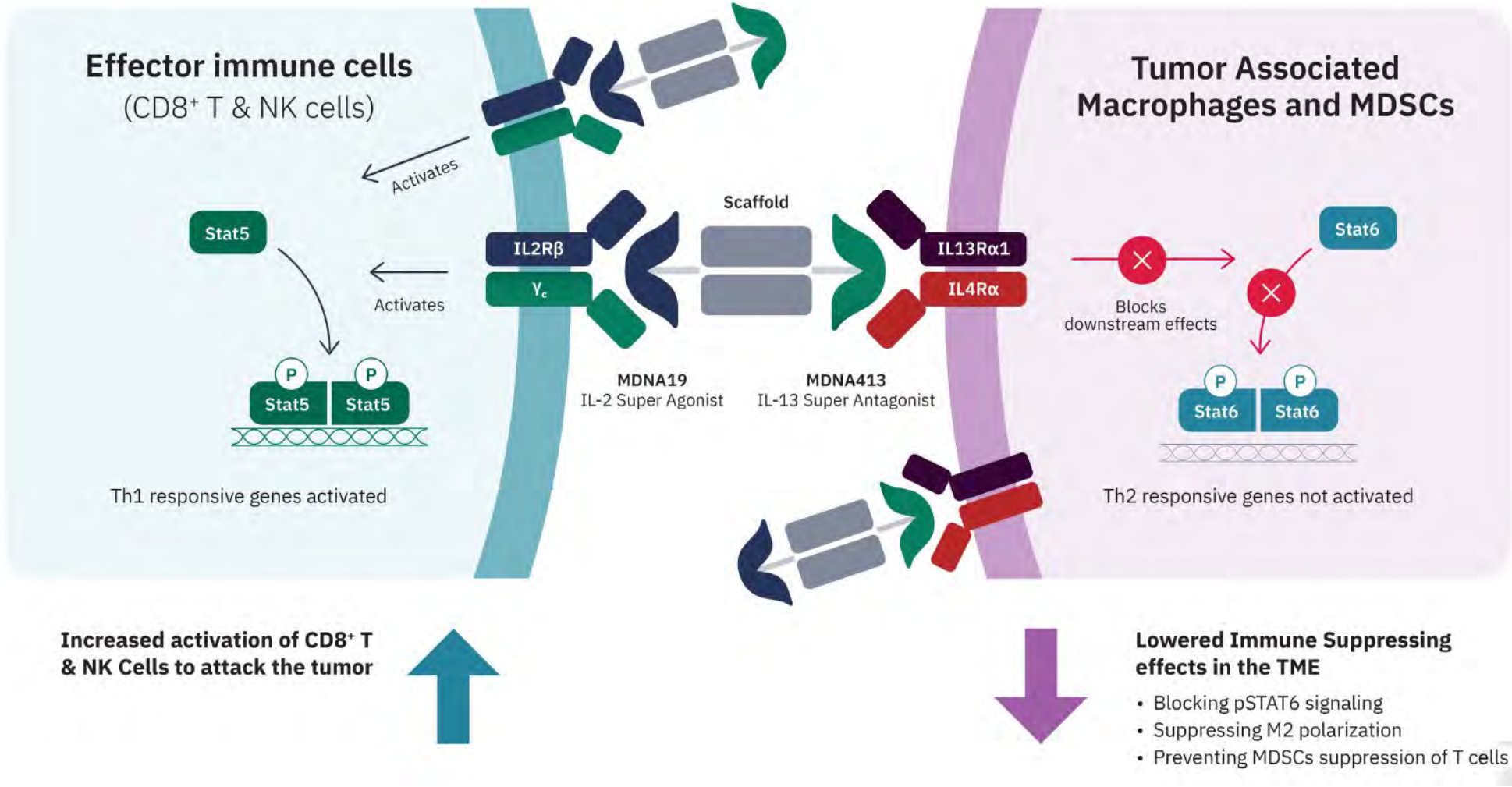


IP treated with 20 μg of anti-αHer2-MDNA109FA on either days 12, 15, and 18 or days 25, 28, and 31. Orally with 1 mg of Afatinib on days 12 and 17.

Sun et al., Nature Communications, 2019

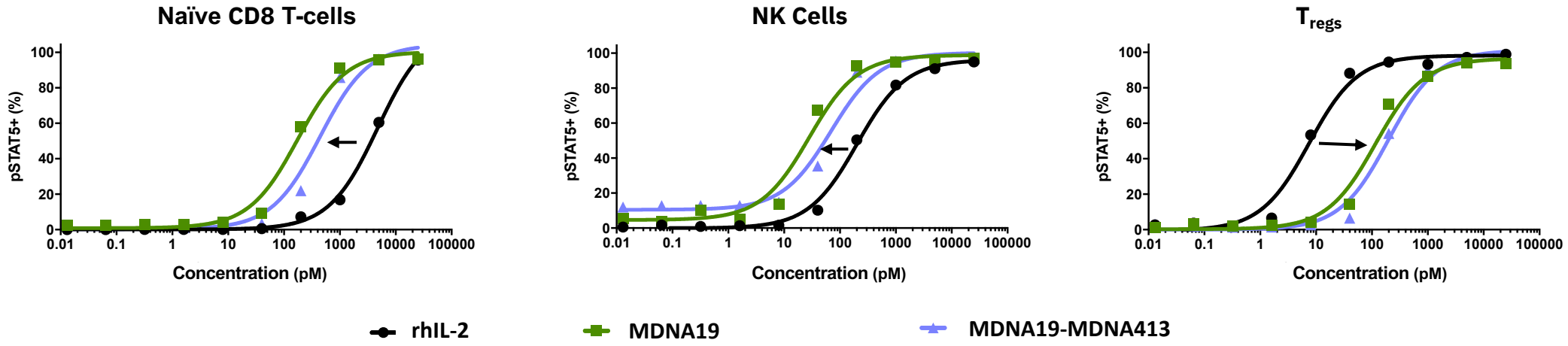
Dual Specific Cytokine (DUCK Cancer™) Mechanism of Action

MDNA109FEAA-Fc-MDNA413



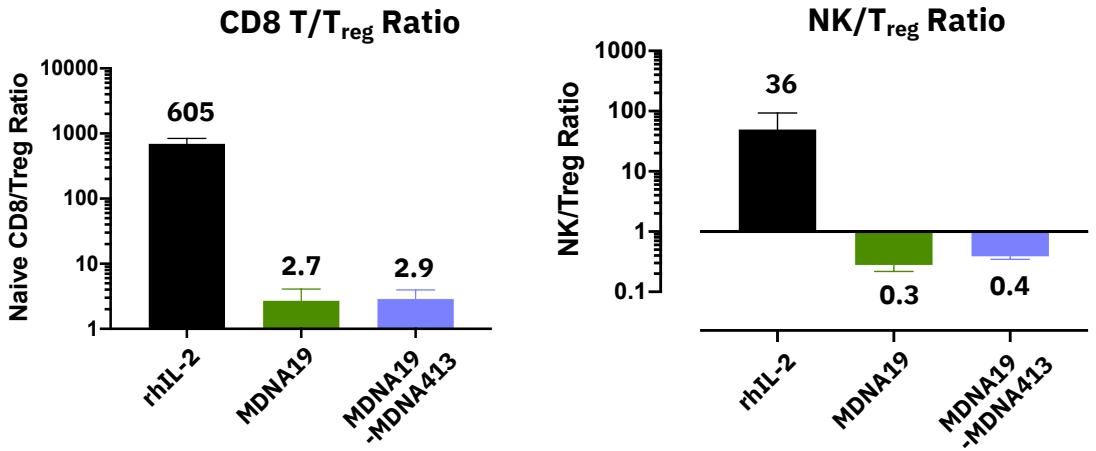
Bi-Specific Superkine

Enhanced signaling in CD8⁺ T and NK cells; diminished signaling in T_{regs} IL-2 Agonism maintained



P-STAT5 (EC_{50}, pM)	rhIL-2	MDNA19	MDNA19-MDNA413
Naïve CD8⁺ T cells	3389.5	370.6	575.8
NK cells	201.5	71.0	80.1
T_{regs}	5.6	135.5	210.3

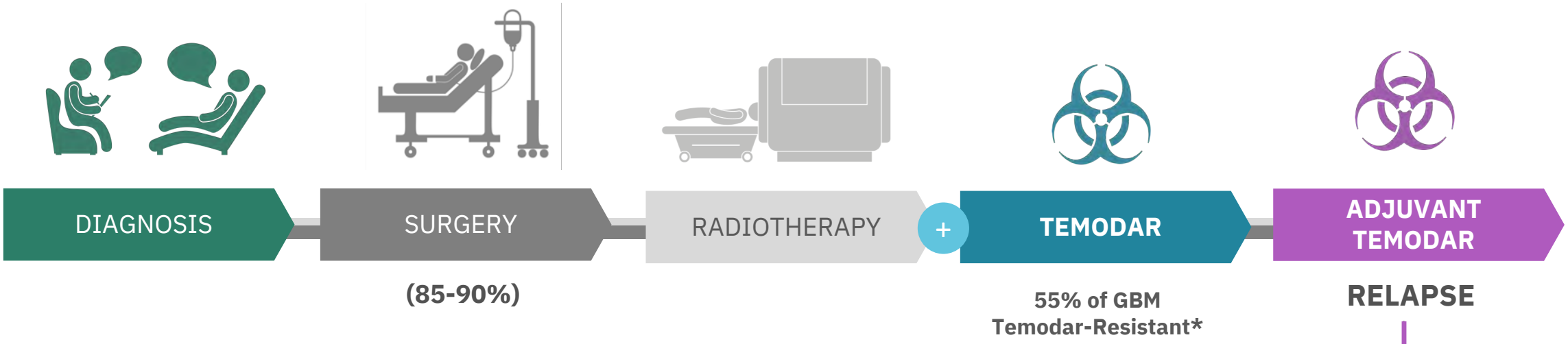
Studies in human PBMC



MDNA55

A Powerful Molecular Trojan Horse Targeting Glioblastoma

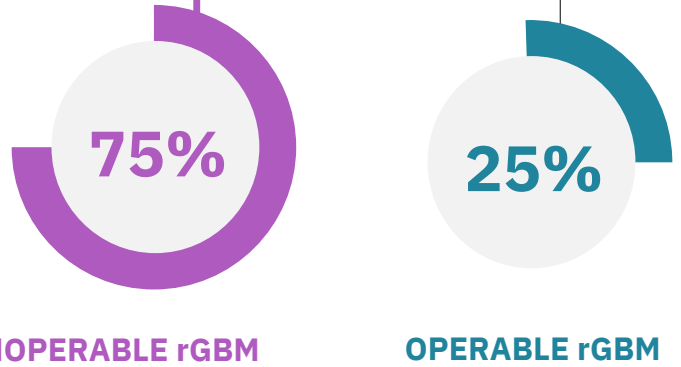
Current Treatment Strategies for GBM are Ineffective



Glioblastoma (GBM) & IL4 Receptor

- Uniformly fatal – virtually all tumors will recur
- New treatment strategies are needed
- IL4 receptor (IL4R) is overexpressed in GBM cells and the tumor microenvironment making it a promising target for GBM treatments

MDNA55 Treatment
Direct infusion into tumor
via convection enhanced delivery (CED)



* Expression of the DNA repair protein O6-methylguanine-DNA methyltransferase (MGMT) is responsible for resistance to Temodar used in GBM treatment.

MDNA55: A Targeted Immunotherapy for GBM

MDNA55

Targets the IL4R, which is expressed in brain tumors and in the tumor microenvironment (TME), but not the healthy brain

Highly Selective

Avoids off-target toxicity

Disrupts the TME

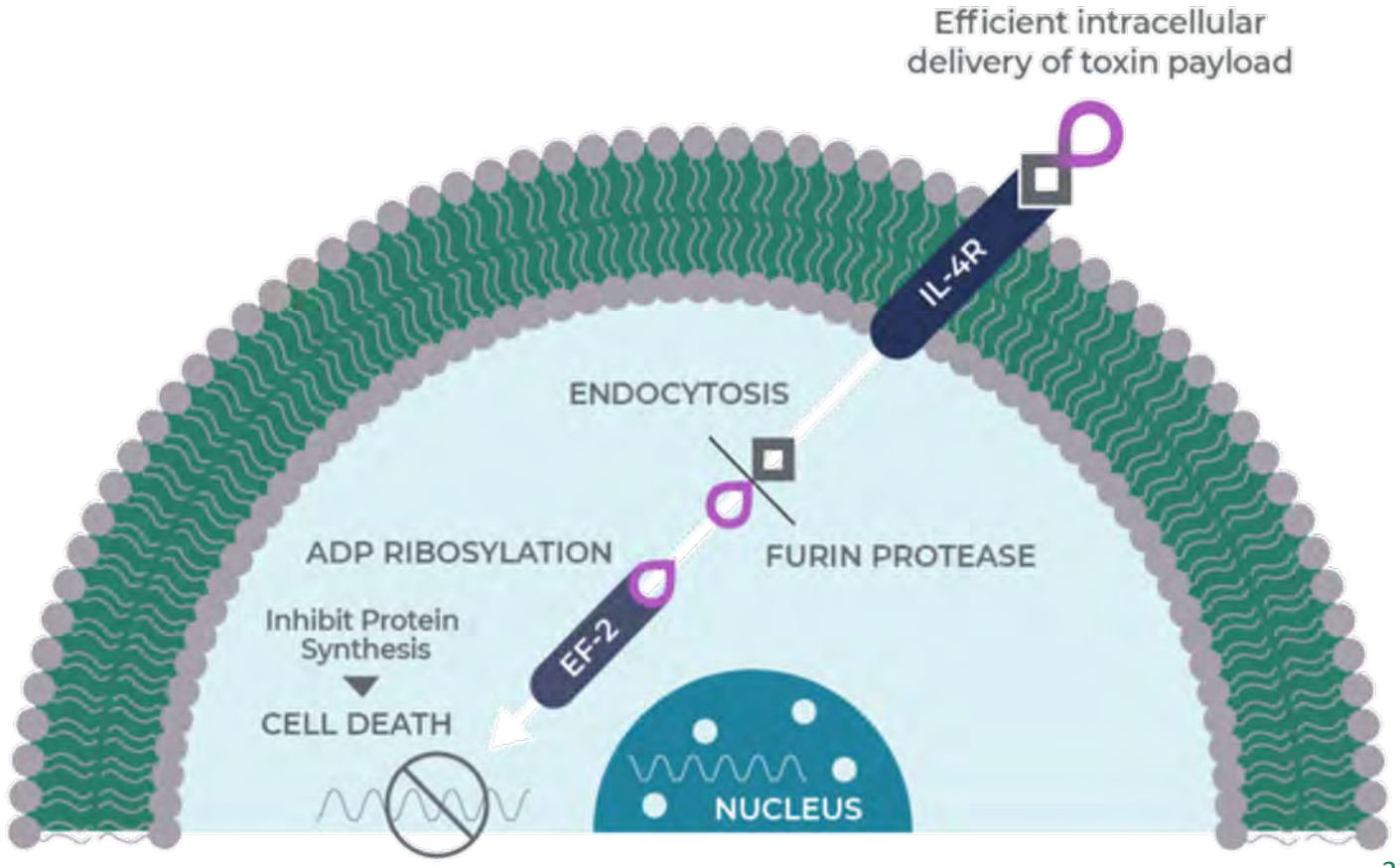
By targeting IL4R positive cells found throughout the TME, MDNA55 unblinds the tumor to the body's immune system

Sustained Immune Memory Response

Anti-tumor immunity is initiated and remains active after MDNA55 is cleared

Targeting Domain
Circularly Permuted Interleukin-4 (cpIL-4)

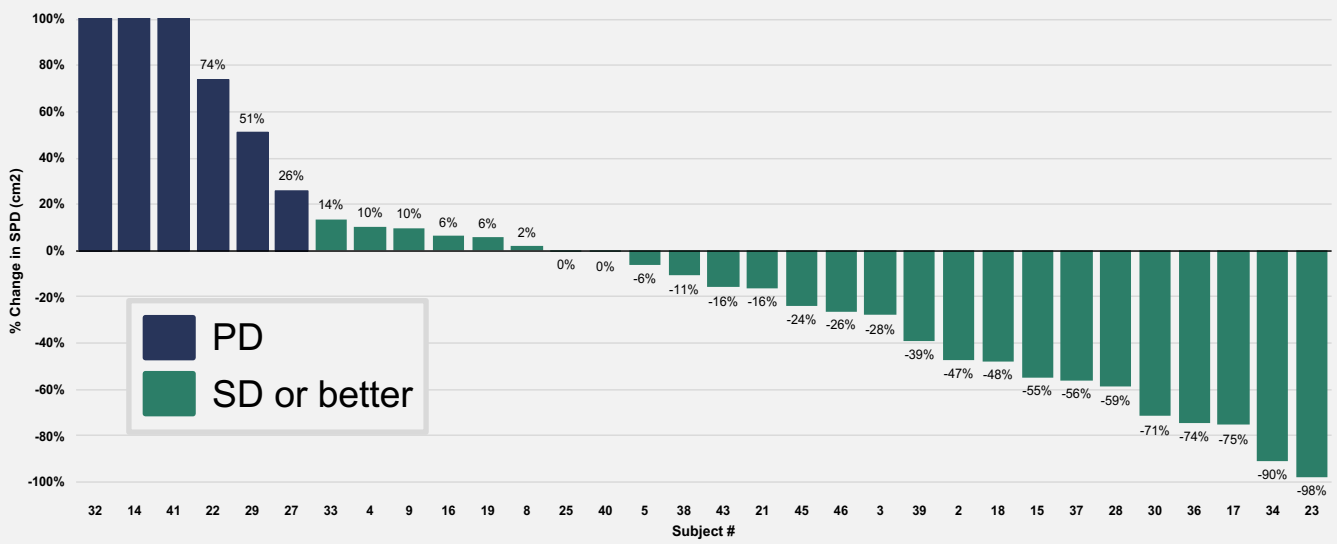
Lethal Payload
Catalytic domain of *Pseudomonas* Exotoxin A (FDA approved Moxetumomab pasudotox)



Improved Tumor Control Rate & Survival in Proposed Population

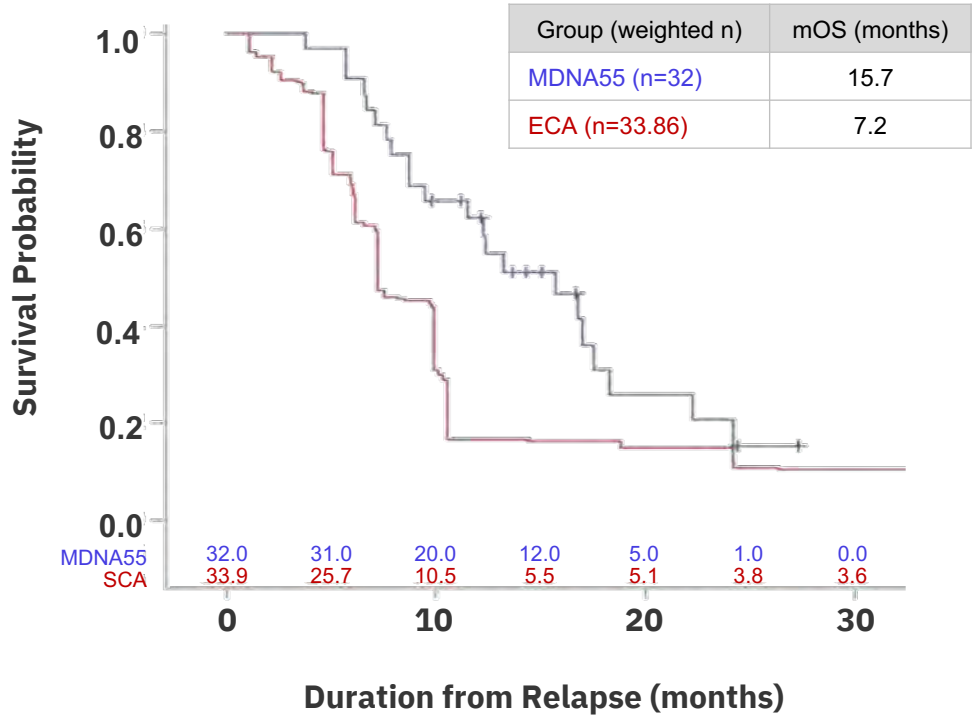
A Proposed Population comprised of all IL4R High (irrespective of dose) as well as IL4R Low subjects receiving the high dose showed over 100% improvement in survival when compared to an External Control Arm (ECA)

Best Response per Modified RANO (following initial PsP)



Shown is tumor response from nadir based on radiologic assessments only

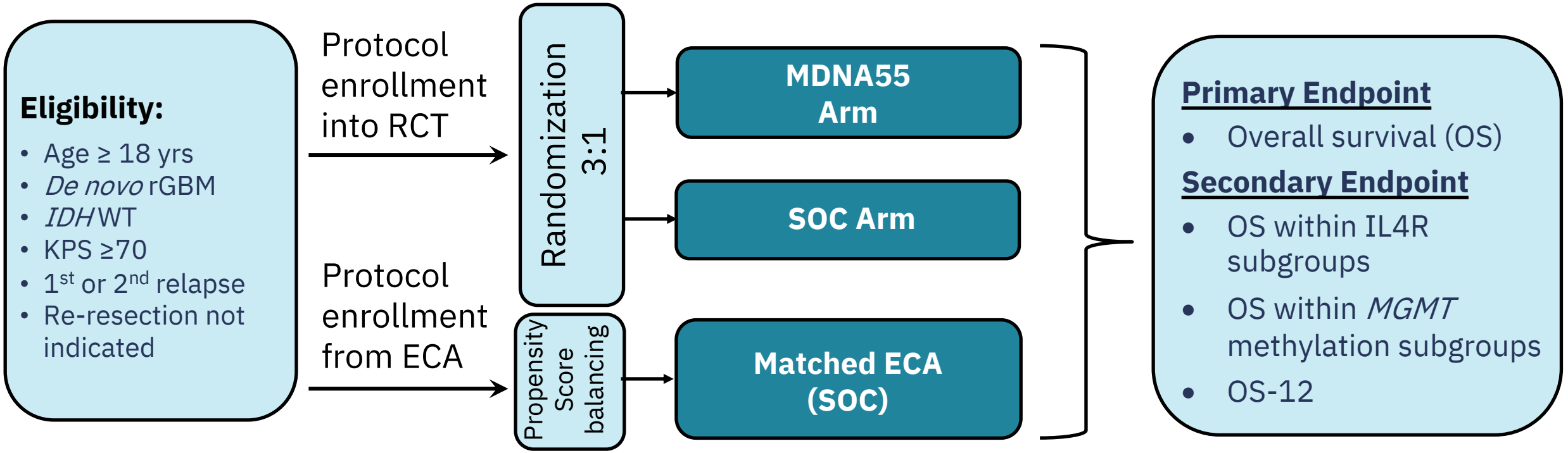
Tumor Control Rate = 81% (26/32)



Group (weighted n)	mOS (months)
MDNA55 (n=32)	15.7
ECA (n=33.86)	7.2

Planned Phase 3 Trial

Pioneered a Hybrid Design Using External Control



Company Overview

Evolutionary Cytokines, Revolutionary Medicines

Medicenna is a clinical stage immunotherapy company that uses directed evolution to generate engineered interleukins called Superkines that can modulate, fine-tune or amplify the immune system in order to combat the most challenging diseases and inspire hope in patients with unmet needs

Nasdaq	**MDNA**
TSX	**MDNA**
Headquarters	**Toronto, CA**
Cash	**CDN $40.4 million ****
Debt	**$0**
Preferred Shares	**0**
Issued and Outstanding	**53,551,555***
Fully Diluted	**62,073,786***

*As of May 27, 2021
**As of March 31, 2021

Thank you

Fahar Merchant, PhD
President and CEO

Elizabeth Williams
Chief Financial Officer

MEDICENNA