



# Inhibitors of the E3 Ubiquitin Ligase CBL-B Promote Potent T and NK Cell Mediated Anti-Tumor Response

Non-Small Cell Lung  
Cancer Drug Development  
Summit

Boston, MA  
Sept 21<sup>st</sup>, 2022

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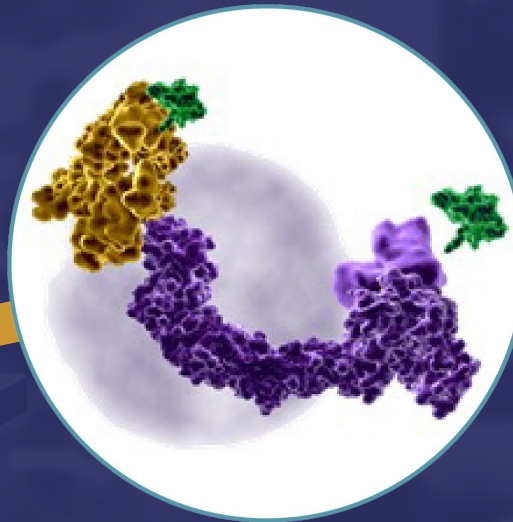
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# Nurix Drugs Engage Ligases for the Treatment of Cancer

Targeted Protein Modulation:  $TPM = TPD + TPE$

**Harness ligases**  
to decrease specific  
protein levels

A Powerful  
Cellular System



Targeted Protein  
Elevation  
(TPE)

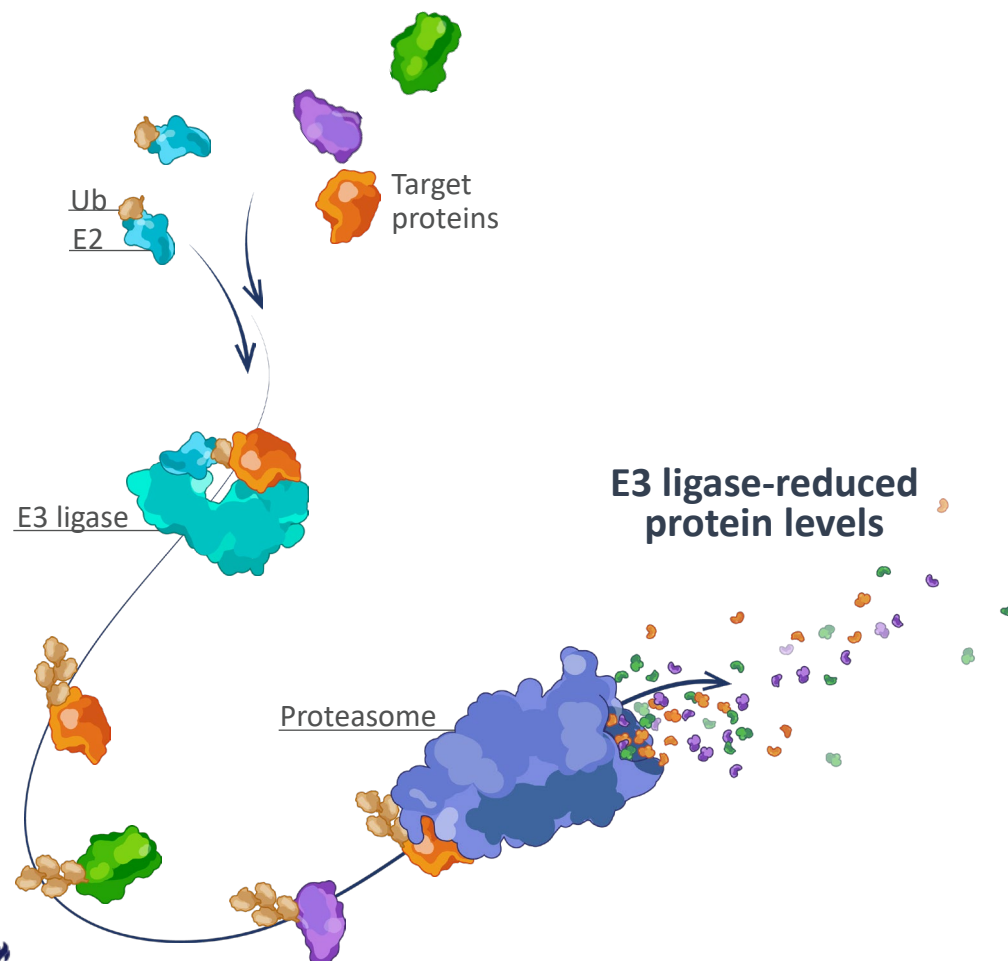
**Inhibit ligases**  
to increase specific  
protein levels

Targeted Protein  
Degradation  
(TPD)

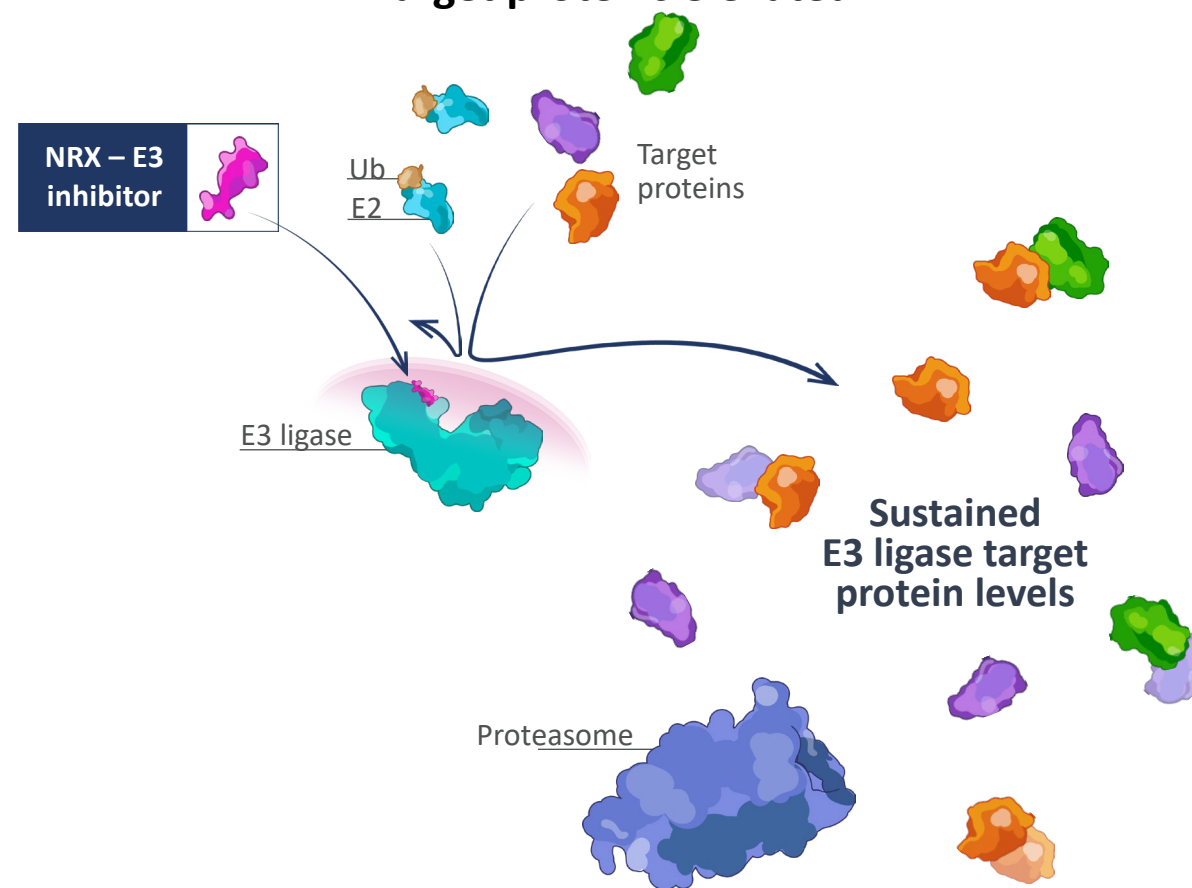
Ubiquitin is ligated to  
target proteins to tag  
them for degradation by  
the proteasome

# E3 Ligase Inhibition Results in Targeted Protein Elevation (TPE)

**Native E3 Ligase activity –  
Maintains target proteins at low levels**



**Inhibited E3 Ligase –  
Target proteins elevated**



# Nurix Is Advancing Four Wholly Owned Clinical Programs with a Deep Pipeline of Proprietary and Partnered Novel Targets

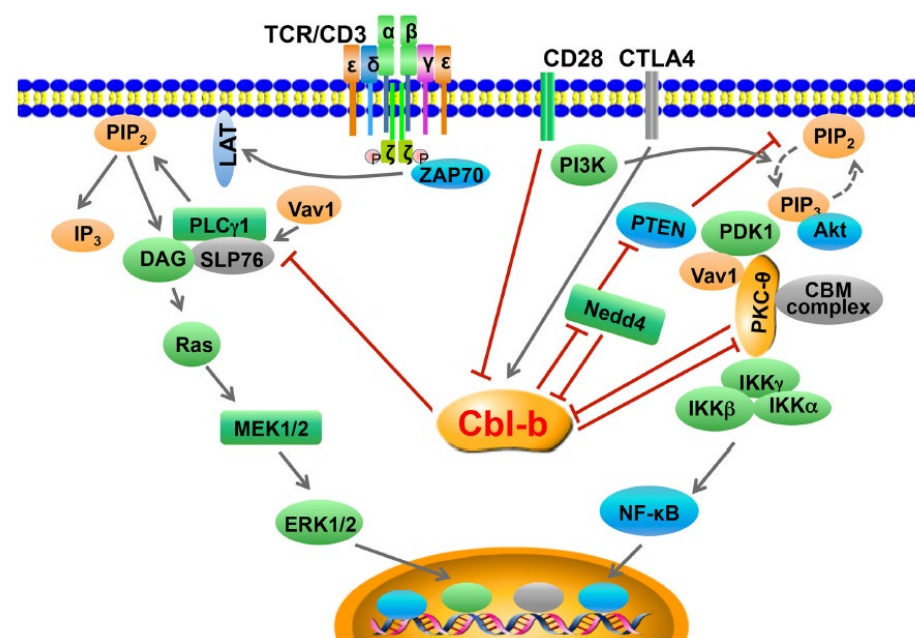
MOA	Drug Program	Target/ Delivery	Therapeutic Area	Pre-Clinical	Phase 1	Phase 2	Phase 3
TPD	<b>NX-2127</b> Degradar	BTK-IKZF <i>Oral</i>	B-Cell Malignancies				
	<b>NX-5948</b> Degradar	BTK <i>Oral</i>	B-Cell Malignancies				
TPE	<b>NX-1607</b> Inhibitor	CBL-B <i>Oral</i>	Immuno-Oncology				
	<b>DeTIL-0255</b> Cell Therapy	Adoptive Cell Therapy <i>Ex vivo CBL-B Inhibition</i>	Gynecologic Malignancies				
TPM	Wholly owned	5 targets	Multiple				
TPD	Gilead Sciences	5 targets	Multiple				
TPD	Sanofi	5 targets	Multiple				

MOA, Mechanism of action; TPD, Targeted Protein Degradation; TPE, Targeted Protein Elevation; TPM, Targeted Protein Modulation



# CBL-B: A Modulator of T Cell Activation and a Novel Target for Immuno-oncology

- CBL-B is an E3 ubiquitin ligase that is expressed in and regulates immune cells, including T, B, NK and dendritic cells
- Mice deficient in CBL-B demonstrate enhanced signal-dependent T cell activation and robust T and NK cell dependent anti-tumor activity
- In T cells, CBL-B limits cell activation following TCR engagement, enforcing the need of CD28 co-stimulation
- Inhibition or deletion of CBL-B increases IL-2 production in T cells upon stimulation and enhances the immune response
- Inhibiting CBL-B with a small molecule represents a novel immunotherapy target opportunity to overcome checkpoint resistance and reduce effects of the suppressive tumor microenvironment



## CBL-B inhibition

- ▲ IL-2 production
- ▲ Proliferation
- ▲ Central memory phenotype
- ▲ Anti-tumor activity
- ▼ Threshold of activation
- ▼ T cell exhaustion

**Synergy with anti-PD-1**

**NX-1607:** Optimized CBL-B inhibitor for oral delivery. Developing as an oral intracellular checkpoint inhibitor for treating solid tumors.

**NX-0255:** Optimized CBL-B inhibitor for *ex vivo* use. Developing in conjunction with autologous T cell therapies including TIL and CAR T.

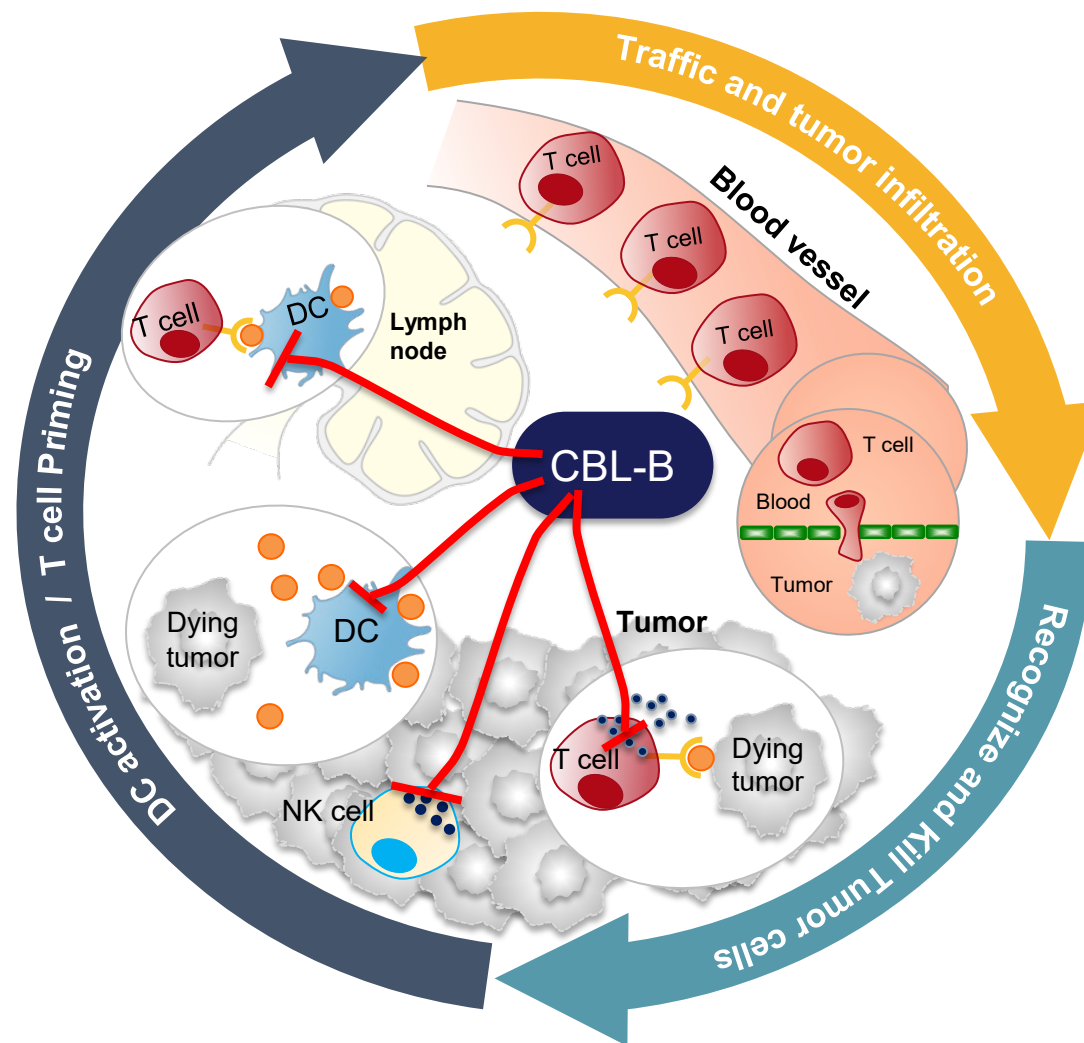
# Targeting CBL-B Enhances Antitumor Response

## A Master Orchestrator of the Immune System

CBL-B mediated mechanisms strongly restrain a productive anti-tumor response

CBL-B inhibition 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- $\beta$



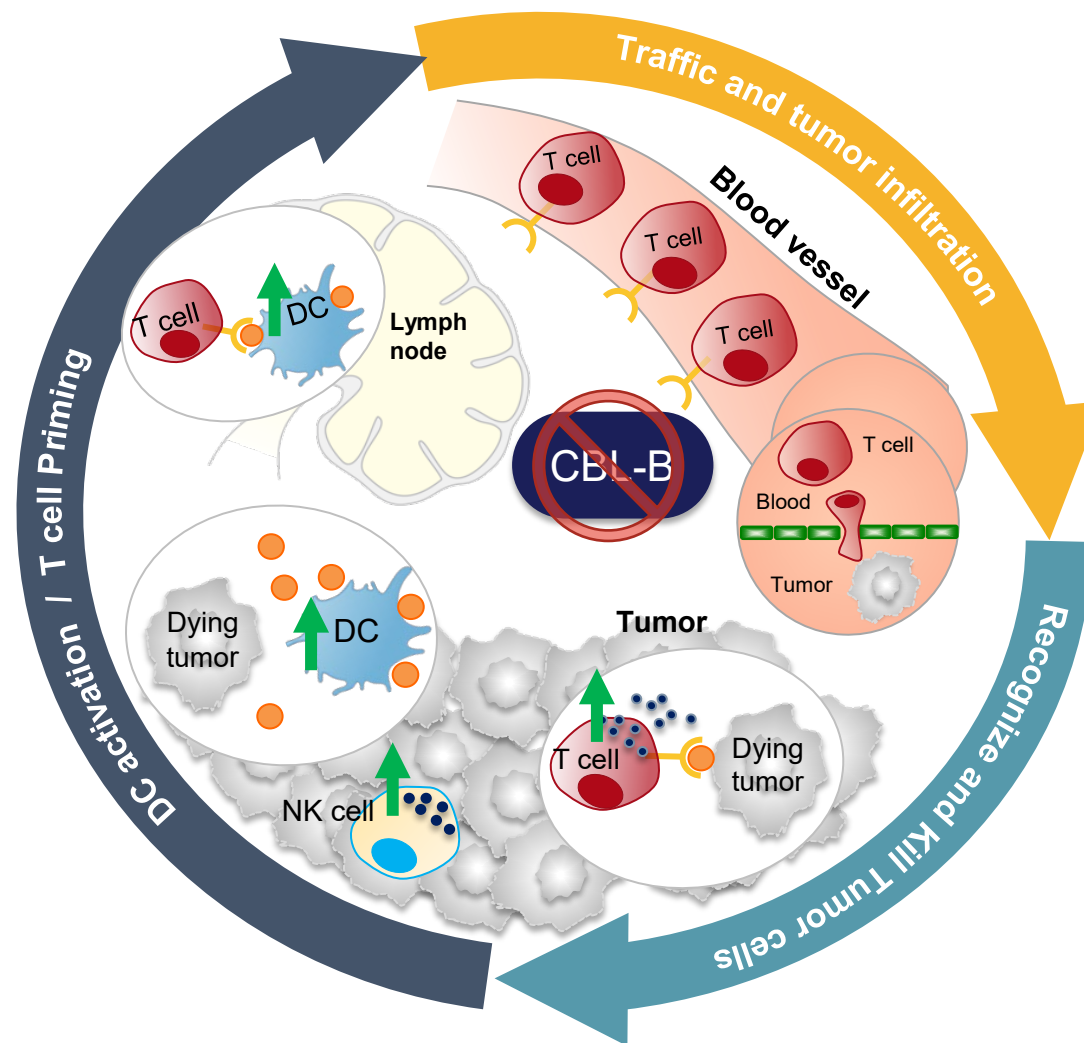
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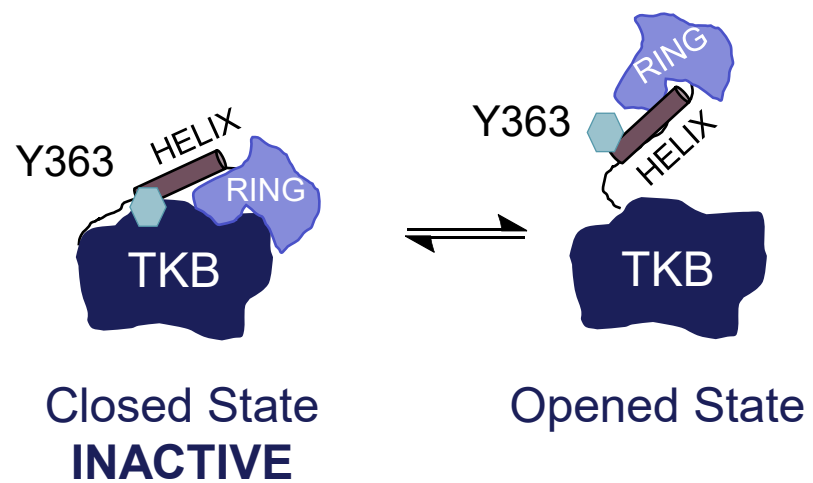
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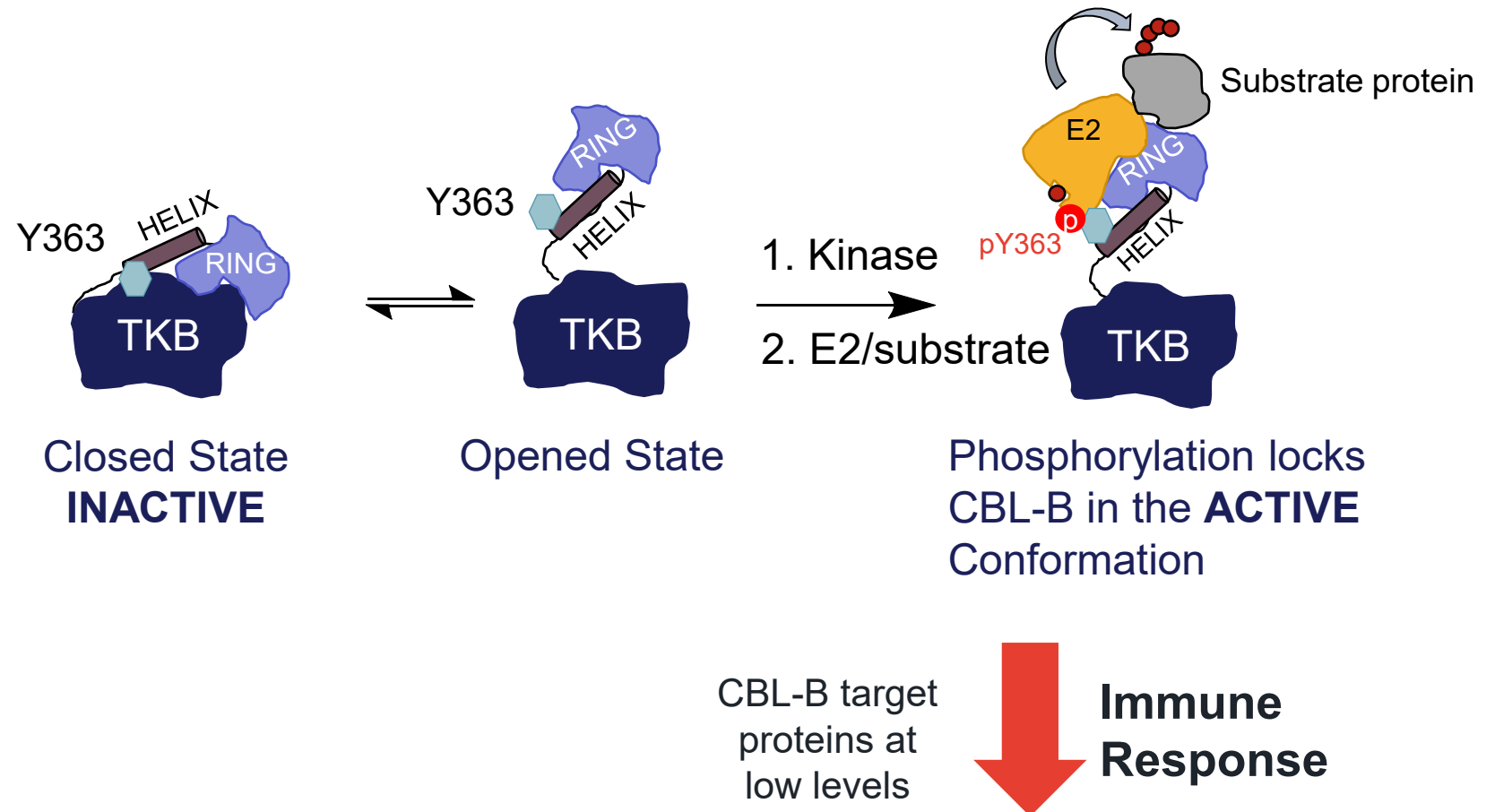


# NX-1607 Mechanism of Action: Intramolecular Glue

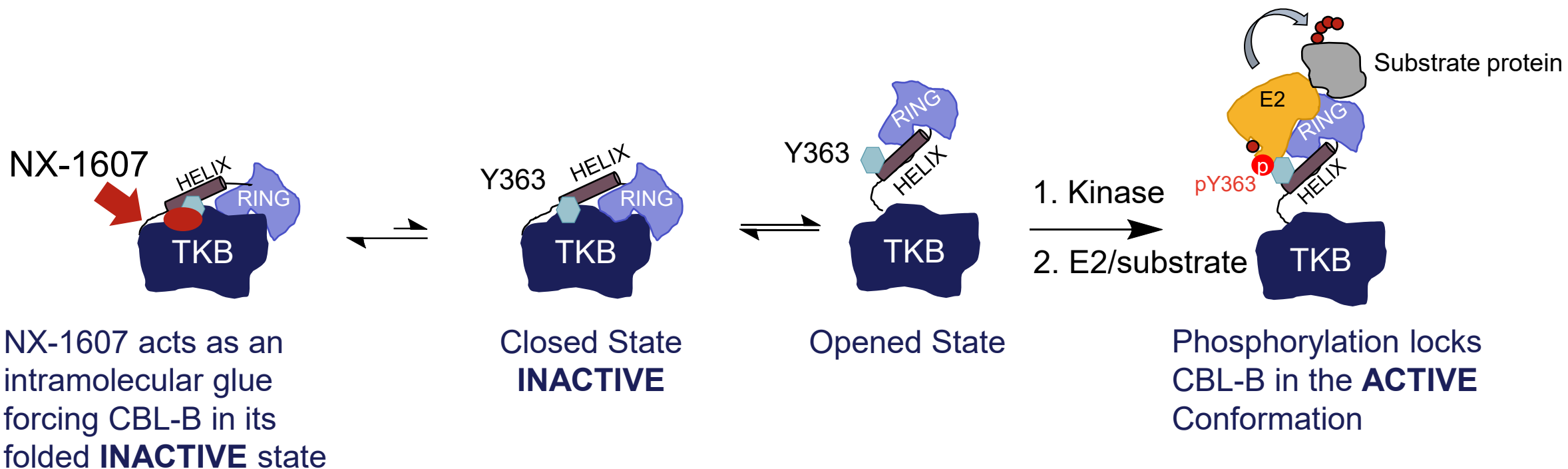
**CBL-B is in Equilibrium Between Closed and Opened State**



# NX-1607 Mechanism of Action: Intramolecular Glue



# NX-1607 Mechanism of Action: Intramolecular Glue



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

Closed State **INACTIVE**

Opened State

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

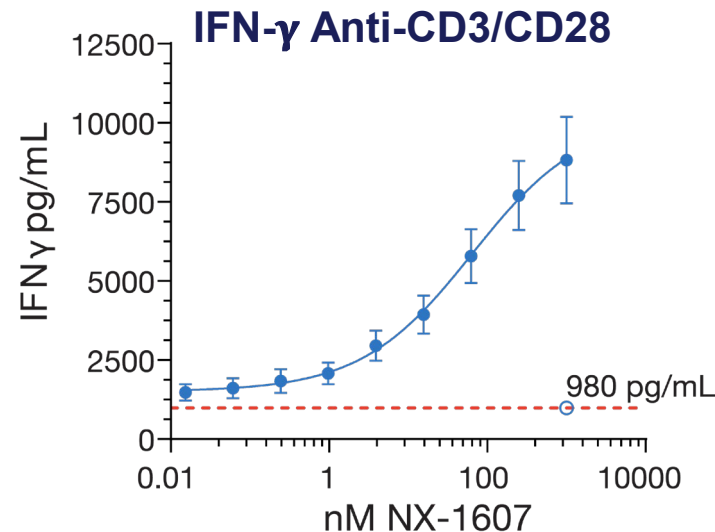
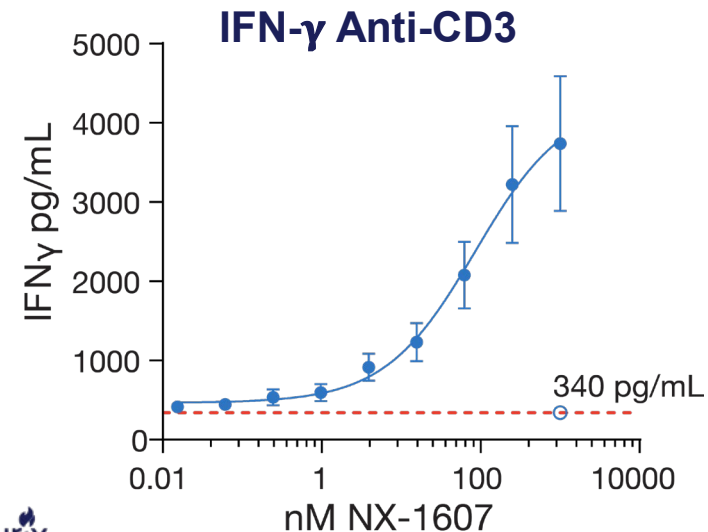
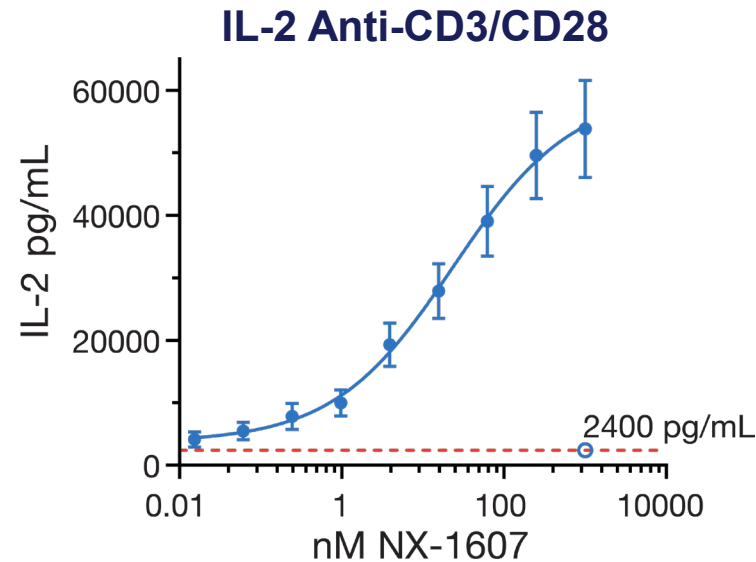
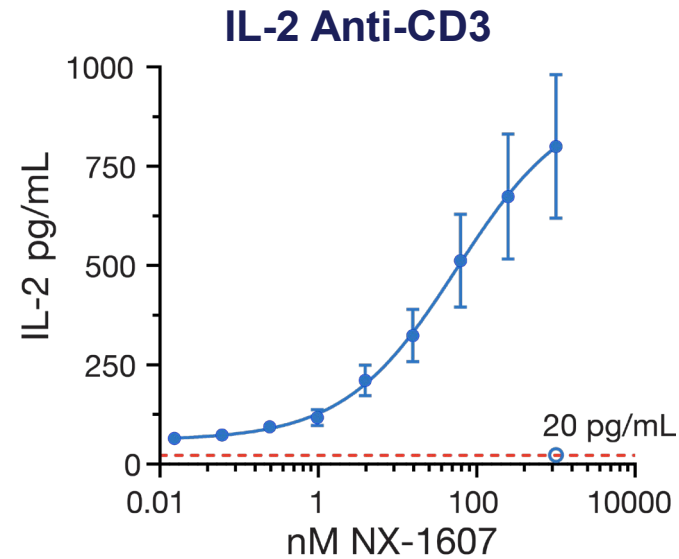
CBL-B target proteins elevated (TPE)

**Immune Response**

CBL-B target proteins at low levels

**Immune Response**

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

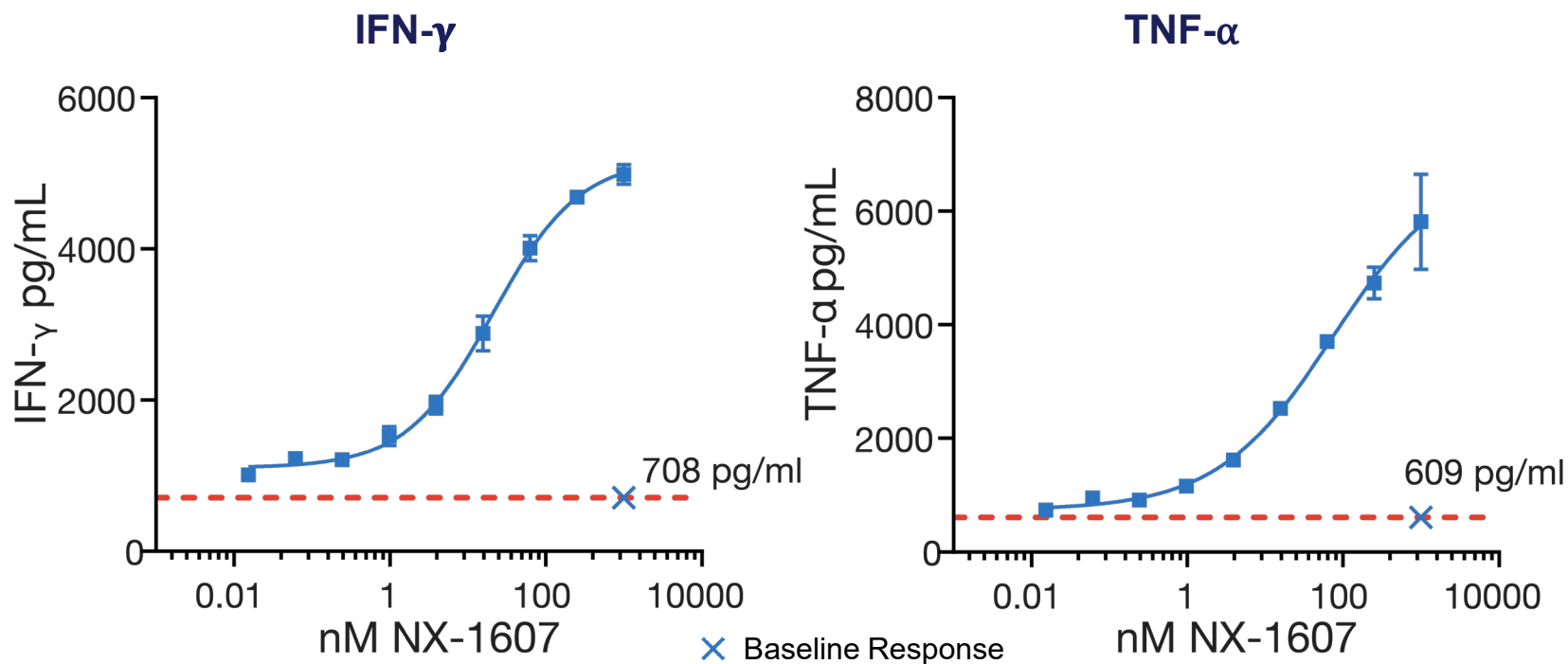


NX-1607 increases TCR stimulation-dependent production of IL-2 and IFN- $\gamma$  in primary human T cells

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

● Cytokine Response  
○ Baseline Response

# 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

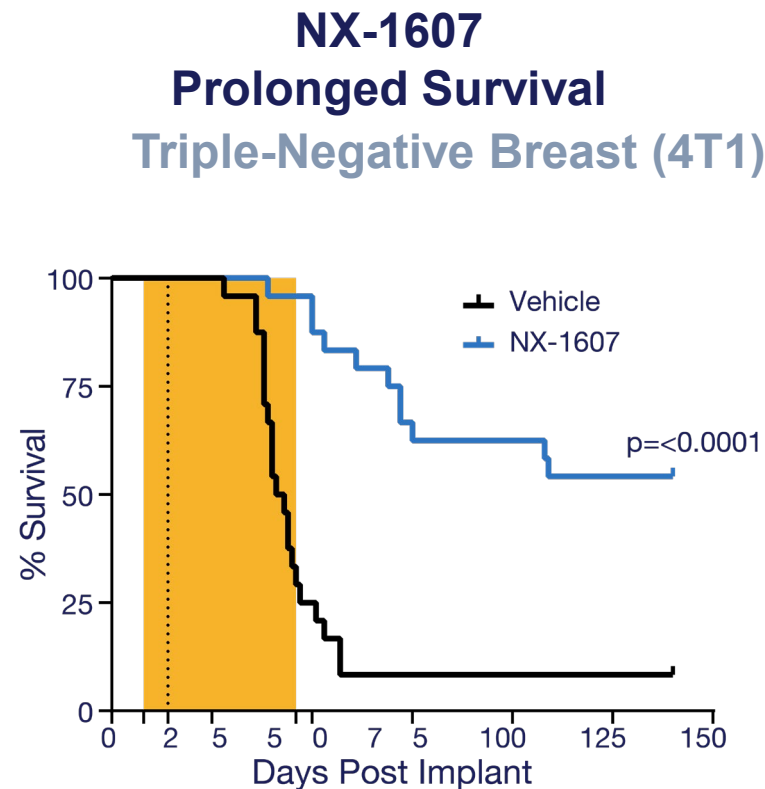
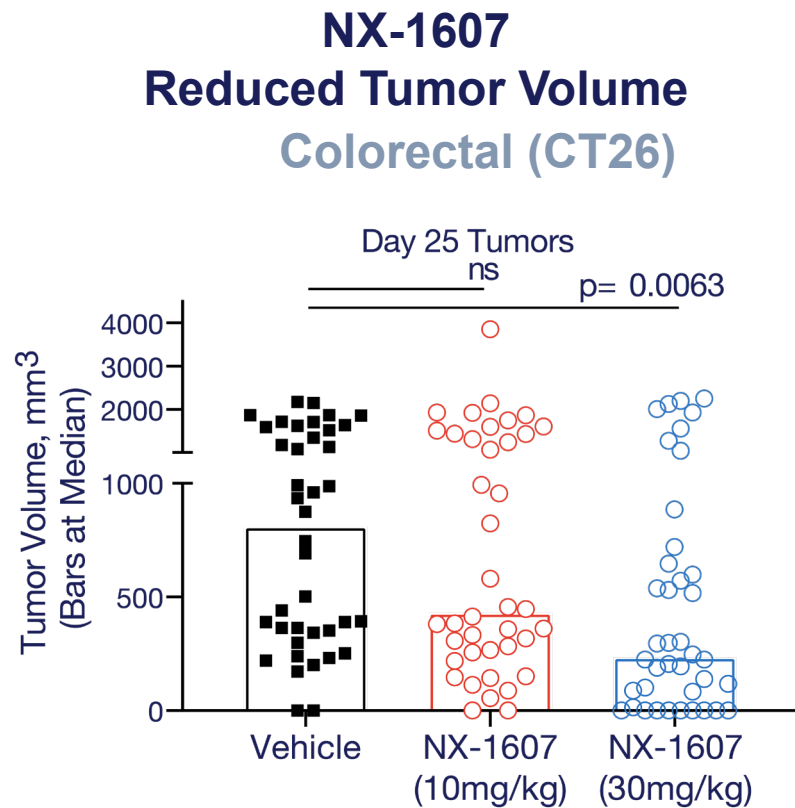
NX-1607 has no impact in the absence of NK cell stimulation, as measured by cytokine release

## NK K562 Killing Assay

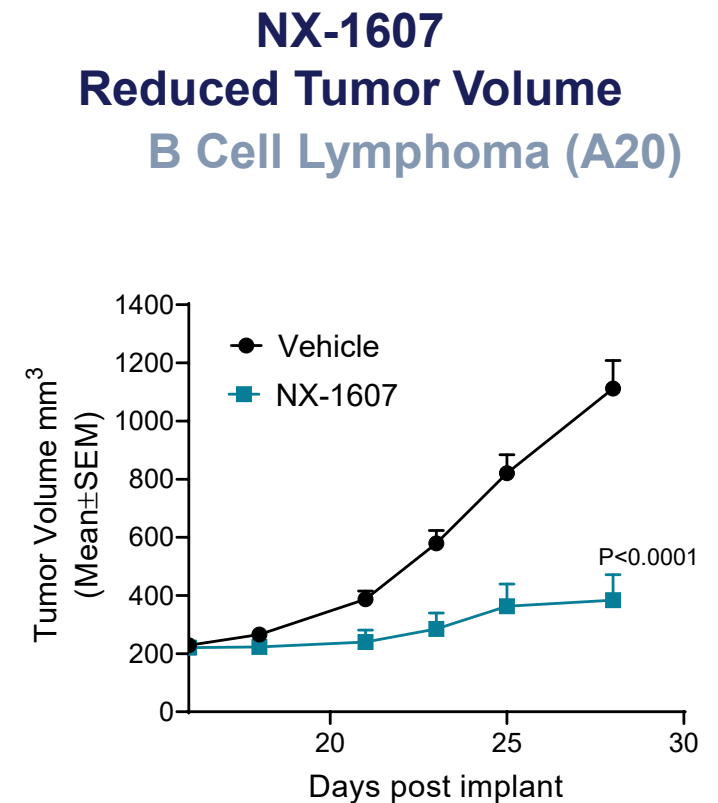
- 1 hour compound pre-treatment prior to addition of K562s target cells
- 6 hour NK/K562 coculture



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



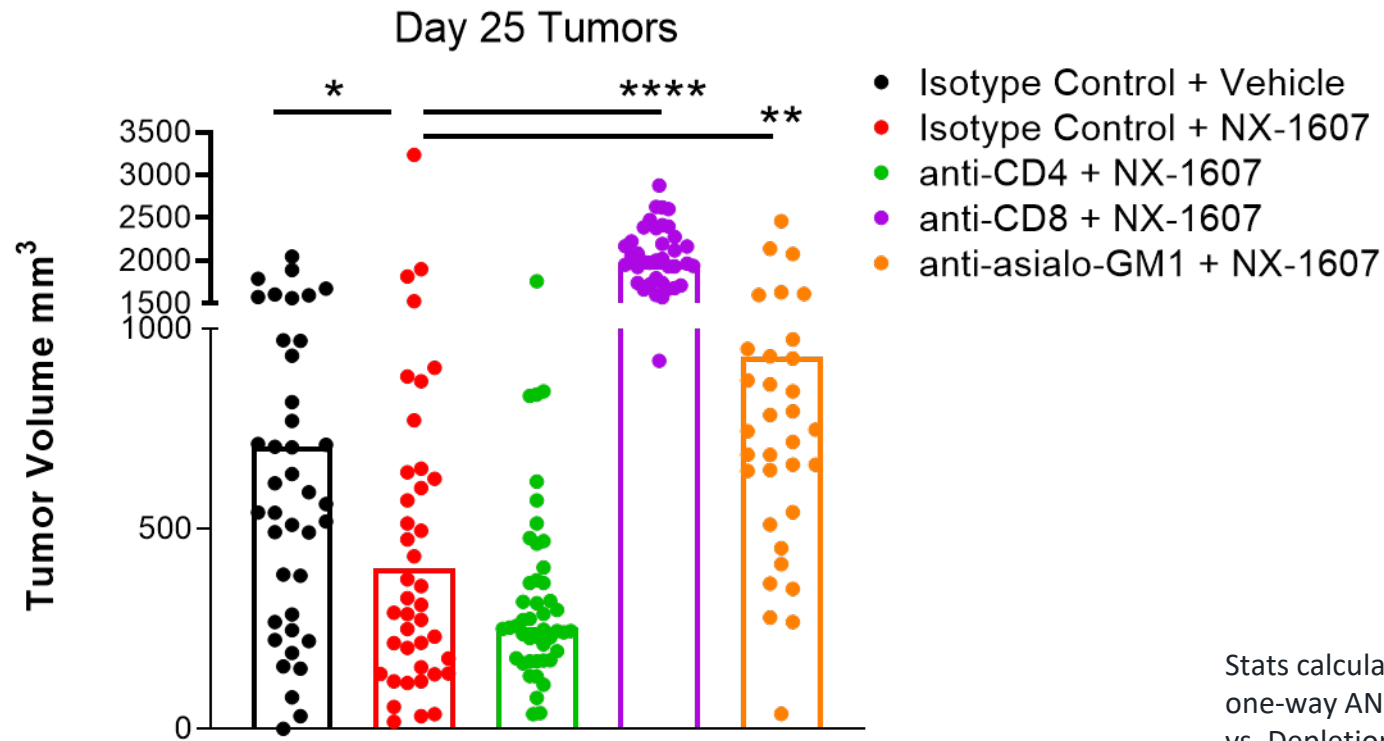
NX-1607 30 mg/kg day 7 to 46



NX-1607 30 mg/kg day 16 to 28

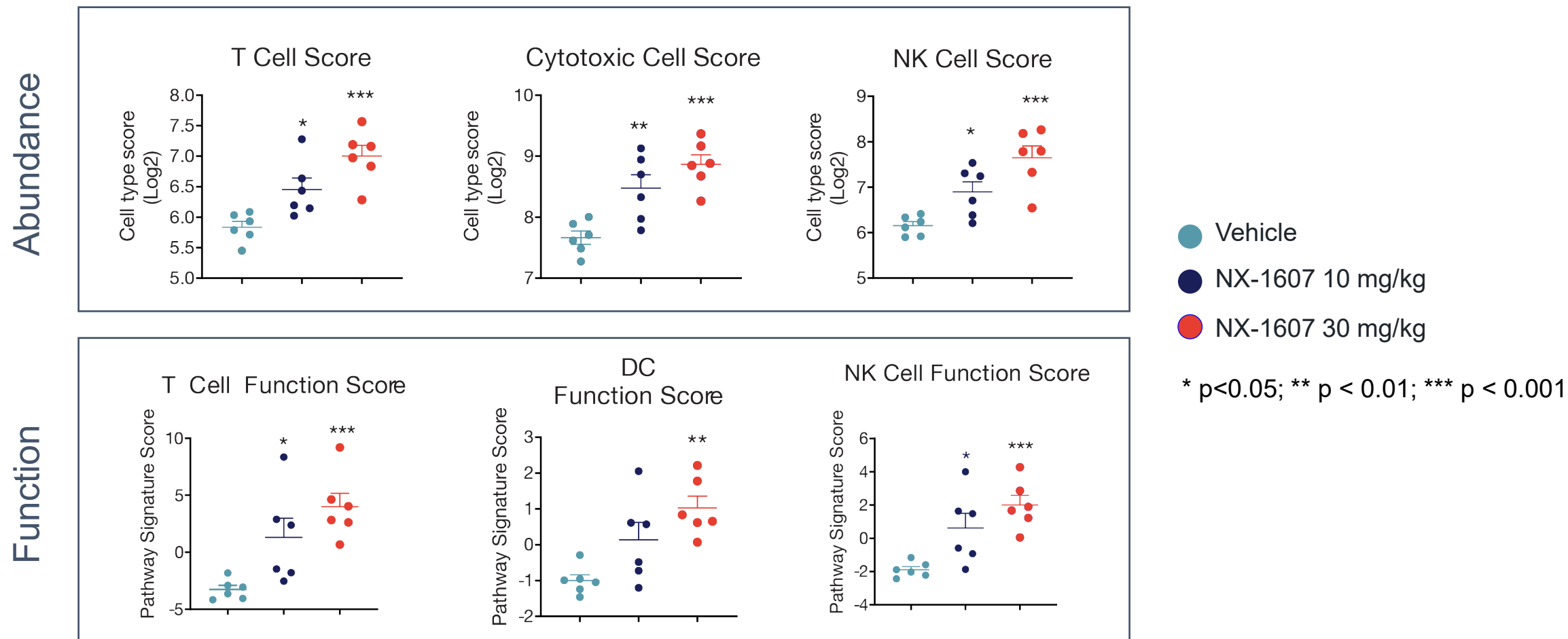
Shaded area indicates dosing period

# NX-1607 Antitumor Efficacy is Dependent on CD8+ T Cells or NK Cell Activity



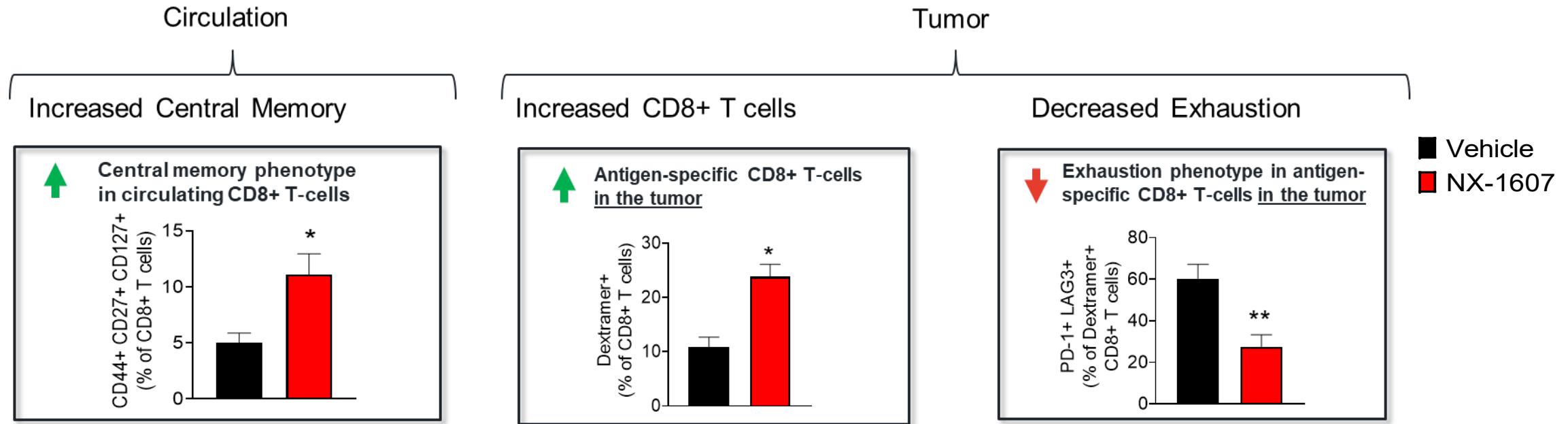
- CT26 colorectal tumor on left and right flanks treated from Day 9 to Day 25 with oral NX-1607 at 30 mg/kg, PO QD in the presence of depleting antibodies for CD4+ cells, CD8+ cells, or NK cells (anti-asialo-GM1)

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



CT26 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 Increases Tumor Antigen Specific Response in a Metastatic Triple Negative Breast Cancer Tumor Model

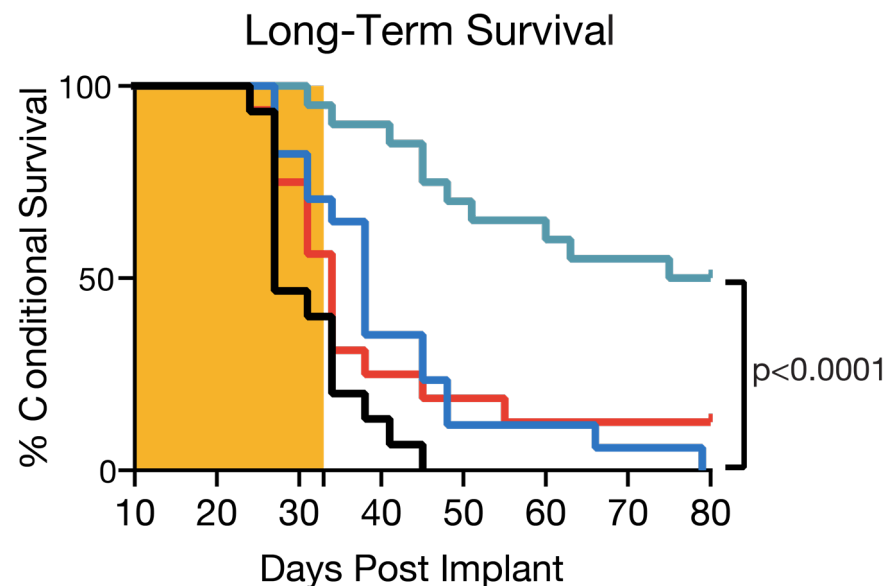


4T1 breast cancer model. ANOVA test with post-hoc Dunn's multiple comparisons test \*  $p < 0.05$ ; \*\*  $p < 0.01$

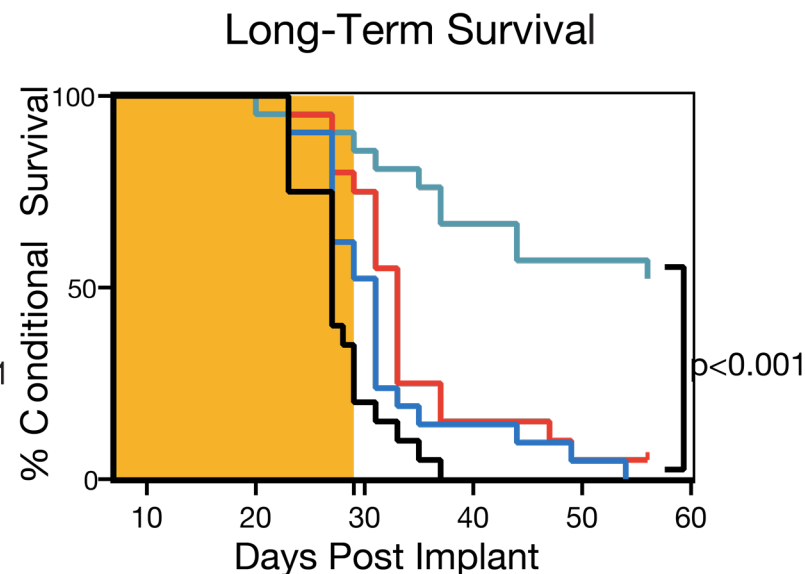
- NX-1607 treatments result in immune cell phenotypic changes, both in the tumor microenvironment (TME) and in peripheral blood in animal models
- Similar changes have been associated with extended survival and better prognosis in cancer patients

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

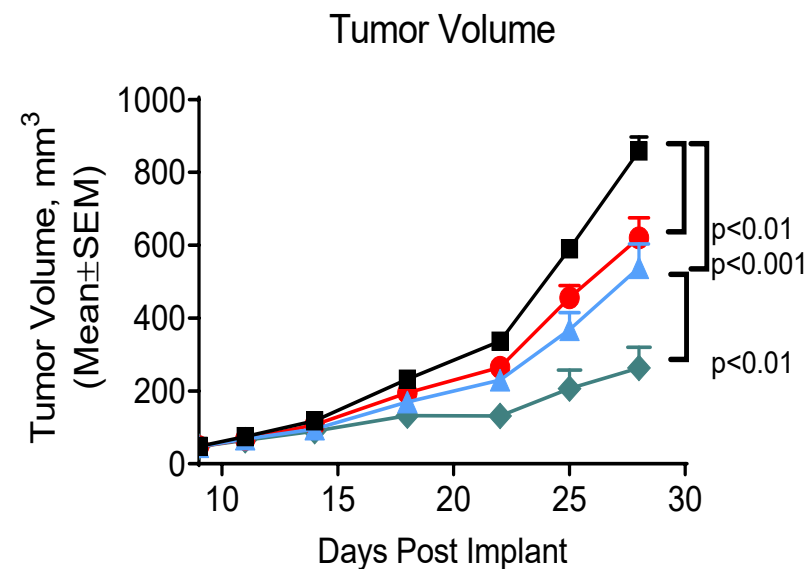
## Colorectal (CT26)



## Colorectal (MC38)



## Triple-Negative Breast (4T1)



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

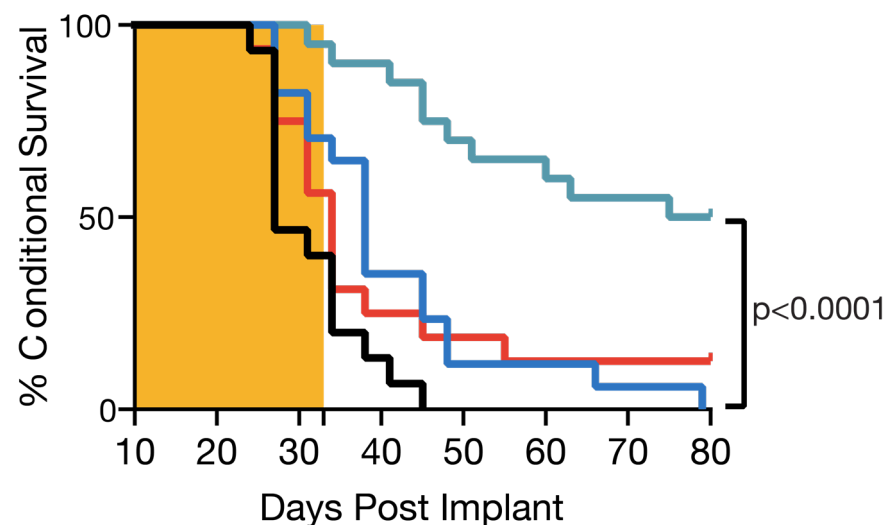
Shaded area indicates dosing period: NX-1607 (30 mg/kg, PO daily)  
and anti-PD-1 twice a week at 10 mg/kg dosing period



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

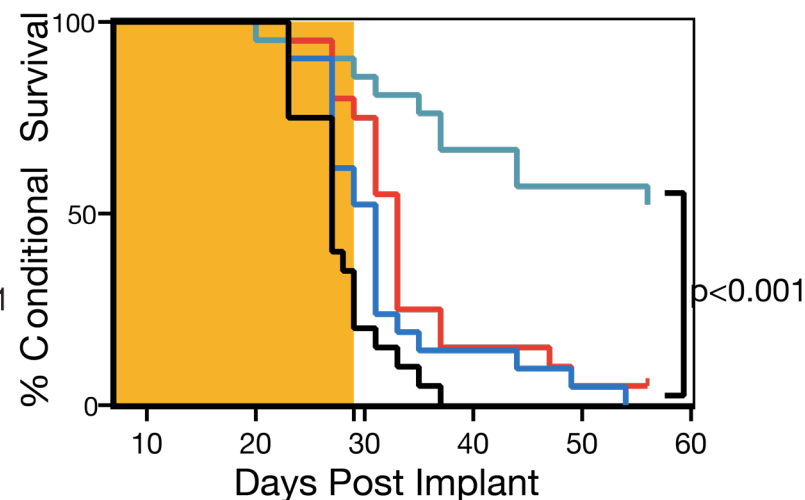
## Colorectal (CT26)

### Long-Term Survival



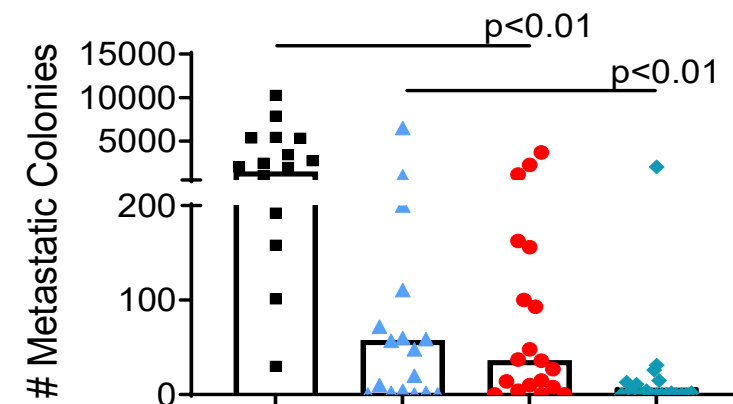
## Colorectal (MC38)

### Long-Term Survival



## Triple-Negative Breast (4T1)

### Day 28 4T1 Lung Metastases

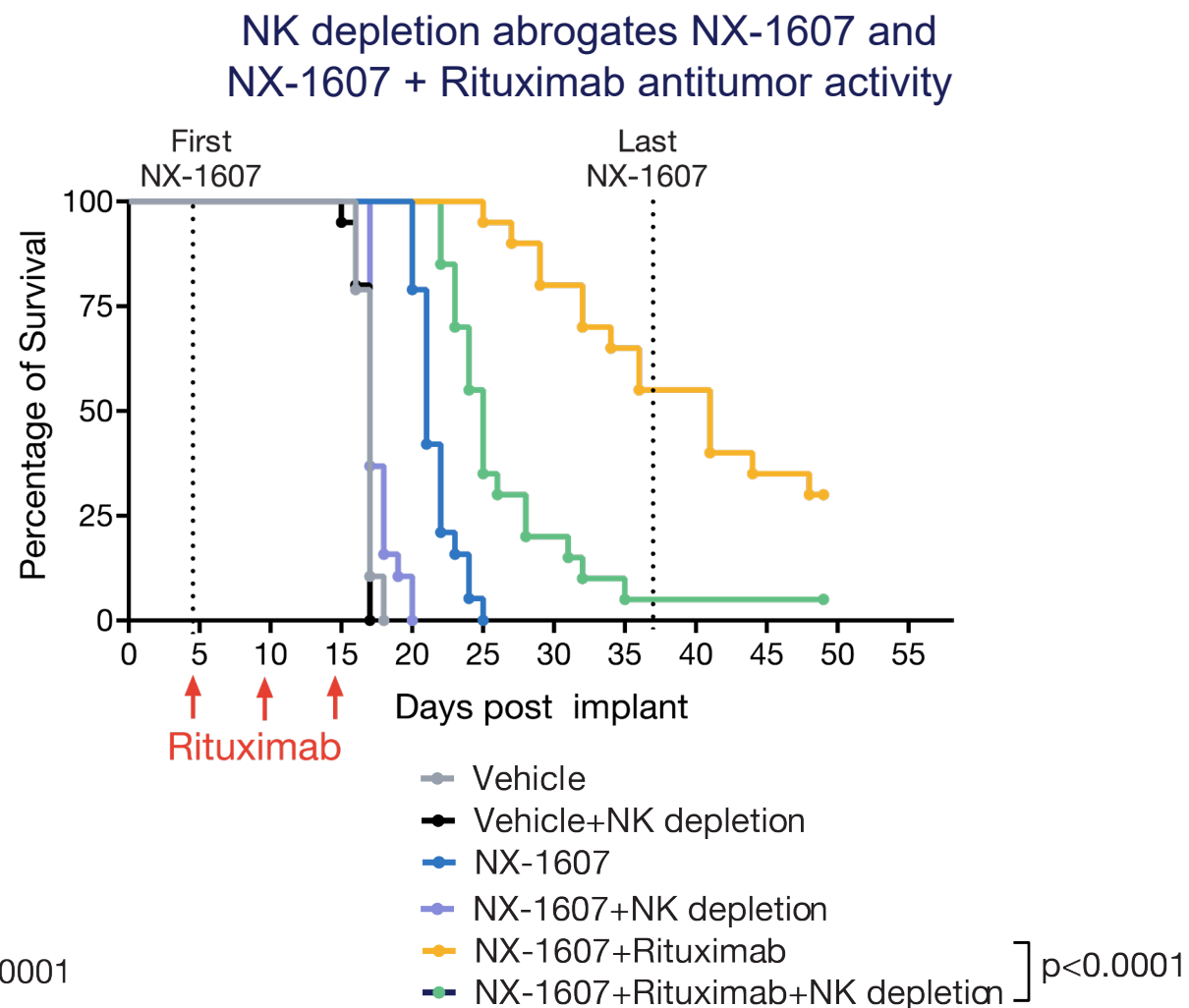
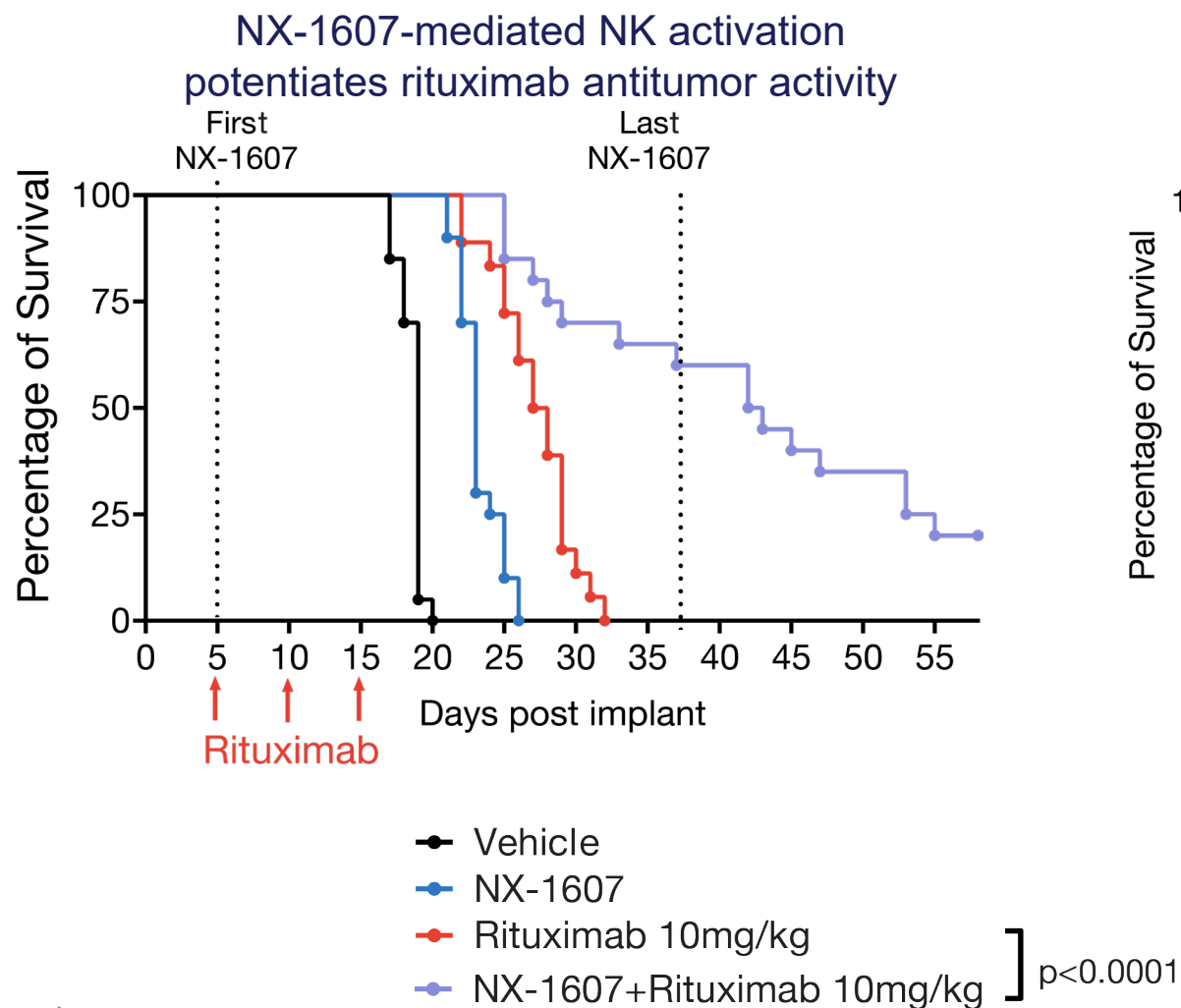


■ Vehicle ▲ NX-1607 ● anti-PD-1 ◆ NX-1607+anti-PD-1

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

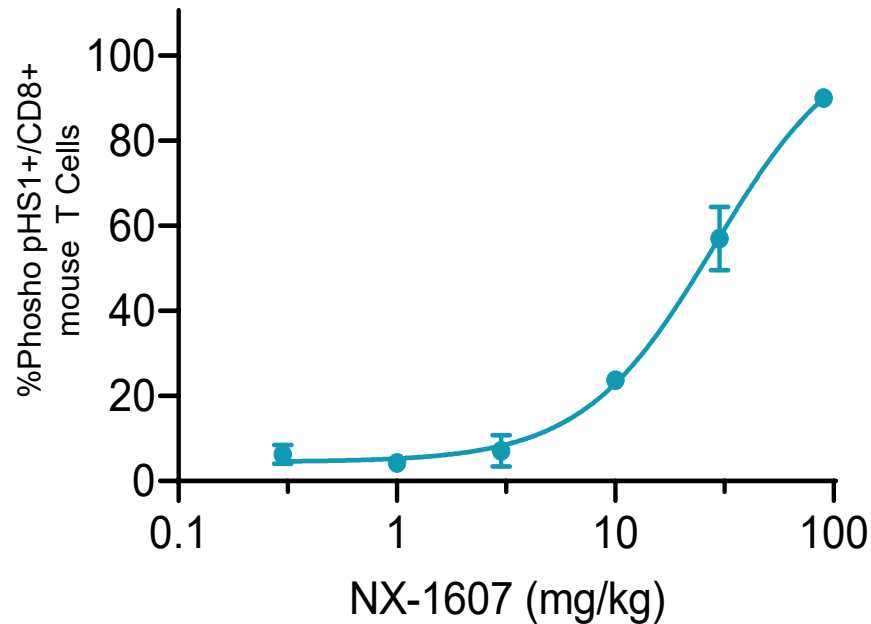
# Combination of NX-1607 and Rituximab Enhances Anti-tumor Activity in a Human NHL Animal Model

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

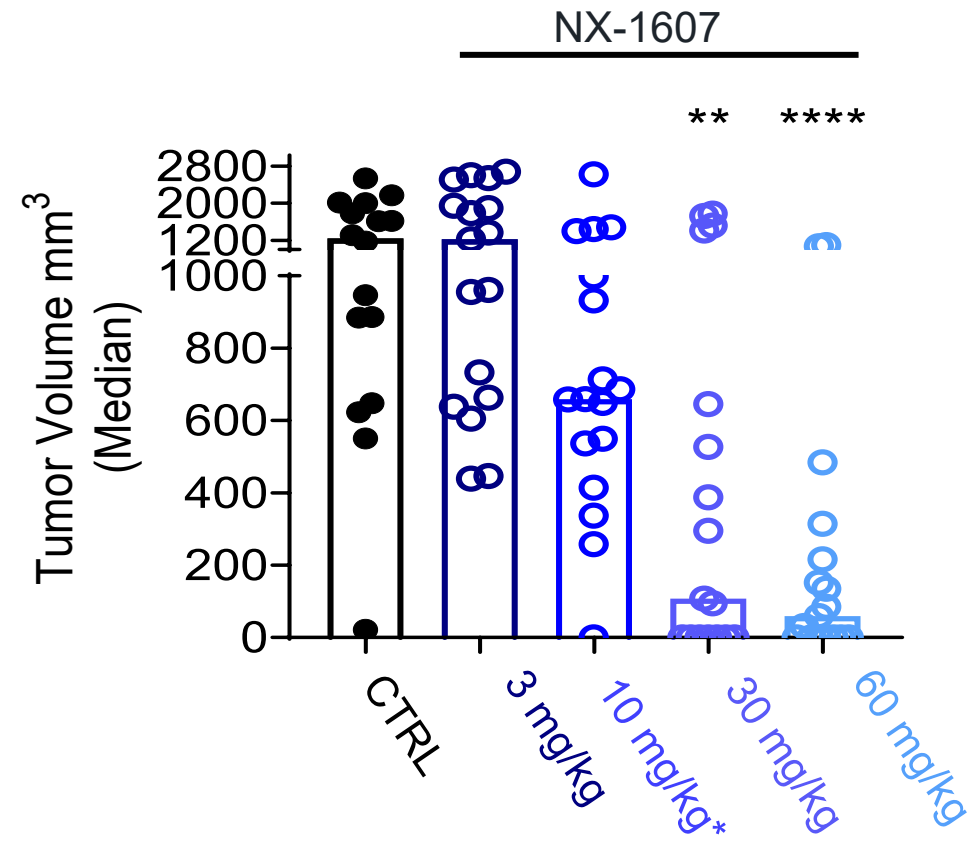


# Dose Dependent Increases of CBL-B Proximal Biomarker Correlates with Antitumor Effects of NX-1607

Pharmacodynamic relationship in mice following NX-1607 dosing



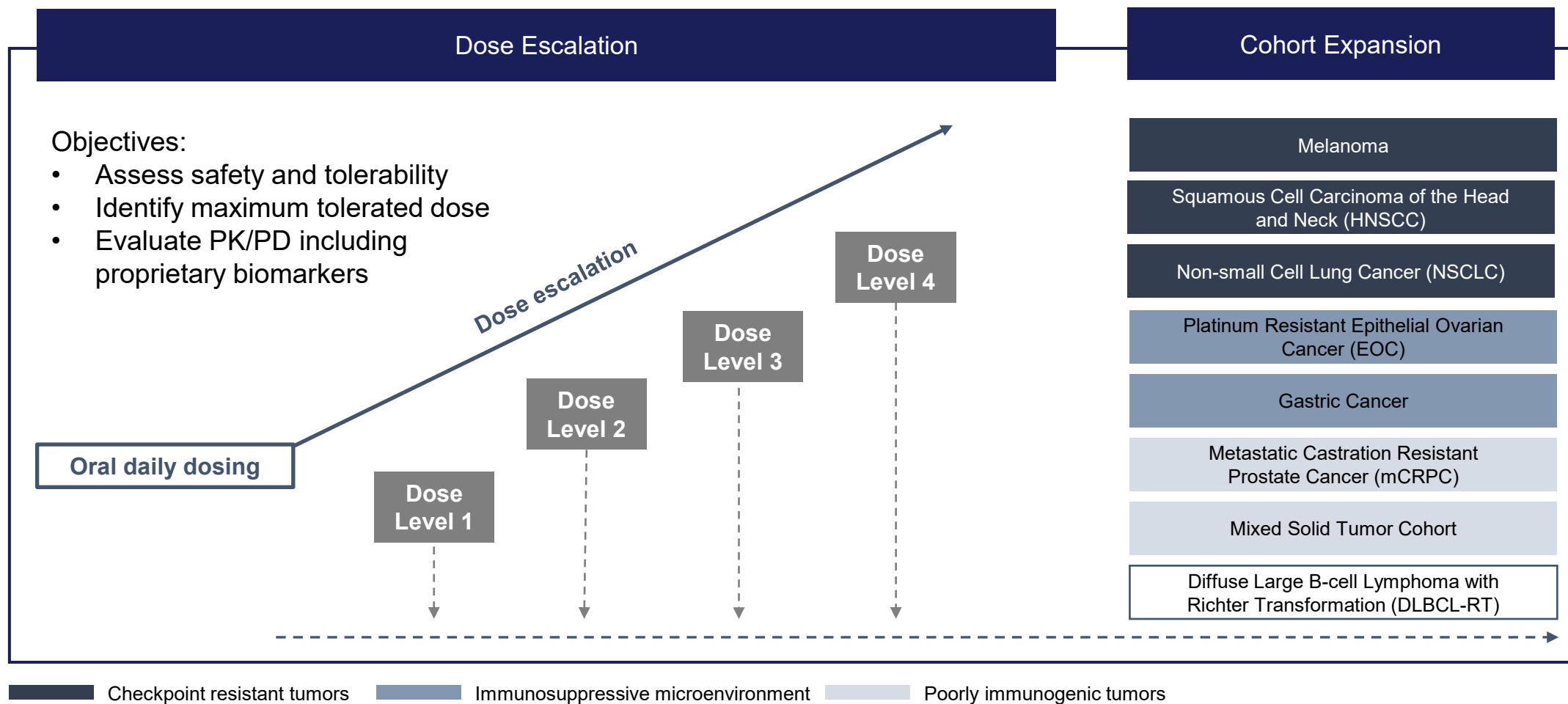
Antitumor activity in mice



A20 - B cell lymphoma model

# 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



# Summary NX-1607

- Pharmacological inhibition of CBL-B with NX-1607 recapitulates the anti-tumor effects observed in the genetic model of ligase inhibition
- NX-1607 exerts potent single agent anti-tumor activity which is dependent on CD8+ T cells and NK cells
- NX-1607 promotes infiltration of activated T cells with a lower exhausted phenotype in the tumor microenvironment
- NX-1607 strongly synergizes with PD-1 blockade to increase the rate of complete rejection and long-term survival of tumor bearing mice
- A Phase 1a clinical trial of NX-1607 is currently on going





Thank you