



Leader in Targeted Protein Modulation

# Targeting a Novel E3 Ligase with a Small Molecule Inhibitor

**NX-1607: A first-in-class CBL-B inhibitor in the clinic**

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Discovery on Target

Boston

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# Nurix Drugs Engage Ligases for the Treatment of Cancer

Targeted Protein Modulation:  $TPM = TPD + TPE$

CBL-B Inhibitor  
NX-1607  
Targeted Protein  
Elevation  
(TPE)

A Powerful  
Cellular System



Harness ligases  
to decrease  
specific protein levels

Inhibit ligases  
to increase  
specific protein levels

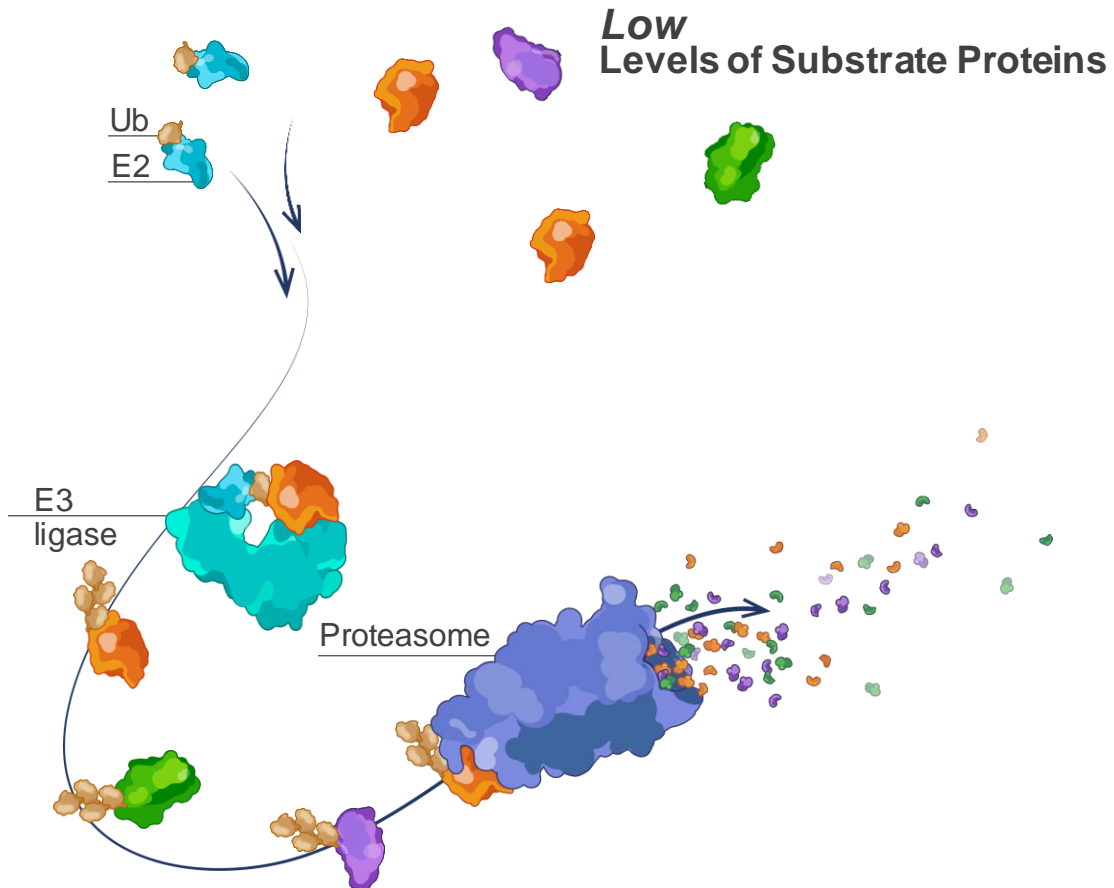
Targeted Protein  
Degradation  
(TPD)  
BTK degraders

Ubiquitin is ligated to  
target proteins to tag  
them for degradation by  
the proteasome

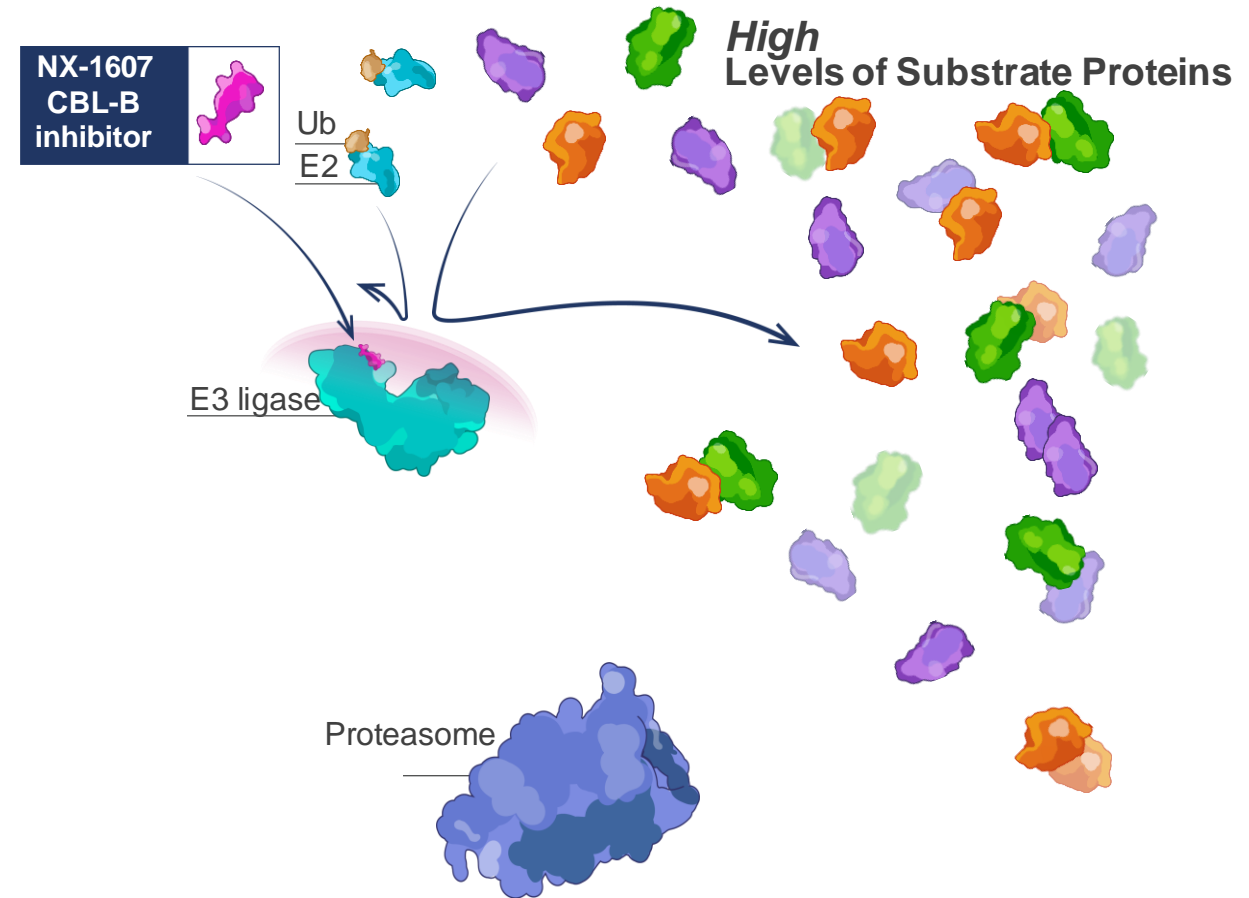
# Targeted Protein Elevation

## The Journey of CBL-B Inhibitor Discovery

CBL-B is an E3 ligase that restrains the levels of substrate proteins necessary for optimal anticancer response



CBL-B inhibition leads to elevated levels of substrate proteins which can restore cancer immunity



# A CBL-B Inhibitor Could Revolutionize Cancer Treatment

The ultimate goal of cancer immunotherapy is to generate a coordinated immune system response against cancer associated antigens

Immune checkpoint agents such as anti-PD-1/PD-L1 have demonstrated impressive long-lasting responses in only a subset of patients

Resistance mechanisms prevent most patients from responding:

---> Low antigen presenting cells and NK cells within the tumor

---> Tumor microenvironment not permissive to T cell trafficking in the tumor

---> Excessive T cell exhaustion from chronic antigen stimulation

---> Downregulation of MHC Class I

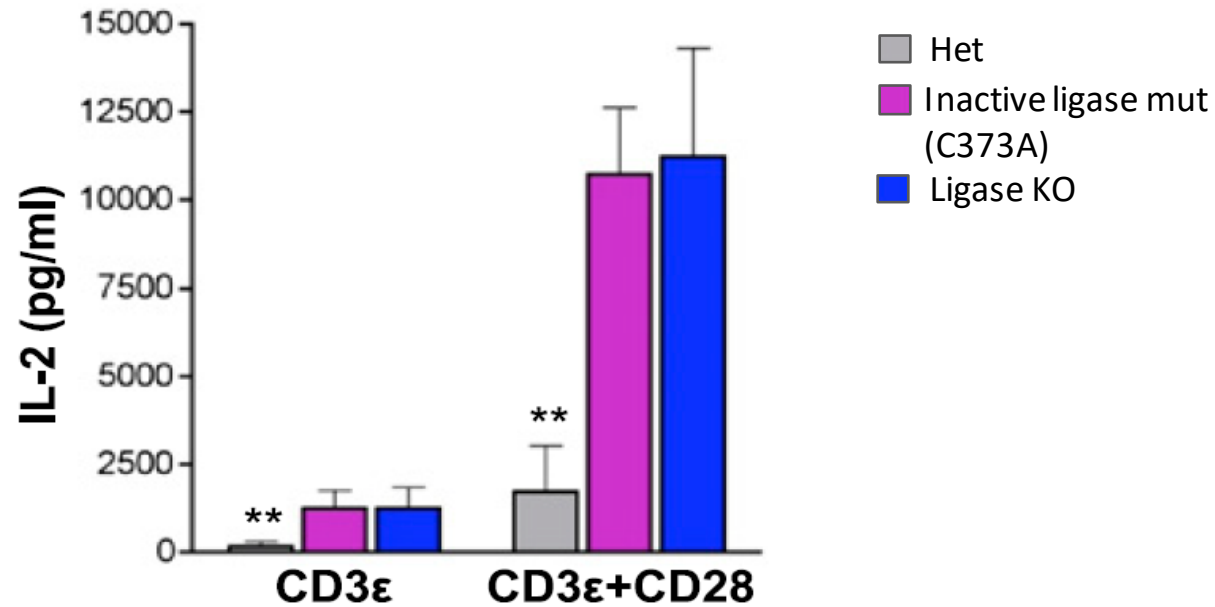
CBL-B inhibitors are optimal next generation IO agents: act on multiple immune cells, addressing multiple resistance mechanisms



# CBL-B is a Master Orchestrator of Immune Cell Activation

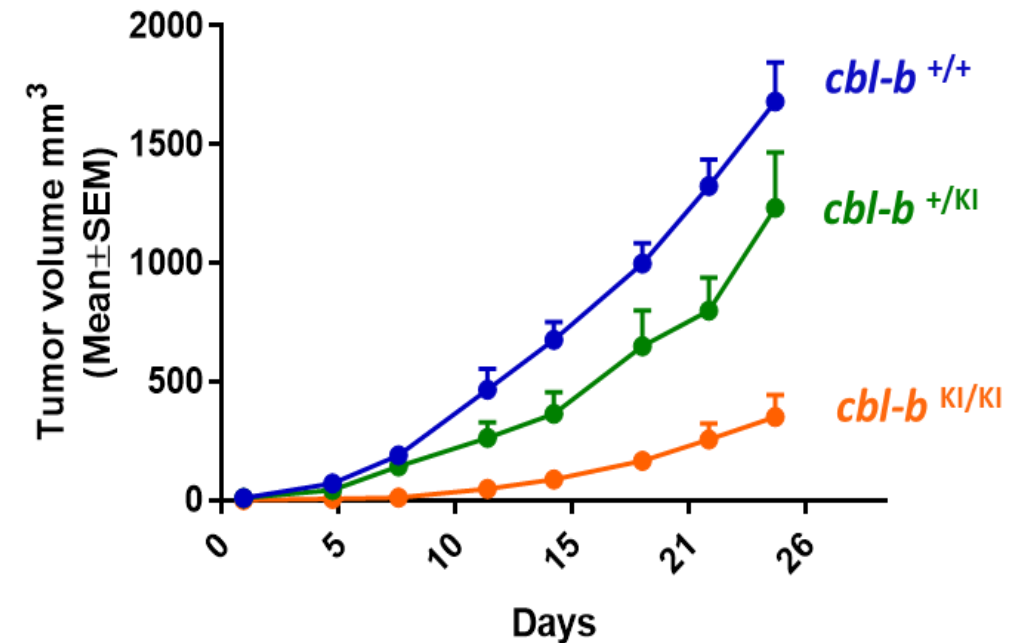
Loss of CBL-B ligase activity results in hyperactive T cells that can reject tumors

IL-2 secretion in KO and ligase inactive T cells *ex vivo*



Ligase-dead or KO exhibit enhanced and equivalent response to either single- or double stimulation

Ligase-inactive *cbl-b* knock-in mice inhibit tumor growth (TC-1 syngeneic model)



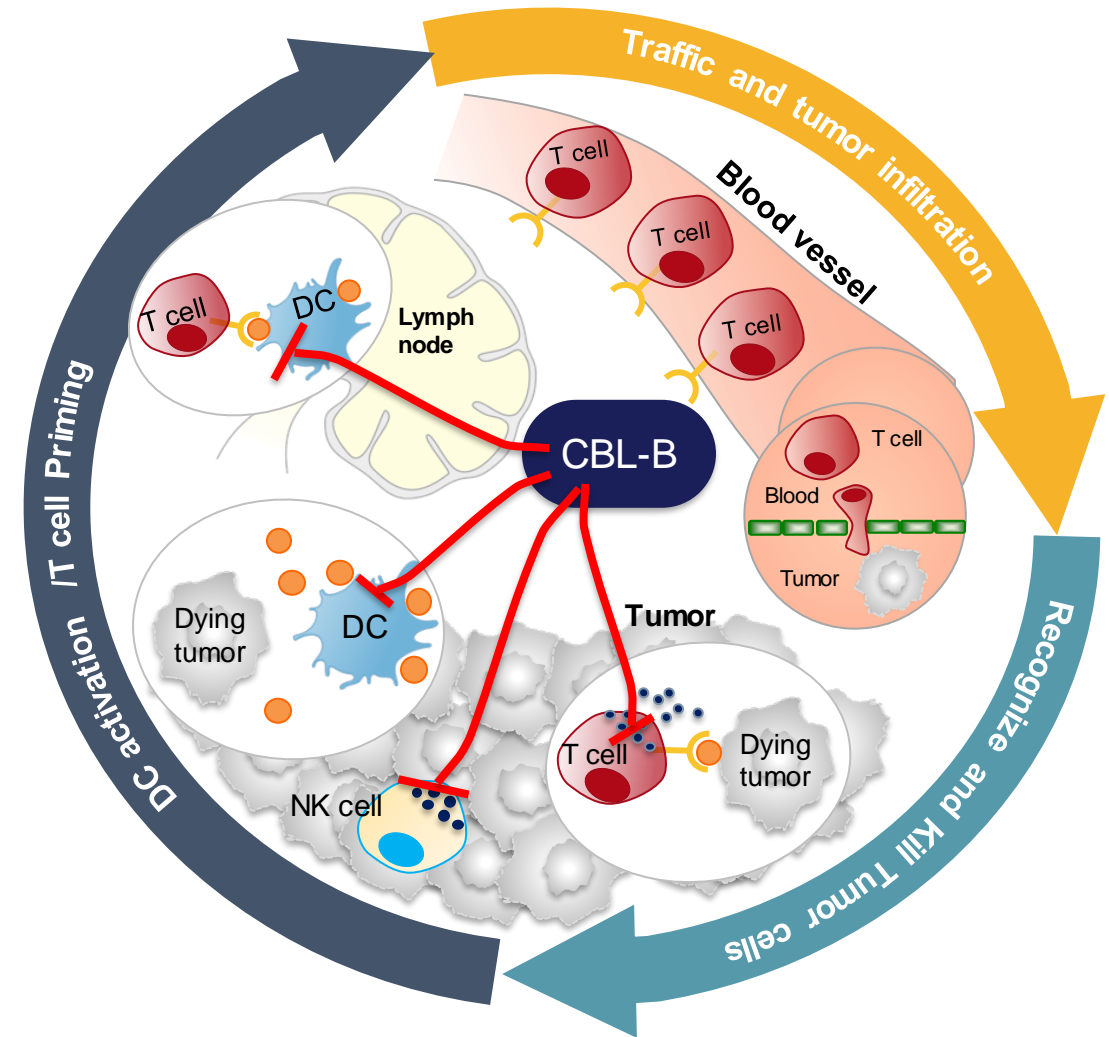
# Targeting CBL-B Enhances Antitumor Response

## A Master Orchestrator of the Immune System

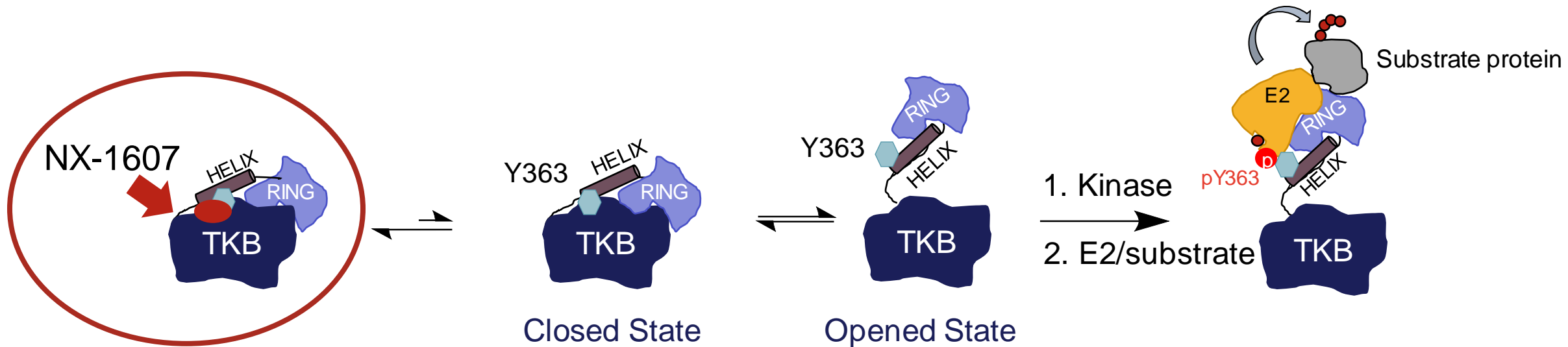
CBL-B is an E3 ubiquitin ligase that strongly restrains a productive anti-tumor response

NX-1607, a CBL-B inhibitor, acts as an intramolecular glue & increases:

- DC and NK infiltration and function
- T cell priming
- Cytotoxic T cells function
- Ability of T cells to resist tumor immunosuppressive mechanisms: Treg, MDSC, and TGF- $\beta$



# NX-1607 Mechanism of Action: Intramolecular Glue



NX-1607 acts as an intramolecular glue forcing CBL-B in its folded **INACTIVE** state

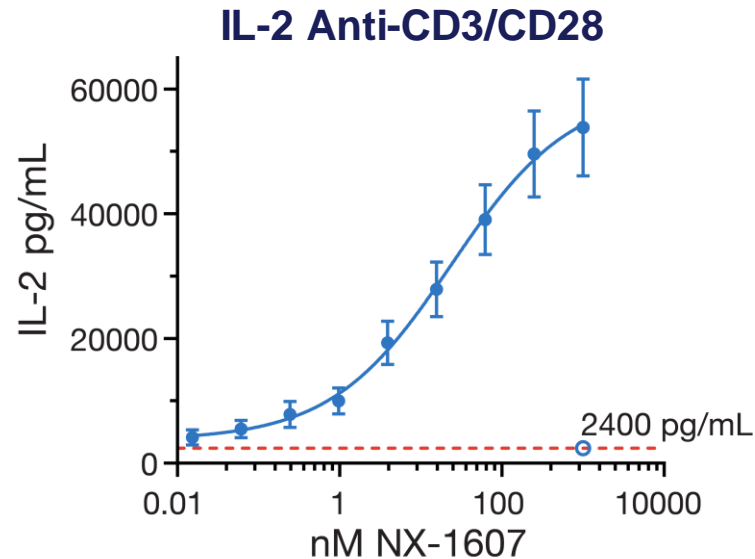
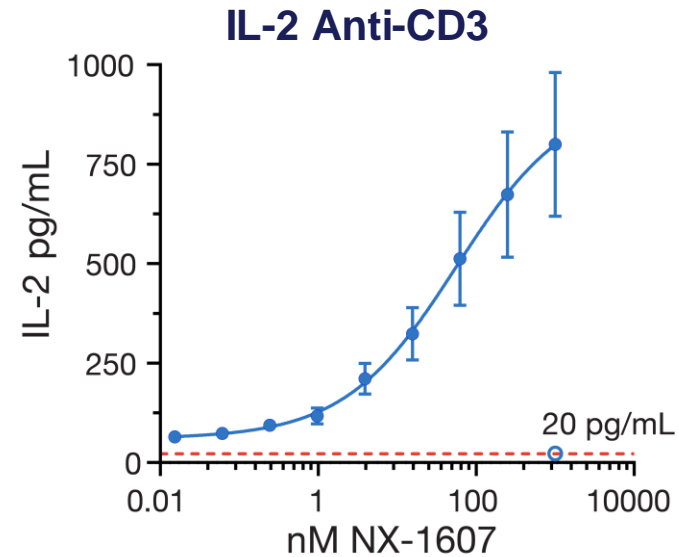
Leading to Enhanced Immune Response

Phosphorylation locks CBL-B in the **ACTIVE** Conformation

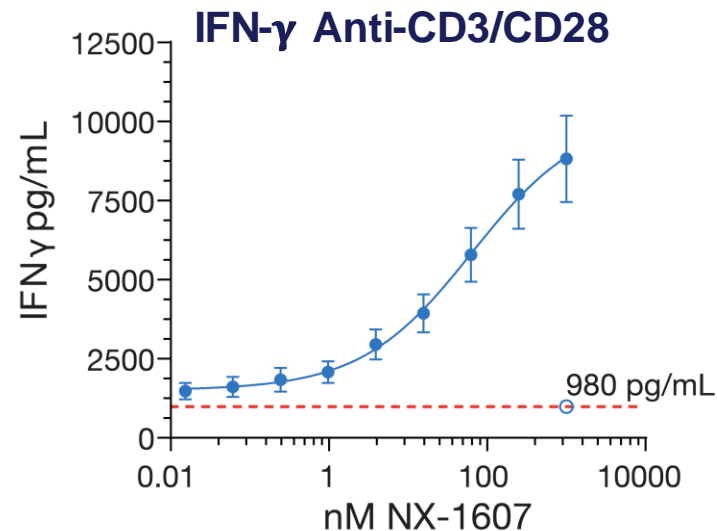
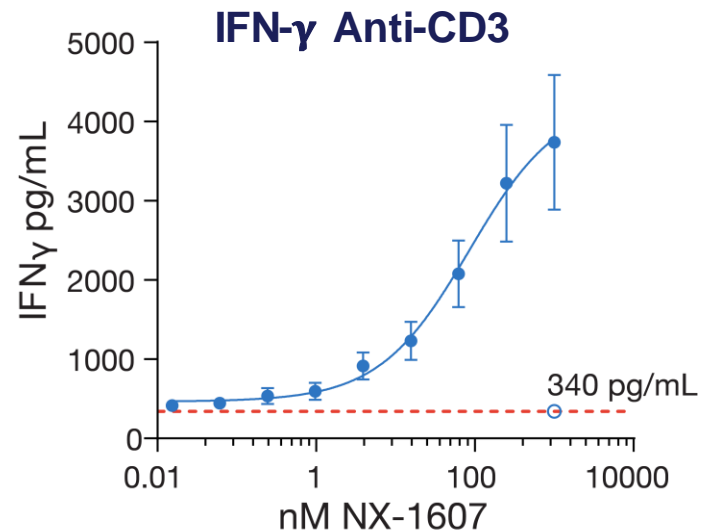
Decreased Immune Response



# NX-1607 Increases IL-2 and IFN- $\gamma$ Secretion in TCR Stimulated Primary Human T cells



NX-1607 increases TCR stimulation-dependent production of IL-2 and IFN- $\gamma$  in primary human T cells

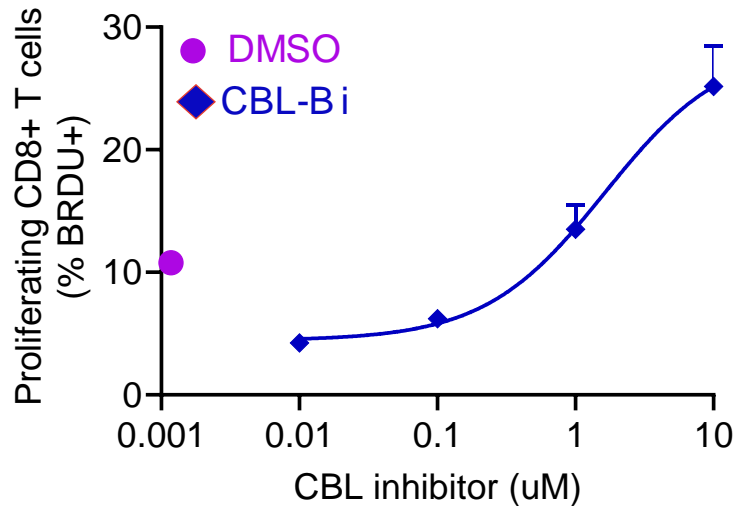


NX-1607 has no impact in the absence of T cell stimulation as measured by proliferation, activation, or cytokine release

● Cytokine Response  
○ Baseline Response

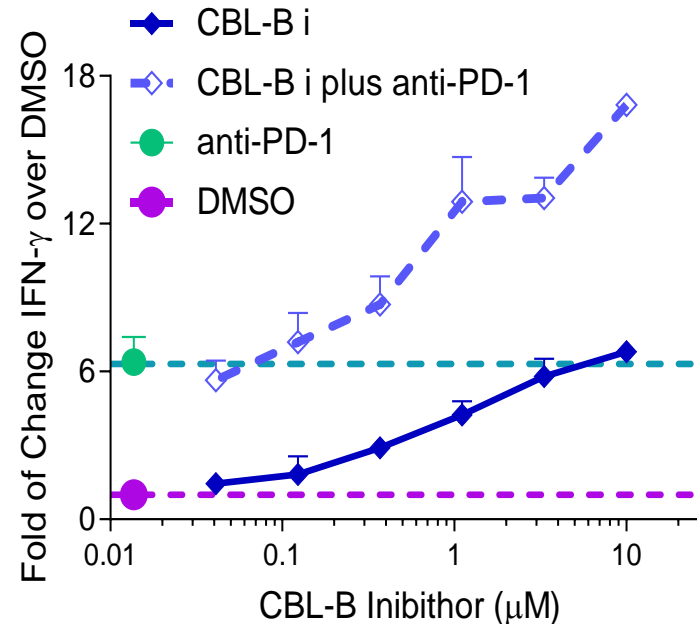
# CBL-B Inhibition Enhances T Cell Proliferation and Function

## CBL-B inhibition enhances antigen recall



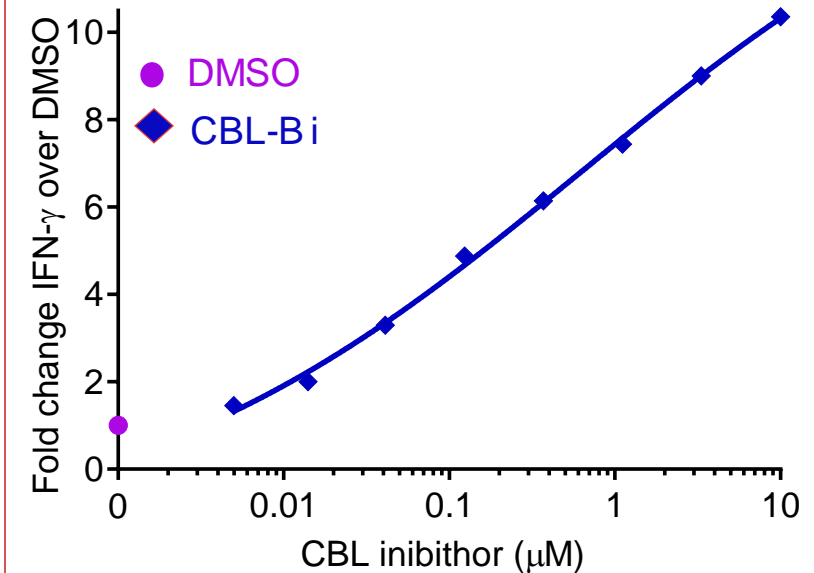
Human PBMC stimulated with CMV antigen for 120 hr in presence or absence of CBL inhibitor

## CBL-B inhibition enhances exhausted T cell function



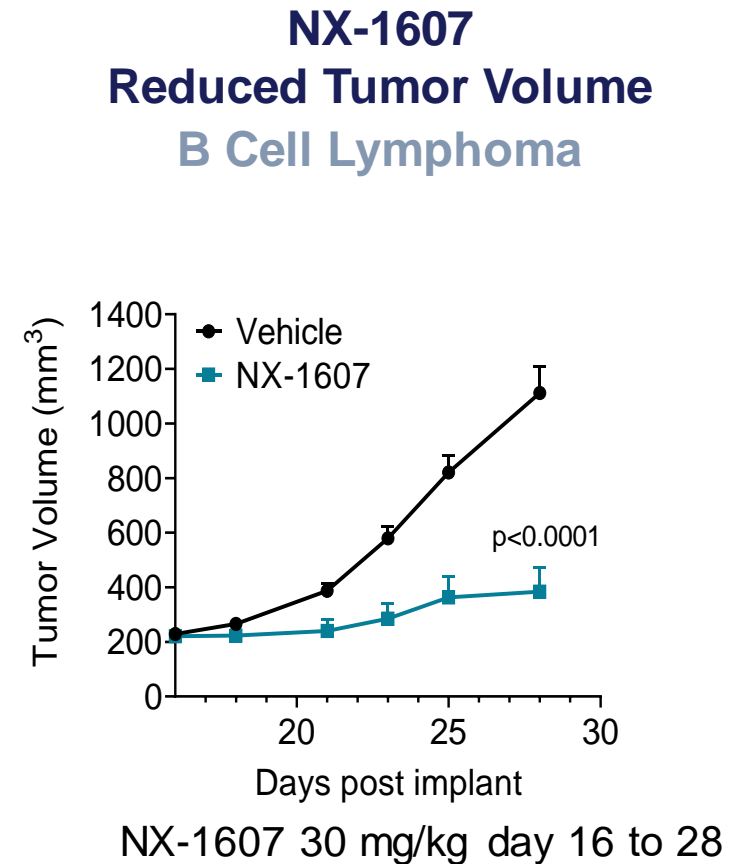
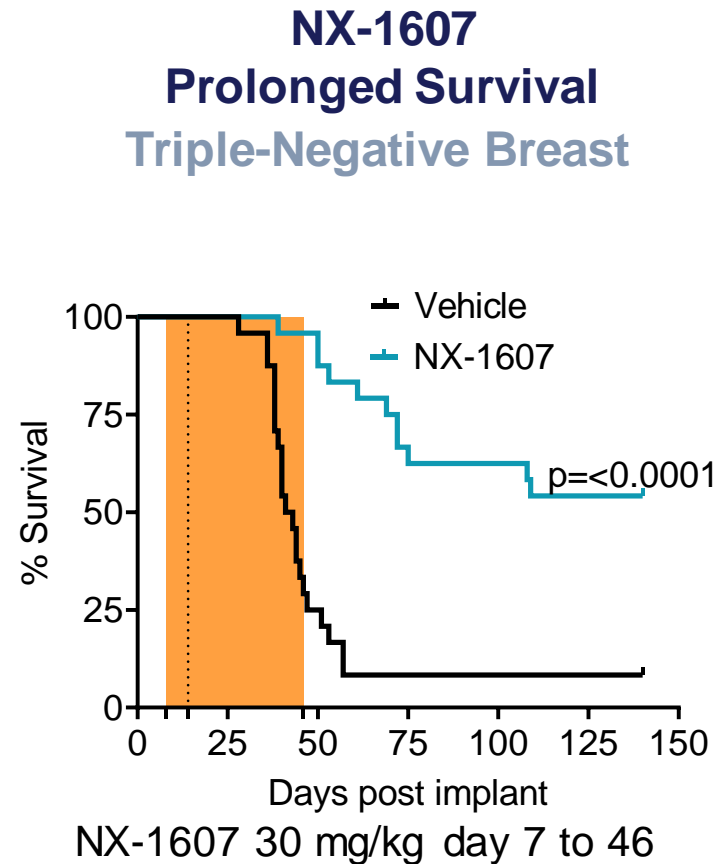
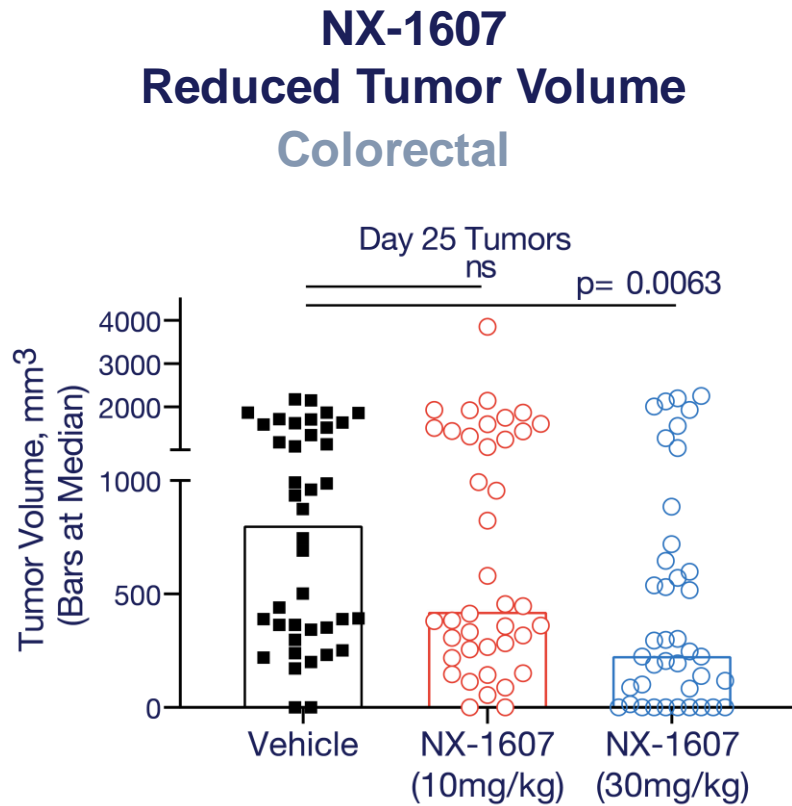
Human exhausted T cells were restimulated in presence of CBL-Bi or anti-PD-1 or a combination of the two.

## CBL-B inhibition enhances anergic T cell function



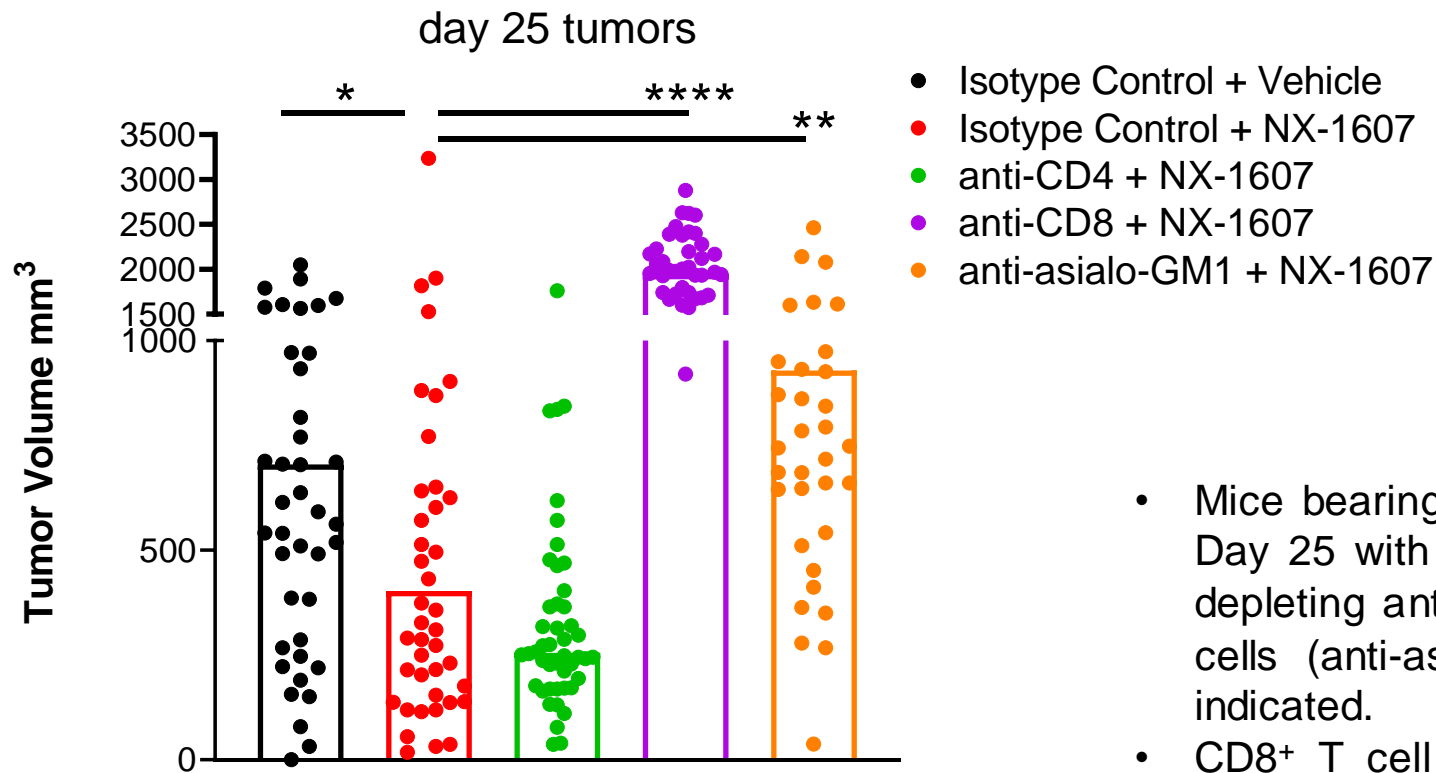
Anergic human T cells were restimulated with CD3/CD28 for 48 hr in presence or absence of CBL inhibitor

# Single-Agent NX-1607 Induces Antitumor Response in Multiple Models



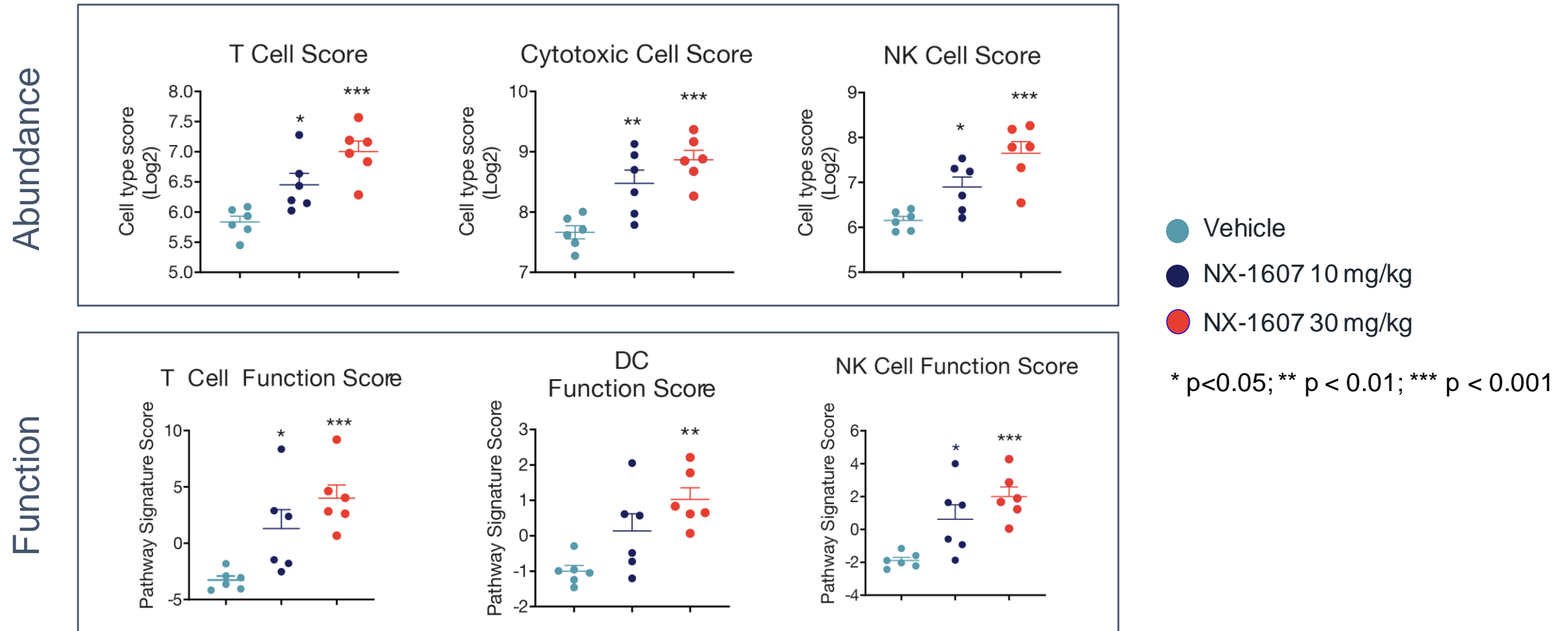
Shaded area indicates dosing period

# NX-1607 Antitumor Efficacy is Abrogated by CD8+ T or NK Cell Depletion



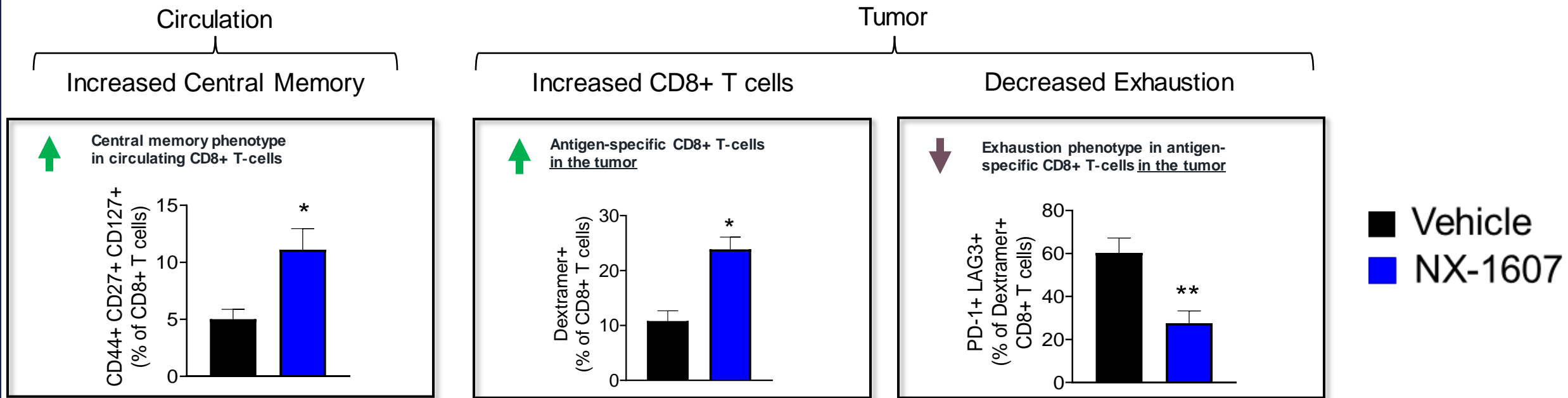
- Mice bearing CT26 tumors were treated from Day 9 to Day 25 with oral NX-1607 at 30 mg/kg in presence of depleting antibodies for CD4+ cells, CD8+ cells, or NK cells (anti-asialo-GM1). Tumor volume at Day 25 is indicated.
- CD8+ T cell or NK cell depletion abrogates NX-1607 activity.

# NX-1607 Treatment Induces Dose Dependent T and NK Cell Intratumoral Infiltration and Enhanced Function



Tumor-bearing mice treated for 18 days with NX-1607 at 10 or 30 mg/kg. Tumor microenvironment profiled using NanoString technology.

# NX-1607 Treatment Results in Immune Cell Phenotypic Changes, Both in the Tumor Microenvironment (TME) and in Peripheral Blood in Animal Models

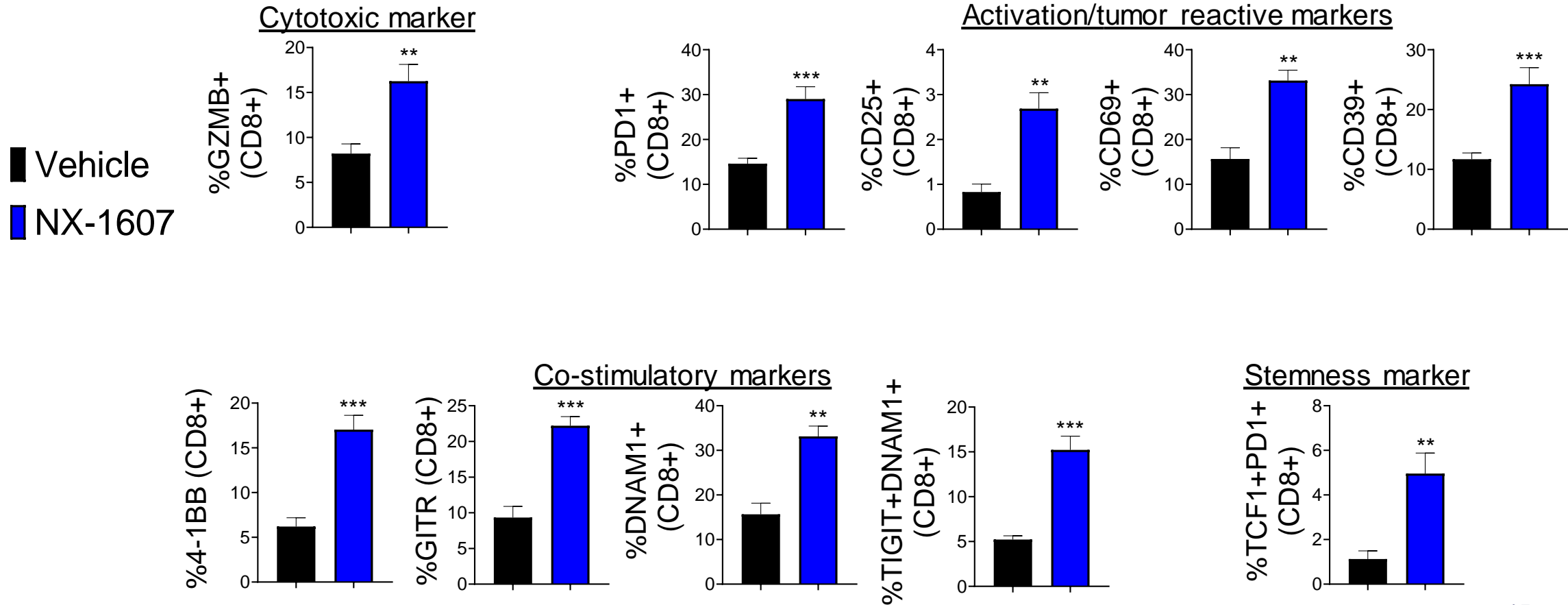


4T1 breast cancer model. ANOVA test with post-hoc Dunn's multiple comparisons test \*  $p < 0.05$ ; \*\*  $p < 0.01$

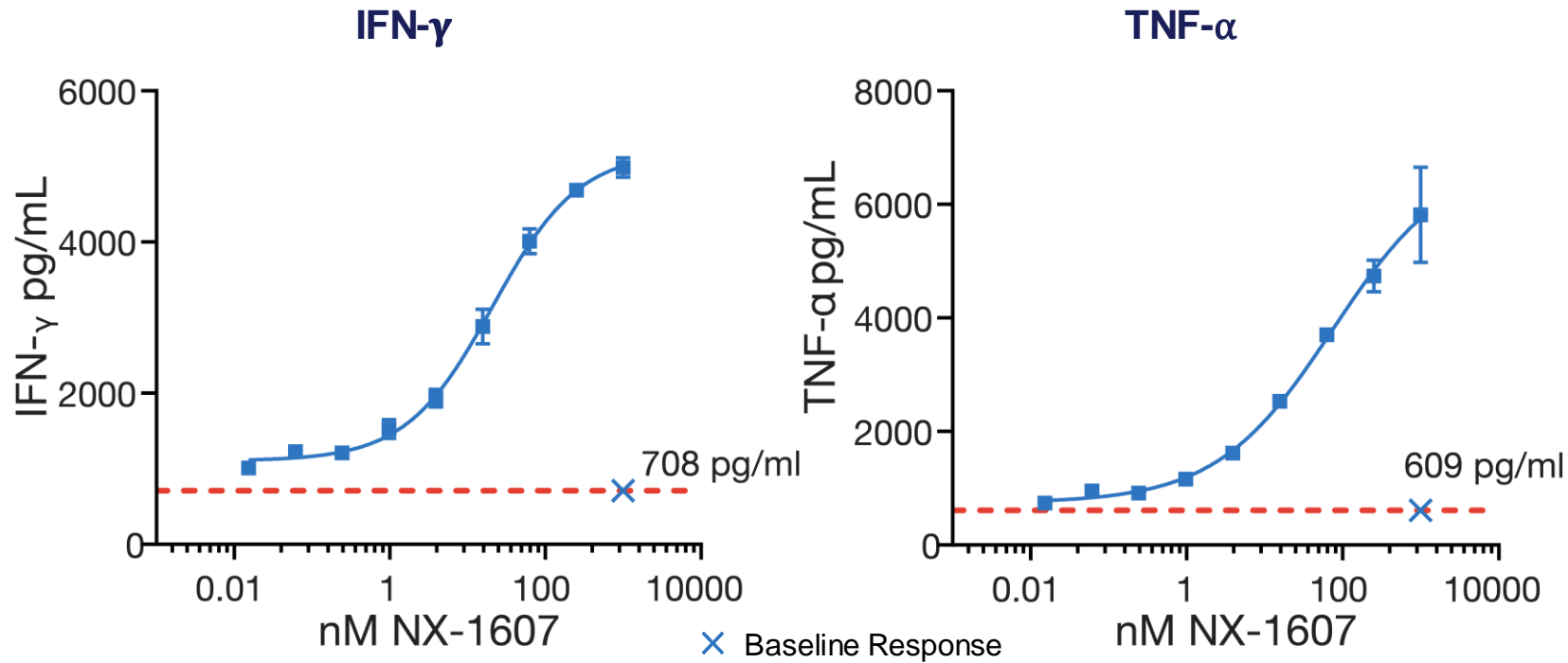


# Response to NX-1607 is Associated with Tumor CD8+ T Cell Subsets Characterized by High Expression of Cytotoxic, Activation and Co-Stimulatory Markers

## Tumor Infiltrating Lymphocyte phenotype:



# NX-1607 Increases Secretion of Pro-Inflammatory Cytokines in Human NK cells



NX-1607 increases stimulation-dependent production of IFN- $\gamma$  and TNF- $\alpha$  in primary human NK cells

NX-1607 has no impact in the absence of NK cell stimulation, as measured by cytokine release

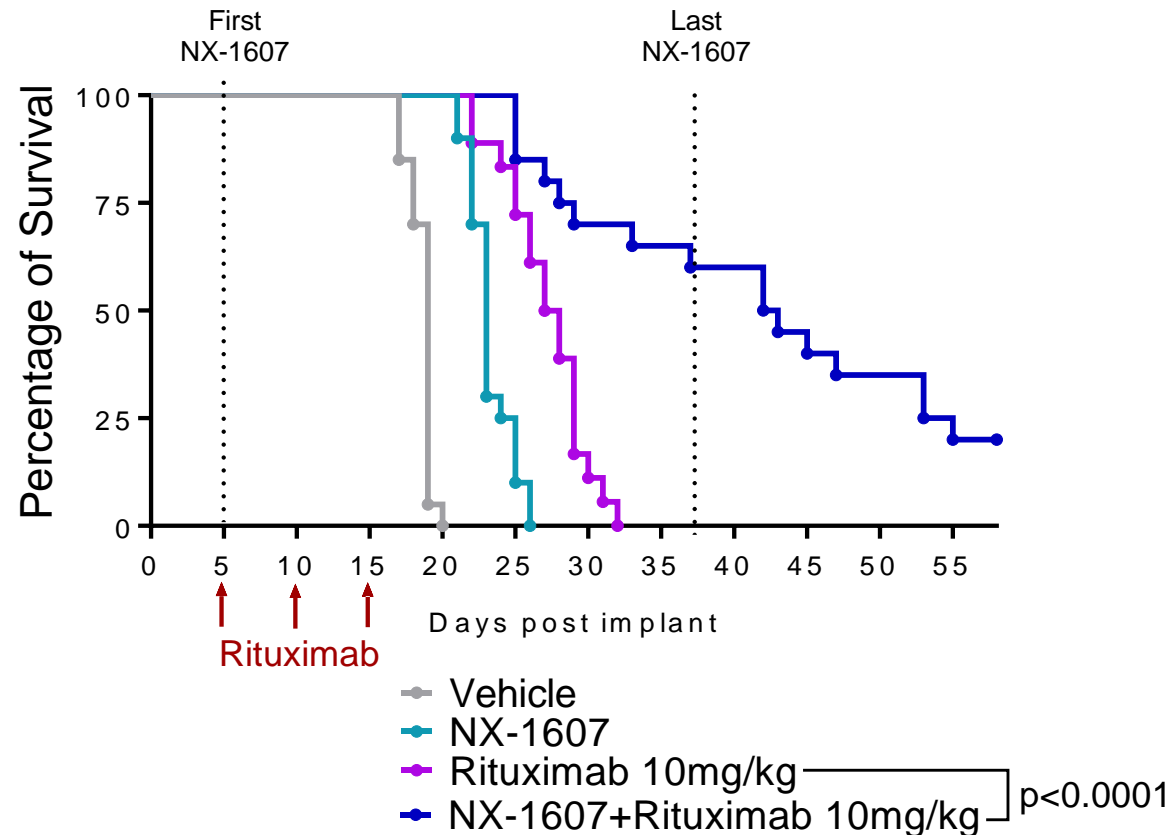
## NK K562 Killing Assay

- 1 hour compound pre-treatment prior to addition of K562s target cells
- 6 hour NK/K562 coculture

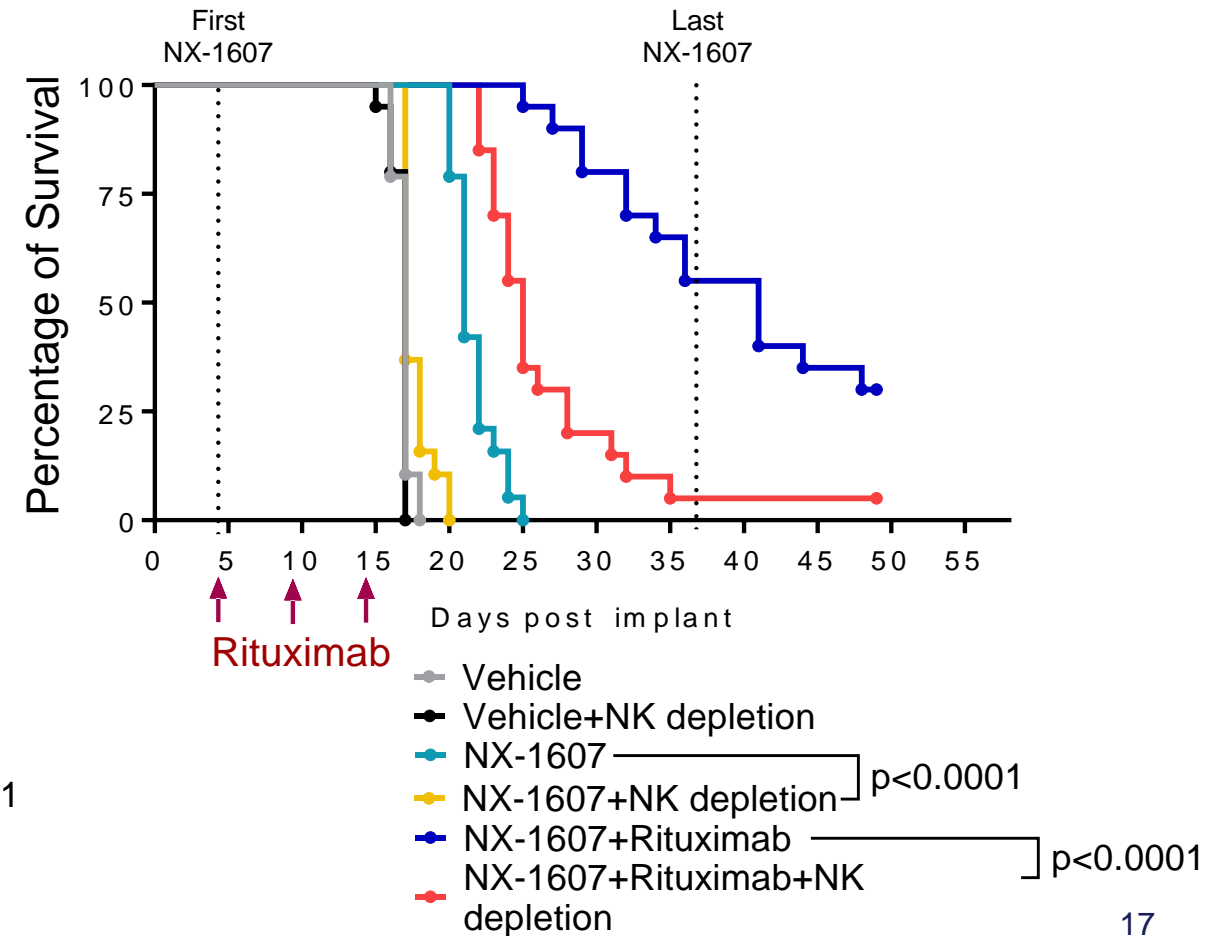
# Combination of NX-1607 and Rituximab Enhances Anti-tumor Activity in a Human NHL Animal Model

## NX-1607 Strongly Potentiates Rituximab-Directed NK Cell ADCC Against Tumor Cells

NX-1607-mediated NK activation potentiates rituximab antitumor activity



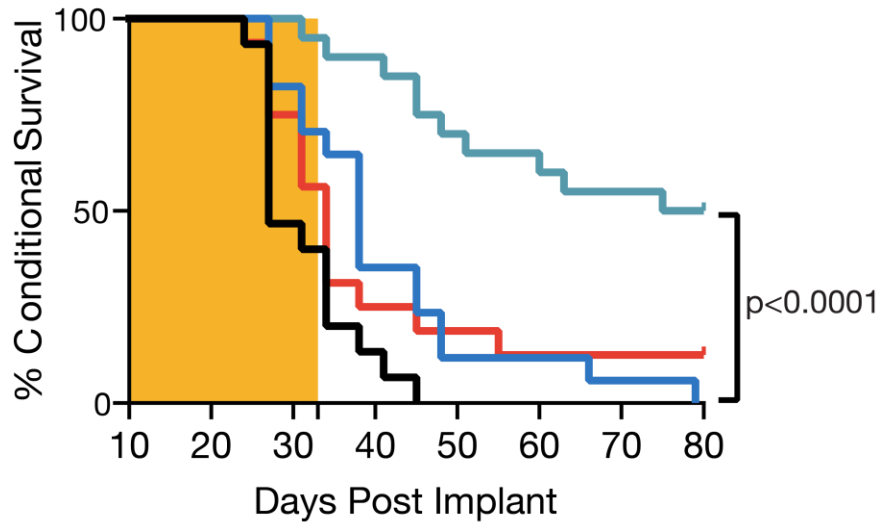
NK depletion abrogates NX-1607 and NX-1607 + Rituximab antitumor activity



# NX-1607 and Anti-PD-1 Synergize to Enhance Anti-tumor Effects and Survival of Mice in Multiple Tumor Models

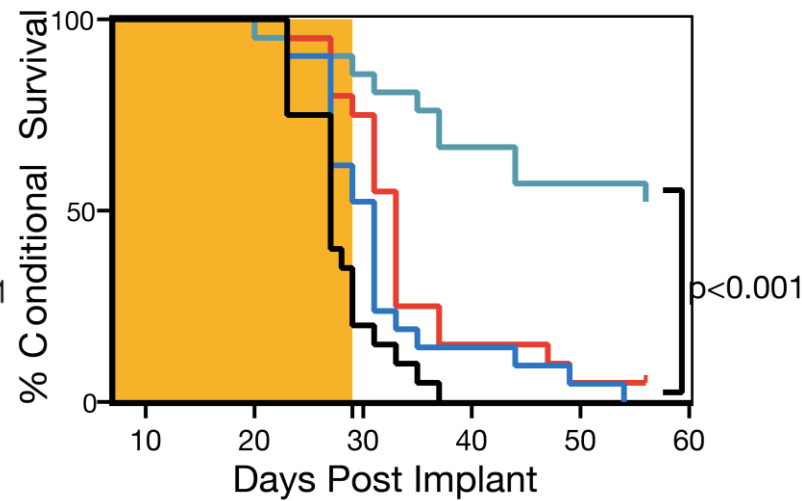
## Colorectal (CT26)

Long-Term Survival



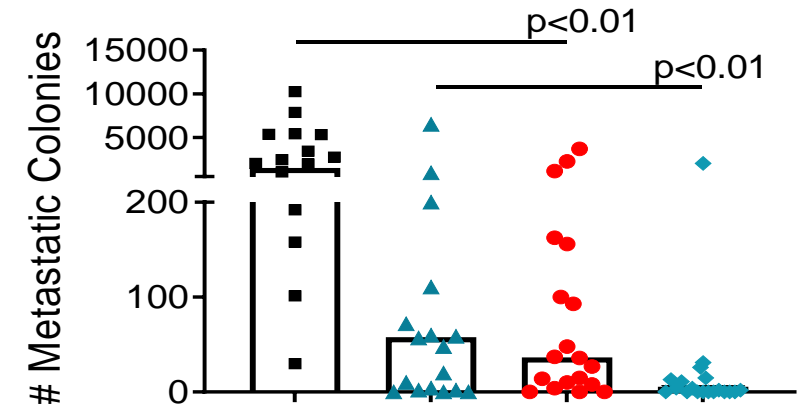
## Colorectal (MC38)

Long-Term Survival



## Triple-Negative Breast (4T1)

Day 28 4T1 Lung Metastases

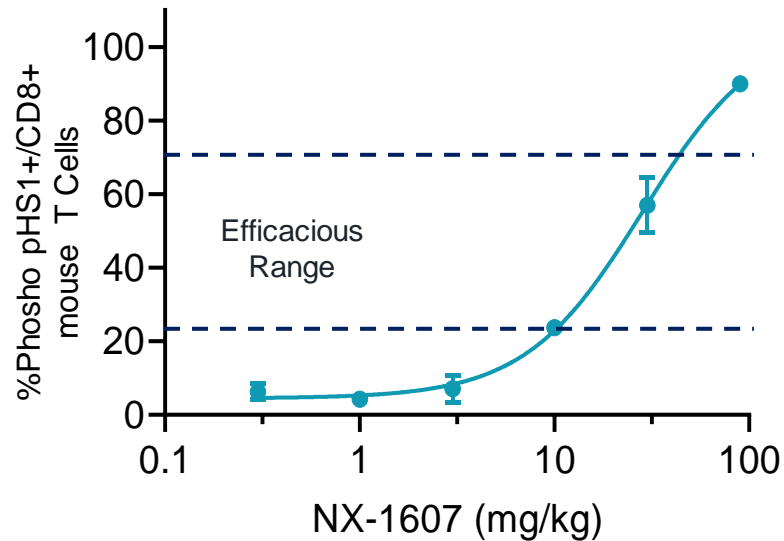


■ Vehicle ▲ NX-1607 ● anti-PD-1 ◆ NX-1607+anti-PD-1

Shaded area indicates dosing period: NX-1607 (30 mg/kg, PO daily) and anti-PD-1 twice a week at 10 mg/kg dosing period

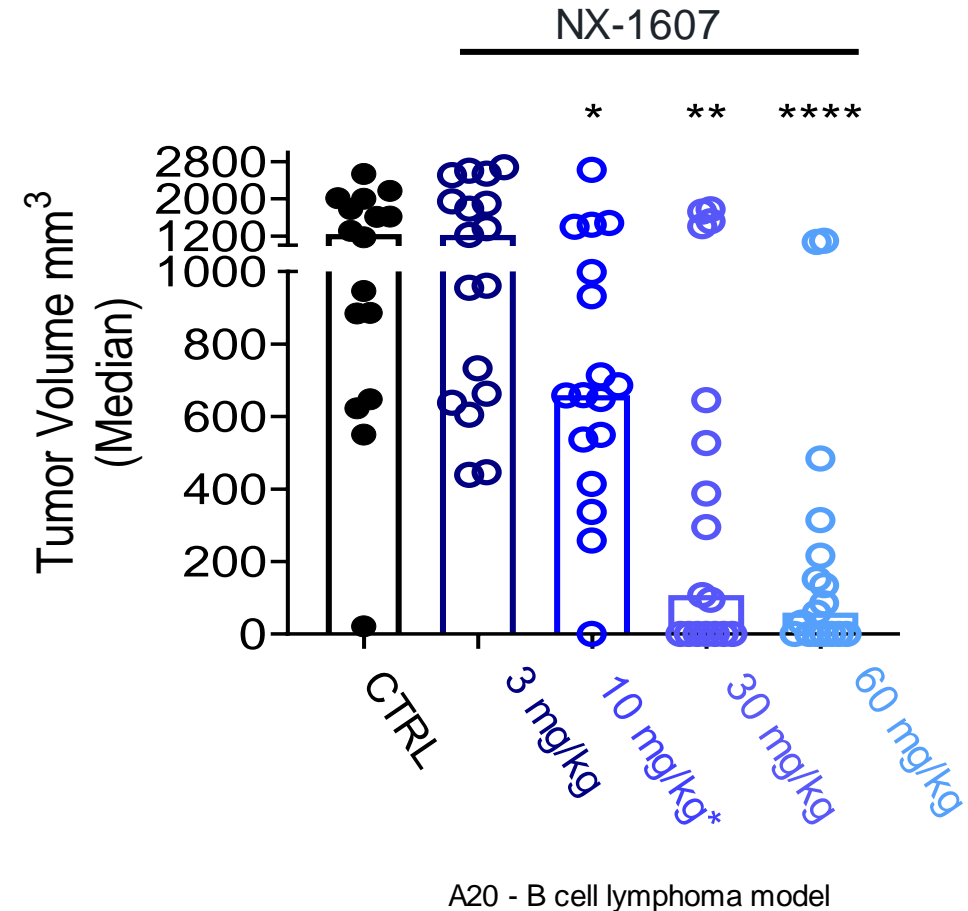
# Dose Dependent Increases of CBL-B Proximal Biomarker Correlates with Antitumor Effects of NX-1607

## Pharmacodynamic relationship in mice following NX-1607 dosing



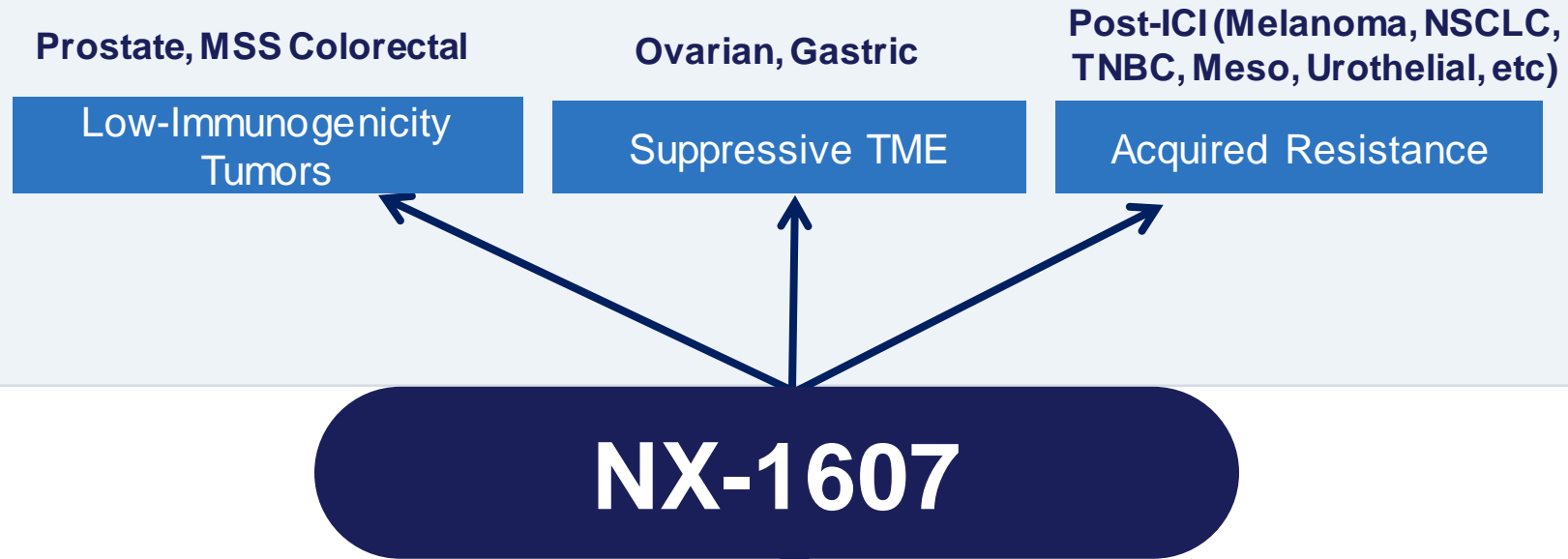
*In vivo* efficacy observed between 10-60 mpk which corresponds to ~20-60% pHS1+CD8+ T Cells

## Antitumor activity in mice

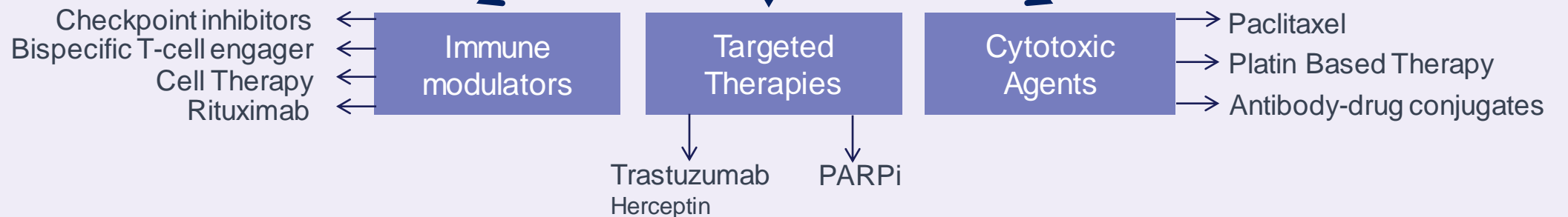


# CBL-B Inhibition: Multiple Hypotheses to Be Tested in the Clinic

## Single-Agent Monotherapy



## Potential Combinations with FDA-Approved Agents





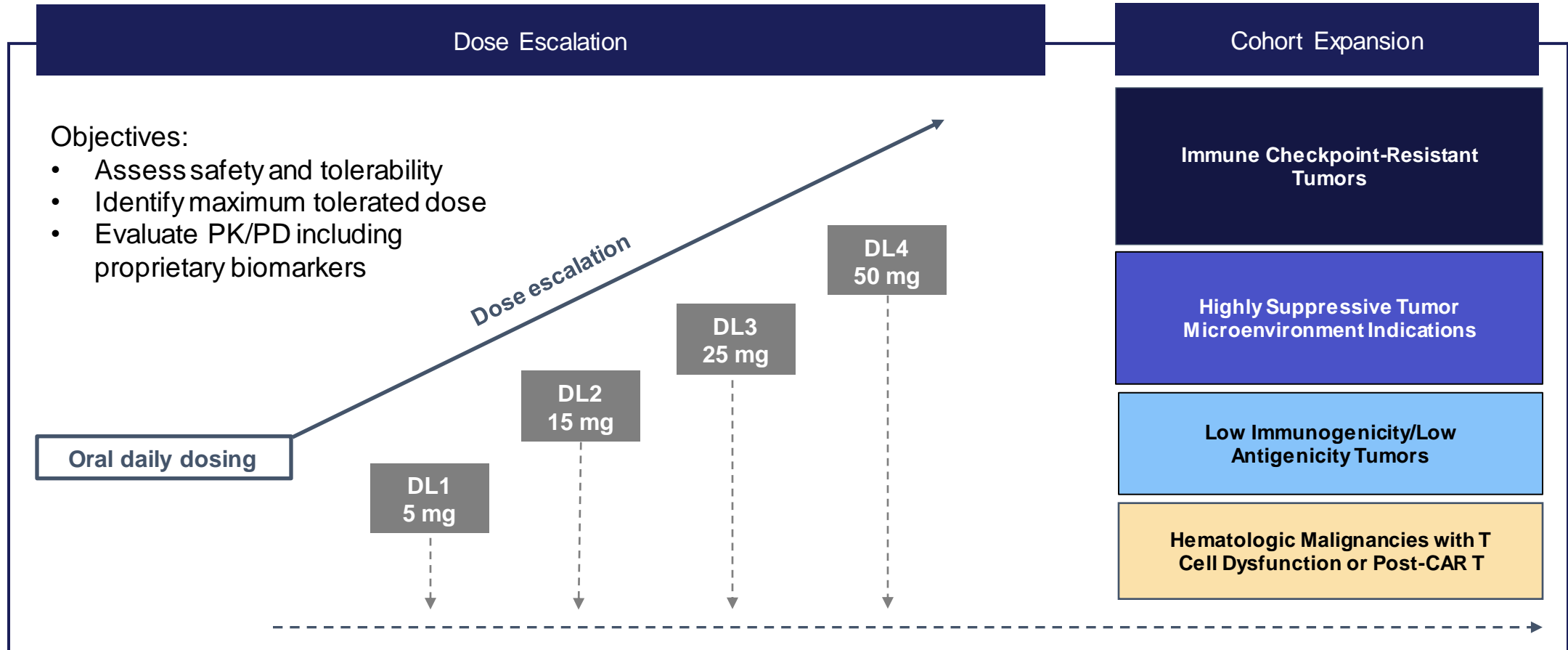
# NX-1607-101

Phase 1 First-in-human Clinical Trial Design

Two-Part Phase 1 Monotherapy Trial of NX-1607 in Relapsed or Refractory Tumors

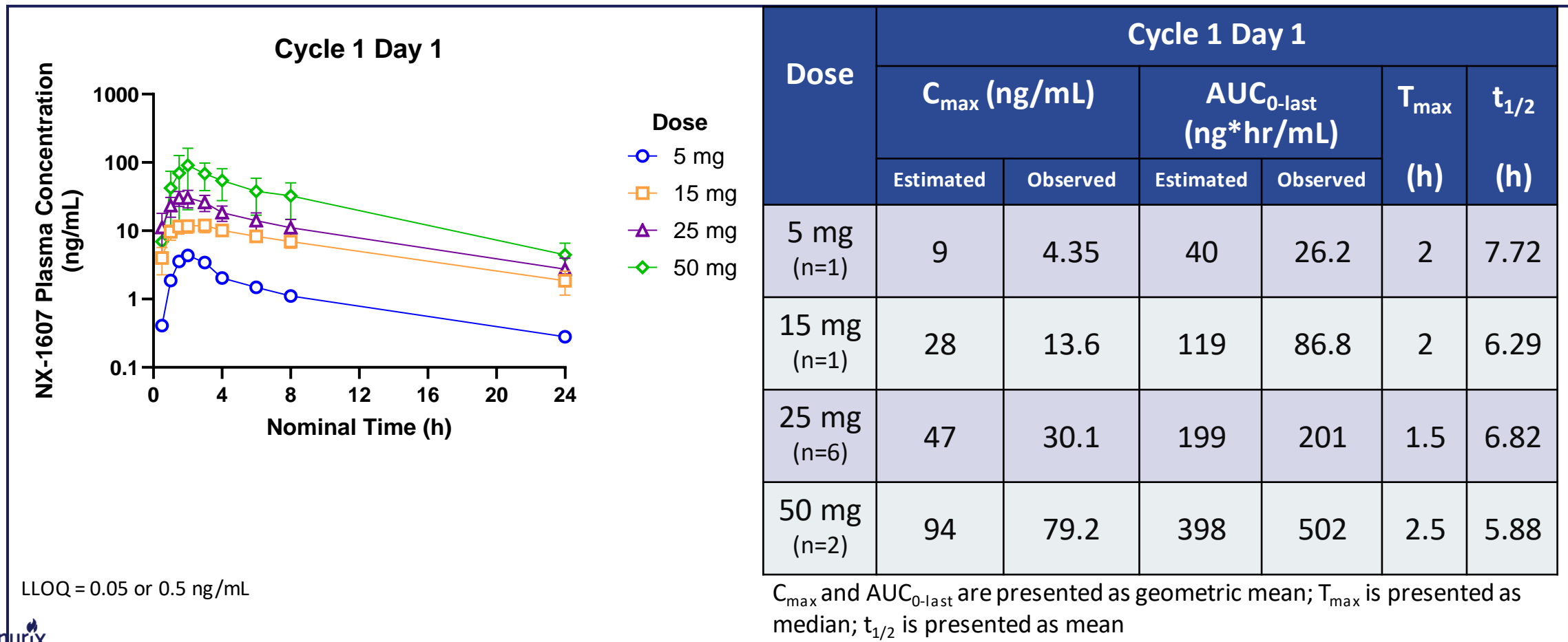
# NX-1607-101: Phase 1 first-in-human clinical trial design

Two-Part Phase 1 Monotherapy Trial of NX-1607 in Relapsed or Refractory Tumors



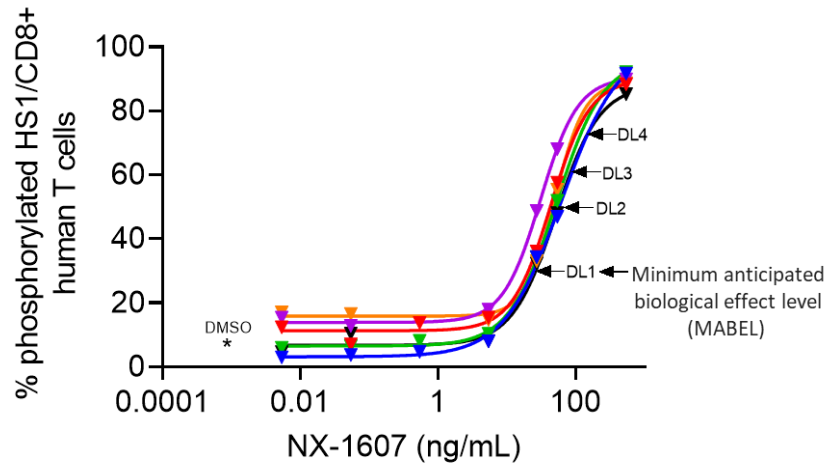
# NX-1607-101 Interim PK Results Suggest Linear PK

- Preliminary PK data suggest NX-1607 has linear PK and a mean half-life of 6 to 8 hours at doses ranging from 5 to 50 mg, with little to no accumulation.



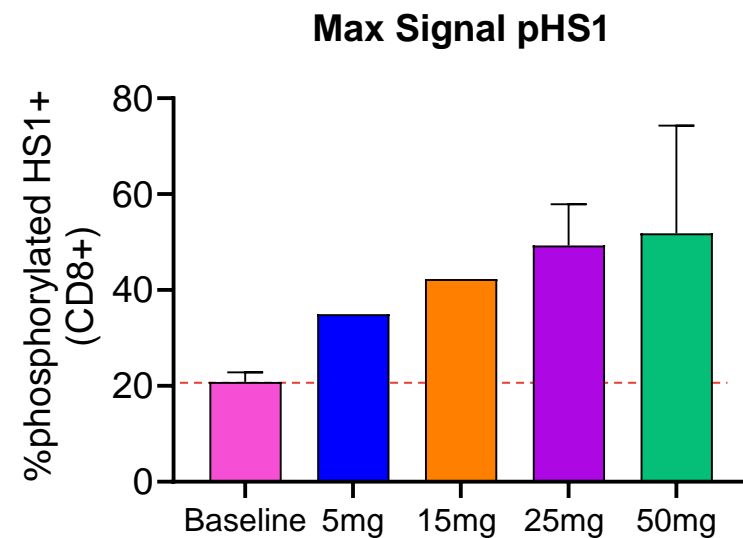
# Interim Proximal PD Evaluation Demonstrates Dose-proportional Increases of pHS1 Consistent with Potent Anti-tumor Activity in Mouse Models

Human whole blood and dose projection modeling



Proposed dose level <sup>a</sup>	NX-1607 dose (mg)	Estimated %pHS1+/CD8+ T cells Cycle 1	Observed % pHS1/CD8+ T cells Cycle 1
-1	2.5	22	
1 <sup>b</sup>	5	30	35
2	15	50	42
3	25	61	49
4	50	74	52

Clinical data C1D1



	Dose level 1 5mg	Dose level 2 15mg	Dose level 3 25mg	Dose level 4 50mg
<b>Cycle 1, N:</b>	1	1	6	2

# Summary and Conclusions

- The E3 ligase CBL-B acts as a major gate-keeper of immune signaling pathways, making it a powerful target for cancer immunotherapy.
- Nurix's CBL-B inhibitor, NX-1607, acts as an intra-molecular glue, locking CBL-B in an inactive conformation preventing the phosphorylation and activation of this E3 Ligase.
- Inhibition of CBL-B shows single agent anti-tumor activity and synergizes with anti-PD-1 to enhance anti-tumor effects and survival of mice in multiple tumor models.
- Tumors in NX-1607-treated mice displayed increased CD8+ T cell infiltration with enhanced cytotoxicity and stemness marker expression.
- A first-in-human phase 1 clinical trial was initiated for NX-1607. Early results show linear PK and evidence of proximal biomarkers increase

Thank You!