



Leader in Targeted Protein Modulation

# Exploring Success with 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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3rd Annual Ligase Targeting Drug Development

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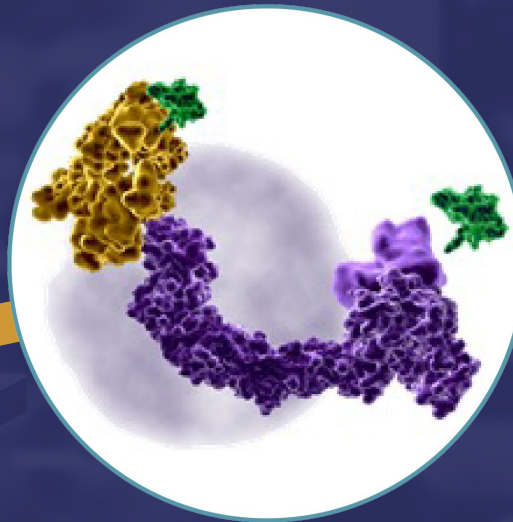
# Nurix Drugs Engage Ligases for the Treatment of Cancer

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

# Nurix is Advancing a Pipeline of Propriety and Partnered Programs in Oncology and Inflammatory Diseases

MOA	Drug program	Target/delivery	Therapeutic area	Discovery	IND enabling	Phase 1a	Phase 1b
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				
	<b>NX-0479 / GS-6791</b> Degradar	IRAK4 <i>Oral</i>	Rheumatoid arthritis and other inflammatory diseases				
TPE	<b>NX-1607</b> Inhibitor	CBL-B <i>Oral</i>	Immuno-Oncology				
TPM	Wholly owned & partnered	14 targets	Multiple				

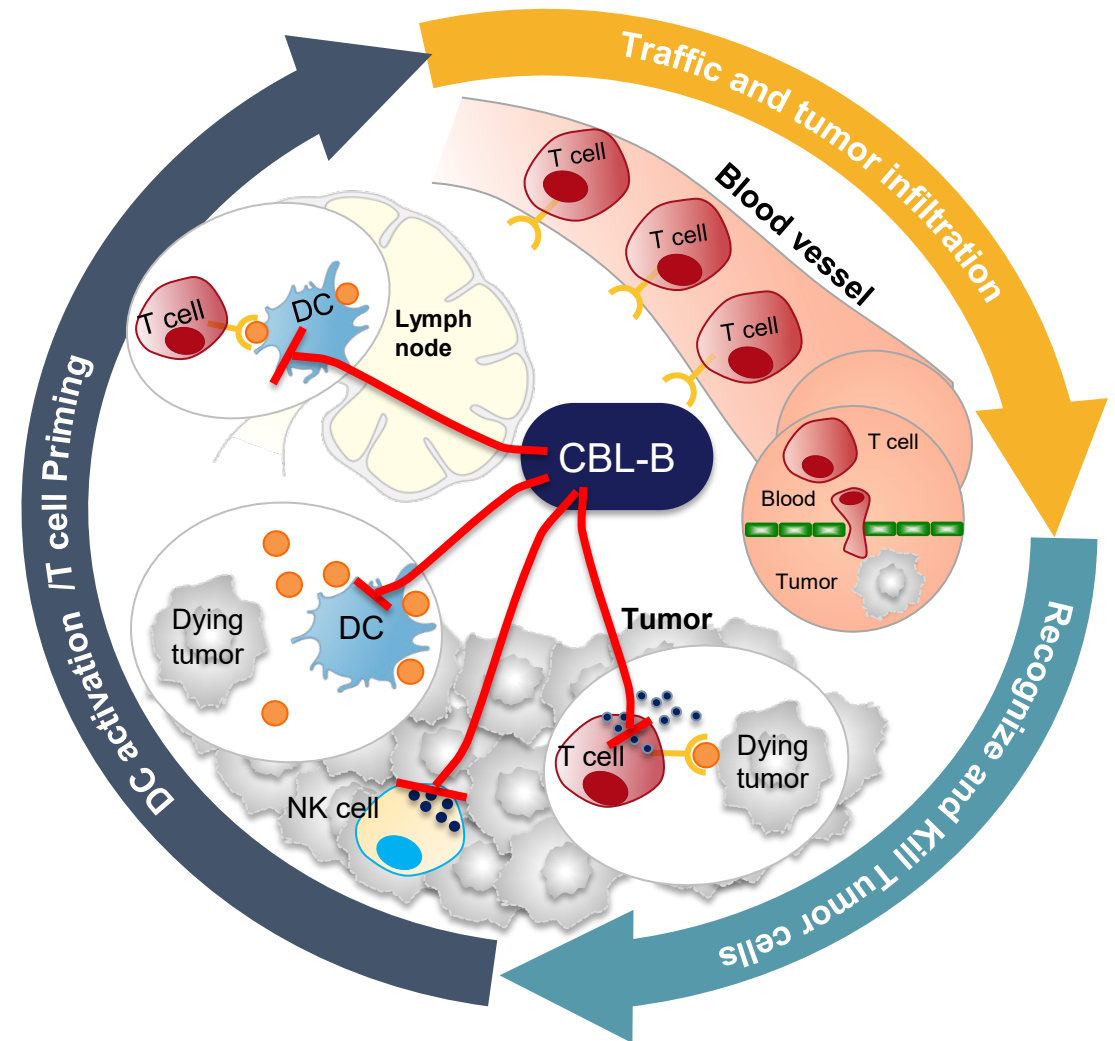
# Targeting CBL-B Enhances Antitumor Response

## A Master Orchestrator of the Immune System

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

CBL-B inhibition increases:

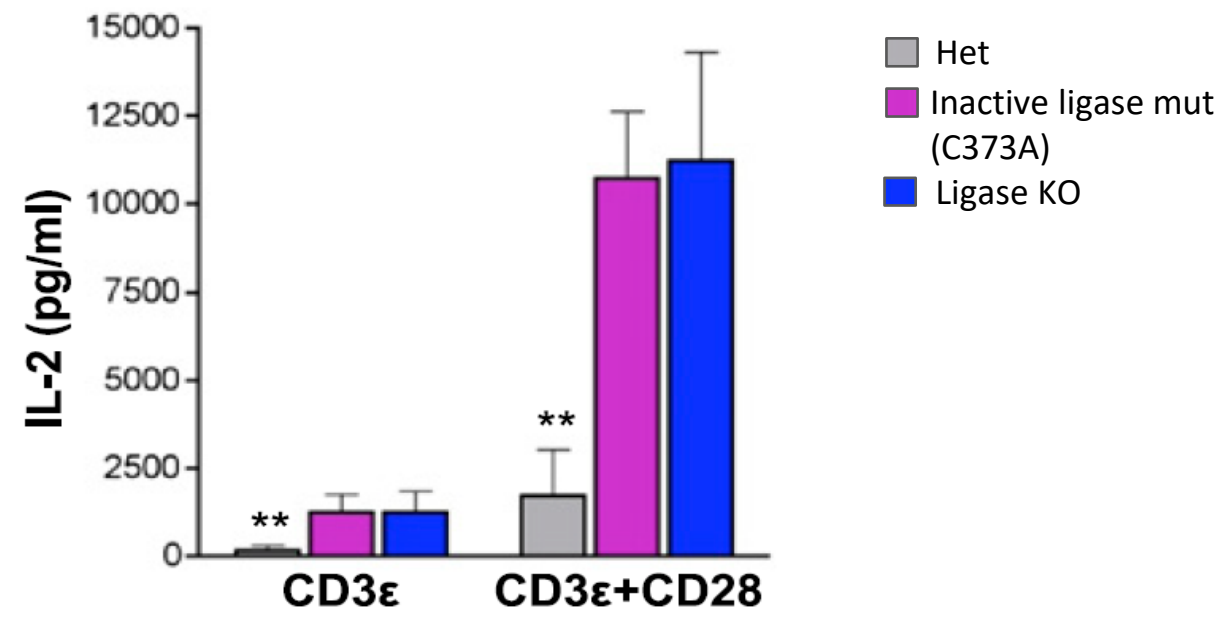
- DC and NK infiltration and function
- T cell priming
- Cytotoxic T cells function
- Ability of T cells to resist tumor immunosuppressive mechanisms: Treg, MDSC, and TGF- $\beta$



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

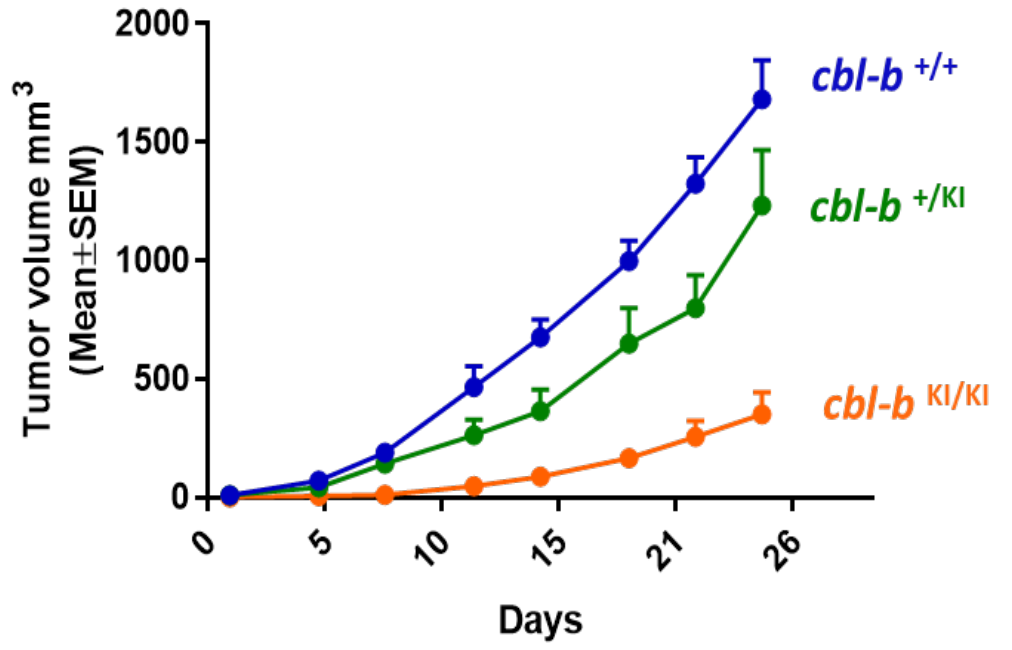
## Loss of CBL-B ligase activity results in hyperactive T cells that can reject tumors

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).

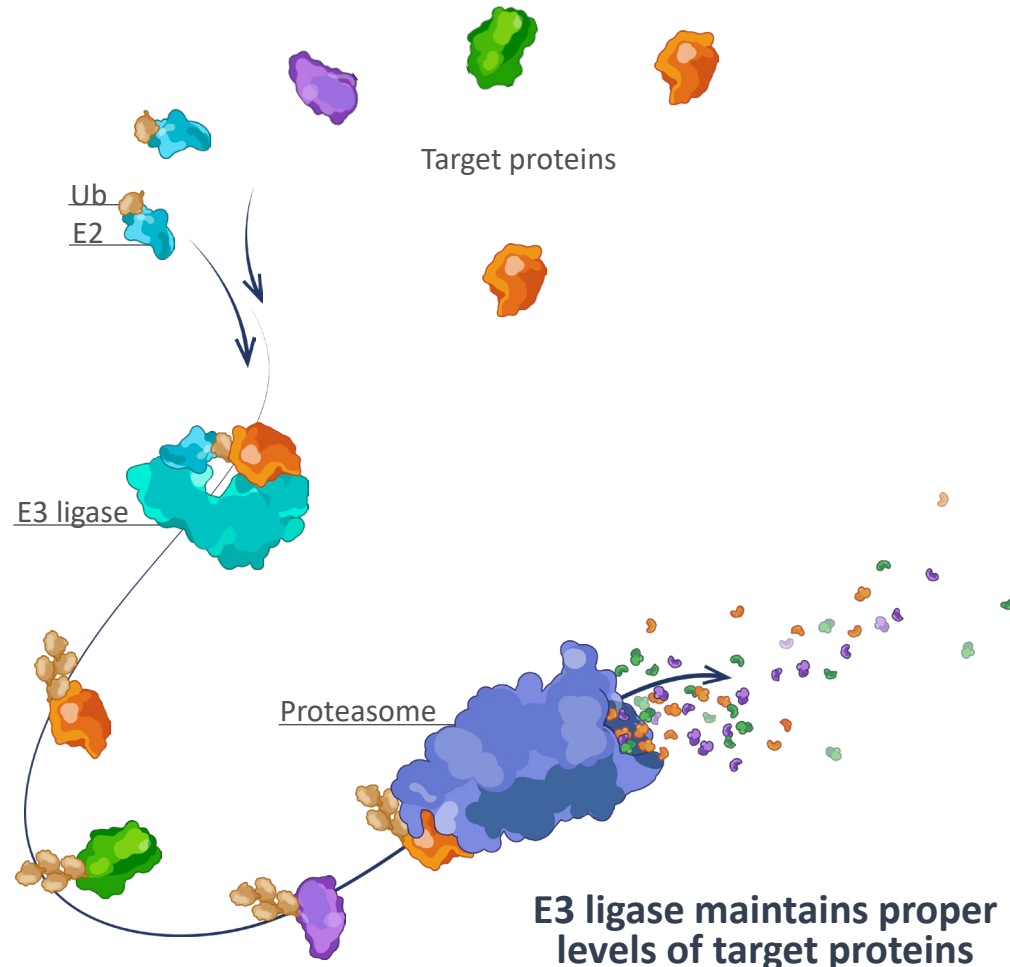


# Targeted Protein Elevation

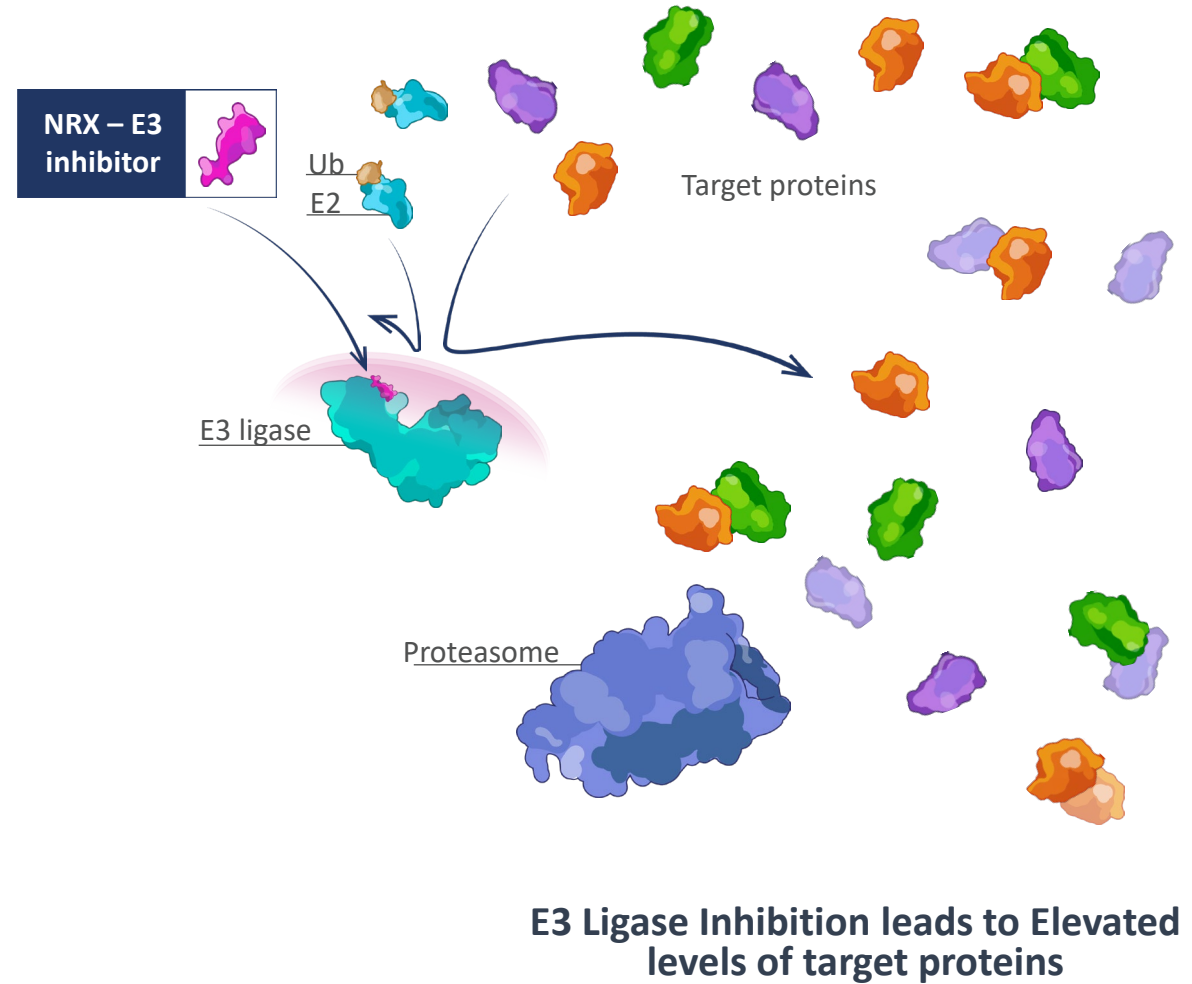
## E3 Ligase Inhibition Raises Substrate Levels

Graphic modified from Sumit's Ligase Workshop

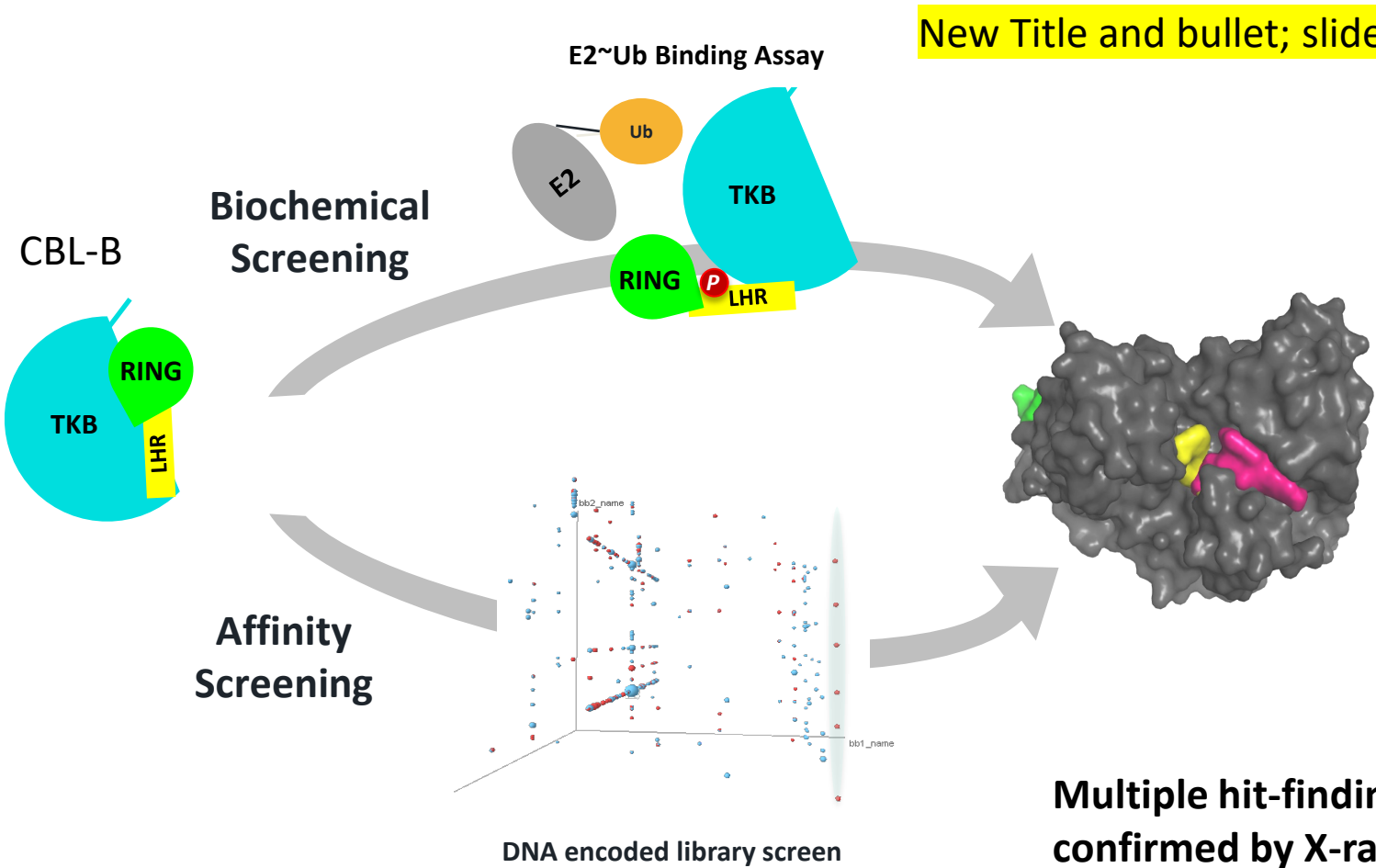
### Native State: Normal Levels of Target



### Ligase Inhibition: Increased Target Abundance



# Multiple Screening Methodologies Yielded Chemical Matter for CBL-B



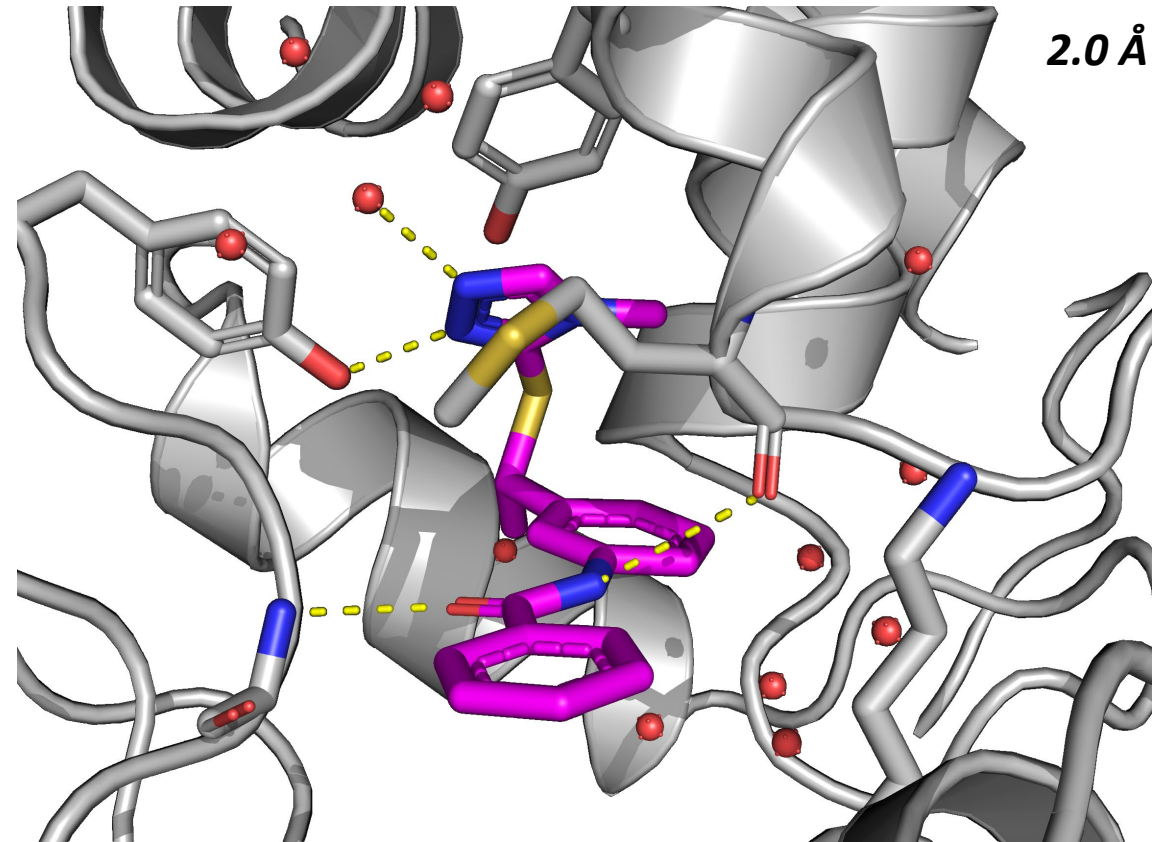
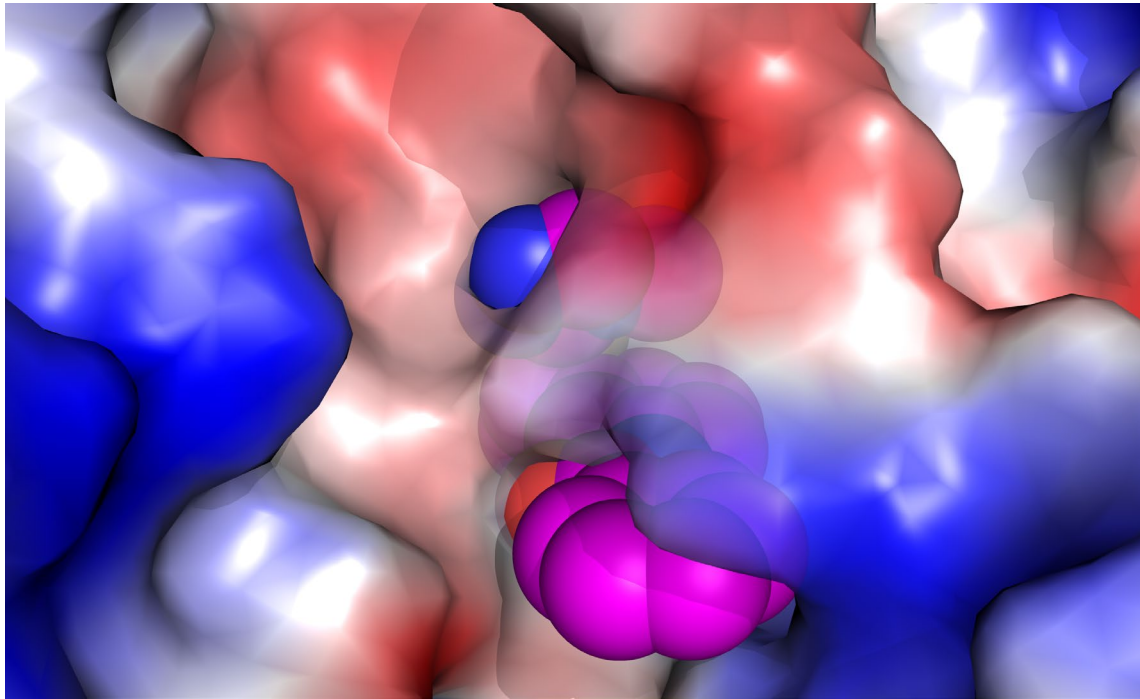
New Title and bullet; slide used at DDC last year

	HTS	DEL	Fragment
Lib size	300K	1X10 <sup>9</sup>	1600
# of Series	1	2	1
Hit Affinity	28 uM	2.4 uM	1800 uM
Hit mwt	338	537	211
Hit LE	0.27	0.22	0.33

Multiple hit-finding techniques yielded starting points that were confirmed by X-ray crystallography as well as biochemical and biophysical assays.



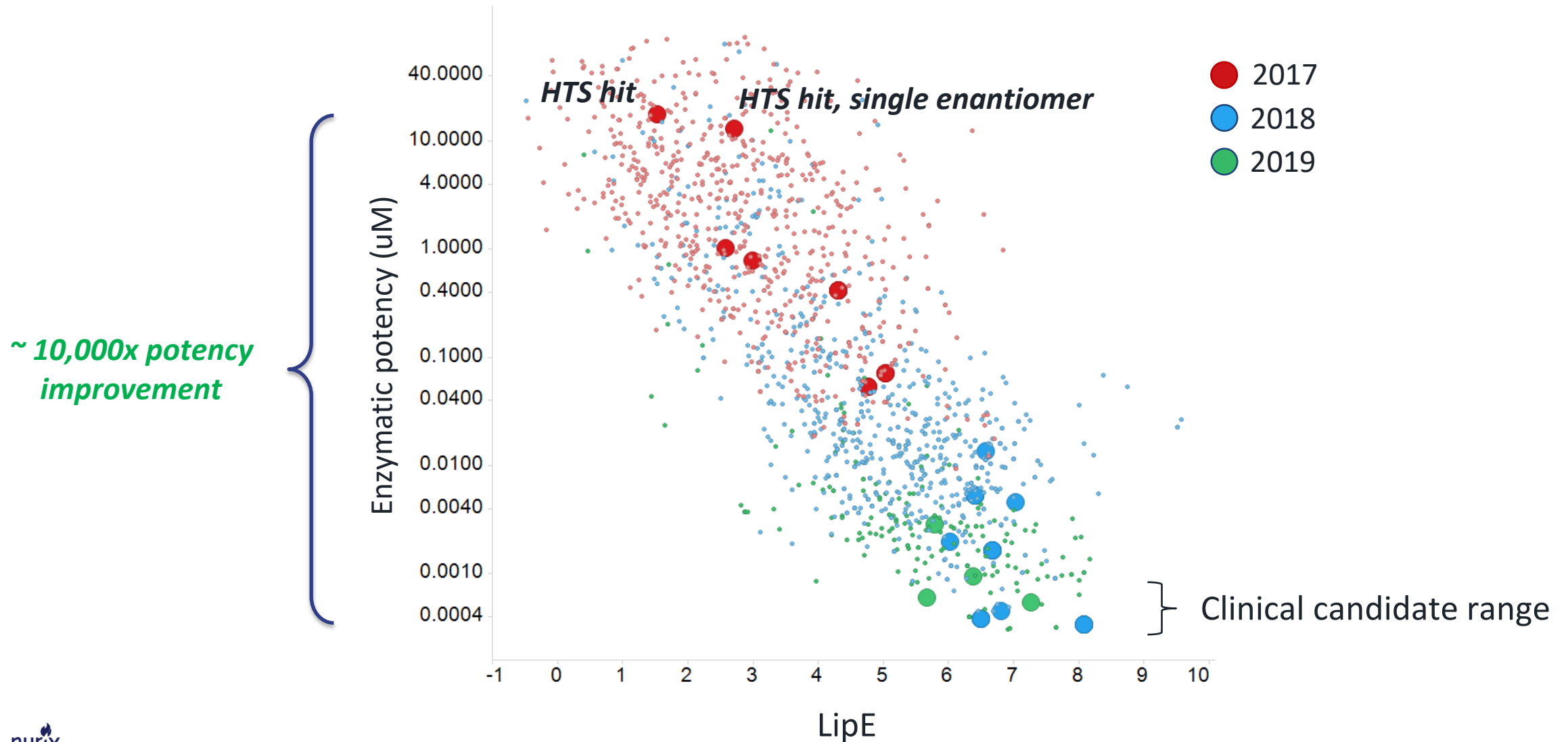
# Crystal Structure Confirms Binding Mode as Intramolecular Glue



**Nurix CBL-B inhibitors bind to closed-state conformation of E3 ligase and prevents phosphorylation**

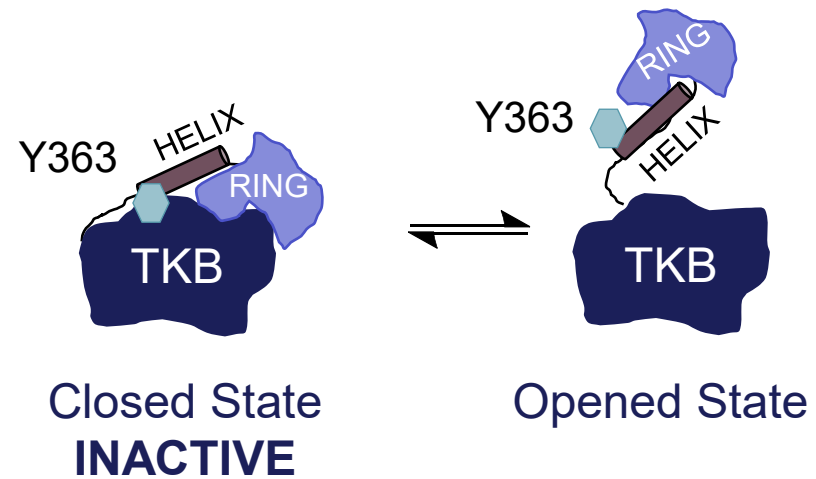
**New Bullet**

# Over 10,000-fold Enzymatic Potency Improvement Achieved While Improving Molecular Properties

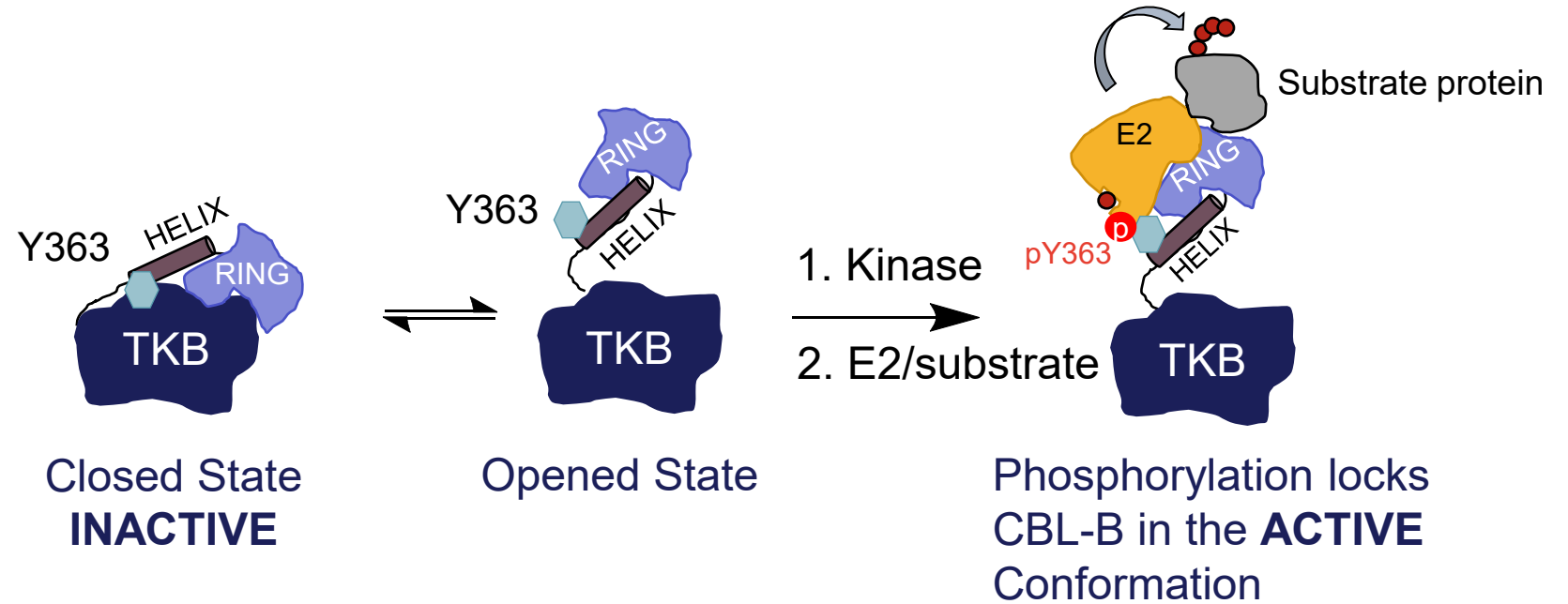


# NX-1607 Mechanism of Action: Intramolecular Glue

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

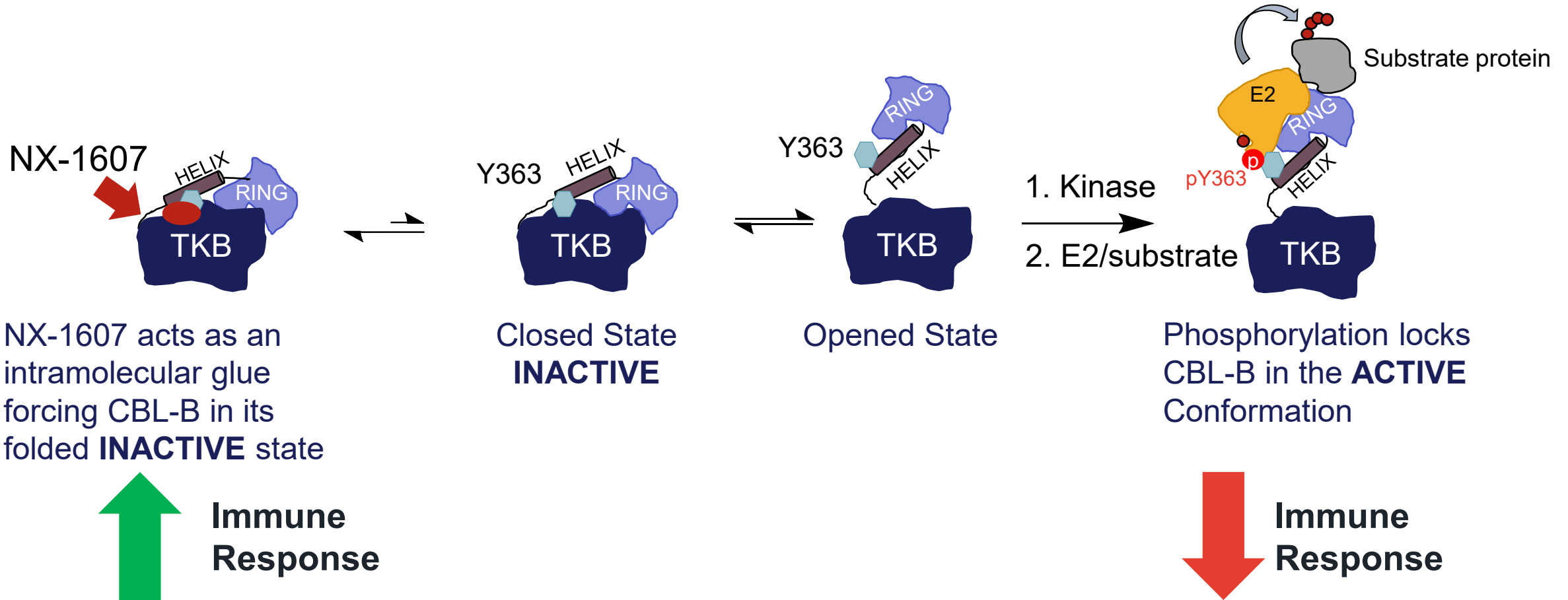


# NX-1607 Mechanism of Action: Intramolecular Glue

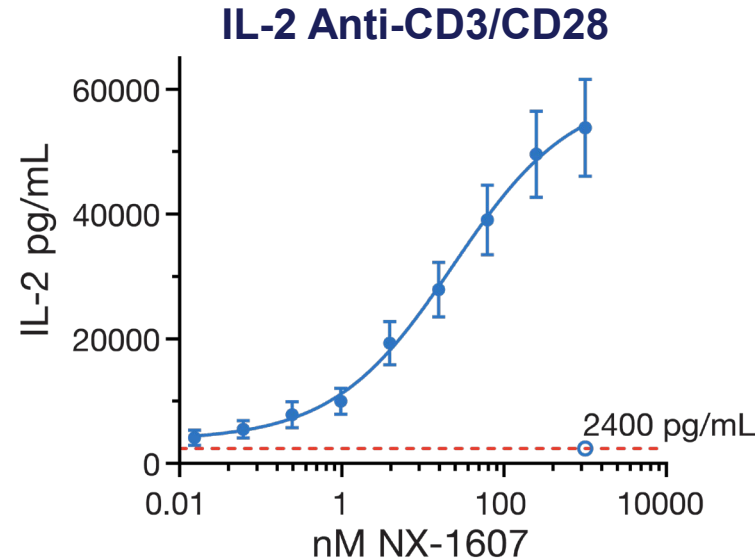
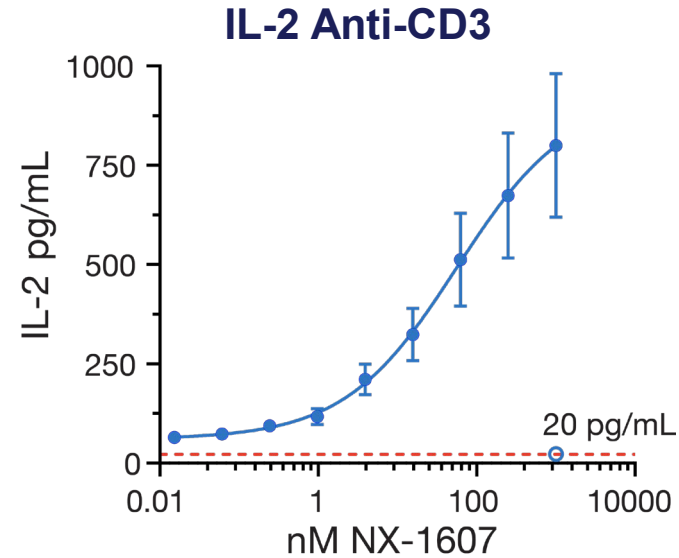


**Immune Response**

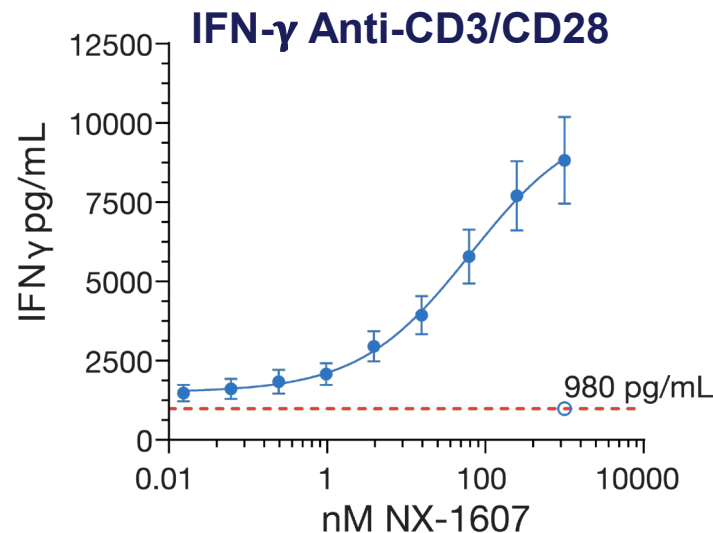
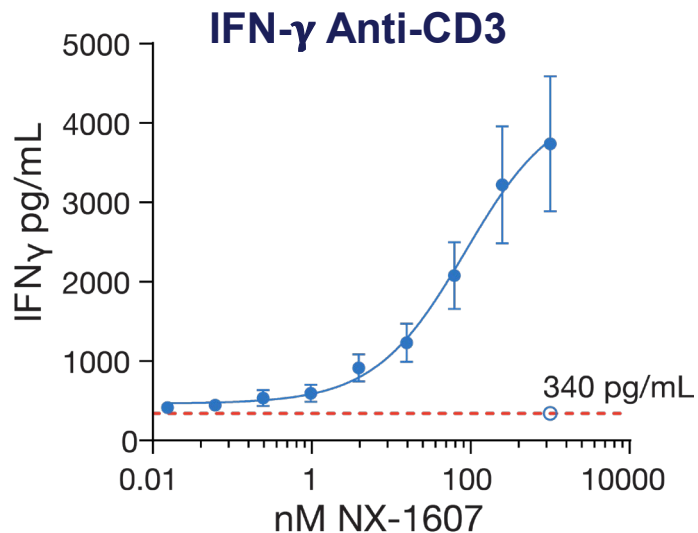
# NX-1607 Mechanism of Action: Intramolecular Glue



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



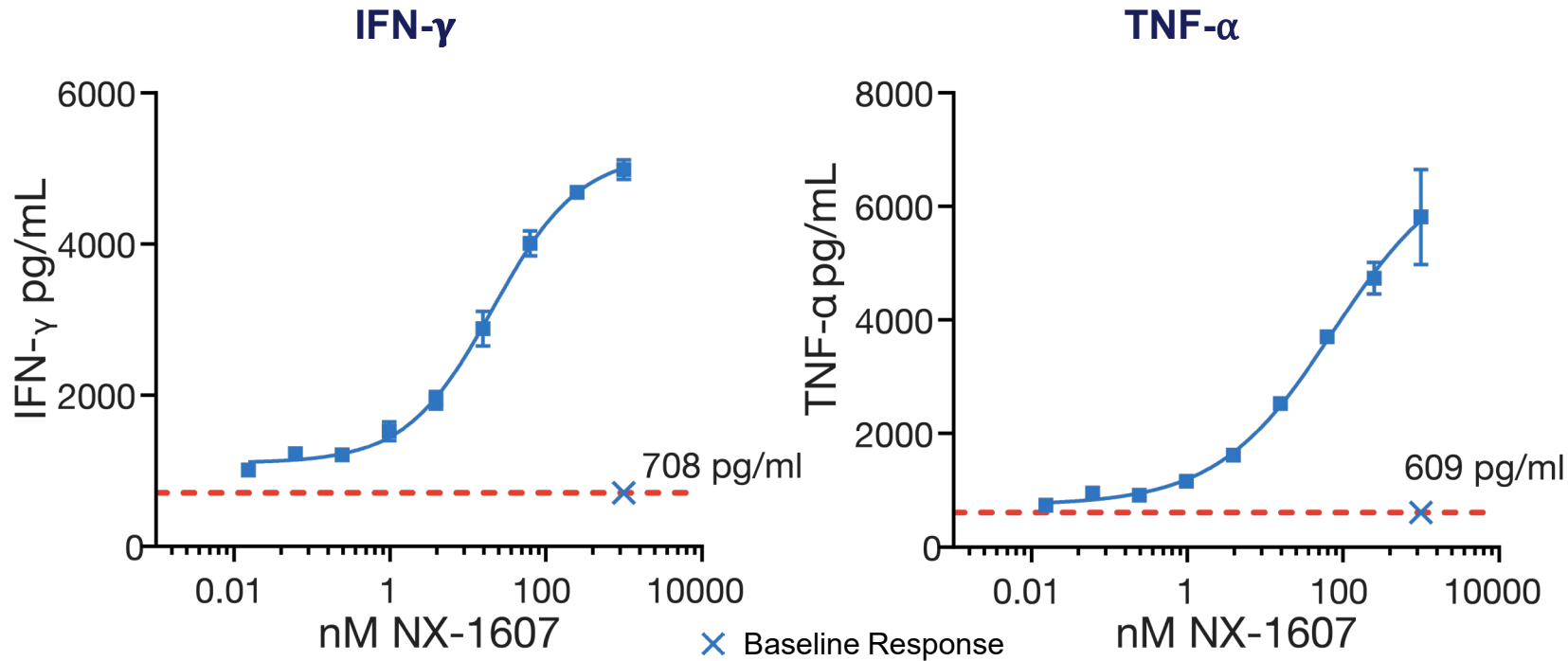
NX-1607 increases TCR stimulation-dependent production of IL-2 and IFN- $\gamma$  in primary human T cells



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



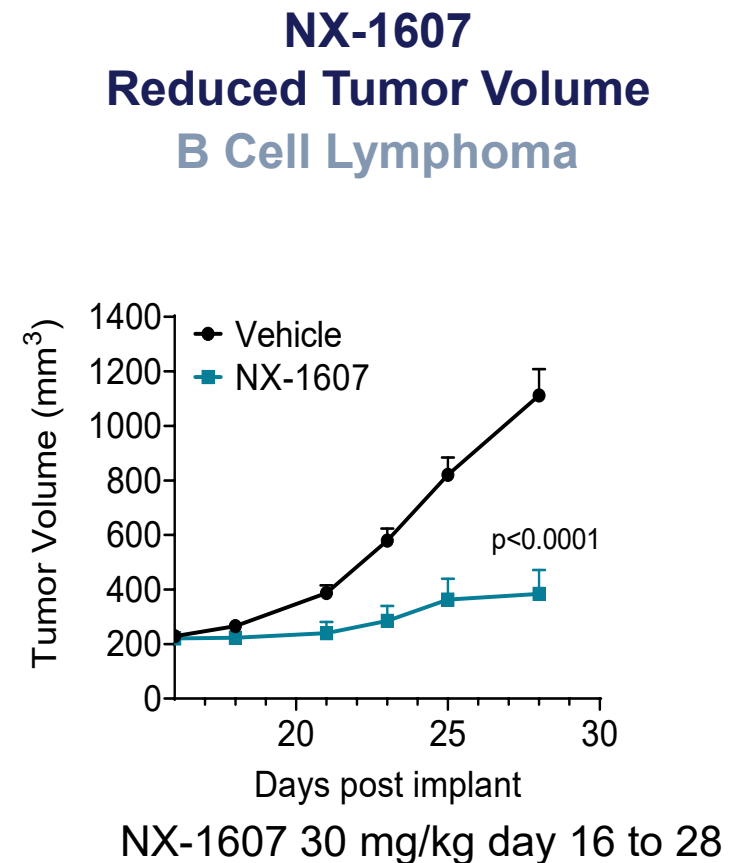
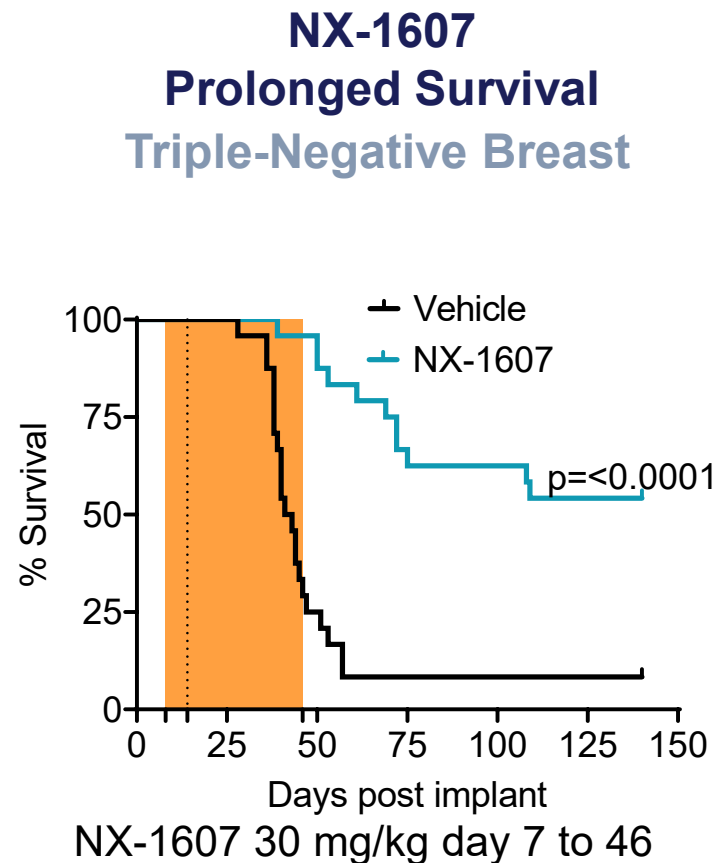
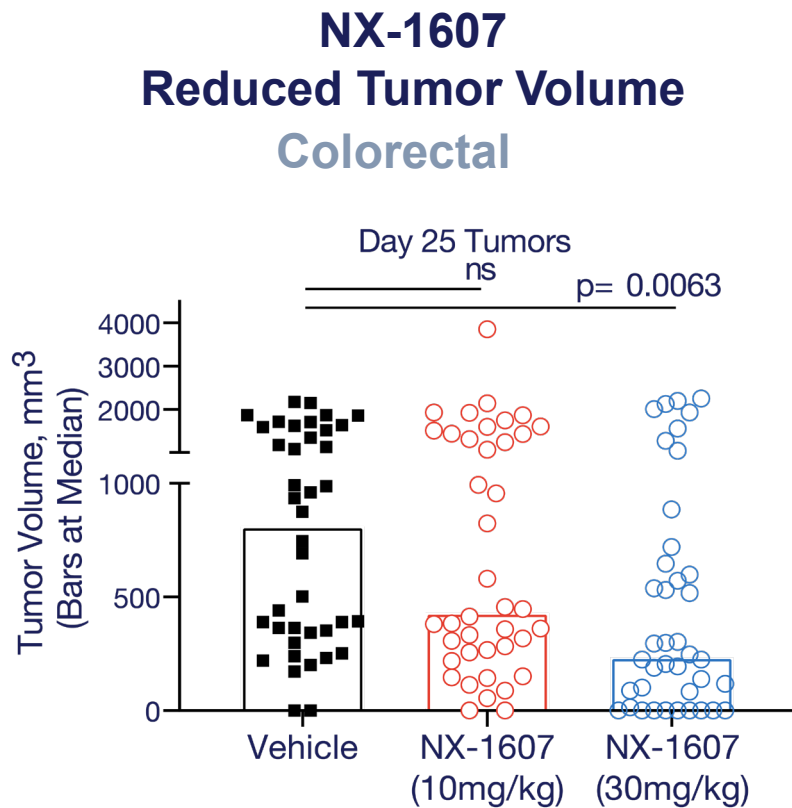
NX-1607 increases stimulation-dependent production of IFN- $\gamma$  and TNF- $\alpha$  in primary human NK cells

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



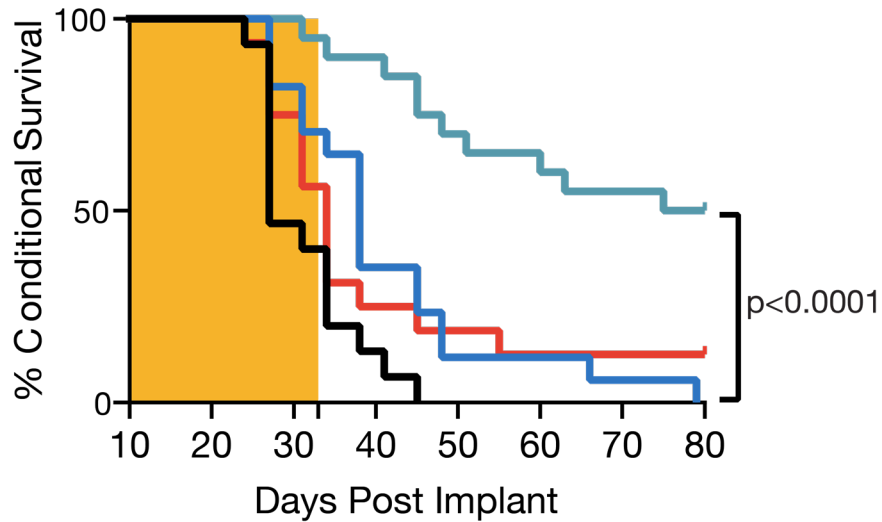
Shaded area indicates dosing period



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

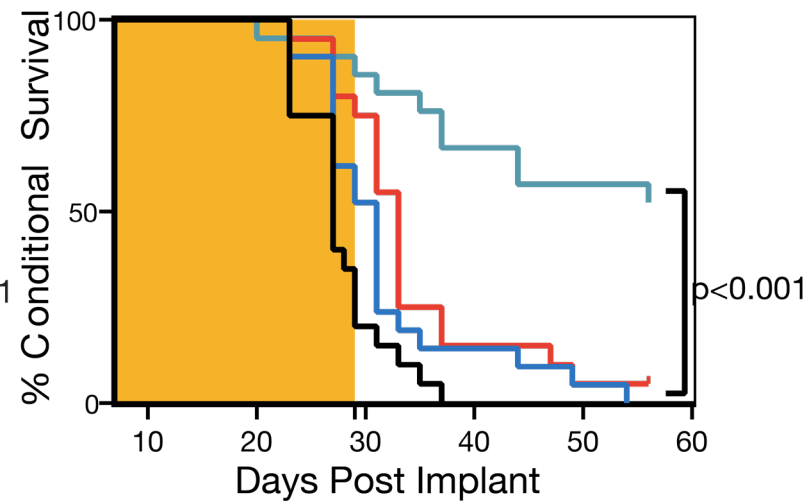
## Colorectal (CT26)

Long-Term Survival



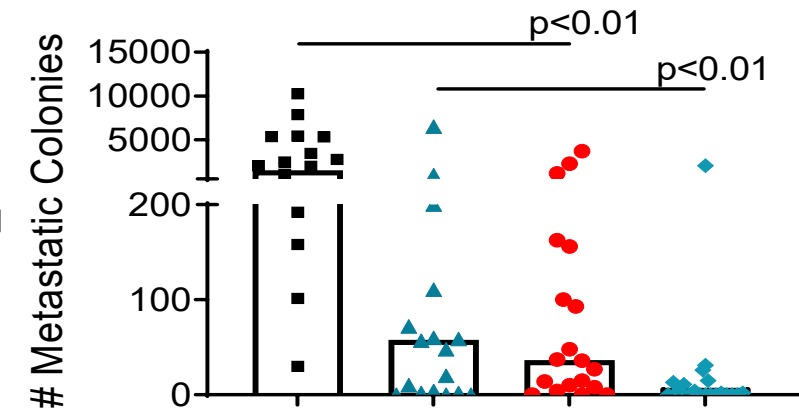
## Colorectal (MC38)

Long-Term Survival



## Triple-Negative Breast (4T1)

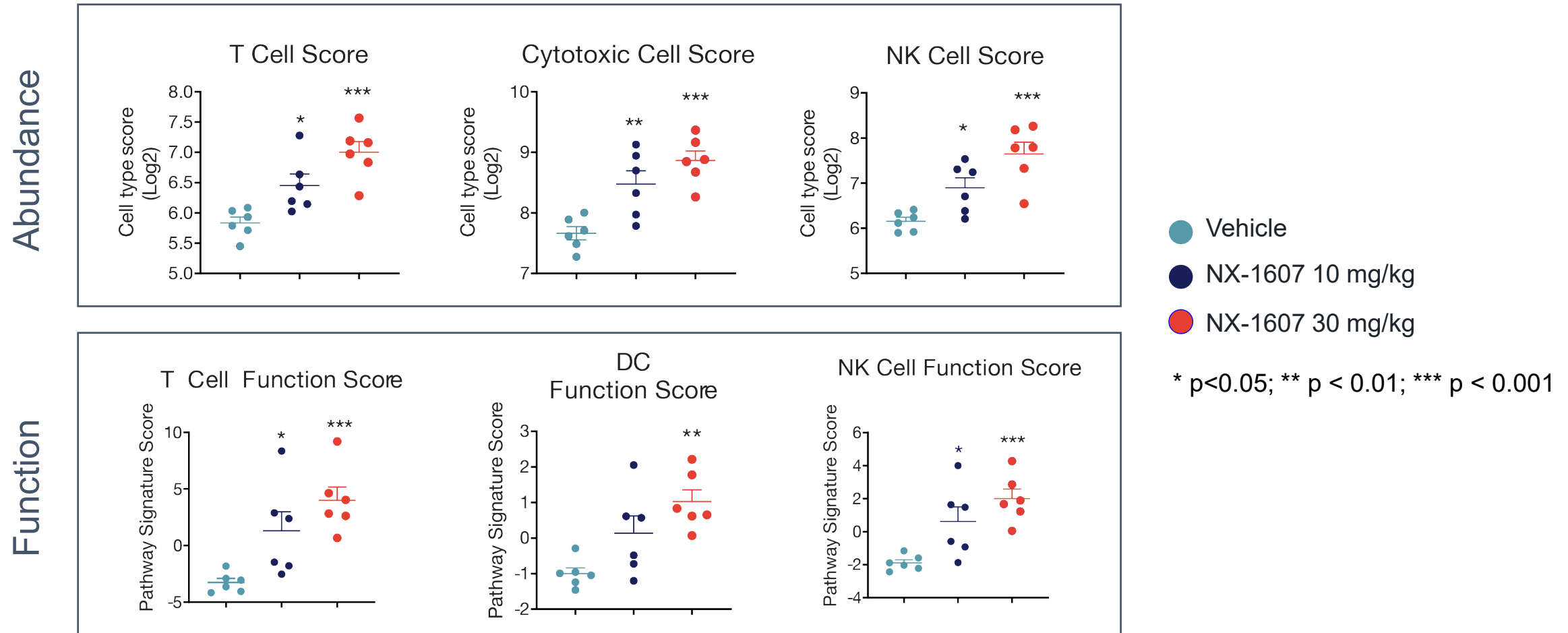
Day 28 4T1 Lung Metastases



■ 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

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

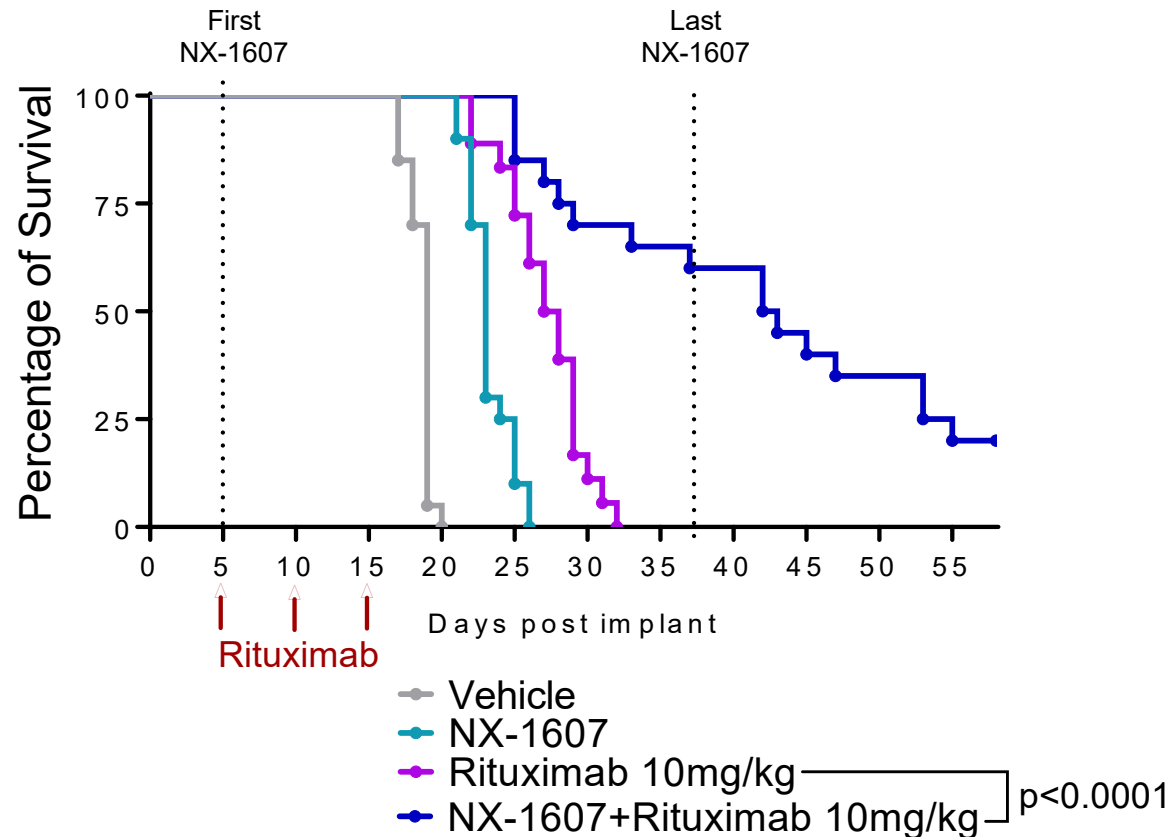


Tumor-bearing mice treated for 18 days with NX-1607 at 10 or 30 mg/kg. Tumor microenvironment profiled using NanoString technology.

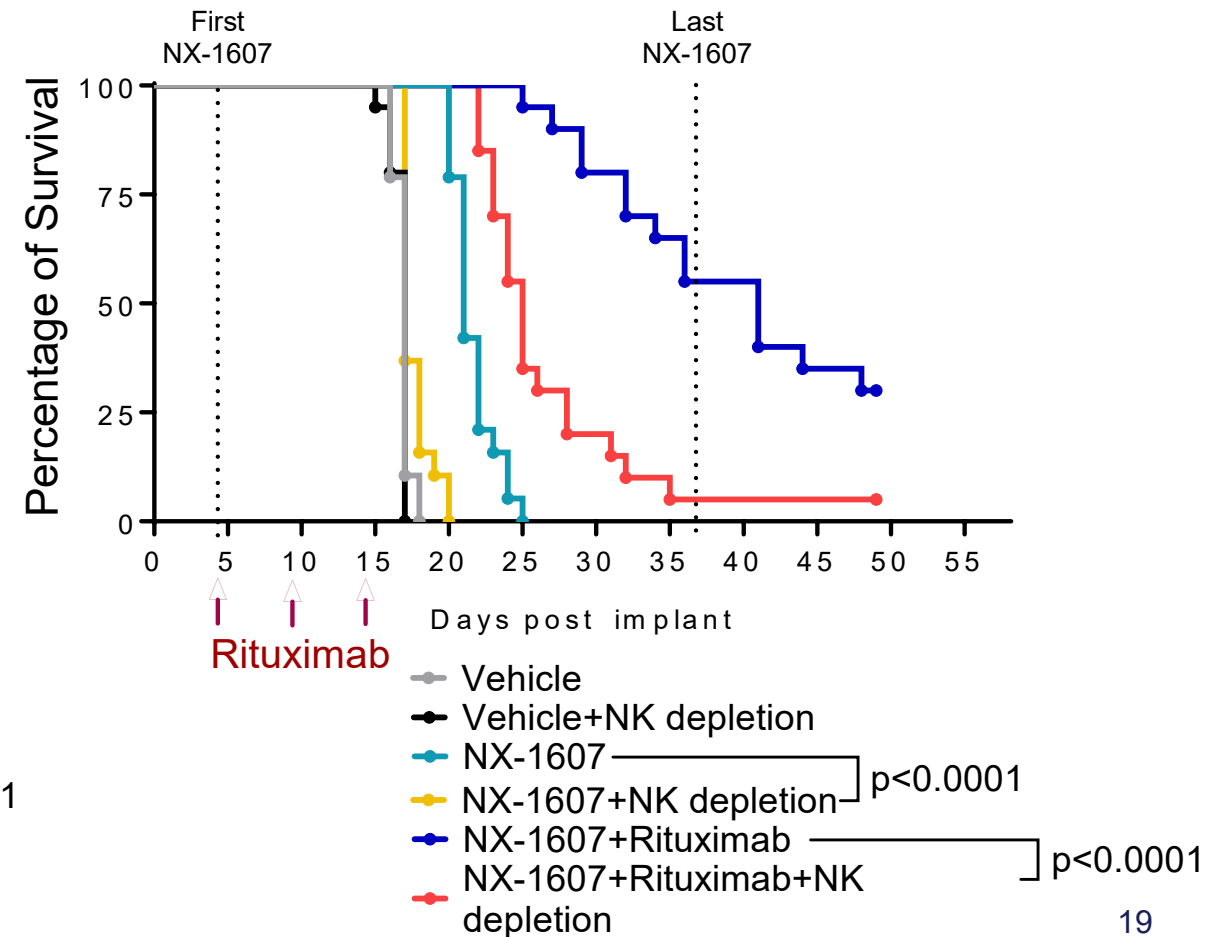
# Combination of NX-1607 and Rituximab Enhances Anti-tumor Activity in a Human NHL Animal Model

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

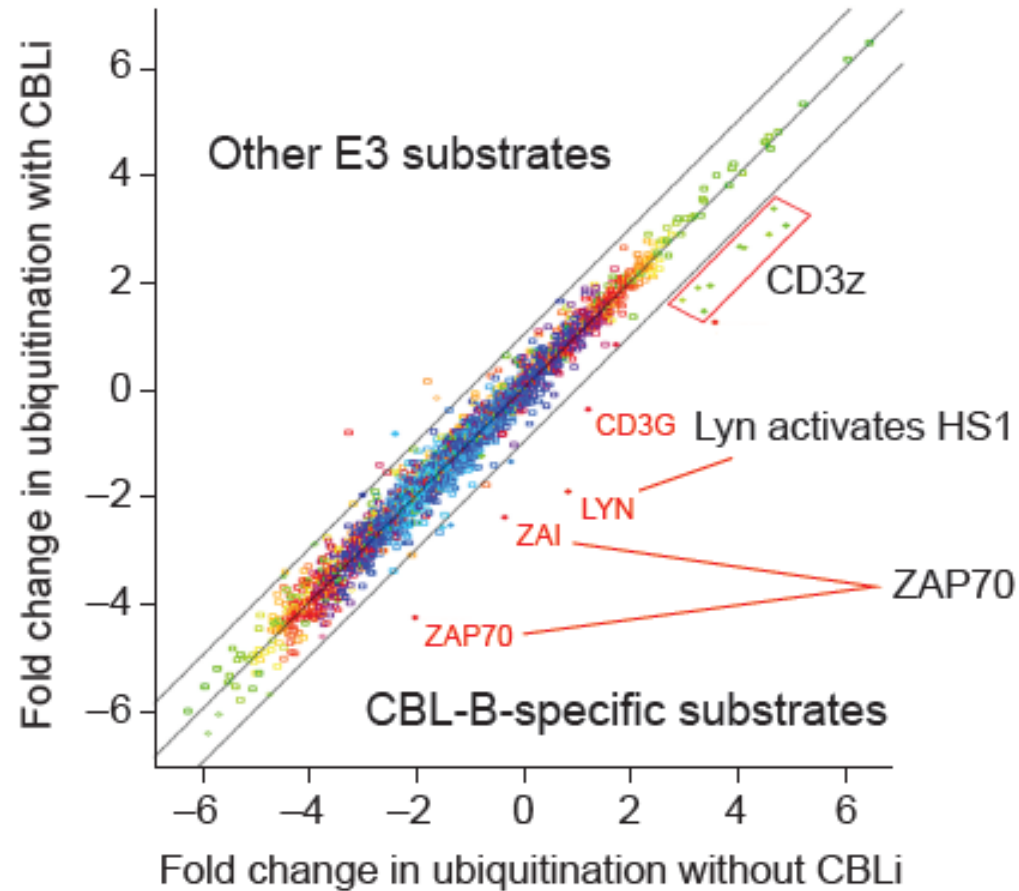
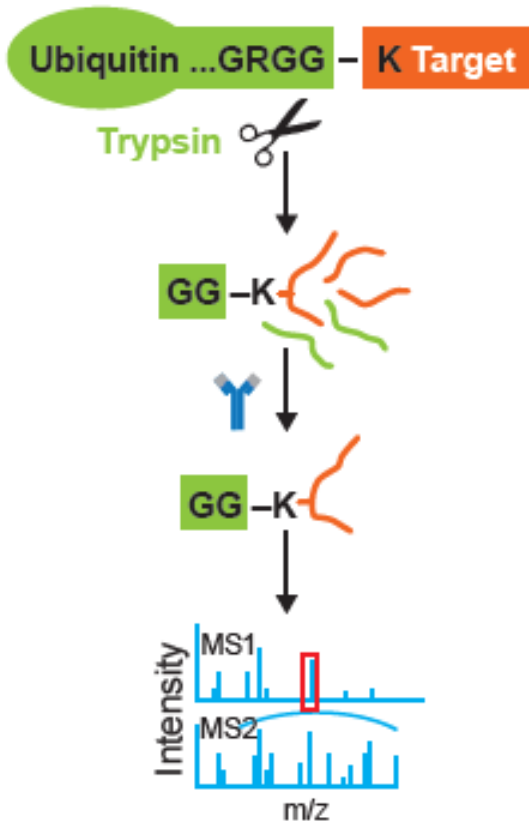
NX-1607-mediated NK activation potentiates rituximab antitumor activity



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



# UbiScan Identified Direct CBL Substrates Within the T Cell Receptor (TCR) Signaling Cascade

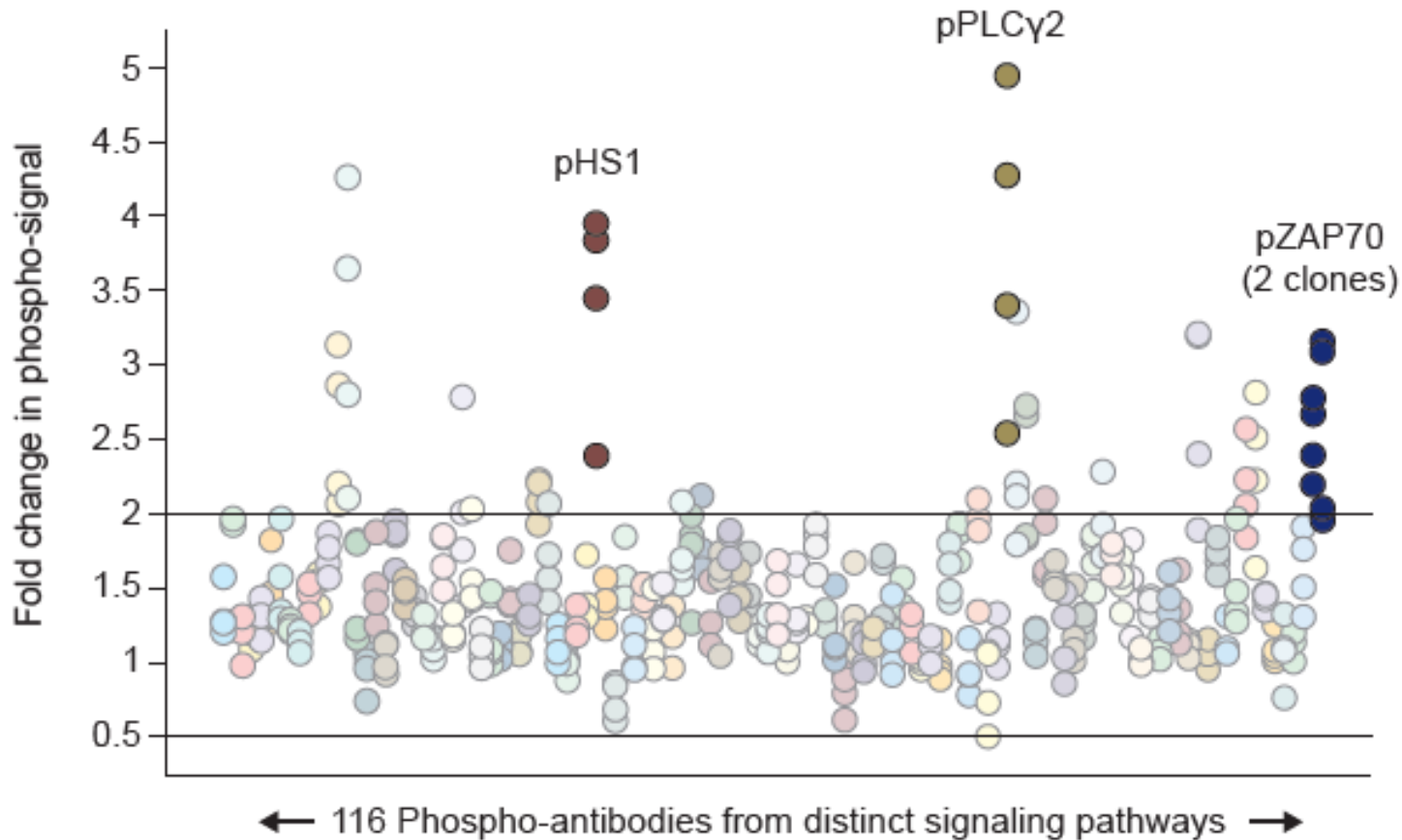


Decreased signal represents direct substrates ubiquitinated by CBL-B ligase activity

Inhibiting CBL-B decreases ubiquitination of important T Cell receptor signaling molecules

# Phospho-Protein Flow Cytometry Assay Identified Proximal Biomarkers

Phosphorylation of proximal biomarkers in CD8+ T cells



- Human PBMCs were stimulated with or without CBL-B inhibition
- Expression levels were determined for phospho-proteins downstream the TCR signaling
- Overlapping results from orthogonal assays (Ubiscan) provided confidence in proximal biomarker signals

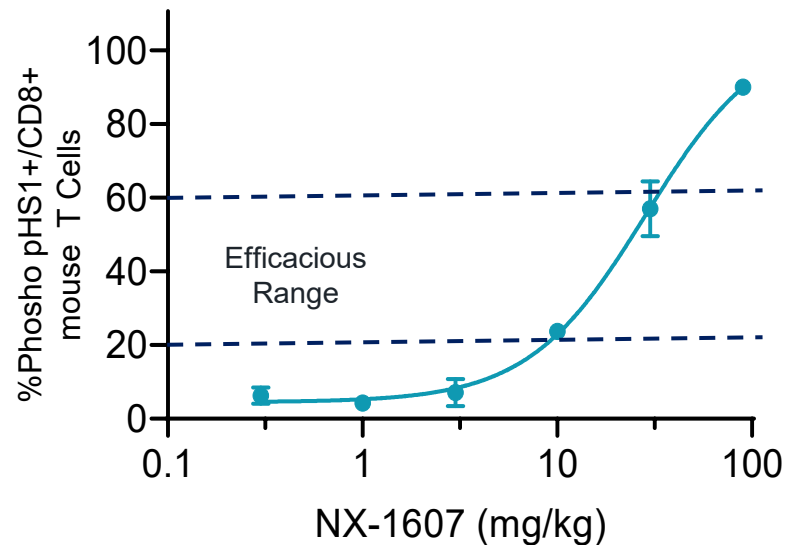
HS1: Substrate of LYN receptor, and an essential adaptor protein at the immune synapse, via VAV1

PLCγ2: Expressed in both T cells and B cells; associates with LAT and SLP-76 & becomes phosphorylated upon TCR stimulation

ZAP70: Key organizer of downstream TCR signaling

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

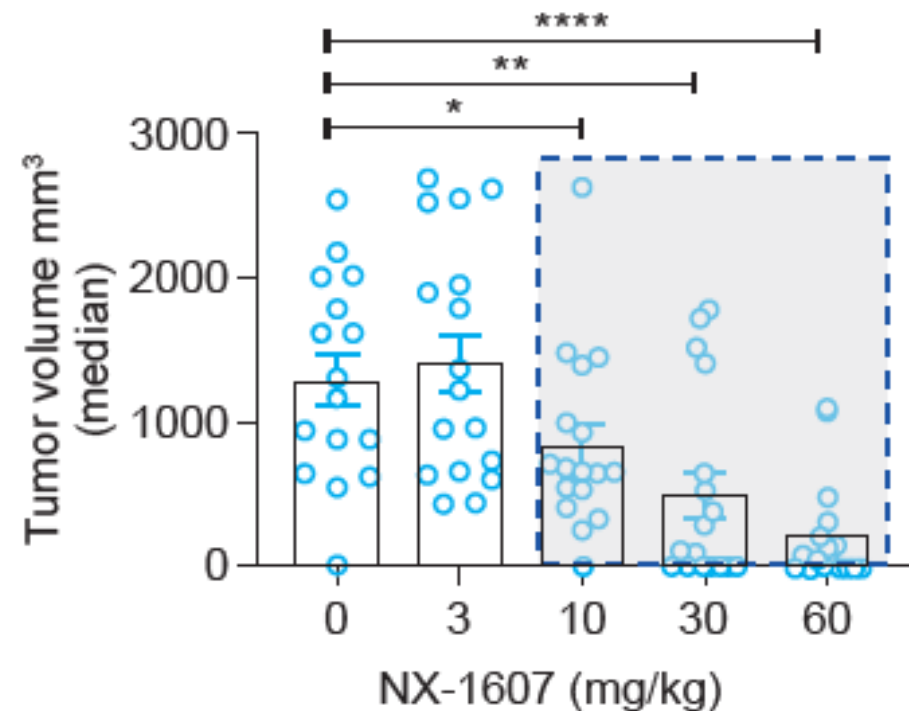
Pharmacodynamic relationship in mice following NX-1607 dosing



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

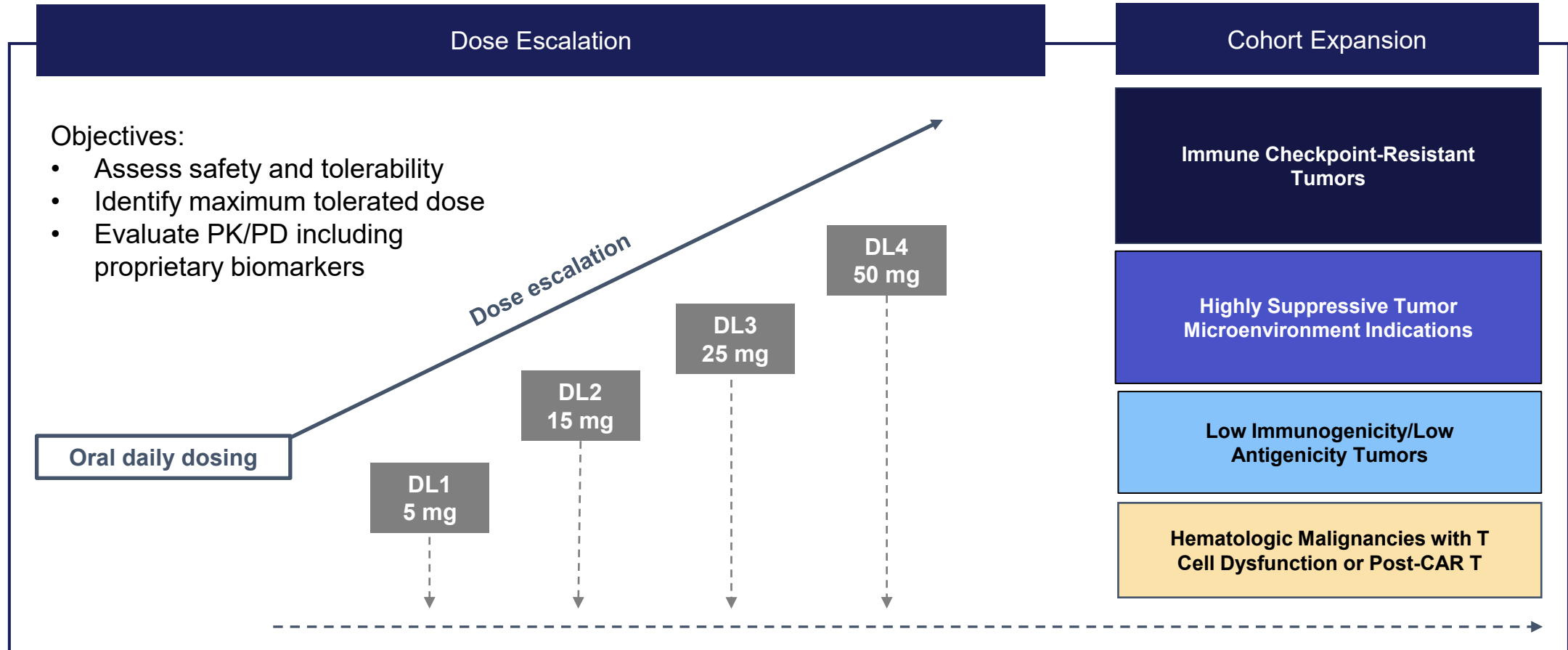
NX-1607 reduced tumor volume

A20 - B cell lymphoma model



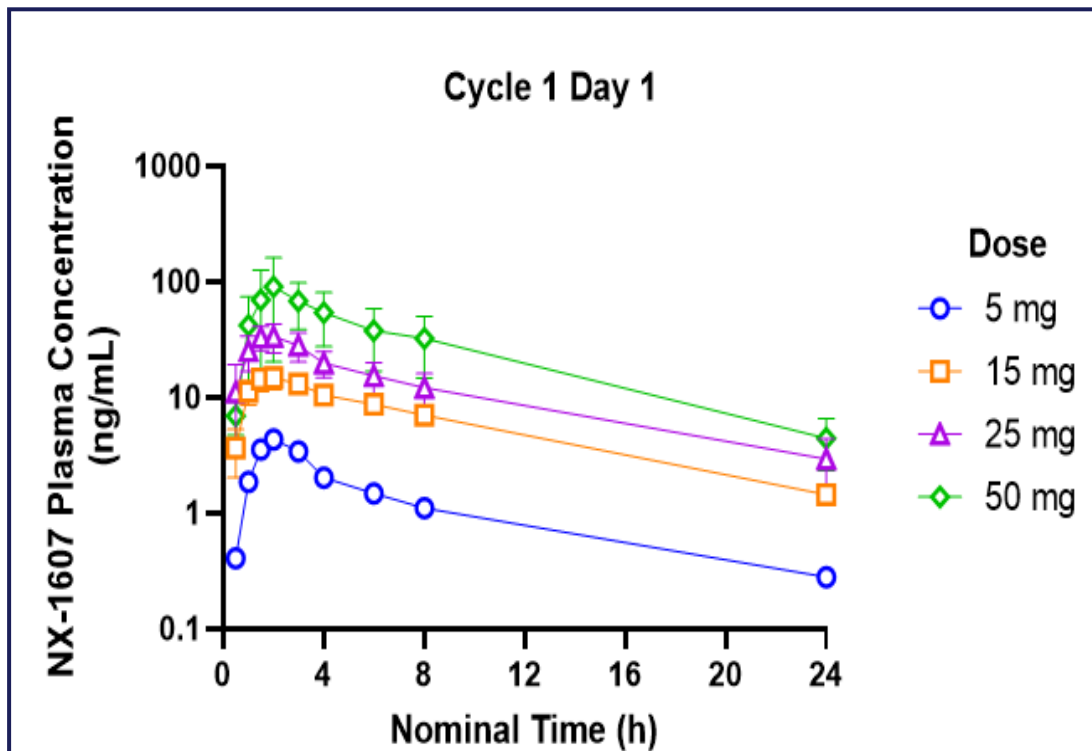
# NX-1607-101: Phase 1 first-in-human clinical trial design

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



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

- Preliminary PK data suggest NX-1607 has dose-proportional exposures and a mean half-life of 6 to 8 hours at doses ranging from 5 to 50 mg



Dose	Cycle 1 Day 1			
	$C_{max}$ (ng/mL)	$AUC_{0-last}$ (h*ng/mL)	$T_{max}$ (h)	$t_{1/2}$ (h)
5 mg (n=1)	4.35	26.2	2.0	7.72
15 mg (n=9)	16.2 (38.5)	129 (33.4)	2.0 (1.5 - 6.0)	7.14 (19.8)
25 mg (n=6)	30.1 (109)	201 (103)	1.5 (1.0 - 3.0)	6.82 (27.5)
50 mg (n=2)	79.2 (134)	502 (113)	2.5 (2.0 - 3.0)	5.88 (7.7)

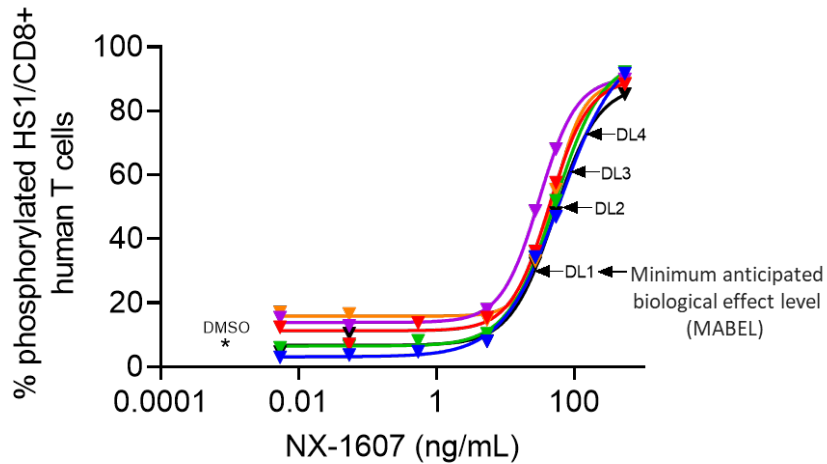
LLOQ = 0.05 ng/mL  
Data extract date: Dec 7th, 2022

$C_{max}$  and  $AUC_{0-last}$  are presented as geometric mean (geometric %CV);  $T_{max}$  is presented as median (range);  $t_{1/2}$  is presented as mean (%CV)



# Characterization of a Novel Biomarker and First Evidence of Target Engagement for a CBL-B Inhibitor in the Clinic

## Human whole blood and dose projection modeling



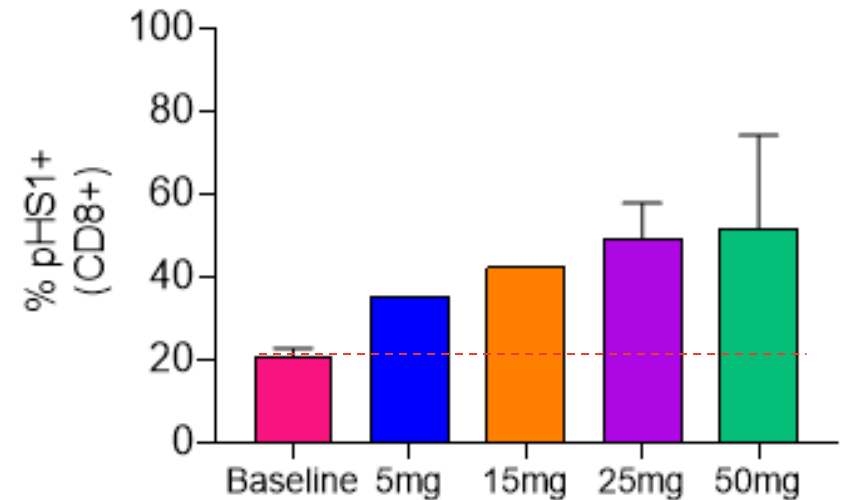
Proposed dose level <sup>a</sup>	NX-1607 dose (mg)	Estimated % HS1+/CD8+ T cells
-1	2.5	22.2
1 <sup>b</sup>	5	30.0
2	15	49.7
3	25	60.6
4	50	74.0

<sup>a</sup>Dose levels in NX-1607-101.

<sup>b</sup>Minimum anticipated biological effect level (MABEL).

## Clinical data

### Maximal % pHS1+ expressing CD8+ T cells observed in C1D1



Dose level 1    Dose level 2    Dose level 3    Dose level 4  
5mg            15mg            25mg            50mg

Cycle 1, N:            1            1            6            2

# NX-1607-101 Clinical Trial Status

New Summary Slide

- Dose escalation is ongoing
- Consistent with preclinical models, we are observing dose-dependent increases of proximal biomarkers
- Initial clinical data from Phase 1a is expected in H2 2023
- We expect to define Phase 1b dose for cohort expansion in H2 2023

# Summary and Conclusions

New Summary Slide

- E3 Ligases like CBL-B can act as gate-keepers of signaling pathways, therefore they can be powerful therapeutic targets
- Inhibition of E3 ligases can raise the levels of many substrate proteins in a coordinated fashion, which can be desirable in a disease setting like cancer
- Nurix CBL-B inhibitors act as intra-molecular glues, locking CBL-B in an inactive conformation and preventing the phosphorylation and activation of this E3 Ligase
- Inhibition of CBL-B shows single agent anti-tumor activity and synergizes with Anti-PD1 to enhance anti-tumor effects and survival of mice in multiple tumor models
- A first-in-human phase 1 clinical trial was initiated for NX-1607. Early results show linear PK and evidence of target engagement using a novel biomarker representing a direct substrate of CBL-B.
- Initial Clinical data from this trial is expected later this year (2H 2023).

Thank You!