



R&D Day

December 13, 2016

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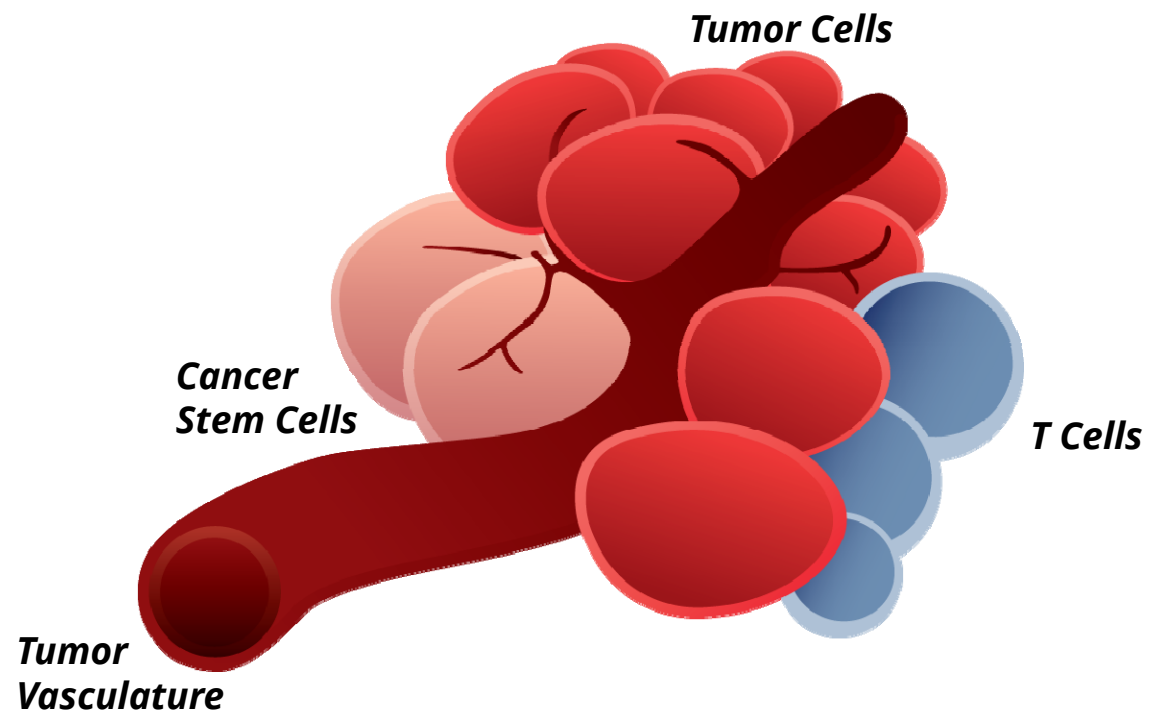
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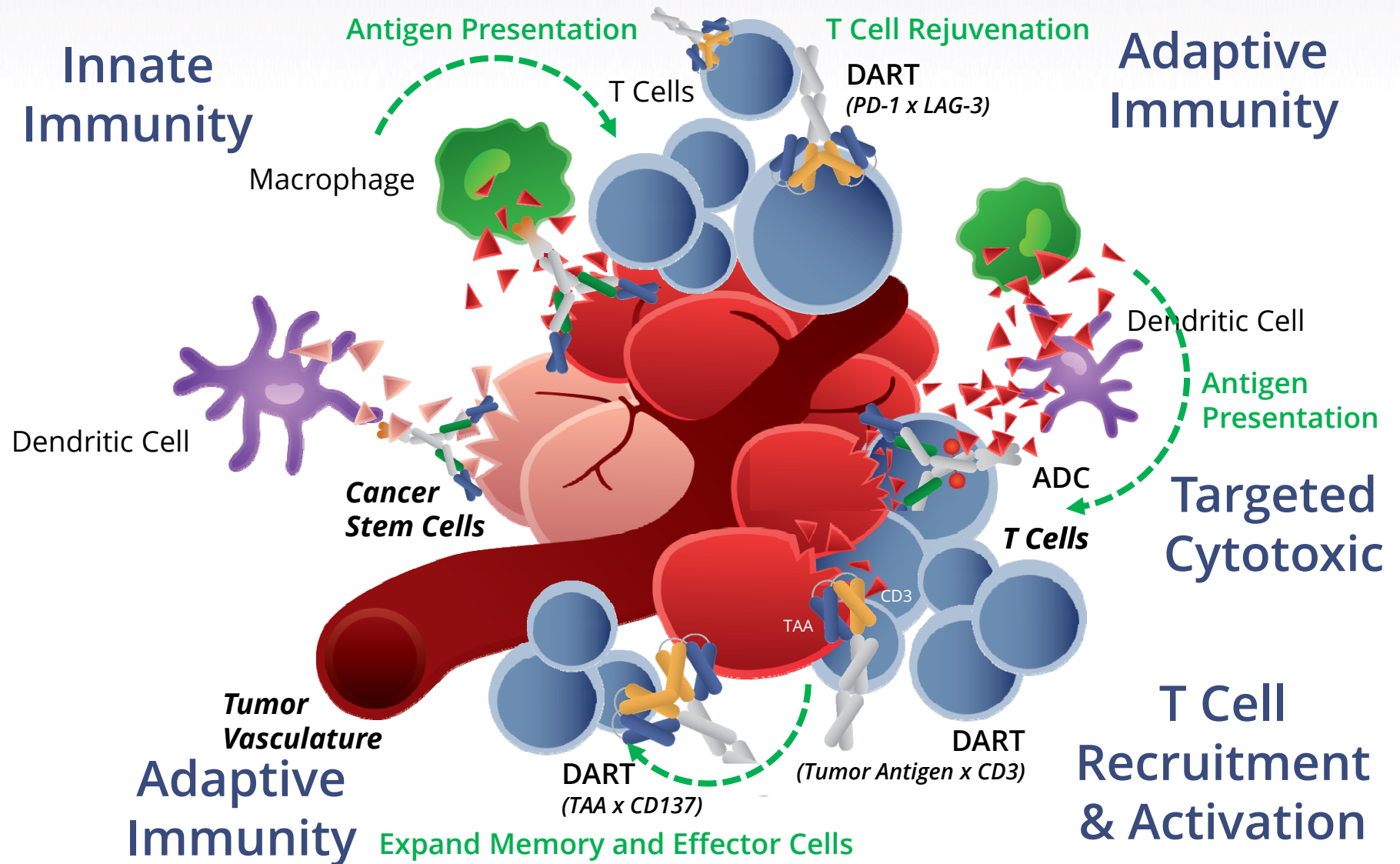
Committed to Breakthrough Biologics

| | |
|---------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Focus  | <ul style="list-style-type: none">• Unmet medical needs in cancer and autoimmune disease• Integrated, highly productive R&D organization |
| Products  | <ul style="list-style-type: none">• Nine clinical candidates, including seven in immuno-oncology• ≥ 1 New IND projected annually (6 INDs in last 3 years) |
| Platforms  | <ul style="list-style-type: none">• DART® and TRIDENT™ – versatile multi-specific mAb technologies• Fc Optimization – more potent therapeutic mAbs• Cancer Stem Cells – novel target ID and drug screening |
| Funding  | <ul style="list-style-type: none">• Well capitalized to advance pipeline (\$314M cash @ 9/30/16)• Alliances with BI, Janssen, Pfizer, Servier and Takeda |
| Employees  | <ul style="list-style-type: none">• 314 Employees as of 11/30/16 (Rockville, MD and SSF, CA)• Leadership team with extensive track-record |


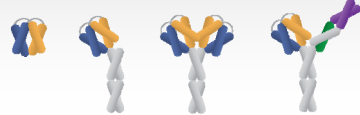


Integrated Immuno-Oncology Portfolio



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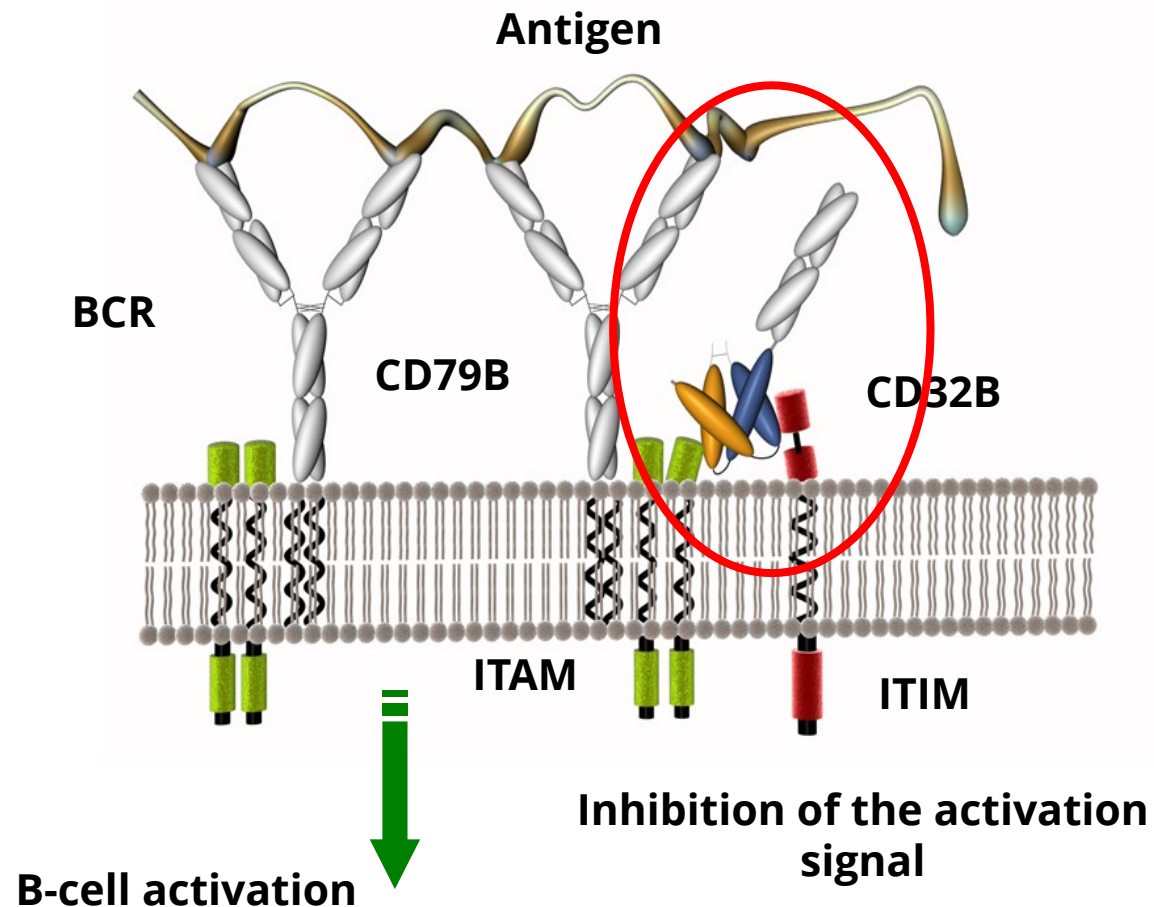


Building Comprehensive Immunotherapeutic Franchises

| Platform | | HER2 <i>Validated</i> | B7-H3 <i>Novel</i> | PD-1 <i>Emerging Backbone</i> |
|----------|-------------------------------------------------------------------------------------------------------------------------|---------------------------------|--------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | mAb/ Fc-Optimized  | margetuximab | enoblituzumab | MGA012 (anti-PD-1) |
| | DART/TRIDENT  | CD137 x HER2 | MGD009 | <ul style="list-style-type: none"> • PD-1 x LAG-3 • PD-1 x CTLA-4 • PD-1 + MGD006 • PD-1 + MGD007 • PD-1 + MGD009 |
| | Checkpoint Combination  | margetuximab + anti-PD-1 | enoblituzumab + anti-PD-1 enoblituzumab + anti-CTLA-4 | enoblituzumab + anti-PD-1 |
| | ADC  | — | MGC018 (B7-H3 ADC) | anti-PD-1 + MGC018 (B7-H3 ADC) |

Leveraging Checkpoint Biology for Autoimmunity

MGD010 (CD32B x CD79B DART) establishes clinical proof-of-principle



Today's Agenda

Welcome

Scott Koenig, M.D., Ph.D. – President & CEO, MacroGenics

Margetuximab: Potential Best-in-Class Anti-HER2 mAb

Jon Wigginton, M.D. – Senior VP, Clinical Development & CMO, MacroGenics

Comprehensive B7-H3 Franchise: Fc-Optimized mAb, DART® and ADC

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Clinical DART Programs Update

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Q&A / Break

"Combination Treatments with Checkpoint Blockade"

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Immuno-Oncology: Targeting Immune Regulators

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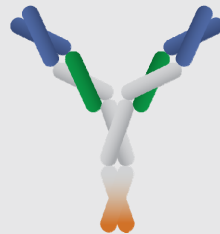
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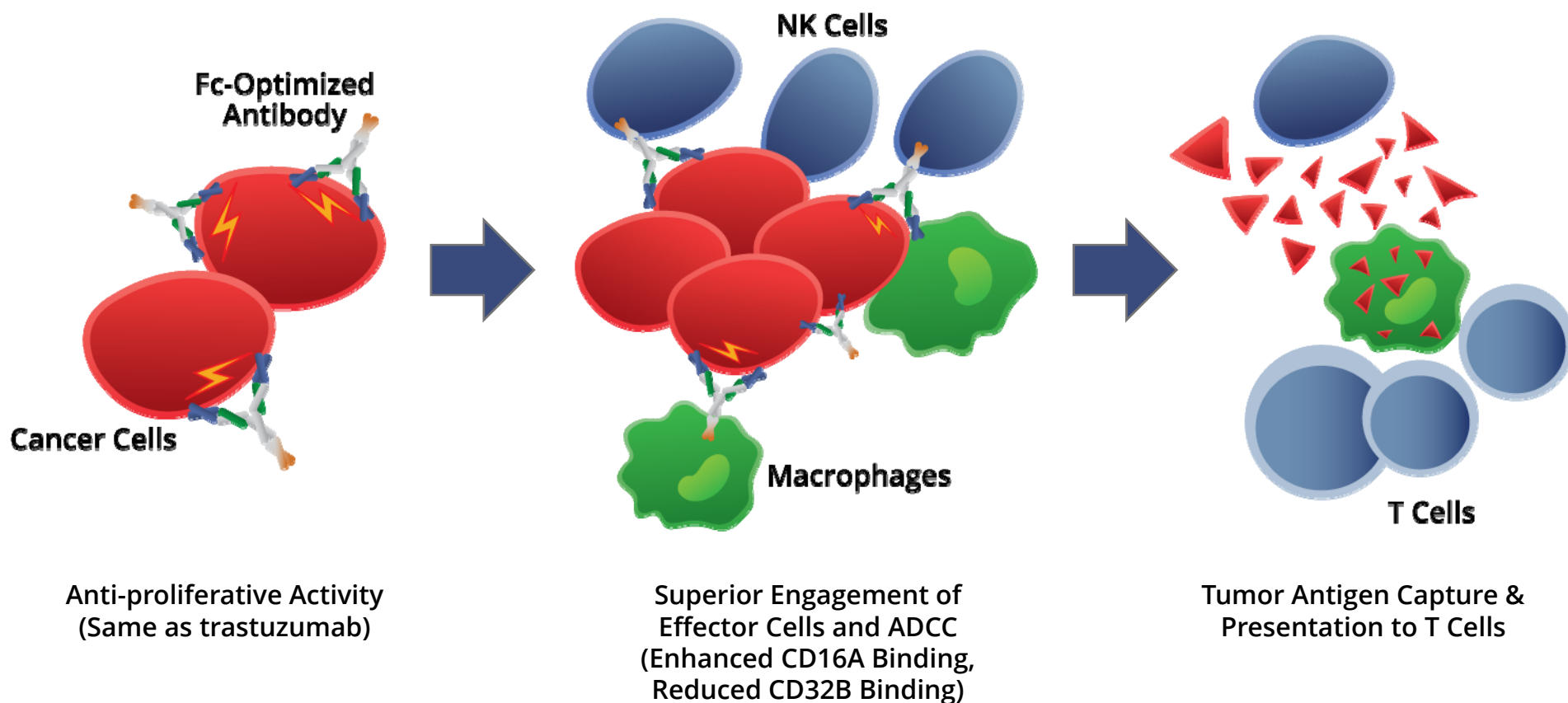
Margetuximab: Potential Best-in-Class Anti-HER2 mAb

Leveraging immune modulation through Fc optimization

| | | |
|---------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Candidate | <ul style="list-style-type: none">• Fc-optimized anti-HER2 mAb |  |
| Function/ MoA | <ul style="list-style-type: none">• Inhibits HER2 signaling (consistent with trastuzumab)• Fc Optimization potentially enhances ADCC<ul style="list-style-type: none">– <u>Increases</u> binding to <u>activating FcγR (CD16A)</u>– <u>Decreases</u> binding to <u>inhibitory FcγR (CD32B)</u> | |
| Lead Indications | <ul style="list-style-type: none">• Ph. 3 SOPHIA study (HER2+ metastatic breast cancer)• Ph. 1b/2 combo study with pembrolizumab (HER2+ gastric cancer) | |
| Partner | <ul style="list-style-type: none">• MacroGenics has global rights (ex-South Korea) | |

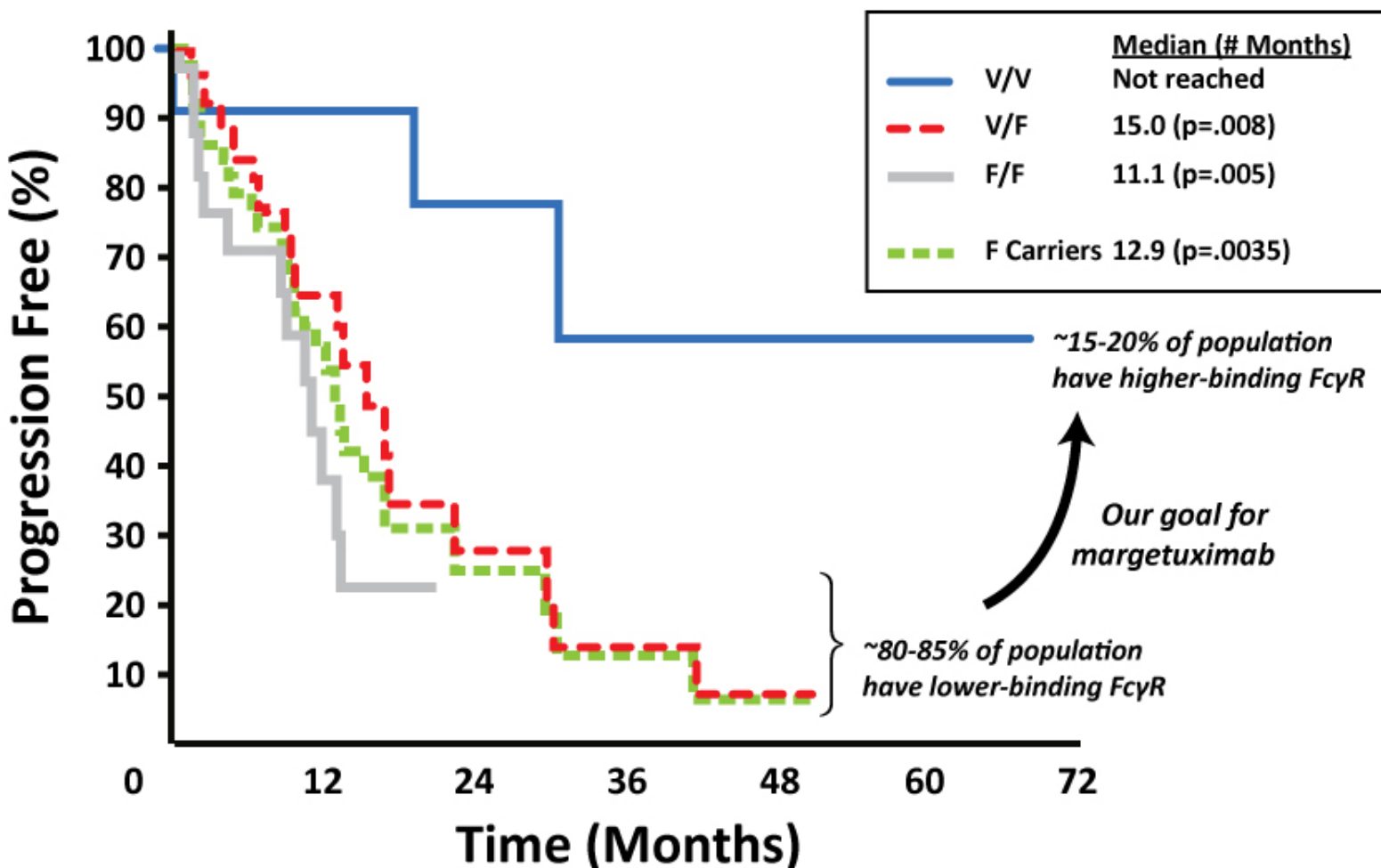
Enhanced Antitumor Activity through Effector Cell Engagement

Margetuximab: same signaling properties as trastuzumab plus enhanced ADCC



Role of Fc γ R Polymorphism in Response to Trastuzumab

*Improved outcomes in patients homozygous for higher-affinity CD16A V-allele**



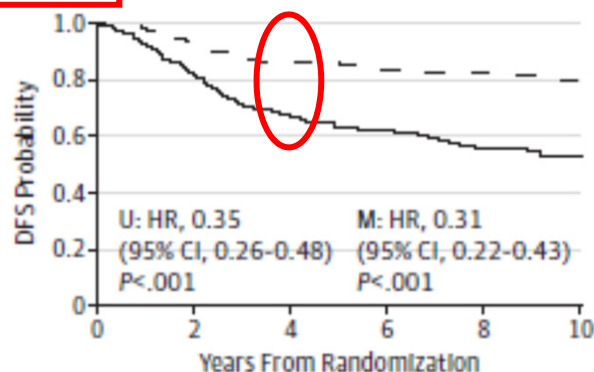
* Musolino, *et al.*, JCO 2008. Kaplan-Meier estimates of PFS to trastuzumab-based therapy by IgG fragment C receptor (Fc γ R) polymorphisms. PFS curves plotted by Fc γ RIIIa 158 valine(V)/phenylalanine(F) genotype. F carriers represent patients with either 158 V/F or 158 F/F genotype.

FcγR Status Can Influence Benefit from Trastuzumab Therapy

Lower affinity F-allele associated with reduced disease-free survival (DFS)

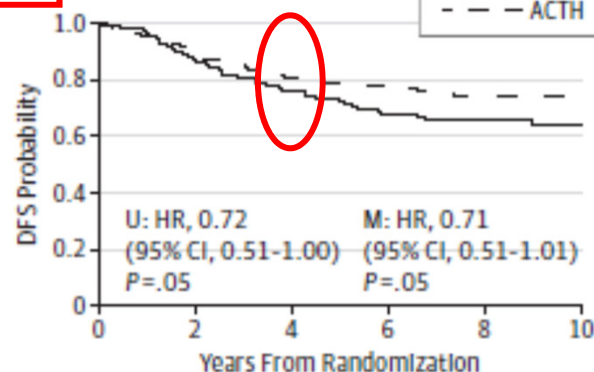
Treatment Effect According to FcγR Polymorphism

A V/V or F/V



| | | | | | | |
|-------------|-----|-----|-----|-----|-----|----|
| No. at risk | | | | | | |
| ACT | 302 | 179 | 138 | 120 | 95 | 11 |
| ACTH | 321 | 294 | 274 | 263 | 155 | 30 |

B F/F



| | | | | | | |
|-------------|-----|-----|-----|-----|-----|----|
| No. at risk | | | | | | |
| ACT | 268 | 163 | 131 | 113 | 89 | 22 |
| ACTH | 273 | 244 | 217 | 206 | 129 | 28 |

| FcγR Genotype | DFS |
|---------------|--------------------|
| V/V | HR=0.12 p<0.001 |
| V/F | HR=0.34 p<0.001 |
| F/F | HR=0.71 p=0.05 |

U: Univariable; M: Multivariable

- NSABP B-31 study (n = 2043) compared standard chemo (AC-T) vs. chemo + trastuzumab (AC-TH) in adjuvant setting for 3+ HER2+ breast cancer¹
 - Adding trastuzumab improved outcome [HR = 0.46, 95% CI 0.37-0.57, p < 0.001]²
- Pre-treatment FcγR polymorphism analysis performed on subset of 1,251 samples²

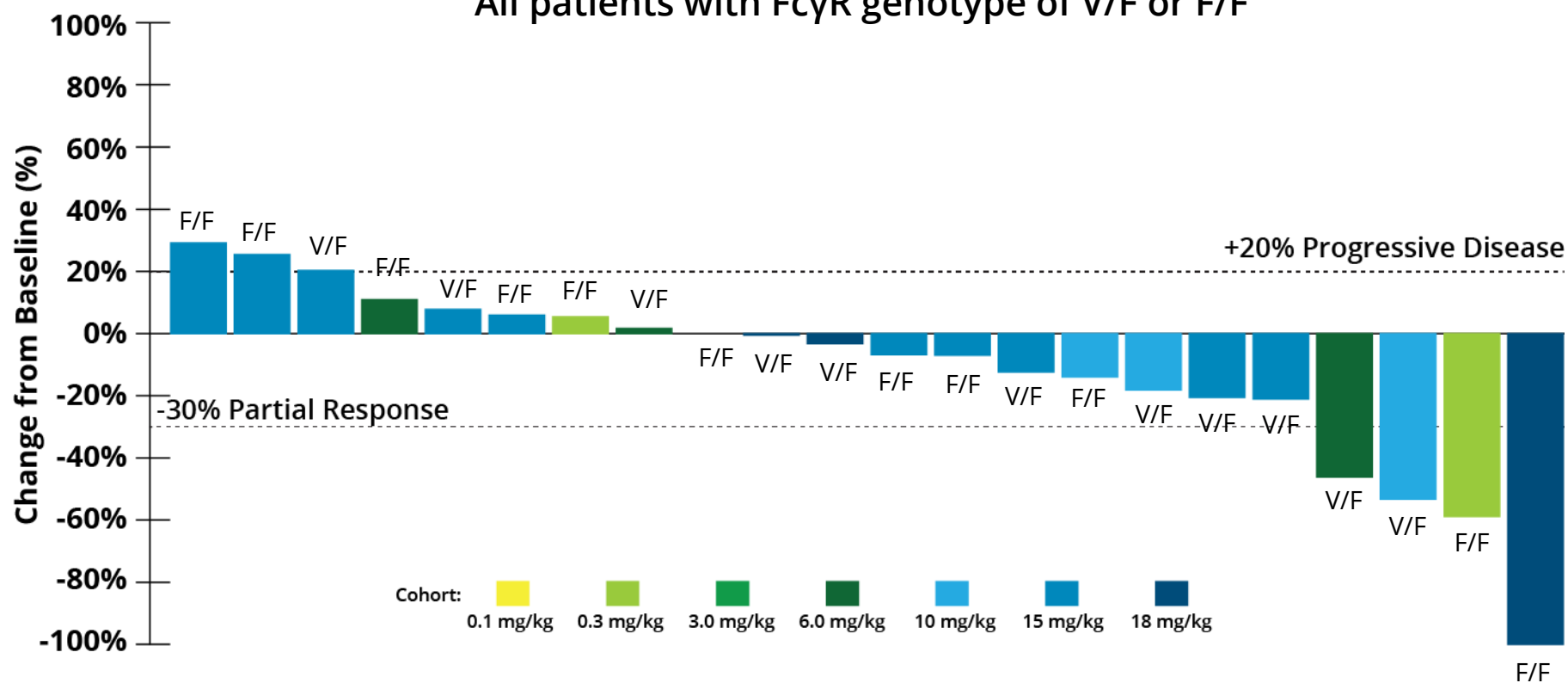
¹ Romond EH et al. N Engl J Med 2005; 353:1673-1684

² Gavin PG et al. JAMA Oncol. Published online November 3, 2016

Margetuximab's Promising Activity Profile

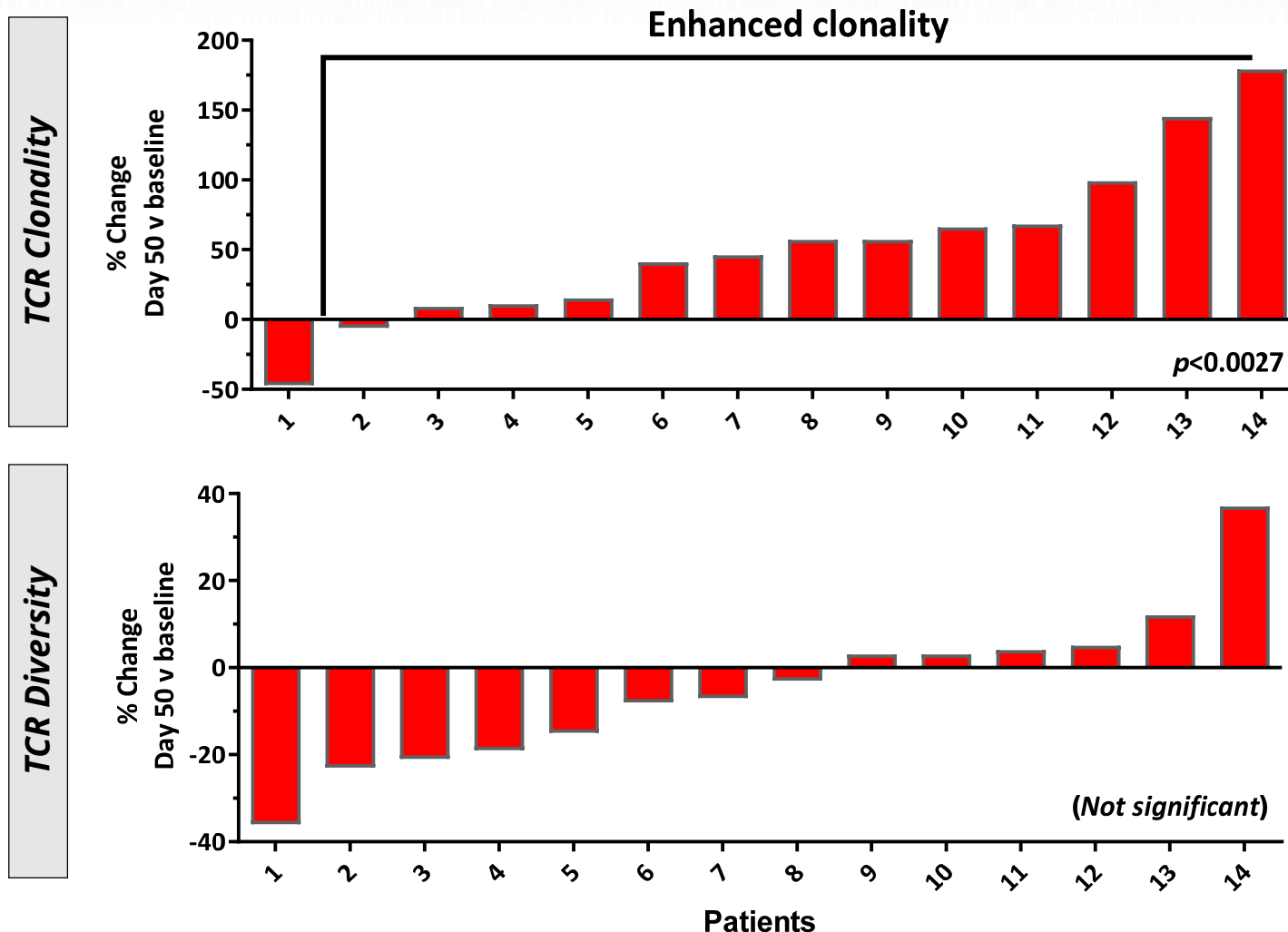
Phase 1 results for metastatic breast cancer patients

Median # prior lines of therapy = 4
All received anti-HER2 agent in earlier line(s) of therapy
All patients with FcγR genotype of V/F or F/F



Margetuximab Treatment Enhances T-cell Clonality

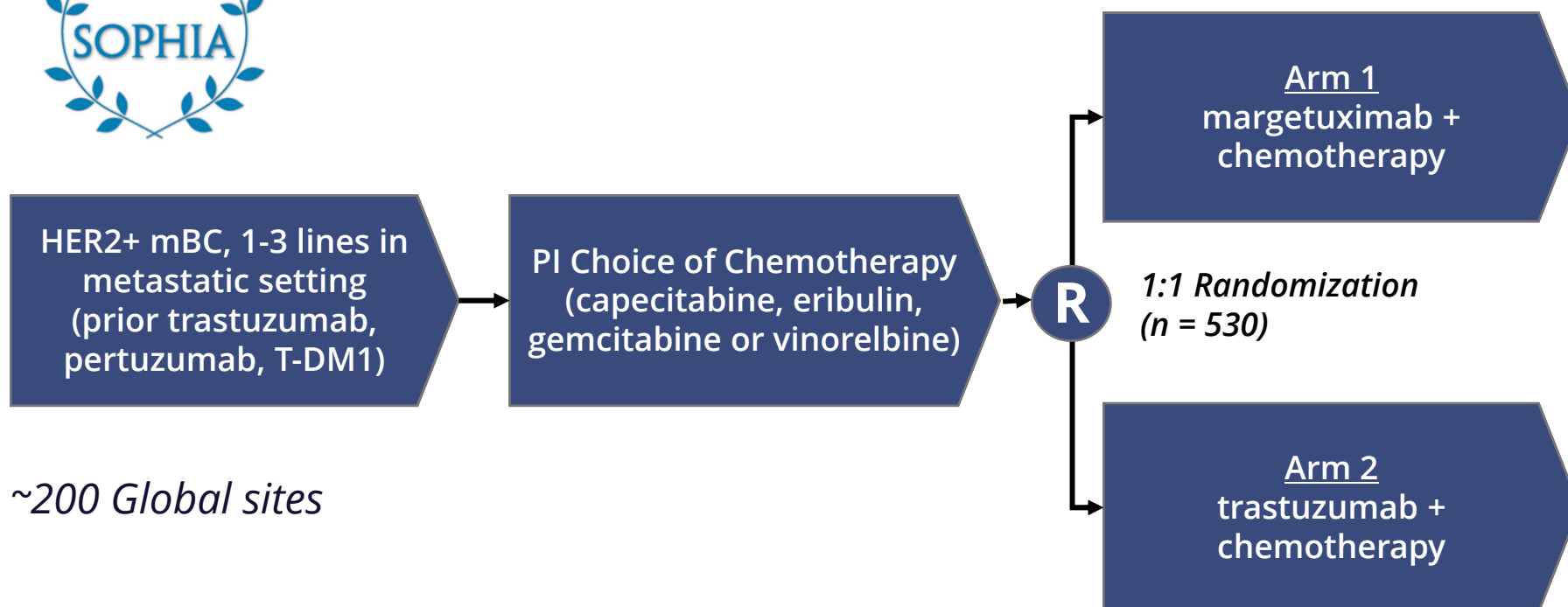
TCR spectrotype analysis indicates an effect on adaptive immunity



Analysis performed by Adaptive Biotechnologies on PBMC from Ph. 1 pts

SOPHIA Study to Establish Superiority to Trastuzumab

Study anticipated to complete enrollment in 2018



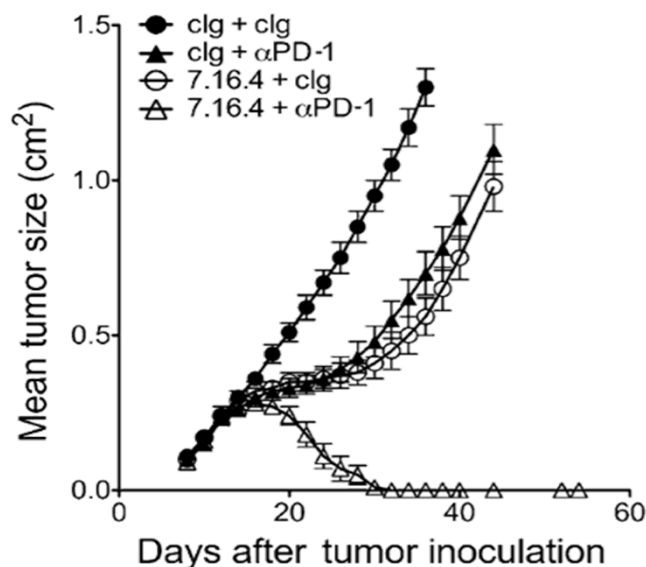
Sequential primary endpoints: Progression-Free Survival & Overall Survival:

PFS (N=257, HR=0.67, $\alpha=0.05$, power=90%)

OS (N=358, HR=0.75, $\alpha=0.05$, power=80%)

Why Combine HER2 and Anti-PD-1 for Gastric Cancer?

- HER2 is validated target in gastric cancer; trastuzumab is component of 1L SoC
- No HER2 SoC after 1L; existing therapy (chemo, ramucirumab) is sub-optimal
- Negative GATSBY trial with T-DM1 in 2L gastric cancer may highlight importance of immune-mediated mechanisms in clinical activity of anti-HER2 agents
- Checkpoint inhibitors are clinically active in patients with gastric cancer (ORR, OS)
- Clear non-clinical rationale for combining anti-HER2 directed therapy and I-O agents
- Synergistic antitumor activity using combination of anti-HER2 and anti-PD-1 antibodies in HER2+ murine mammary adenocarcinoma model (*Stagg, et al. PNAS, 2011*)



Phase 1b/2 Study in Adv./Metastatic Gastric & GEJ Cancers

Potential for chemotherapy-free regimen



Dose Escalation ✓
(n=3-6 per margetuximab dose)

margetuximab 10 – 15 mg/kg q3w
+
pembrolizumab 200 mg q3w

Dose Expansion

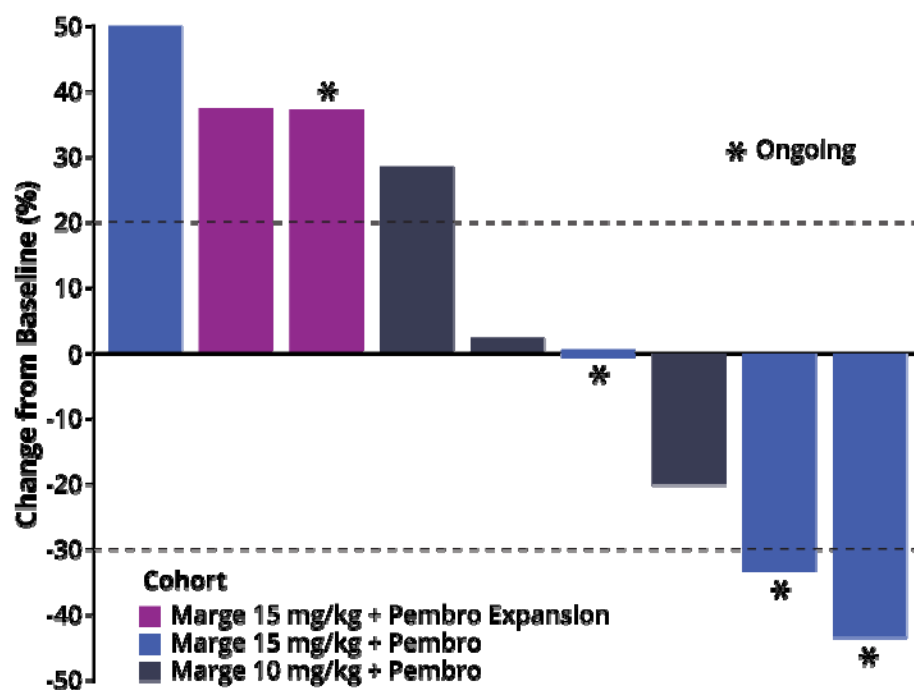
margetuximab MTA/MTD
+
pembrolizumab

- Treatment
 - Pembrolizumab: Day 1 of every cycle
 - Exploring two dose levels for margetuximab: Day 1 of every cycle
- Inclusion/exclusion criteria
 - IHC HER2 2+ / 3+ or FISH-amplified with prior trastuzumab progression
 - Received ≥ 1 prior line of chemotherapy treatment
 - No prior immunotherapy
- Endpoints
 - Primary: safety, tolerability and efficacy (as evaluated by ORR) of combo
 - Secondary: PFS, PFS-6, OS-6 / OS, Immunogenicity

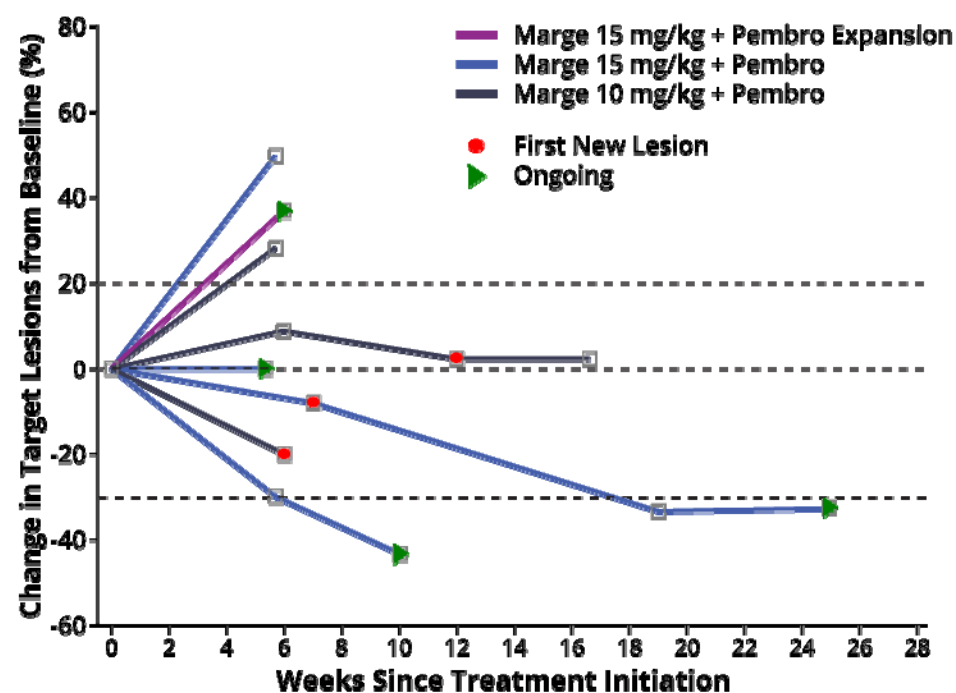
Margetuximab + Pembrolizumab Initial Clinical Activity

Phase 1b/2 study in advanced/metastatic gastric & GEJ cancers

Best Percent Change from Baseline of Target Lesions in Response-evaluable Population



Percent Change in Target Lesions Over Time in Response-evaluable Population

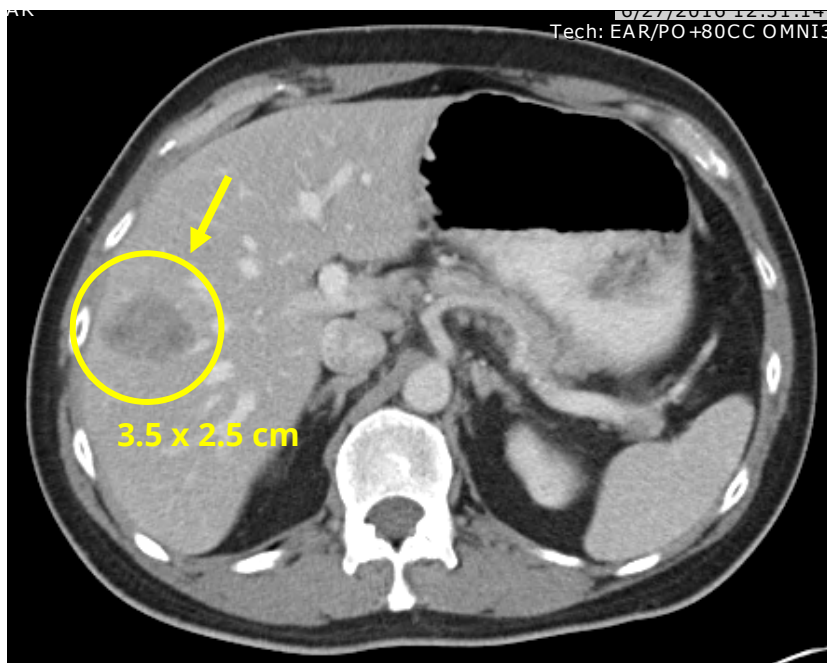


Note: December 1, 2016 data cutoff

Confirmed PR in Gastric Cancer: 50% Reduction

M+P combo case study #1: 50 y/o male w/metastatic HER2+ gastric cancer

Baseline



- Patient had metastatic GEJ and gastric adenocarcinoma, with gastric cardia and liver lesions
- Progressed after prolonged 1L treatment with FOLFOX/trastuzumab followed by maintenance capecitabine/trastuzumab

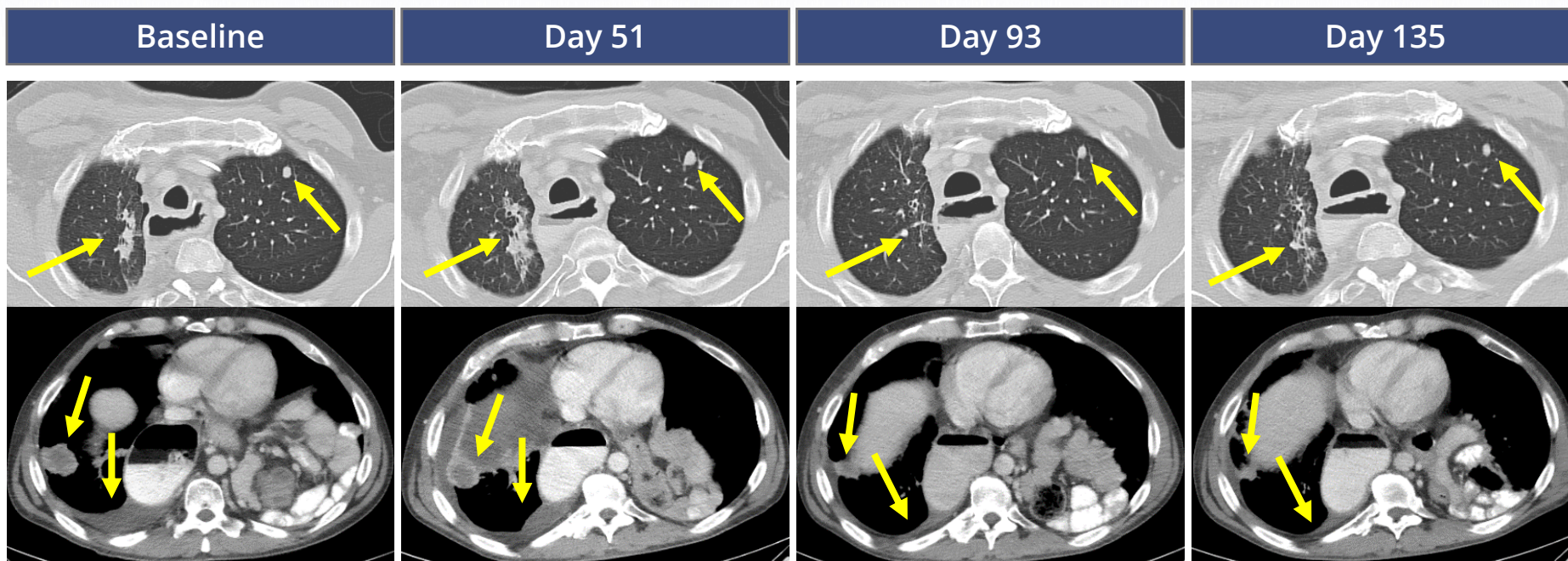
Day 72



- Confirmed PR with margetuximab + pembrolizumab combination (**50% reduction**)
- Later in course, experienced clinical deterioration, not felt to be candidate for treatment beyond progression, withdrawn from study

Confirmed irPR in Gastric Cancer: 30% Reduction

M+P combo case study #2: 50 y/o male w/metastatic HER2+ gastric cancer



- Patient had metastatic HER2+ GEJ/gastric adenocarcinoma with lesions in liver, lungs and supraclavicular LNs
- Progressed following 3 prior lines of therapy:
 - Carboplatin, taxol and radiotherapy
 - Cisplatin, capecitabine and trastuzumab → maintenance trastuzumab
 - 5-FU and trastuzumab
- Confirmed irPR (**30% reduction**)
- Currently on Cycle 9 (well tolerated)

HER2 Franchise Summary

- Fc optimization designed to enable antitumor activity across FcγR genotypes
 - Enhanced antitumor activity compared to trastuzumab in ~80% of patients who are low affinity carriers (either V/F or F/F)
 - Enhanced ability to induce cell killing and secondary engagement of T-cell immunity
- If SOPHIA is successful, positioned to move into earlier lines of therapy
- Combo with anti-PD-1 could establish “chemo-free” treatment paradigm for advanced/metastatic gastric & GEJ cancers
- Follow-on programs, including CD137 x HER2 DART, to deliver tumor-specific immune modulation
- Upcoming milestones:
 - Complete gastric study enrollment in 2017
 - Complete SOPHIA enrollment in 2018

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Immuno-Oncology: Targeting Immune Regulators

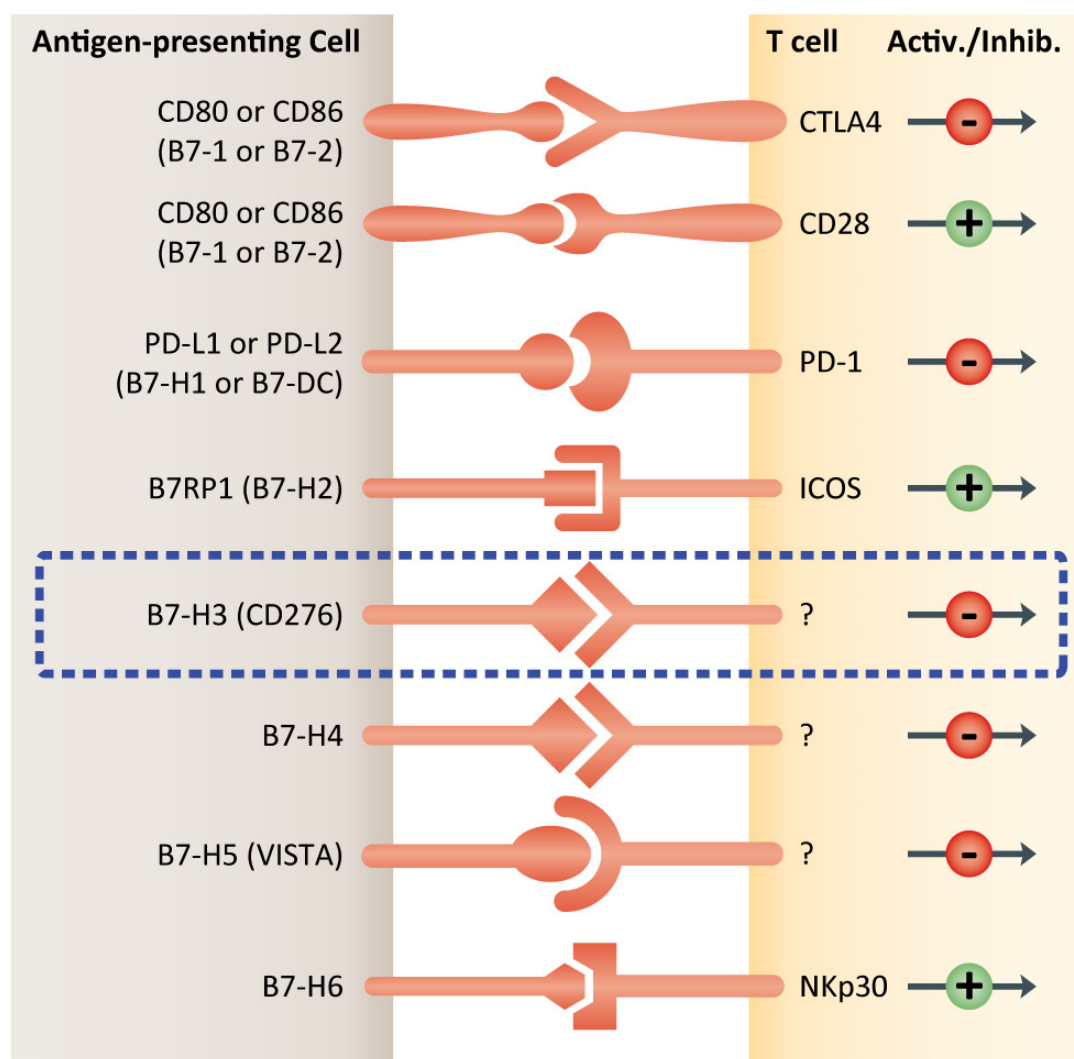
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B7-H3: Member of B7 Family of Immune Regulators



Immunosuppressive Role

- Crystal structure resolved: T-cell inhibitory domain mapped (*Vigdorovich 2013*)
- Expression on lung cancer cells and macrophages suppresses T-cell mediated antitumor immune response (*Chen 2013*)
- B7-H3 negatively regulates acute GVHD (*Veenstra 2015*)

Tumor Metabolism & Metastatic Role

- Enhances metastatic potential of melanoma cells (*Tekle 2012*)
- Promotes epithelial-mesenchymal transition and expression of CSC markers in colorectal cancer (*Jiang 2016*)
- Reprograms glucose metabolism in breast cancer (*Lim 2016*)

(see handout w/ updated bibliography of B7-H3 scientific references)

Adapted from Pardoll, et al., Nature, April 2012.

Confirmed High Penetrance in Broad Set of Solid Tumors

Minimal/no expression on normal tissues

| Fixed Tumor MicroArray | IHC Summary of Samples Screened | | | |
|-------------------------------|---------------------------------|-----------------|-------------|-----------------|
| | B7-H3 Positive | | 2+ or Above | |
| Potential Indications: | | | | |
| Head and Neck | 19/19 | <div>100%</div> | 19/19 | <div>100%</div> |
| Kidney Cancer | 77/78 | <div>99%</div> | 75/78 | <div>96%</div> |
| Glioblastoma | 65/66 | <div>98%</div> | 63/66 | <div>95%</div> |
| Thyroid Cancer | 34/35 | <div>97%</div> | 33/35 | <div>94%</div> |
| Mesothelioma | 41/44 | <div>93%</div> | 39/44 | <div>89%</div> |
| Melanoma | 132/146 | <div>90%</div> | 94/146 | <div>64%</div> |
| Prostate Cancer | 88/99 | <div>89%</div> | 51/99 | <div>52%</div> |
| Pancreas Cancer | 69/78 | <div>88%</div> | 45/78 | <div>58%</div> |
| Bladder | 134/156 | <div>86%</div> | 123/156 | <div>79%</div> |
| Lung Cancer | 324/379 | <div>85%</div> | 300/379 | <div>79%</div> |
| Breast Cancer | 189/249 | <div>76%</div> | 156/249 | <div>63%</div> |
| Ovarian Cancer | 59/79 | <div>75%</div> | 36/79 | <div>46%</div> |

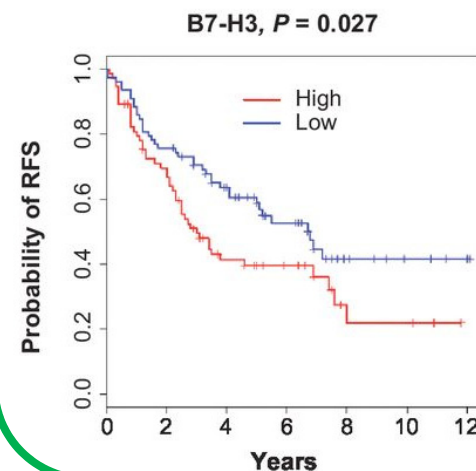
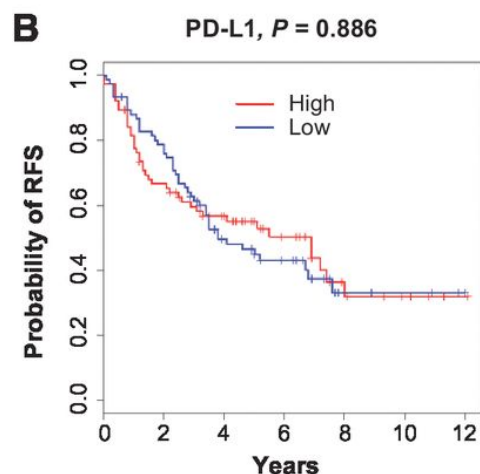
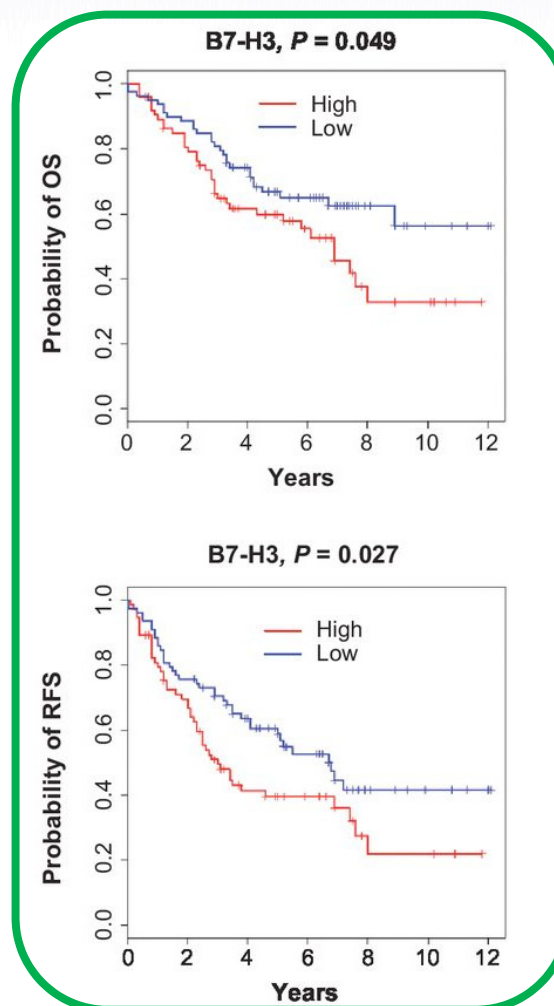
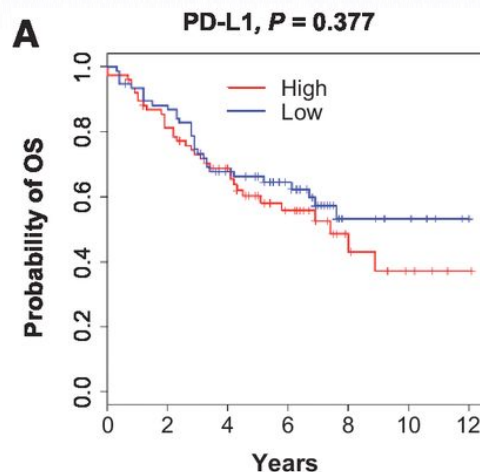
Target expression on both tumor cells and tumor vasculature

B7-H3 Identified as Prognostic Lung Cancer Biomarker

B7-H3 expression correlates with poor OS and RFS in NSCLC

Analyses of >450 lung adenocarcinoma patients revealed enhanced expression of checkpoint molecules (PD-1, PD-L1, PD-L2, B7-H3, CTLA-4, LAG-3, BTLA and TIM-3) in “mesenchymal” lung adenocarcinoma

Among checkpoints, only B7-H3 demonstrates correlation with overall survival and relapse-free survival across lung adenocarcinoma

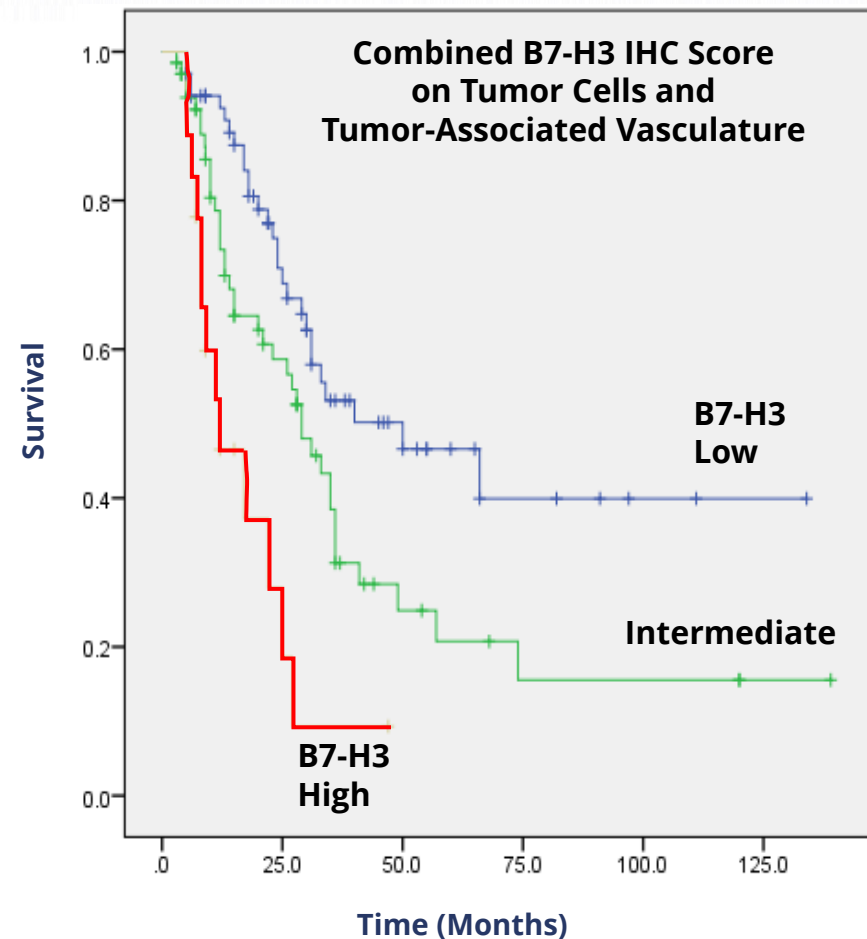


“Epithelial-mesenchymal transition is associated with a distinct tumor microenvironment including elevation of inflammatory signals and multiple checkpoints on lung adenocarcinoma”; Lou, Y, et al.; Clin Cancer Res. 2016 Jul 15;22(14):3630-42.

B7-H3 Expression Level Correlates w/ Patient Outcome

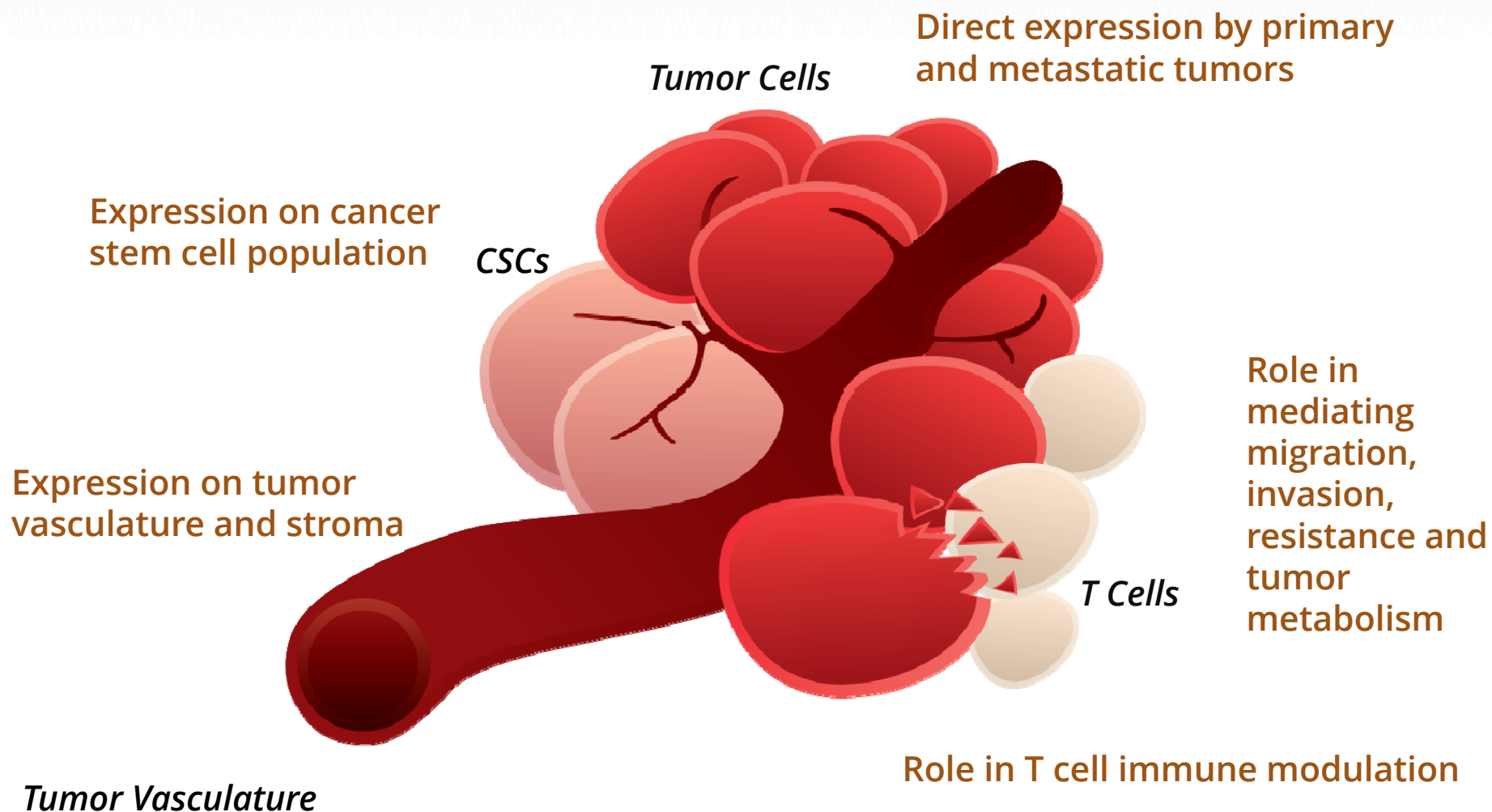
IHC analyses of 154 pancreatic ductal adenocarcinoma (PDAC) patients

- **High statistical inverse correlation between B7-H3 expression and patient survival**
- Consistent with prior studies, lower CD8 T-cell infiltration also correlates with poorer patient outcome





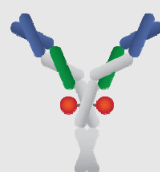
B7-H3 membrane expression determined using diagnostic test supporting enoblituzumab and MGD009 clinical studies; Ongoing collaboration with Mass General Hospital (Ferrone)

Rationale for Targeting B7-H3 in Cancer

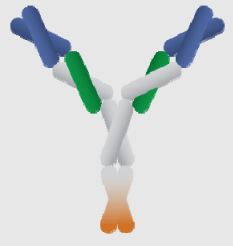


Comprehensive B7-H3 Franchise

MacroGenics retains global rights

| | Enoblituzumab (MGA271) | MGD009 | MGC018 |
|----------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Candidate | <ul style="list-style-type: none"> Fc-optimized mAb  | <ul style="list-style-type: none"> B7-H3 x CD3 DART (Fc-bearing)  | <ul style="list-style-type: none"> B7-H3 Antibody-Drug Conjugate  |
| Potential MoA | <ul style="list-style-type: none"> Direct tumor killing Adaptive T-cell immune response enhancement | <ul style="list-style-type: none"> Recruitment and expansion of T cells Potent redirection of T cells to kill tumor cells | <ul style="list-style-type: none"> Direct tumor killing Leverage Synthon's drug-linker |
| Current Development Status | <ul style="list-style-type: none"> Monotherapy Ph. 1 trial (7 solid tumor types) Combo studies | <ul style="list-style-type: none"> Phase 1 dose escalation | <ul style="list-style-type: none"> 2018 IND planned |

Enoblituzumab: “First-in-class,” Fc-Optimized Anti-B7-H3 mAb

| | | |
|----------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Candidate | <ul style="list-style-type: none">Humanized, Fc-optimized anti-B7-H3 mAb |  |
| Opportunity | <ul style="list-style-type: none">Very large commercial opportunity for targeting B7-H3, given vast expression across many different solid tumor types | |
| Targeted Indications | <ul style="list-style-type: none">Exploring seven solid tumor indications | |
| Development | <ul style="list-style-type: none">Monotherapy Ph. 1 studyCombination studies ongoing with ipilimumab, pembrolizumab | |
| Partner | <ul style="list-style-type: none">MacroGenics retains global rights | |

Enoblituzumab Monotherapy

Phase 1 Monotherapy Study: Seven Solid Tumor Types

Tumor-specific expansion cohorts

Initial Expansion Cohorts

Enrollment Complete

Prostate (n=20)

Bladder (high B7-H3) (n=8)

Melanoma (post-CPI failure) (n=31)

Head & Neck (n=19)

Triple-negative Breast (n=16)

Renal Cell (n=16)

NSCLC (high B7-H3) (n=8)

New Expansion Cohorts

Enrollment Started October 2016

Prostate (n=16)

Bladder (n=16)

Note: Enoblituzumab Phase 1 monotherapy study; October 17, 2016 data cutoff

Favorable Safety Profile in Phase 1 Study

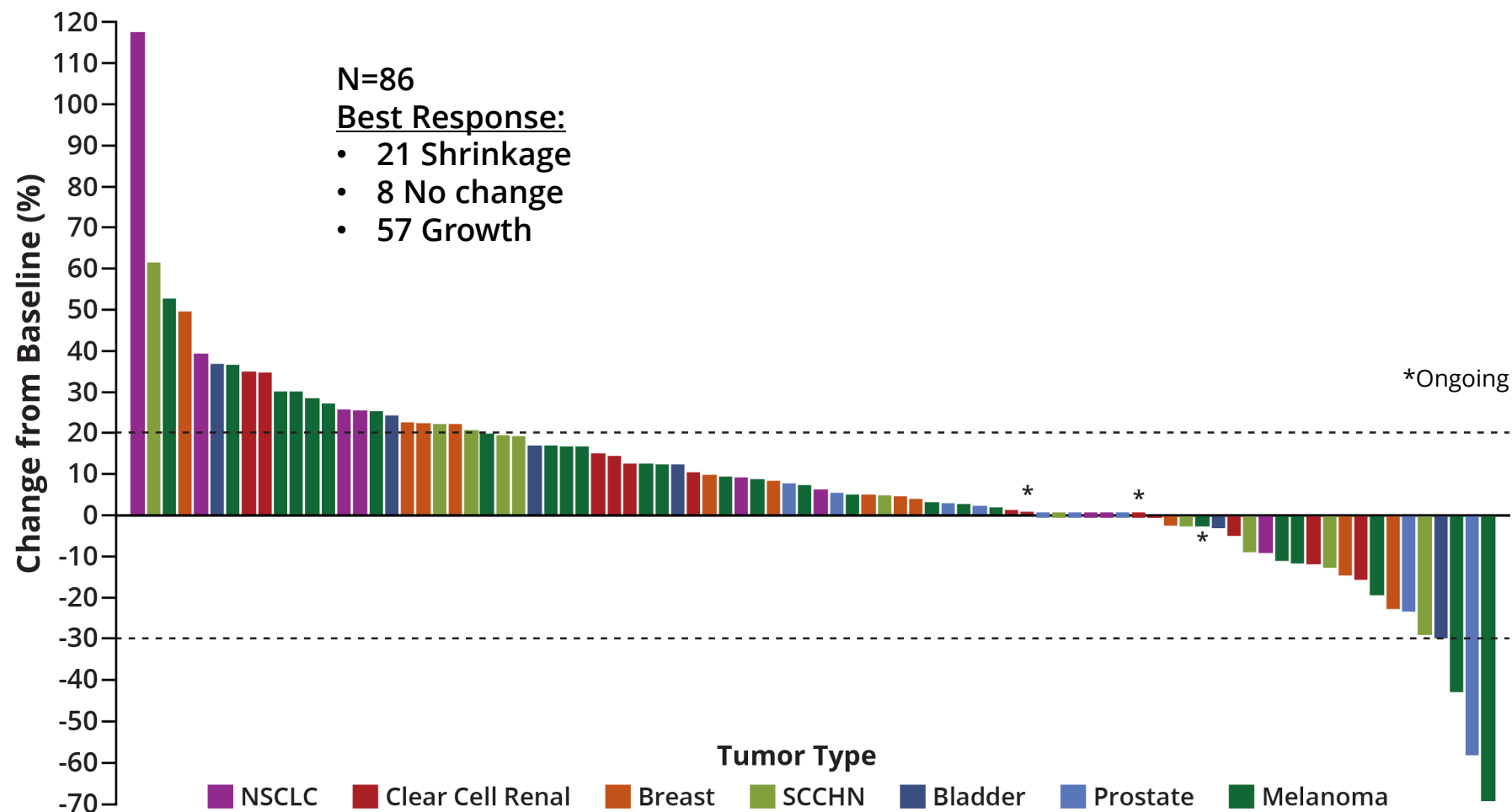
No severe immune-related AEs (15 mg/kg)

| Drug-Related Adverse Event (≥ 10% of Patients) | No. (%) of Patients | |
|---------------------------------------------------|-----------------------|-----------------------|
| | All Grades (N=130) | Grades 3-4 (N=130) |
| Any adverse event | 125 (80) | 11 (9) |
| Infusion-related reaction | 57 (37) | 4 (3) |
| Fatigue | 51 (33) | 2 (2) |
| Nausea | 31 (20) | 0 |
| Vomiting | 20 (13) | 0 |
| Chills | 23 (15) | 0 |

Note: Enoblituzumab Phase 1 monotherapy study; October 17, 2016 data cutoff

Tumor Reduction in Heavily Pretreated Patients

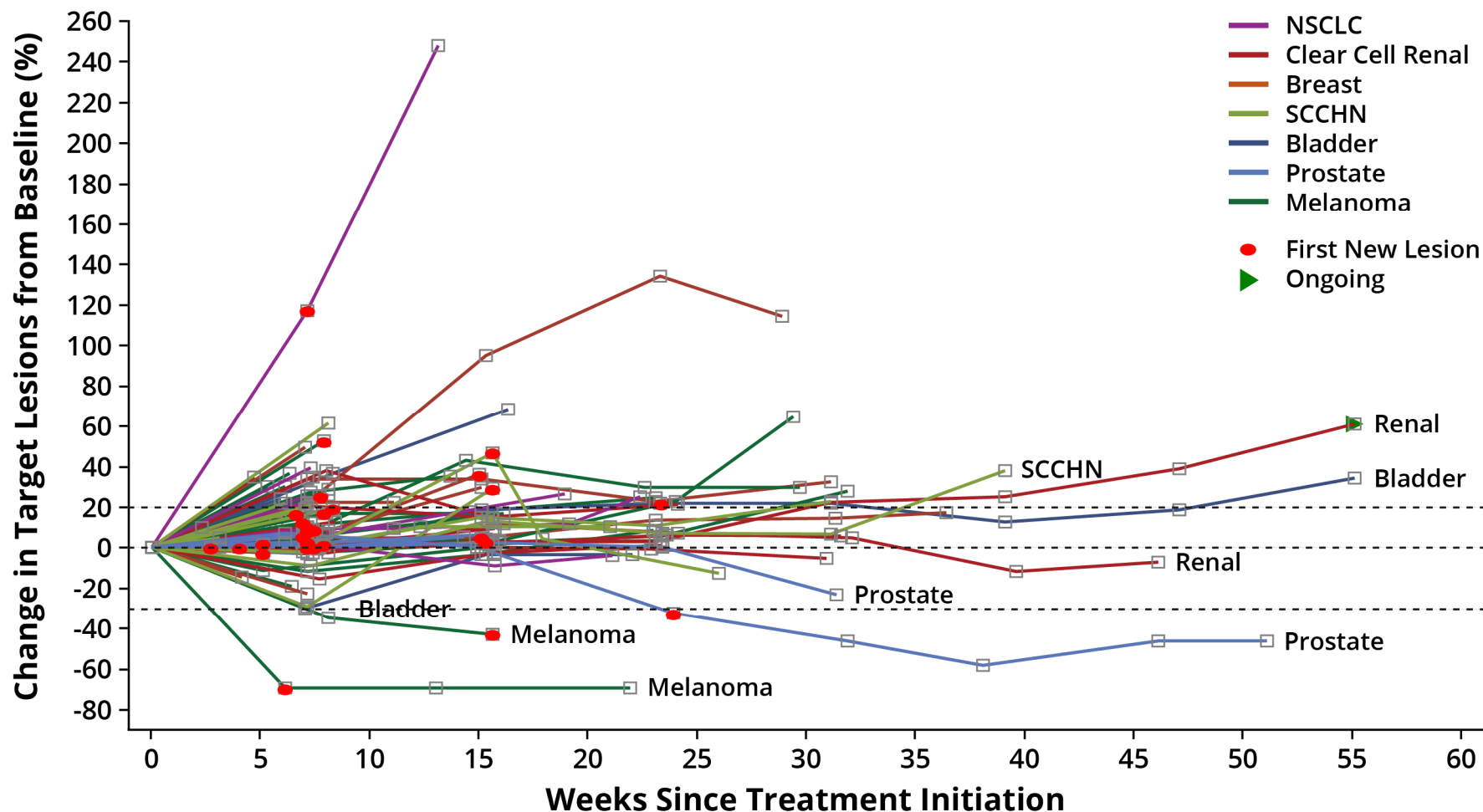
Best % change in response-evaluable tumor-specific cohorts (15 mg/kg)



Note: Enoblituzumab Phase 1 monotherapy study; October 17, 2016 data cutoff

Multiple Patients with Durable Tumor Reductions

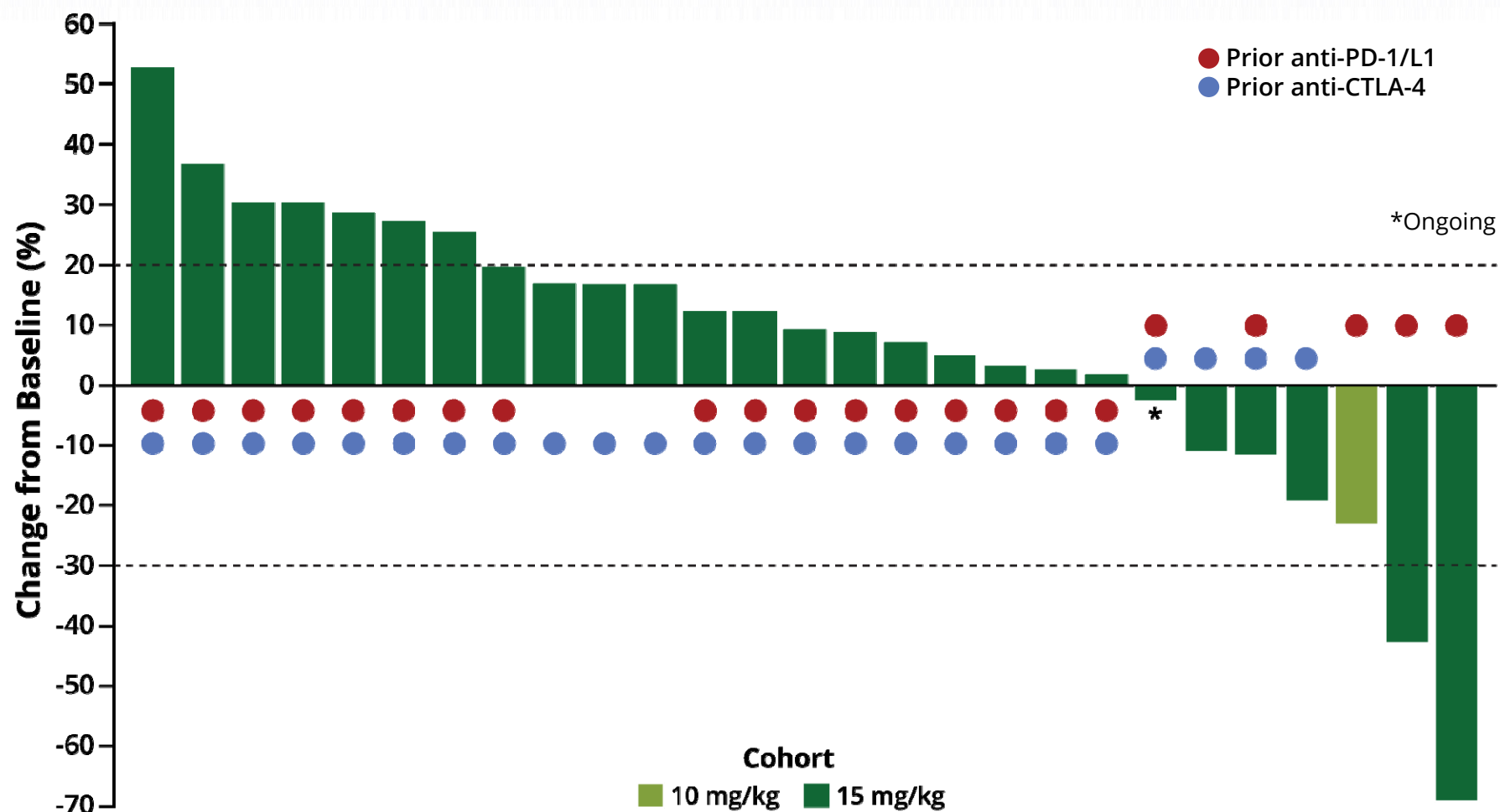
Best % change in response-evaluable tumor-specific cohorts (15 mg/kg)



Note: Enoblituzumab Phase 1 monotherapy study; October 17, 2016 data cutoff

Activity in Post-Checkpoint Melanoma Patients

Best % change in response-evaluable melanoma patients

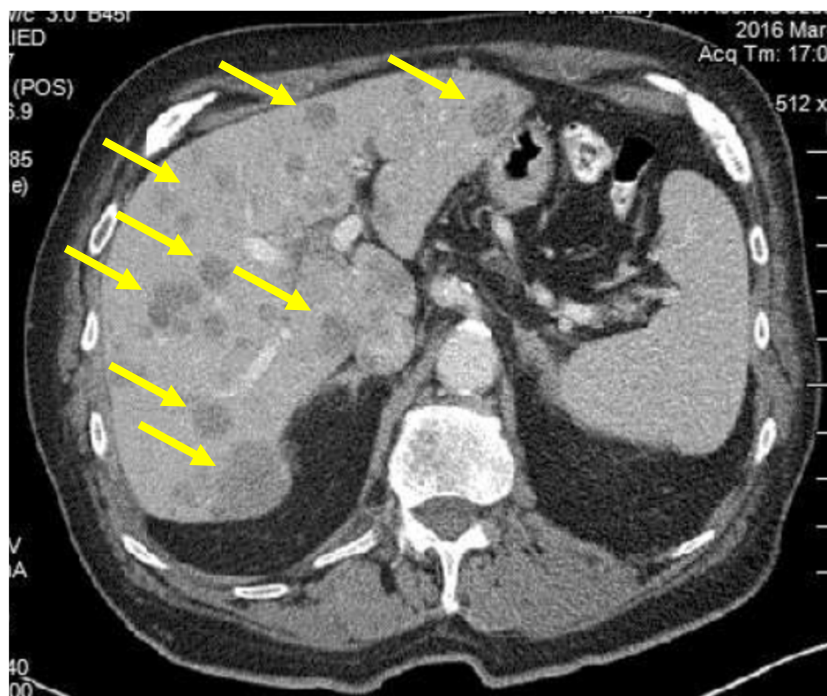


Note: Enoblituzumab Phase 1 monotherapy study; October 17, 2016 data cutoff

Rapid Reduction in Multiple Tumor Lesions

Enoblituzumab case study #1: 87 y/o man w/ metastatic melanoma

Baseline



- Melanoma patient had liver and bone metastases
- Had progressed on nivolumab
 - Treated Oct. 2015 to Jan. 2016
 - Only prior systemic cancer therapy

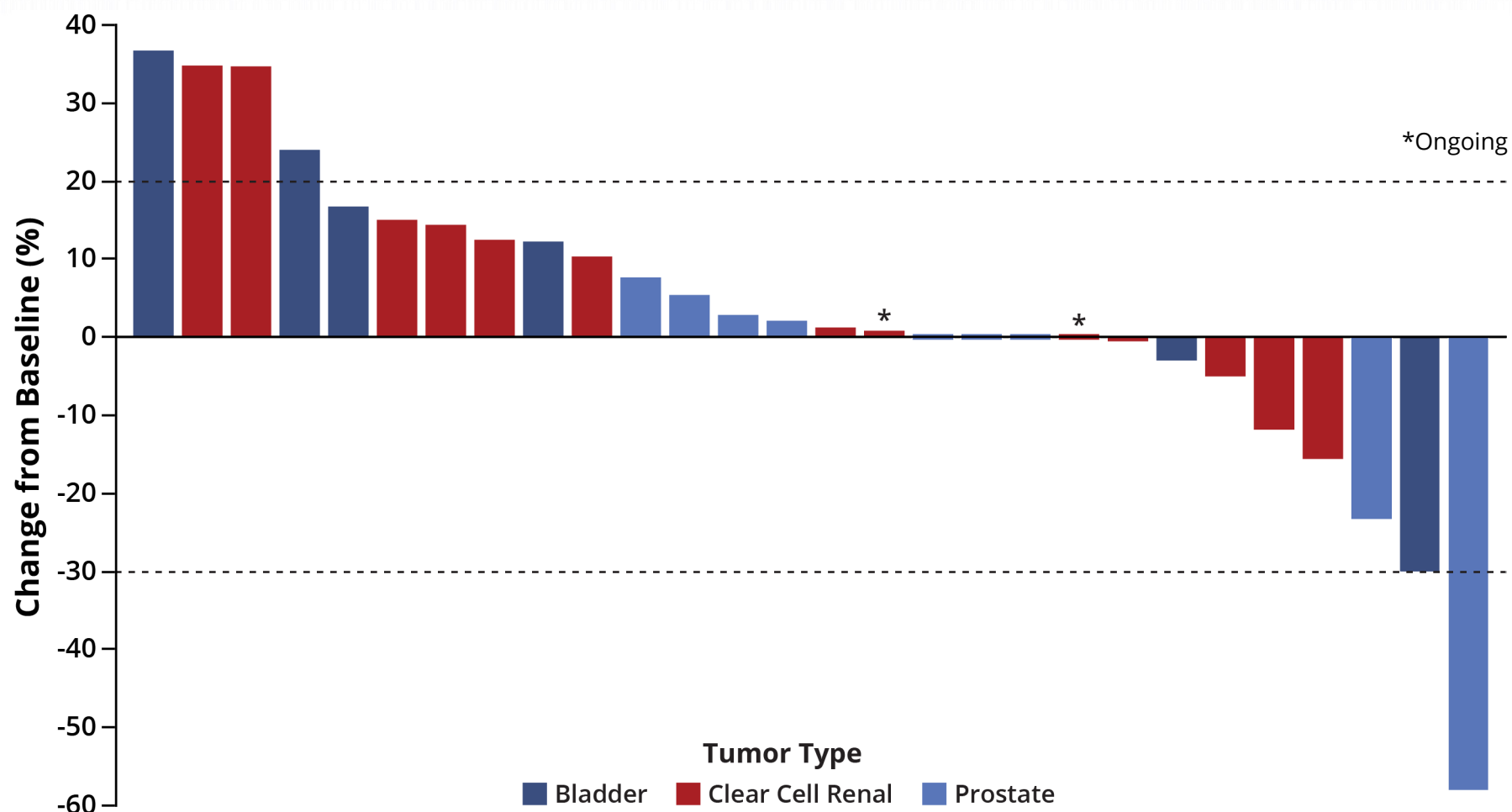
Day 100



- Enrolled in enoblituzumab monotherapy (Mar. 2016)
- **Rapid reduction in multiple tumor lesions**
 - Cycle 1: **35% shrinkage** (w/smaller bone lesions)
 - Cycle 2: **42% shrinkage**
- MRI showed small brain mets (no baseline MRI)
 - Gamma knife brain radiation

Activity in Urological Malignancies (Monotherapy)

Best % change in tumor burden in response-evaluable patients (15 mg/kg)

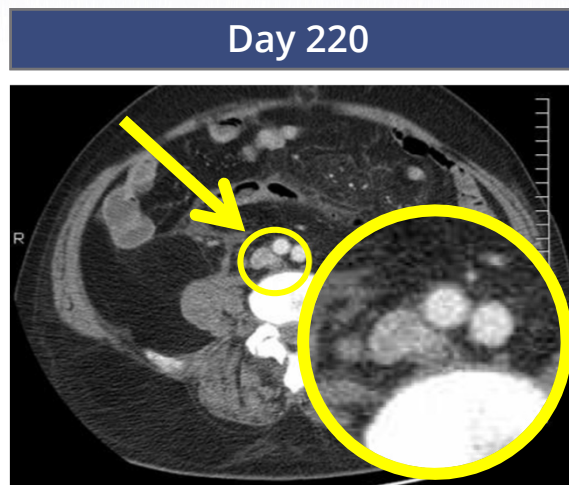
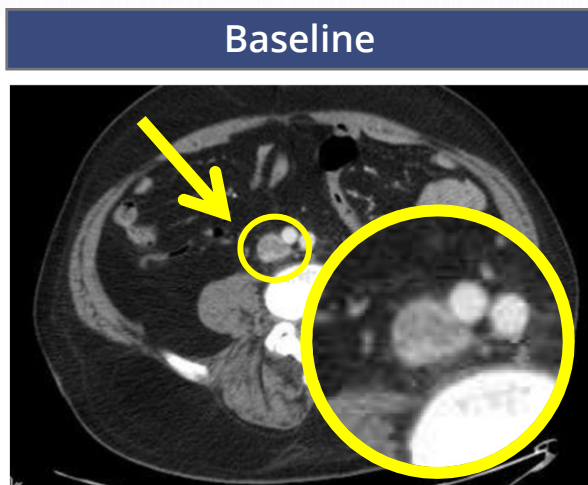


Note: Enoblituzumab Phase 1 monotherapy study; October 17, 2016 data cutoff

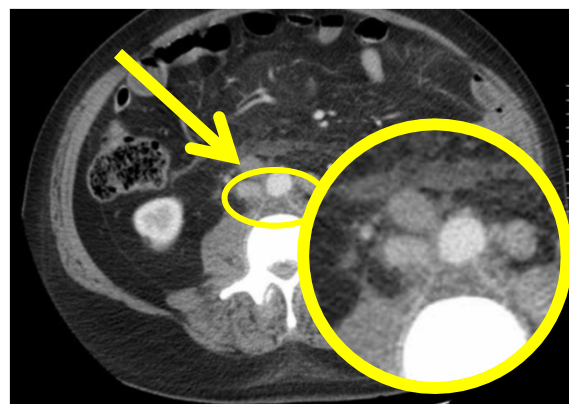
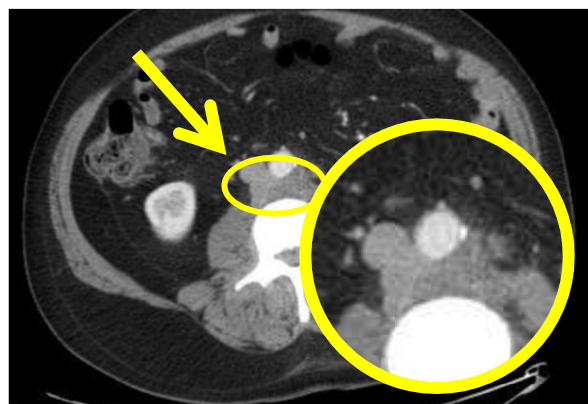
Selected Prostate Patients with Antitumor Activity

Enoblituzumab case study #1: 65 y/o man with prostate cancer

**Aorto-Caval
Lymph Node**



**Retro-Aortic
Mass**



- Mets: retroperitoneal LN, bone
- Previous therapy: sipuleucel-T, abiraterone, enzalutamide, radium 223, taxotere

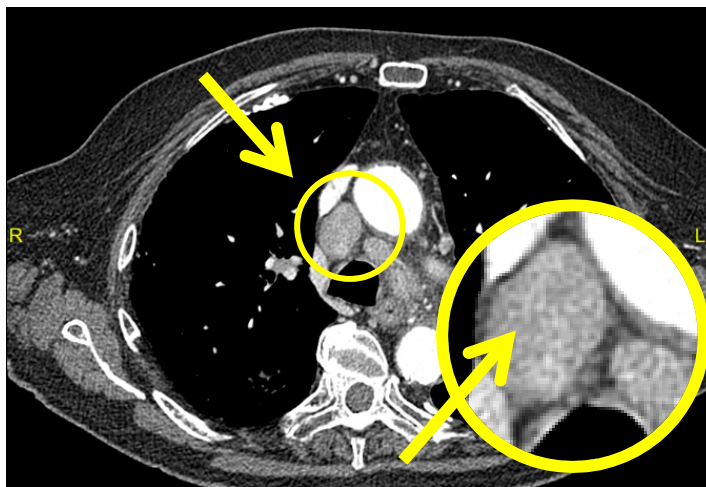
- Tumor: **23% reduction** RECIST
- PSA: **46% decrease**
- Remained on therapy for 13 mos.

Selected Prostate Patients with Antitumor Activity

Enoblituzumab case study #2: 87 y/o man with prostate cancer

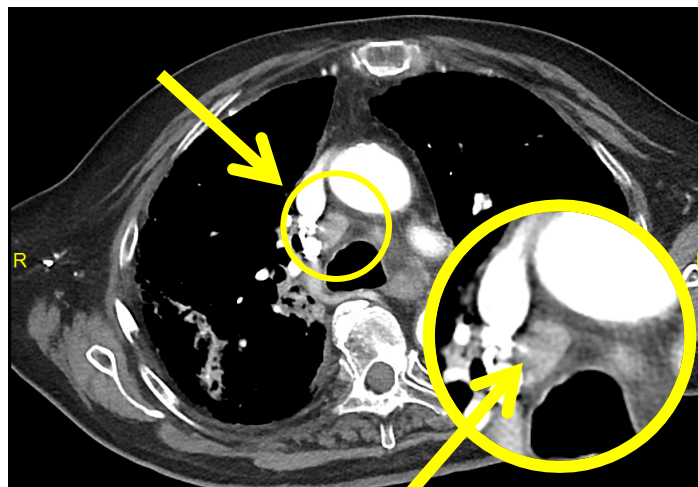
**Right
Paratracheal
Lymph Node**

Baseline



- Mets: mediastinal and retroperitoneal LN, bone, porta-caval LN
- Previous therapy: radiation

Day 290



- Tumor: **58% reduction** RECIST
- PSA: **51% decrease**

Key Enoblituzumab Monotherapy Takeaways

- Well tolerated at doses of up to 15 mg/kg q week
 - Safety profile supports combinability with various other molecules, including checkpoint inhibitors
- Evidence of modulation of T-cell function, including induction of cytokine/chemokine production and enhanced clonality of T-cell repertoire
- Most promising monotherapy activity observed in prostate, bladder and post-checkpoint melanoma
 - Bladder and prostate cancer enrollment ongoing
 - Melanoma being further evaluated as monotherapy as well as in combo with anti-PD-1 or anti-CTLA-4

Enoblituzumab Combination Therapy

Rationale for Enoblituzumab Combination Studies

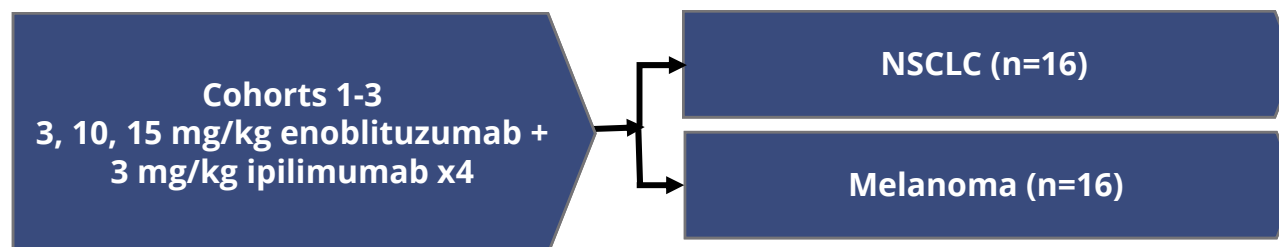
- Coordinate engagement of innate and adaptive immunity by combining agents that modulate T cell function and potentiate ADCC
- Combinations of two molecules targeting B7 family members can synergize clinically (e.g., anti-CTLA-4/PD-1)
- Anticipate easier combinability with either anti-CTLA-4 or anti-PD-1
 - Limited B7-H3 expression on normal cells appears to limit disruption of self tolerance and trigger of immune-related AEs (irAEs) by enoblituzumab
 - Improved risk-benefit compared to anti-CTLA-4/anti-PD-1 combination

Enoblituzumab + Anti-CTLA-4 Combination Study

Anticipate initiation of dose expansion in 2017

Dose Escalation

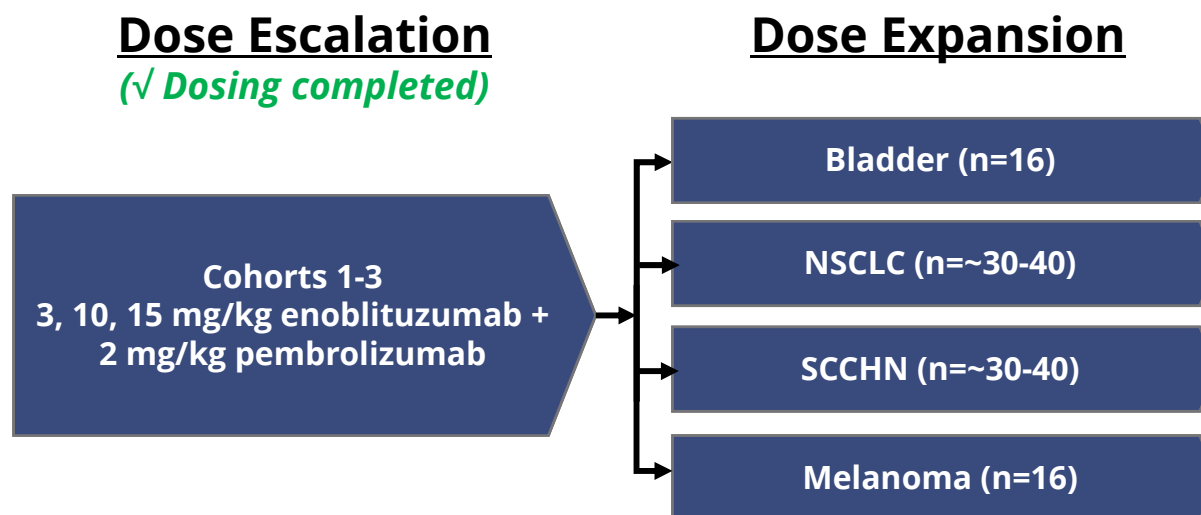
(currently completing Cohort 3)



Dose Expansion

Enoblituzumab + Anti-PD-1 Combination Study

Dose expansion ongoing

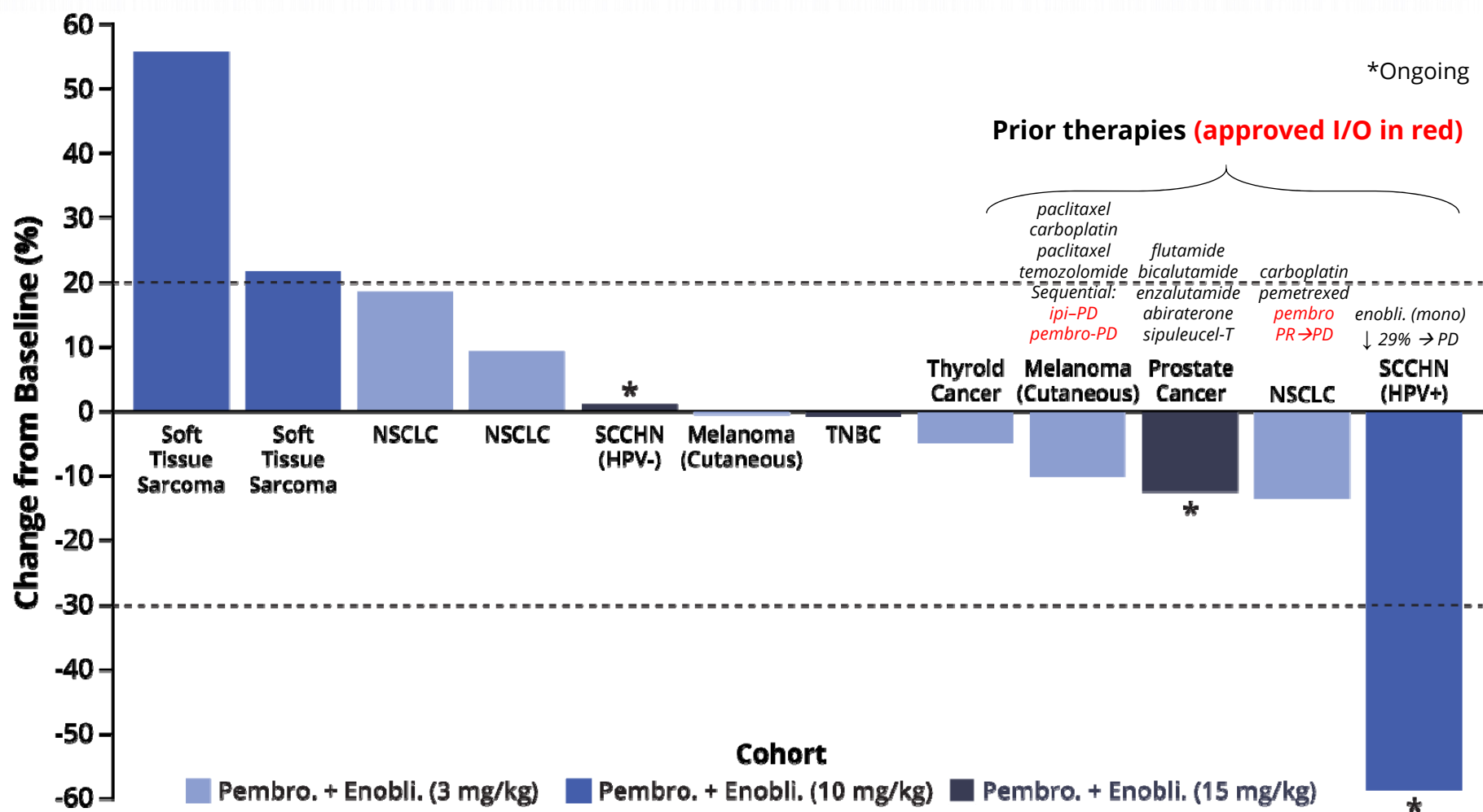


Observations to date

- Manageable AEs
- Initial signs of antitumor activity
- DLT period: first 6 weeks of dosing

Initial Signs of Activity in Heavily Pretreated Patients

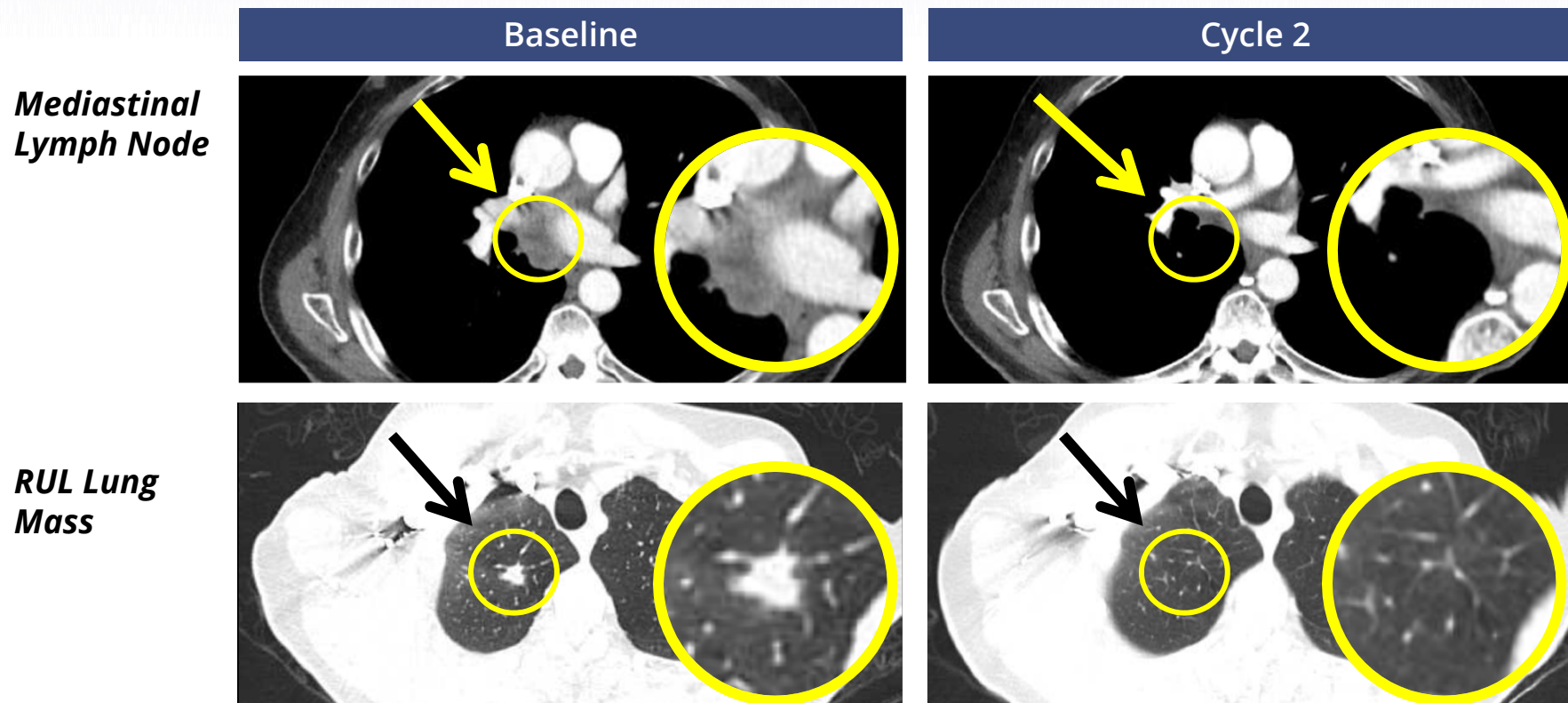
Best % change in tumor burden in response-evaluable patients



Note: Enoblituzumab + anti-PD-1 (pembrolizumab) combination study; October 17, 2016 data cutoff

Enoblituzumab + Anti-PD-1: Confirmed PR in SCCHN

Case study: 70 y/o man w/ unresectable locally adv./metastatic HPV+ SCCHN




- Disease in submandibular lymph nodes, bone, lung & mediastinum
- Only prior systemic cancer therapy was enoblituzumab (mono)
 - Rapid tumor reduction of 29.2% on Cycle 1 w/ subsequent regrowth / PD

- 10 mg/kg enoblituzumab qW + 2 mg/kg / pembrolizumab q3W (dose esc. Cohort #2)
- **Confirmed PR after 2 cycles**
- Rapid **tumor reduction of 45%** on Cycle 1
- Subsequent **further reduction to 58%**

Enoblituzumab: Advancing Combination Therapy

- Combine administration of enoblituzumab with checkpoint inhibitors to achieve additive or synergistic antitumor activity
- Identify enoblituzumab combination with clinical activity in tumors where anti-CTLA-4 or anti-PD-1 have limited activity
- Define enoblituzumab-based combination regimens that are superior to anti-CTLA-4 or anti-PD-1 alone in tumor types where these agents are active
- Identify enoblituzumab-based regimens that benchmark favorably against existing combos (i.e., anti-CTLA-4/anti-PD-1) — safety, efficacy or both

MGD009: Expanding B7-H3 Franchise

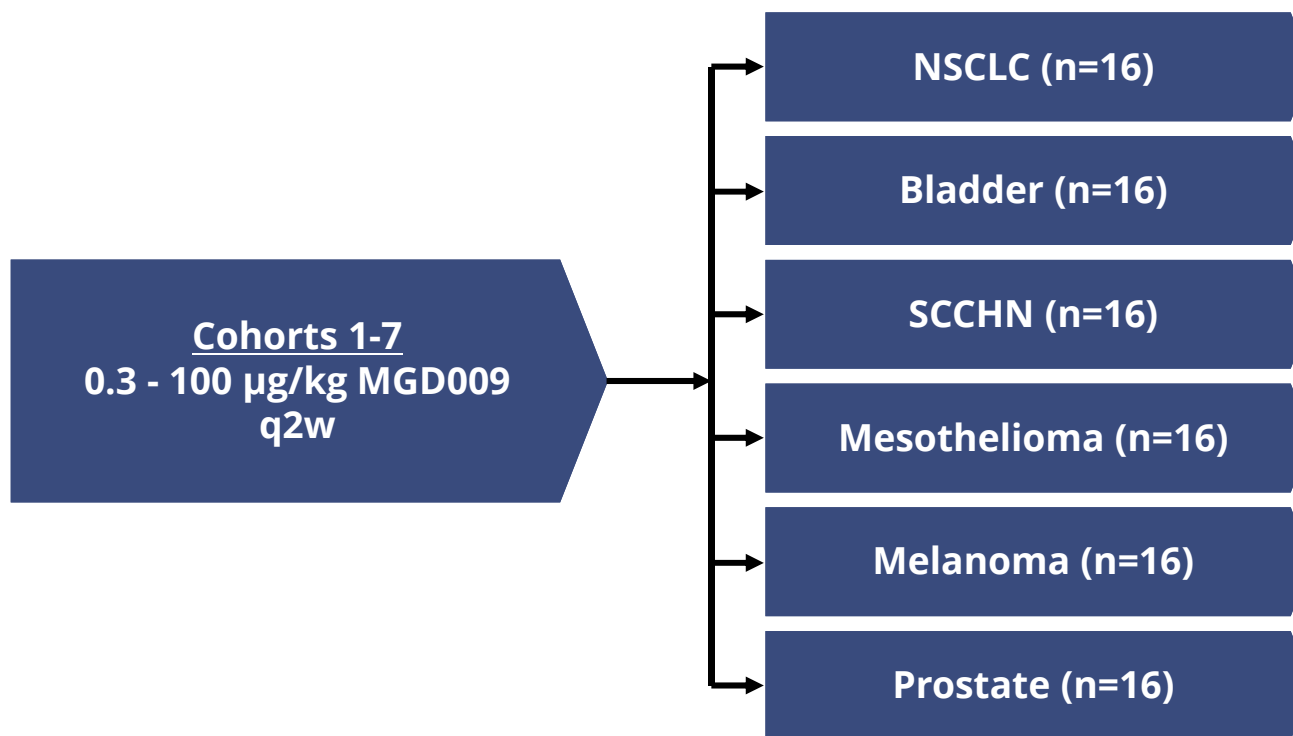
| | | |
|---------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Candidate | <ul style="list-style-type: none"> Humanized, Fc-bearing B7-H3 x CD3 DART |  |
| Opportunity | <ul style="list-style-type: none"> Large opportunity (vast expression across different tumors types) B7-H3 expression correlated with disease severity and outcome | |
| Function/MoA | <ul style="list-style-type: none"> Redirected T-cell killing <ul style="list-style-type: none"> Recruitment and activation of T cells, irrespective of TCR specificity and MHC restriction Potential expansion of tumor-specific T cells MoA complementary to enoblituzumab: <ul style="list-style-type: none"> Fc-mediated killing & priming for optimized T-cell response | |
| Indications | <ul style="list-style-type: none"> NSCLC, melanoma, head & neck, mesothelioma, bladder, others | |
| Development | <ul style="list-style-type: none"> Phase 1 study ongoing (dose escalation) | |
| Partner | <ul style="list-style-type: none"> MacroGenics retains global rights | |

MGD009 Phase 1 Trial Dose Escalation Ongoing

Dose Escalation: 3 + 3 + 3 Design

(Open to selected B7-H3+ tumor types)*

Dose Expansion

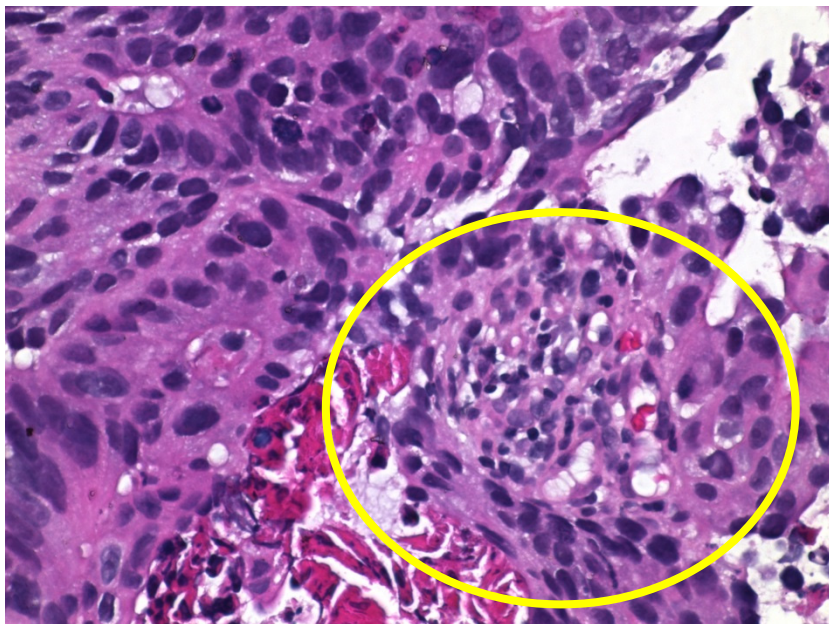


* B7-H3 positivity defined as > 10% tumor, $\geq 2+$ and/or > 25% of vasculature positive

Lymphocytes Associated w/ Areas of B7-H3 Expression

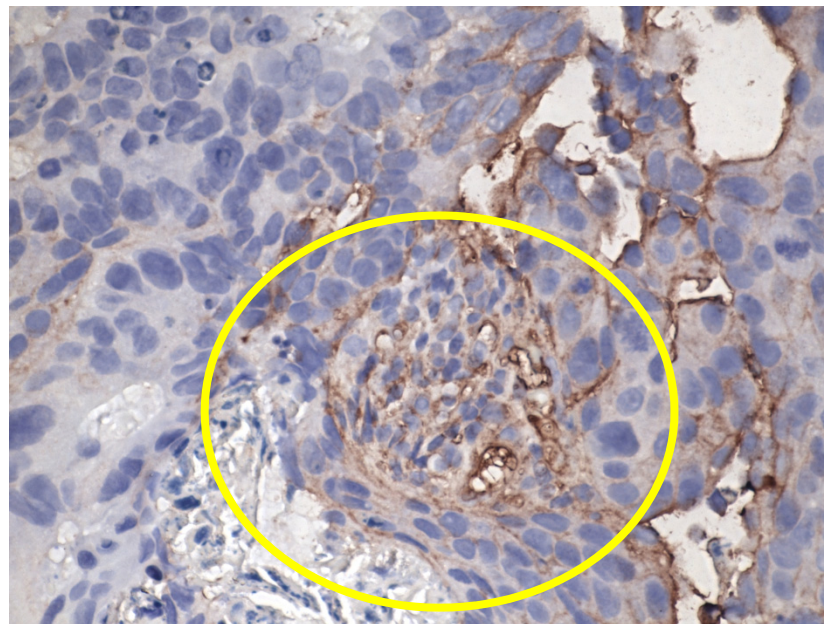
Tumor biopsy in MGD009 patient (dosed 1 $\mu\text{g/kg}$)

H&E Staining



- Glandular architecture
- Lymphocytes within tumor region
- Non-viable tumor cells associated with inflammatory cell infiltration

Anti-B7-H3 Staining



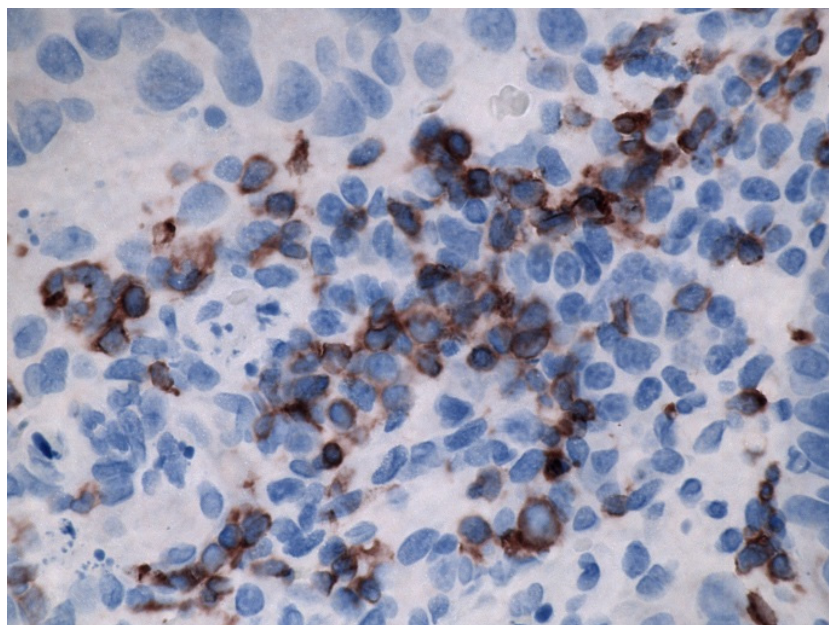
R&D Systems Goat anti-hu B7-H3, 1 $\mu\text{g/mL}$

- B7-H3 positive tumor cells surrounded by lymphocytes

T-cell Recruitment and Proliferation at Tumor Site

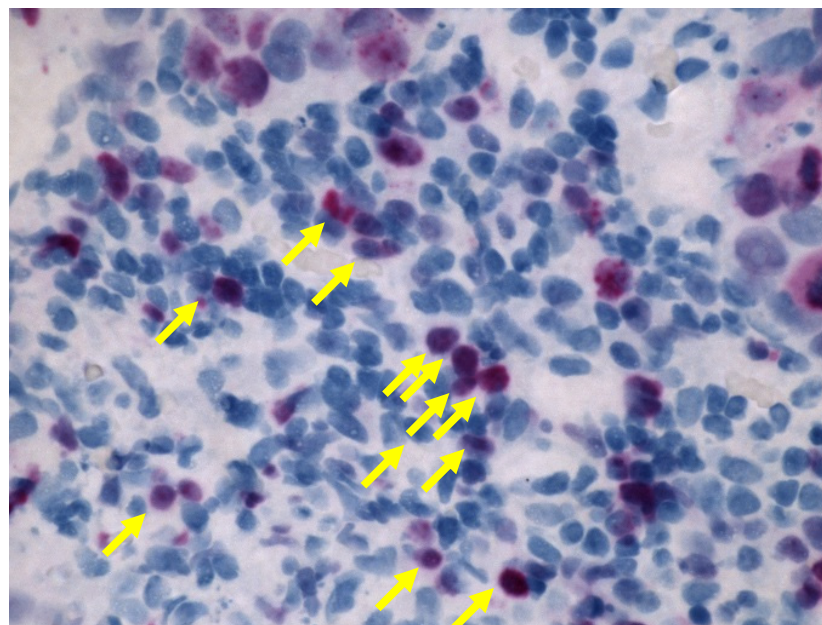
Tumor biopsy in MGD009 patient (dosed 1 μ g/kg)

CD3 Staining



- Lymphocyte infiltration (brown) adjacent to tumor cells

**Ki67 Staining
(Proliferation Marker)**



- Subset of infiltrating lymphocytes (some indicated with arrows) are proliferating (red)

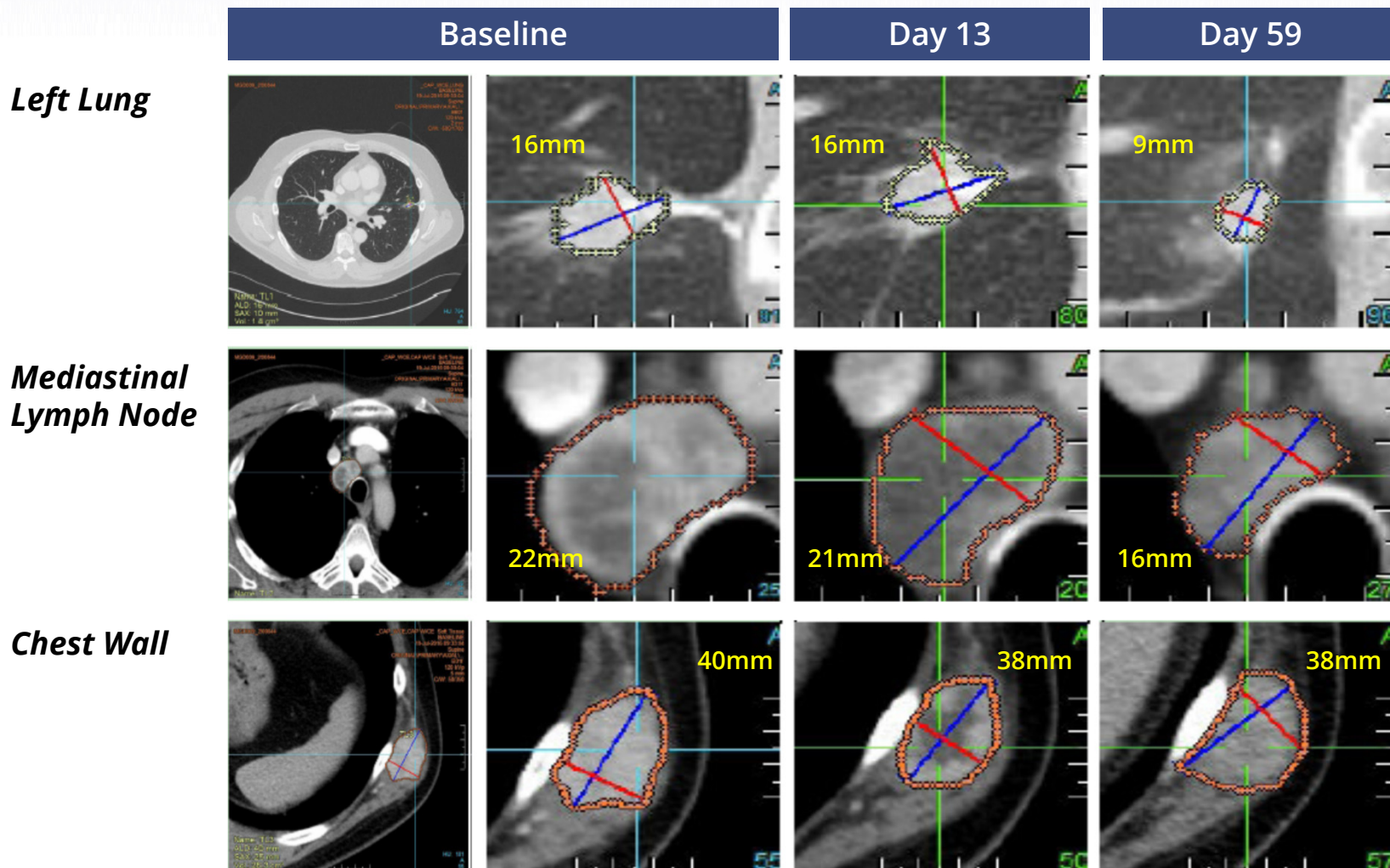
MGD009 Dose Escalation: Antitumor Activity in RCC

Case study #1: 60 y/o man with metastatic RCC

- Patient had metastases in brain, mediastinal LN, lungs, liver and subcutaneous chest wall
- Progression on multiple previous systemic therapies:
 - IL-2, sorafenib, temsirolimus, nivolumab and sunitinib
- After 1st dose of MGD009 at 10 µg/kg
 - Transient infusion reaction considered DLT (fever/chills/rash, transient increase in liver and renal function tests)
- Rapid antitumor activity observed 2 weeks after 1st dose
 - Subcutaneous chest lesion palpably softer vs. baseline (noticed within first week)
 - Decreased vascularity of multiple lesions and lymph nodes with central necrosis
 - 4% Tumor reduction on CT scan
- Treatment continued x 1 dose: **tumor reduction 19%**
 - Patient required brain radiation for new brain disease: treatment discontinued

MGD009 Dose Escalation: Antitumor Activity in RCC

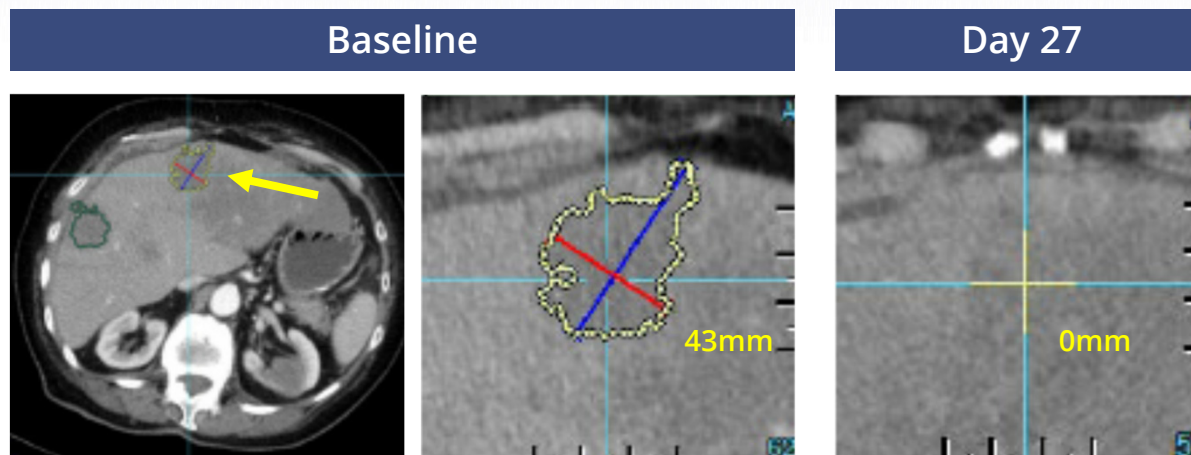
Case study #1: 60 y/o man with metastatic RCC



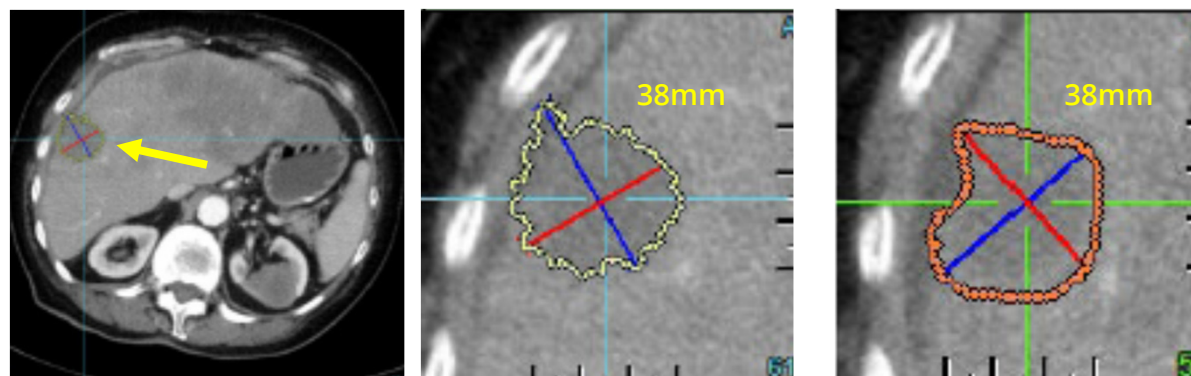
MGD009 Dose Escalation: Antitumor Activity in TNBC

Case study #2: 78 y/o woman with metastatic TNBC to lung & liver (dosed 10 $\mu\text{g/kg}$)

Liver Lesion 1



Liver Lesion 2



- Previously on enoblituzumab + pembro. study
- Stable disease, but discontinued after 1st Cycle
- Secondary to previous medical conditions/ low-grade infusion reactions
- Received two doses MGD009
- Discontinued following infusion reaction, transient transaminase elevation
- Rapid **20% tumor reduction** observed

MGD009 Dose Escalation: Antitumor Activity in Mesothelioma

Case study #3: 82 y/o man with pleural mesothelioma (dosed 10 µg/kg)

Upper Chest

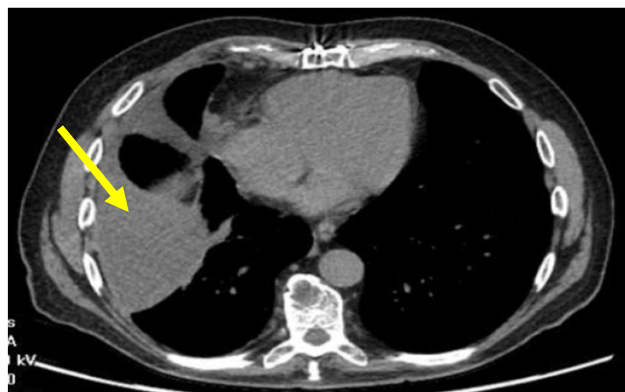
Baseline



Day 45



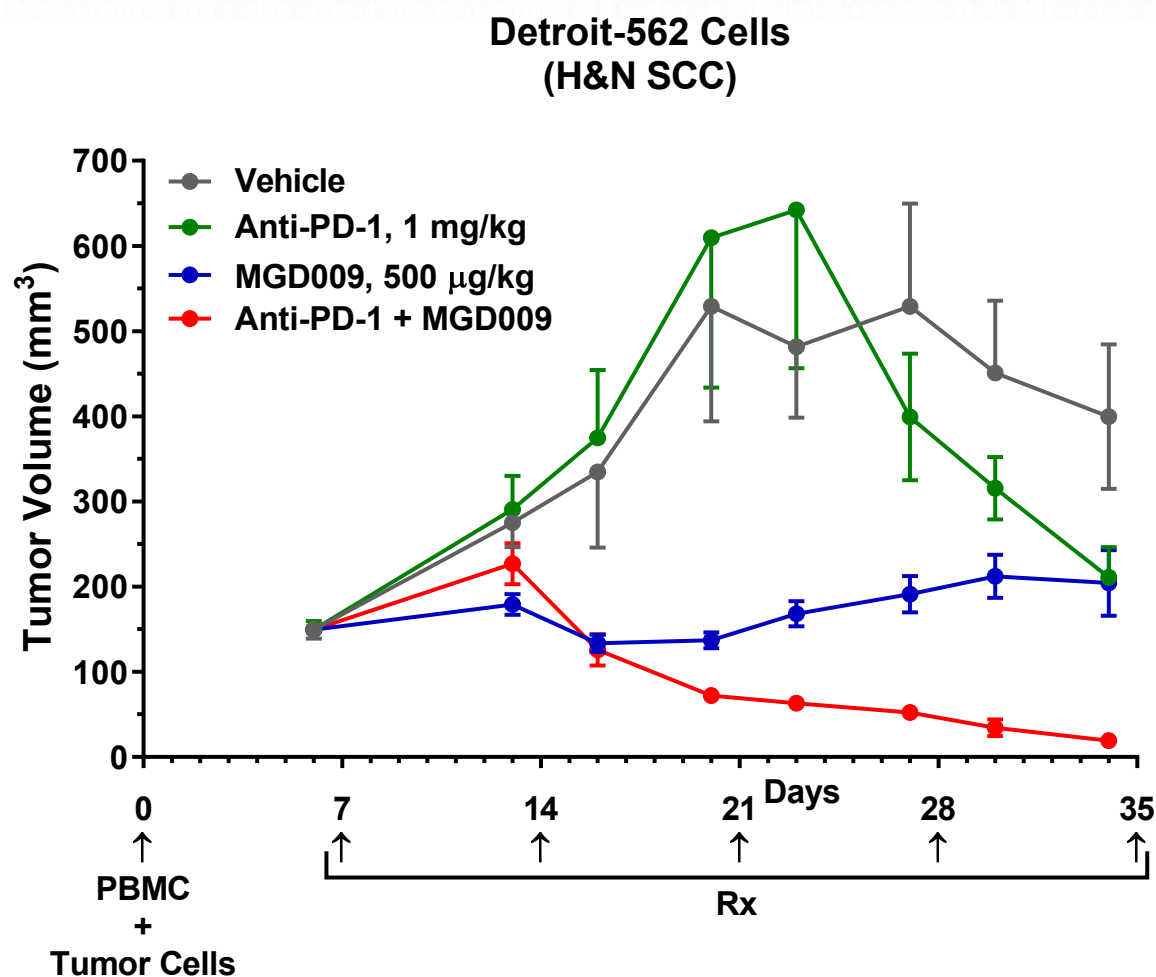
Mid Chest



- Pleural tumors with large loculated effusion
- Progression on cisplatin /pemetrexed
- Rapid antitumor activity after 1st Cycle
 - Resolution of loculated effusion
 - Tumor stable after 1st dose
 - Symptomatic improvement
- Continues on 2nd Cycle of treatment

Anti-PD-1 Enhances MGD009-mediated T-cell Killing in Vivo

Opportunity for combinatorial clinical strategy in solid tumors

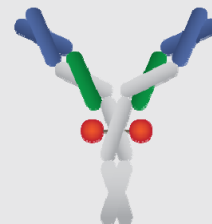


NSG MHC-I^{-/-} mice, 5x10⁶ tumor cells ID, PBMC, 10⁶ cells IP

MGD009: Advancing DART Molecule in Solid Tumors

- Dose escalation ongoing in Cohort #4 (10 µg/kg)
 - Manageable AEs
 - Initial signs of antitumor activity observed
- MoA complementary to enoblituzumab
 - Enoblituzumab promotes Fc-mediated killing by NK and macrophages, primes for optimized T cell response
 - MGD009 recruits and activates T cells (irrespective of TCR specificity) with potential expansion of tumor-specific T cells
- Plans for future combination studies with anti-PD-1

MGC018: B7-H3 Antibody-Drug Conjugate

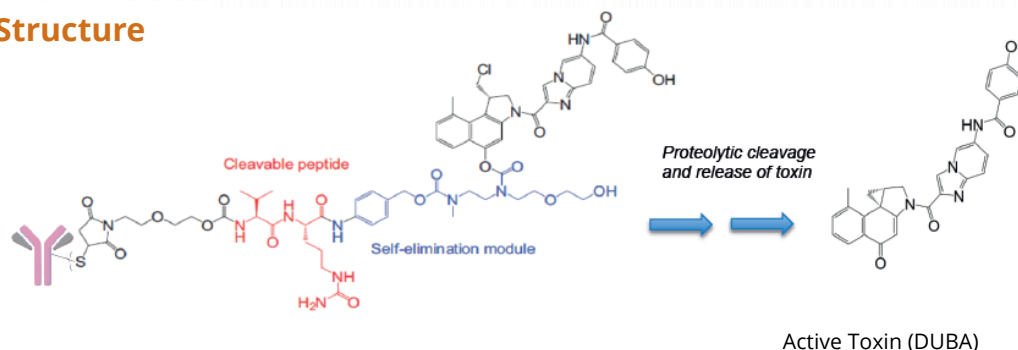
| | | |
|---------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Candidate | <ul style="list-style-type: none"> • Humanized B7-H3 antibody drug conjugate • Alternate epitope, non-overlapping with enoblituzumab and MGD009 • Drug-linker licensed from Synthon Biopharmaceuticals |  |
| Opportunity | <ul style="list-style-type: none"> • Complementary mechanism for targeting B7-H3 <ul style="list-style-type: none"> – Targeted payload delivery – Potential for de-bulking and combination strategies • Large opportunity given broad B7-H3 expression across tumor types | |
| Function/MoA | <ul style="list-style-type: none"> • Duocarmycin-based payload with cleavable peptide linker <ul style="list-style-type: none"> – Highly potent DNA-damaging agent – Targets non-dividing cancer stem cells as well as dividing tumor cells – Not subject to multi-drug resistance (MDR) | |
| Status | <ul style="list-style-type: none"> • IND targeted for 2018 • Favorable potency in B7-H3 xenografts • Acceptable non-human primate toxicology profile | |
| Partner | <ul style="list-style-type: none"> • MacroGenics retains global rights | |

Duocarmycin-based Linker Drug Payload

vc-seco-DUocarmycin-hydroxyBenzamide Azaindole (DUBA)

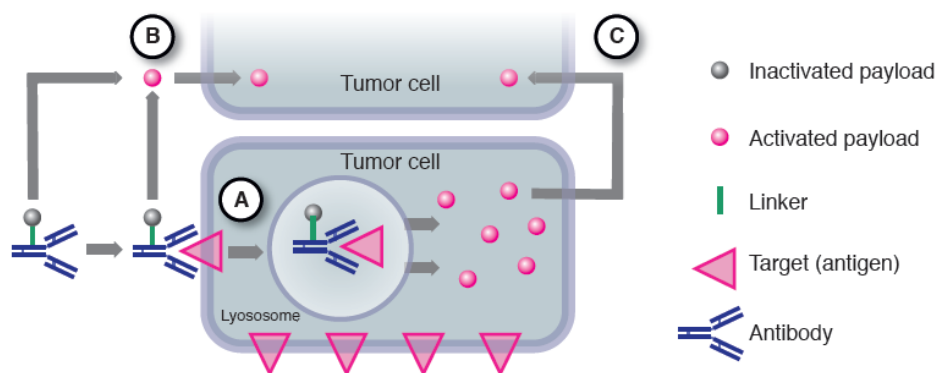
- Fully synthetic, cell-cycle independent, DNA alkylating agent
- Retain activity in MDR lines
- Cleavable peptide linker
 - Facilitates bystander effect
- Clinical-stage
 - Synthon's SYD985 in Ph. 1
 - Anti-HER2-DUBA

Structure



Mode of Action

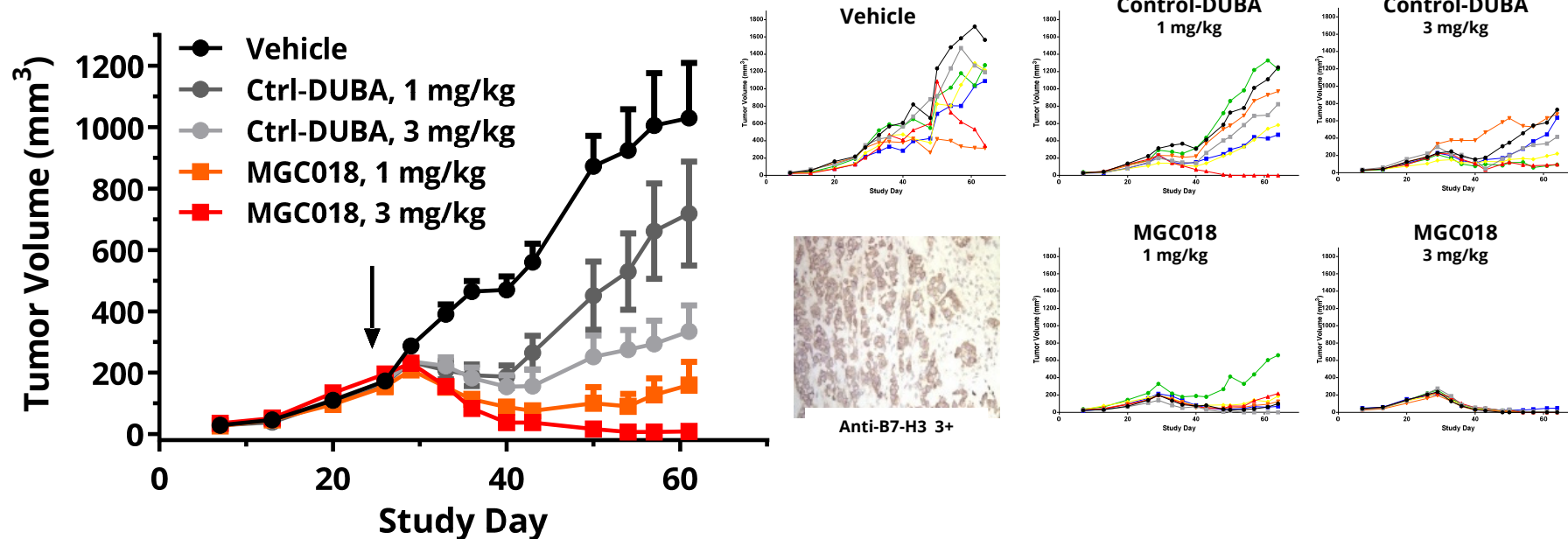
- Uptake of ADC by internalization and intracellular release of payload (A)
- Proteolytic cleavage of payload in tumor microenvironment (B)
- Diffusion of active payload to neighboring tumor cells (C)



Synthon

MGC018: Potent Activity in Xenograft Models

A375.S2 Melanoma



| Treatment | Dose qW (mg/kg) | Tumor Control Ratio (%) | Complete Response |
|------------------|-----------------|-------------------------|-------------------|
| Control mAb-DUBA | 1 | 70 | 1/7 |
| Control mAb-DUBA | 3 | 33 | 0/7 |
| MGC018 | 1 | 16 | 1/7 |
| MGC018 | 3 | 1 | 5/7 |

B7-H3 Franchise Summary

- Broad target expression on most solid tumors
- Ideal target for multiple mechanisms of action
 - Fc-mediated killing and antigen presentation (enoblituzumab)
 - T-cell re-targeting (MGD009)
 - ADC (MGC018)
 - Combination therapy
- Encouraging data from ongoing enoblituzumab and MGD009 trials
 - Acceptable safety profile to date
 - Initial antitumor activity
 - Rationale for combination with anti-PD-1
- Upcoming milestones:
 - *Enoblituzumab* - 2017
 - Complete enrollment in new expansion cohorts for bladder and prostate cancer
 - Define future development plans based on monotherapy and combination study results
 - *MGD009*: enroll patients in expansion cohorts in 2017
 - *MGC018 (ADC)*: submit IND in 2018

Today's Agenda

Welcome

Scott Koenig, M.D., Ph.D. – President & CEO, MacroGenics

Margetuximab: Potential Best-in-Class Anti-HER2 mAb

Jon Wigginton, M.D. – Senior VP, Clinical Development & CMO, MacroGenics

Comprehensive B7-H3 Franchise: Fc-Optimized mAb, DART and ADC

Paul Moore, Ph.D. – VP, Immunology & Cell Biology, MacroGenics

Jim Vasselli, M.D. – VP, Clinical Development, MacroGenics

DART and TRIDENT: Leading Multi-specific Antibody Platforms

Syd Johnson, Ph.D. – VP, Antibody Engineering, MacroGenics

Clinical DART Programs Update

Jon Wigginton, M.D. – Senior VP, Clinical Development & CMO, MacroGenics

Q&A / Break

"Combination Treatments with Checkpoint Blockade"

F. Stephen Hodi, Jr., M.D. – Director, Center for Immuno-Oncology, Dana-Farber Cancer Institute

Immuno-Oncology: Targeting Immune Regulators

Jon Wigginton, M.D. – Senior VP, Clinical Development & CMO, MacroGenics

Ezio Bonvini, M.D. – Senior VP, Research & CSO, MacroGenics

Wrap-up / Q&A

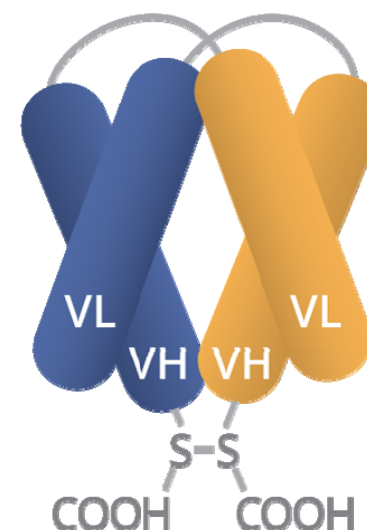
Scott Koenig, M.D., Ph.D. – President & CEO, MacroGenics

DART Platform

DART: The Most Advanced Bispecific Platform

- Robust, flexible bispecific platform
 - Multiple applications across different disease areas
 - Predictable manufacturability
 - Long-term structural stability
 - Ability to tailor half-life and valency
- Six DART molecules in clinical testing⁽¹⁾
- Multiple pre-clinical programs advancing
- Validating DART collaborators

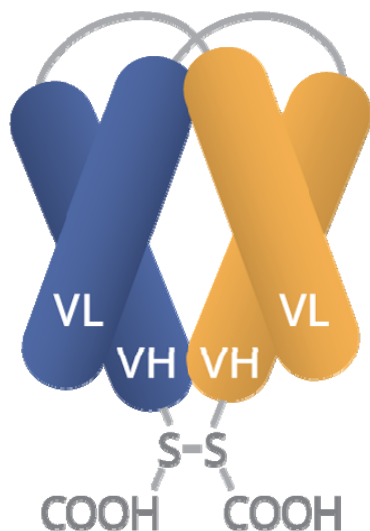
Basic DART
(No Fc Domain)



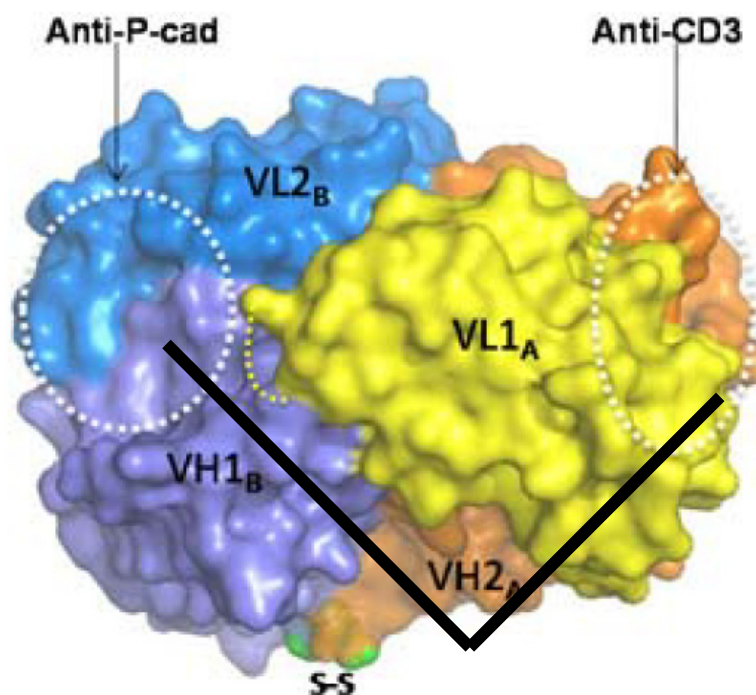
(1) Two clinical DART molecules are being developed by collaboration partners (MGD011/duvortuxizumab by Janssen and PF-06671008 by Pfizer).

Basic DART Structure: Asymmetry of Binding Domain

Basic DART
(No Fc Domain)

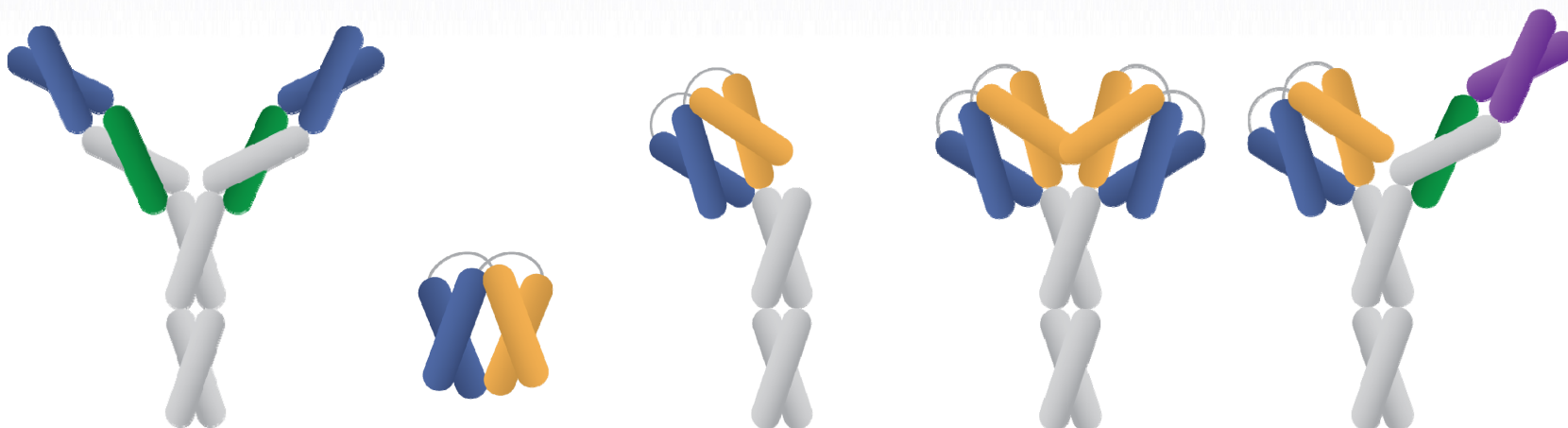


DART Crystal
Structure (Pfizer^(a))



(a) Crystallography of Pfizer's P-Cadherin x CD3 DART molecule. The two antigen binding sites (shown by red dot circles) are separated from each other by approximately 30 Å and are facing away from each other at an angle of approximately 90°. Source: Root, et al., Antibodies 2016, 5, 6; March 4, 2016.

Formats Tailored for Different Applications
























| Construct | mAb | DART | DART | DART | TRIDENT |
|-------------|-------------------------------------|------------|----------------------------------------------------------------------|---------------|-----------------------------------------------|
| Specificity | Monospecific | Bispecific | Bispecific | Bispecific | Tri-specific |
| Valency | Bivalent | Bivalent | Bivalent | Tetravalent | Trivalent |
| Half-life | Days to weeks | Hours | Days to weeks | Days to weeks | Days to weeks |
| Candidates | margetuximab, enoblituzumab, MGA012 | MGD006 | MGD007, MGD009, MGD010, MGD011 (duvortuxizumab), MGD014, PF-06671008 | MGD013 | Multiple programs in pre-clinical development |

DART: Leading Bispecific Platform

| Technology Originator (Platform) | Construct | # of Clinical Programs | Characteristics of Clinical Candidate(s) | | | |
|----------------------------------|----------------|------------------------|------------------------------------------|----------------------|------------------------------------|---------------------------|
| | | | Potential for IgG-like Half-life | Cis-binding Modality | Redirected T-cell Killing Modality | Monovalent Binding to CD3 |
| ► MacroGenics (DART) | Diabody | 6 | ✓ | ✓ | ✓ | ✓ |
| Roche (CrossMAb) | Ig-Like | 6 | ✓ | ✓ | ✓ | ✓ |
| Genmab (DuoBody®) | Ig-Like | 2 | ✓ | ✓ | ✗ | – |
| Merus (Biclonics®) | Ig-Like | 2 | ✓ | ✓ | ✓ | ✓ |
| Trion (Triomab®) | Ig-Like | 1 | ✓ | ✗ | ✓ | ✓ |
| Oncomed (BiMab™) | Ig-Like | 1 | ✓ | ✓ | ✗ | – |
| Regeneron | Ig-Like | 1 | ✓ | ✗ | ✓ | ✓ |
| AbbVie (DVD-Ig™) | Dual-Ig | 2 | ✓ | ✓ | ✗ | – |
| Sanofi | Dual-Ig | 1 | ✓ | ✓ | ✗ | – |
| Amgen (BiTE®) | scFv-Based | 6 | ✗ | ✗ | ✓ | ✓ |
| Affimed (TandAb®) | scFv-Based | 2 | ✗ | ✗ | ✓ | ✗ |
| Eli Lilly | IgG + scFv | 2 | ✓ | ✓ | ✗ | – |
| Xencor | IgG + scFv | 1 | ✓ | ✗ | ✓ | ✓ |
| Aptevo (ADAPTIR®) | scFv-Based | 1 | ✓ | ✗ | ✓ | ✗ |
| Merrimack | IgG + scFv | 1 | ✓ | ✓ | ✗ | – |
| Immunocore (ImmTAC) | TCR + scFv | 1 | ✗ | ✗ | ✓ | ✓ |
| Ablynx (Nanobodies®) | Alt. Scaffold | 1 | ✓ | ✓ | ✗ | – |

* Based on available public information as of December 5, 2016. Excludes in-licensed and inactive programs.

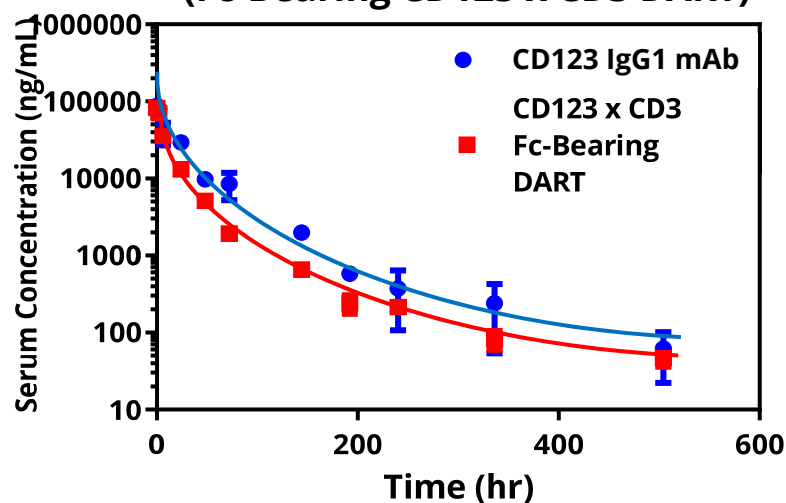
Key Attributes of Different Bispecific Platforms

| | DART | Ig-Like | scFv-based |
|-------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------|
| Ease of Manufacturing | Standard mAb platform  | More complex CMC  | Unpredictable  |
| Stability Against Aggregation | Stable  | Stable  | Unstable (domain exchange)  |
| Valency Flexibility | Customizable (2x or 4x)  | Fixed 2x  | Feasible, but complex  |
| Half-life Extension | Customizable (short to IgG-like)  | IgG-like  | Feasible, but complex  |
| High Potency |  |  |  |
| Tri-specific Variant | TRIDENT (fully customizable)  | Unavailable  | Feasible, but complex  |
| "Plug-and-play" w/ Virtually Any Fv Pair | Highly predictable  | Less predictable (for some)  | Unpredictable  |

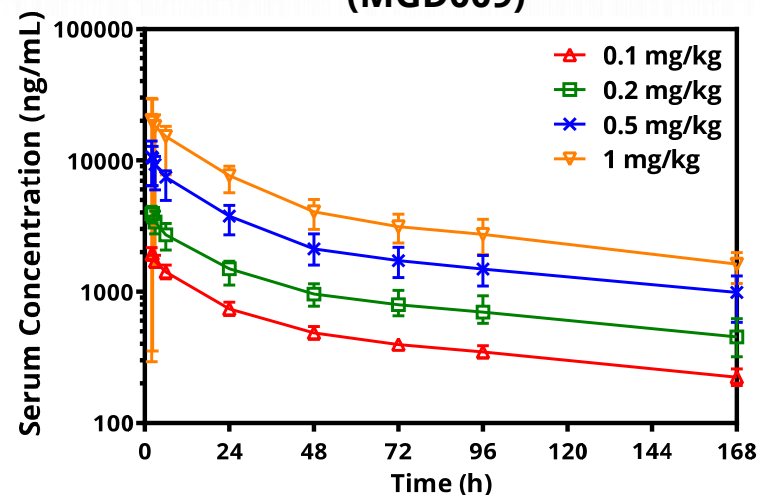


Fc Domain Extends DART Half-Life

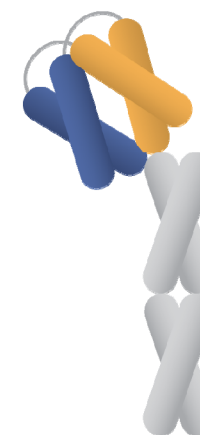
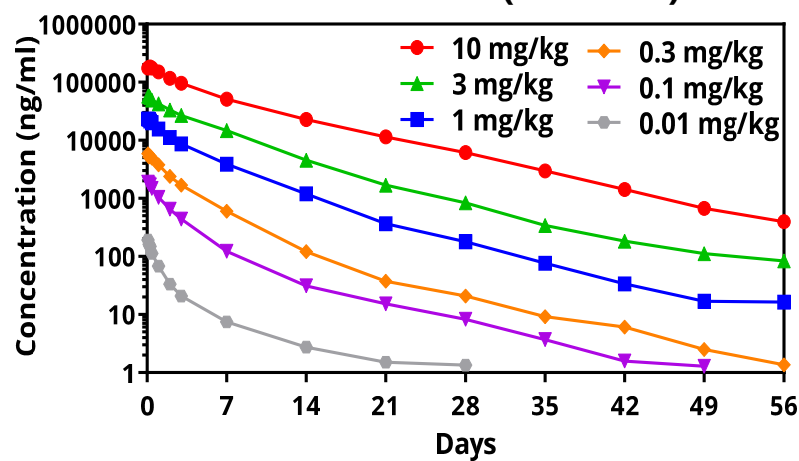
PK in FcRn-Tg Mice
(Fc-Bearing CD123 x CD3 DART)



PK in Cynomolgus Monkeys
(MGD009)



PK in Humans (MGD010)



Established Platform for DART Manufacturing

16 GMP lots across 7 distinct molecules at MacroGenics

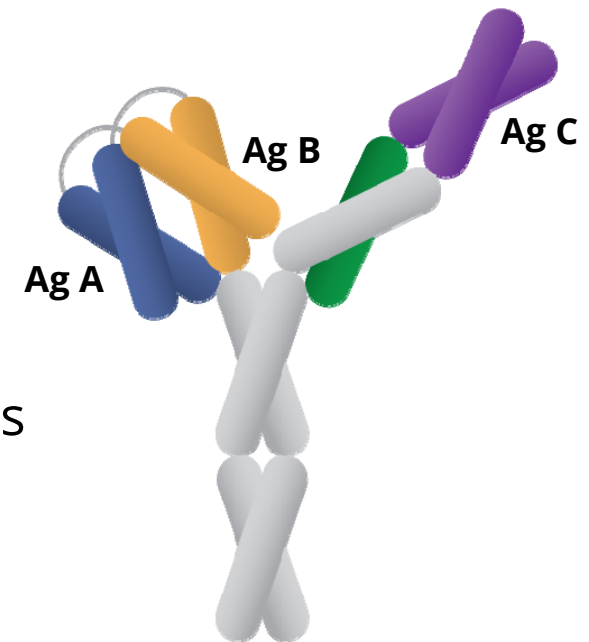
- 500 Liter single-use bioreactors
 - Commercially available media and feeds
 - Scalable performance from Development (2L, 10L, 50L) to GMP (500L)
- Standard downstream unit operations
- Current titer range = 1.3 – 3.7 g/L
- Drug Product typically stored as liquid at 2-8 °C
 - Earliest lots > three years old
- Successful tech transfer to multiple pharma partners



TRIDENT Platform: Extending Multispecific Capability

Customizable trispecific platform

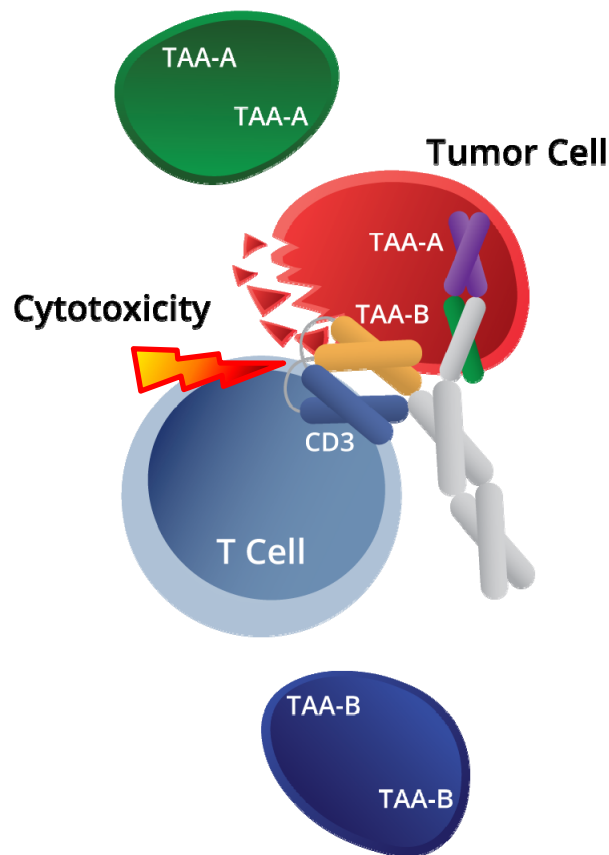
- Recognition of two or three separate antigens
- Ability to independently control valency of individual targets
- Enhanced potency and/or selectivity via bi-epitopic target recognition plus effector arm
- Selective recruitment of subsets of effector cells



TRIDENT™
MW: ~ 155 kDa

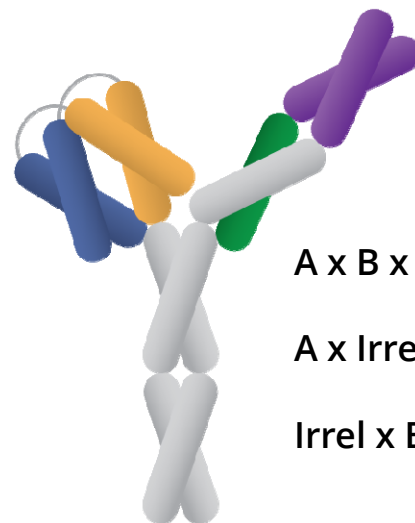
Dual-Antigen Recognition for Increased Tumor Selectivity

Dual Cancer Antigen Targeting



Concept: Targeting of two cancer antigens co-expressed on tumor cells (e.g., Targets A and B) but displaying mutually exclusive normal tissue expression provides opportunity to increase therapeutic window

Validation Approach: TRIDENT molecules incorporating single or dual cancer antigen specificity and an anti-CD3 targeting arm were evaluated for relative efficacy in redirected T-cell killing



A x B x CD3

A x Irrel x CD3

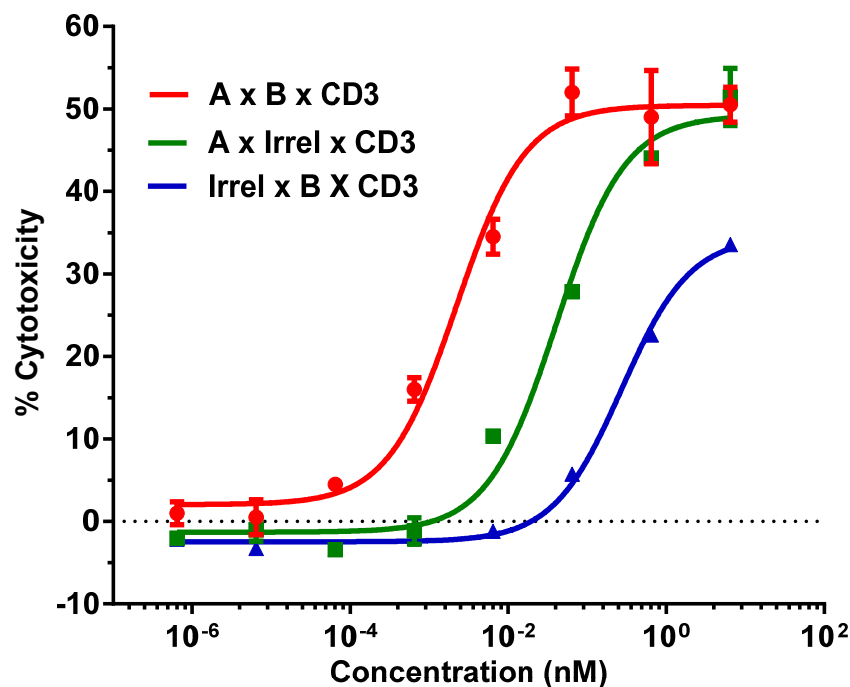
Irrel x B x CD3

TRIDENT molecules generated for biological characterization

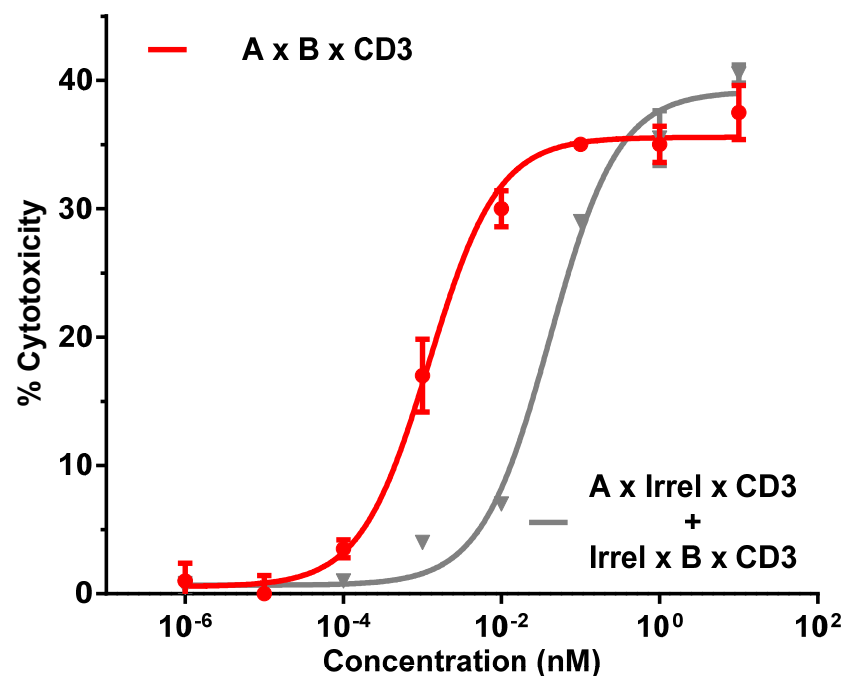
TAA = Tumor-associated antigen

TRIDENT-Enhanced CTL Activity via Dual Cancer Ag Recognition

Lysis of Target Cells Expressing A & B Antigens



>10x increase in potency with dual-antigen targeting TRIDENT



Two single-specificity TRIDENT molecules cannot reconstitute potency of A x B x CD3 TRIDENT

Effectors = T-cells; E:T = 10:1 or 1:1; Cytotoxicity based on LDH Release Assay

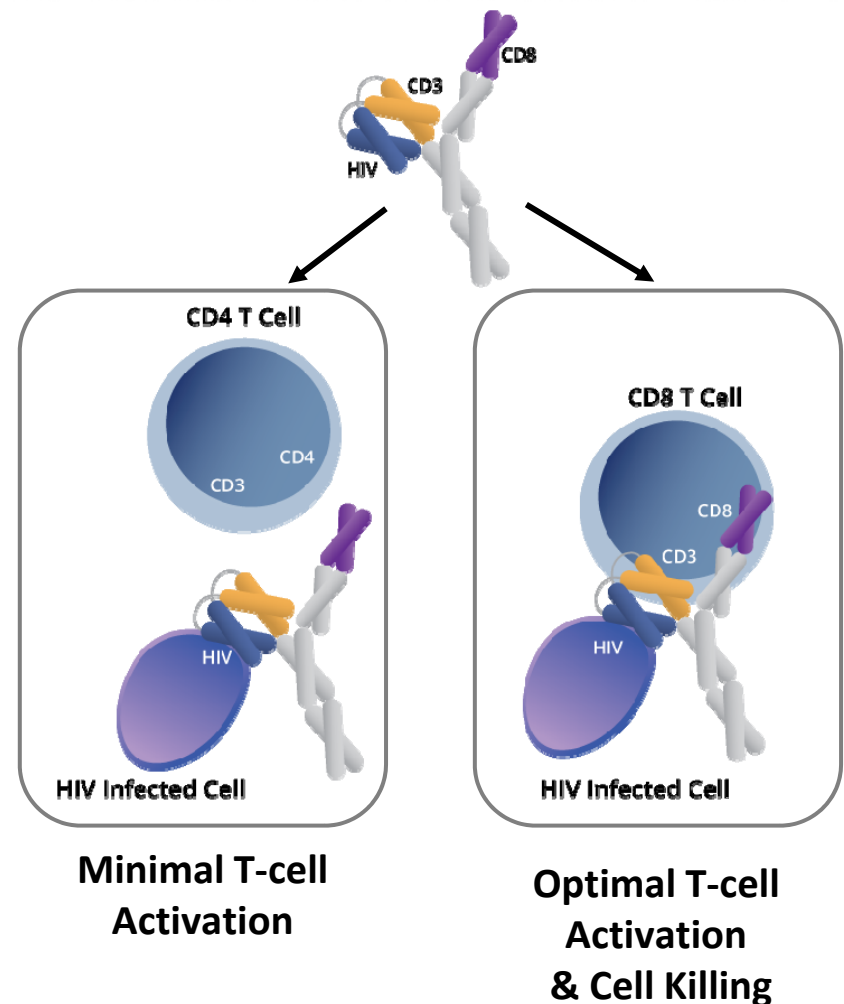
Preferential Engagement of CD8 Killer T Cells

Hypothesis:

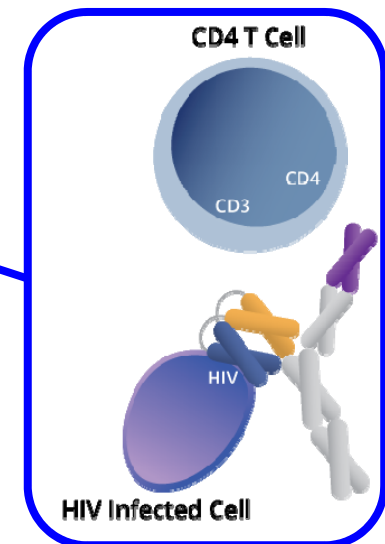
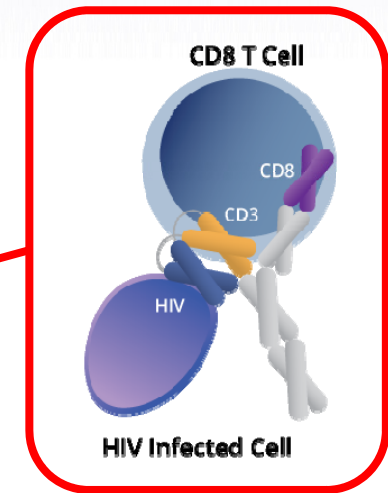
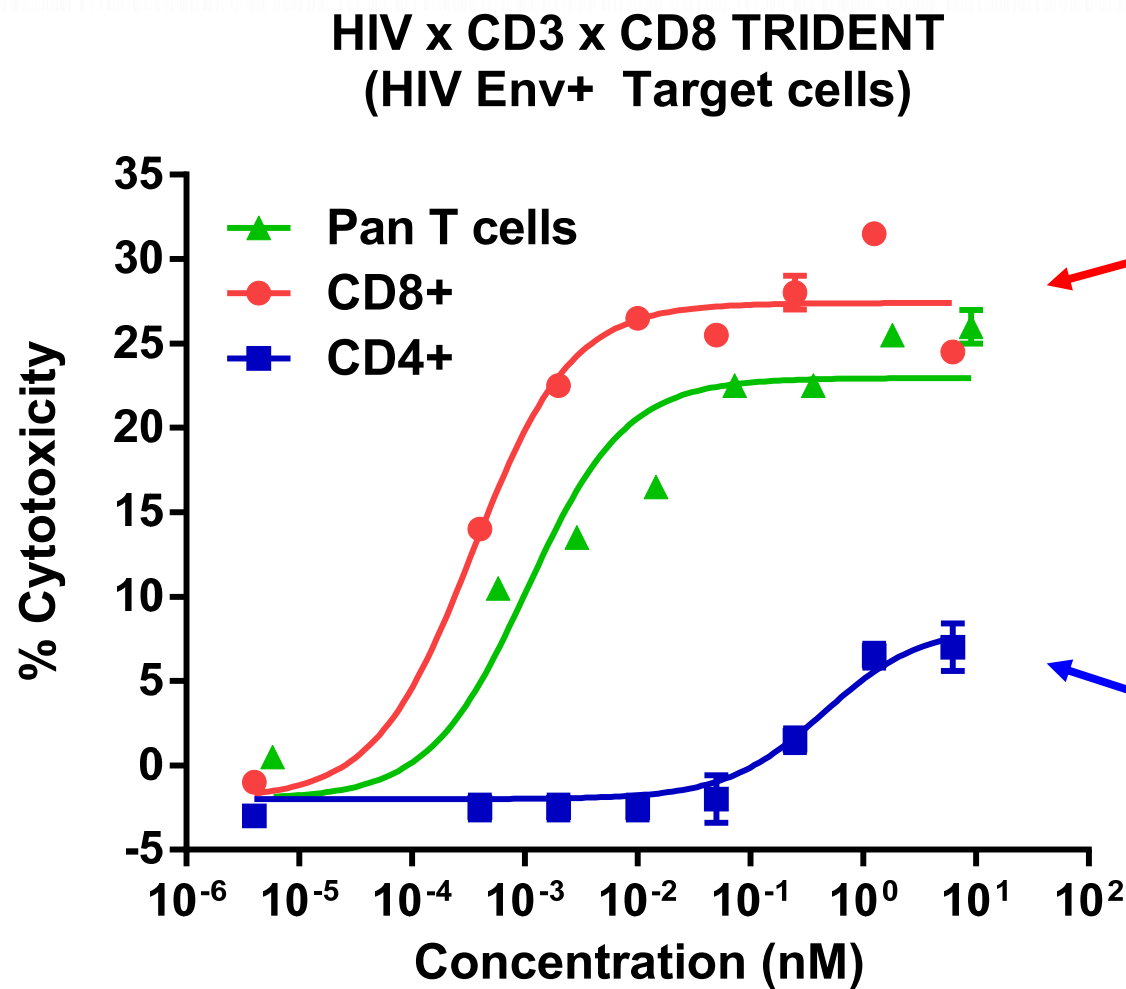
- Preferential recruitment and activation of CD8 T cells to enhance potency of redirected killing and reduce cytokine release

Approach:

- Combine anti-CD8 with anti-CD3 and HIV-targeting arm in same molecule
- Evaluate TRIDENT vs. DART activity in killing assay



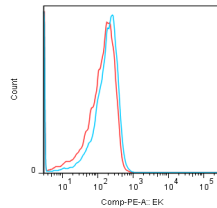
HIV x CD3 x CD8 TRIDENT: Enhanced CD8-mediated Killing



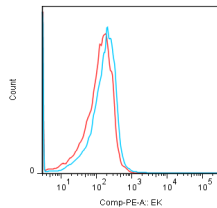
TAA x CD3 x CD8 TRIDENT Binds CD8 Killer T Cells In Vivo

Flow cytometry analysis of TRIDENT-treated cynomolgus monkeys

CD4 T-Cells

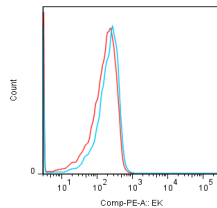


Pre

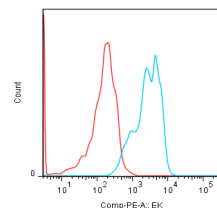


24H

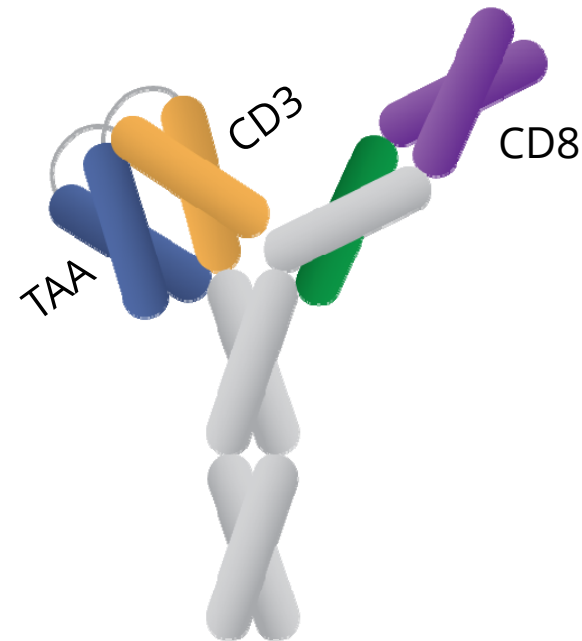
CD8 T-Cells



Pre



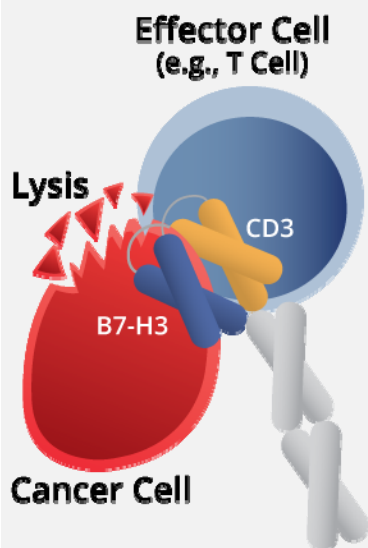
24H



DART & TRIDENT: Designed for Broad Range of Modalities

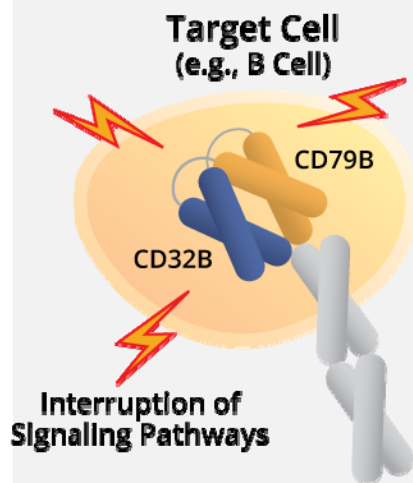
Significant advantage over other multi-specific technologies

Redirected T-cell Activation and Killing



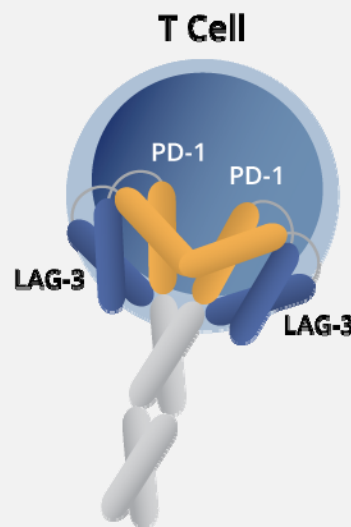
Product Candidates:
MGD006 (CD123 x CD3)
MGD007 (gpA33 x CD3)
MGD011 (CD19 x CD3)
MGD009 (B7-H3 x CD3)
MGD014 (HIV x CD3)

Modulation of Receptor Signaling



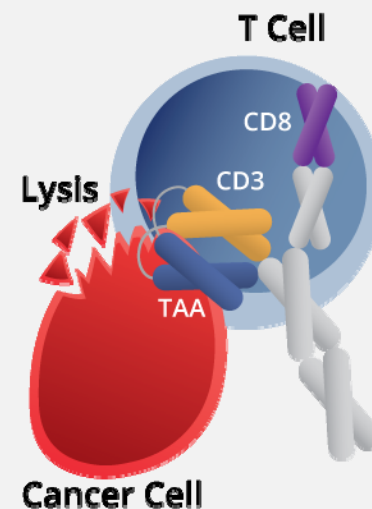
Product Candidate:
MGD010 (CD32B x CD79B)

Simultaneous Targeting of Multiple Checkpoint Inhibitors



Product Candidate:
MGD013 (PD-1 x LAG-3)

Redirected T-cell Activation and Killing (TRIDENT)



Product Candidate:
TBD
(TAA x CD3 x CD8)

Today's Agenda

Welcome

Scott Koenig, M.D., Ph.D. – President & CEO, MacroGenics

Margetuximab: Potential Best-in-Class Anti-HER2 mAb

Jon Wigginton, M.D. – Senior VP, Clinical Development & CMO, MacroGenics

Comprehensive B7-H3 Franchise: Fc-Optimized mAb, DART and ADC

Paul Moore, Ph.D. – VP, Immunology & Cell Biology, MacroGenics

Jim Vasselli, M.D. – VP, Clinical Development, MacroGenics

DART and TRIDENT: Leading Multi-specific Antibody Platforms

Syd Johnson, Ph.D. – VP, Antibody Engineering, MacroGenics

Clinical DART Programs Update

Jon Wigginton, M.D. – Senior VP, Clinical Development & CMO, MacroGenics

Q&A / Break

"Combination Treatments with Checkpoint Blockade"

F. Stephen Hodi, Jr., M.D. – Director, Center for Immuno-Oncology, Dana-Farber Cancer Institute

Immuno-Oncology: Targeting Immune Regulators

Jon Wigginton, M.D. – Senior VP, Clinical Development & CMO, MacroGenics

Ezio Bonvini, M.D. – Senior VP, Research & CSO, MacroGenics

Wrap-up / Q&A

Scott Koenig, M.D., Ph.D. – President & CEO, MacroGenics

Six DART Molecules in Phase 1 Development


| Product Candidate | MGD006 | MGD007 | MGD011 | MGD009 | PF-06671008 | MGD010 |
|------------------------------|--------------------------------------|------------------------------------|--------------------------------|------------------------|-----------------------|---------------------------|
| Targets | CD123 x CD3 (S80880) | gpA33 x CD3 | CD19 x CD3 (duvortuxizumab) | B7-H3 x CD3 | P-cadh. x CD3 | CD32B x CD79B |
| MoA | Redirected T-Cell Killing | | | | | Signal Modulation |
| Current Dosing | Continuous IV | q3W | q2W | q2W | Undisclosed | Expected weekly or longer |
| Indications | AML, MDS | Colorectal cancer | B-cell heme malignancies | Solid tumors | Solid tumors | Autoimmune disorders |
| Our Commercial Rights | North America, Japan, Korea, India | North America, Japan, Korea, India | U.S. Co-promote | Worldwide | Royalties/ Milestones | Worldwide |
| Partner | Servier | Servier (<i>Option</i>) | Janssen | — | Pfizer | — |
| Data Pres. | ASH 2013, <i>Sci Transl Med</i> 2015 | AACR 2014 | ASH 2014 | Keystone Symposia 2016 | AACR 2015 | AAI 2014, EULAR 2016 |

CD3-Directed DART Molecules – Learnings to Date

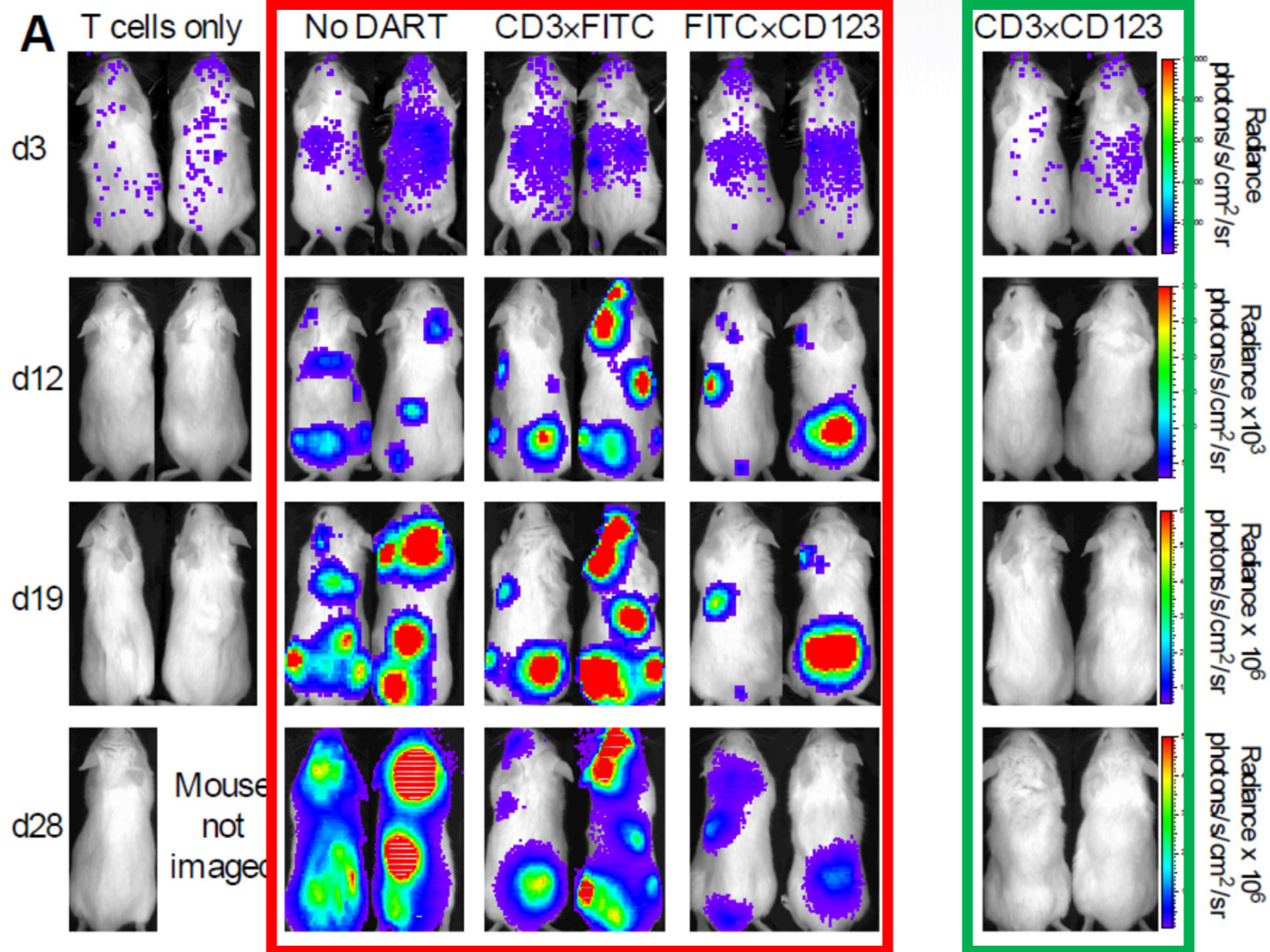
- On-target engagement
- Significant potency and low-dosing requirement (vs. mAb)
- Manageable safety/tolerability (i.e., Cytokine Release Syndrome)
- Preliminary evidence of biological and clinical activity
- Rationale for combination with anti-PD-1

MGD006 Clinical Update

MGD006: CD123 x CD3 DART

| | |
|---------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Candidate | <ul style="list-style-type: none"> Humanized CD123 x CD3 DART  |
| Function/MoA | <ul style="list-style-type: none"> Redirected T-cell killing against targeted leukemia cells <ul style="list-style-type: none"> Elimination of leukemic stem cells Sparing of normal hematopoietic stem cells Capable of engaging any T-cell without HLA-restriction Potent in vivo preclinical activity in preclinical models Extremely low clinical dosing (ng/kg) |
| Indications | <ul style="list-style-type: none"> Lead: acute myeloid leukemia (AML) and myelodysplastic syndrome (MDS) Other hematologic neoplasms including B-cell ALL |
| Development | <ul style="list-style-type: none"> Phase 1 study ongoing in US and EU (dose escalation) |
| Partner | <ul style="list-style-type: none"> MacroGenics retains full rights in No. Amer., Japan, Korea & India Servier has rights for all other territories |

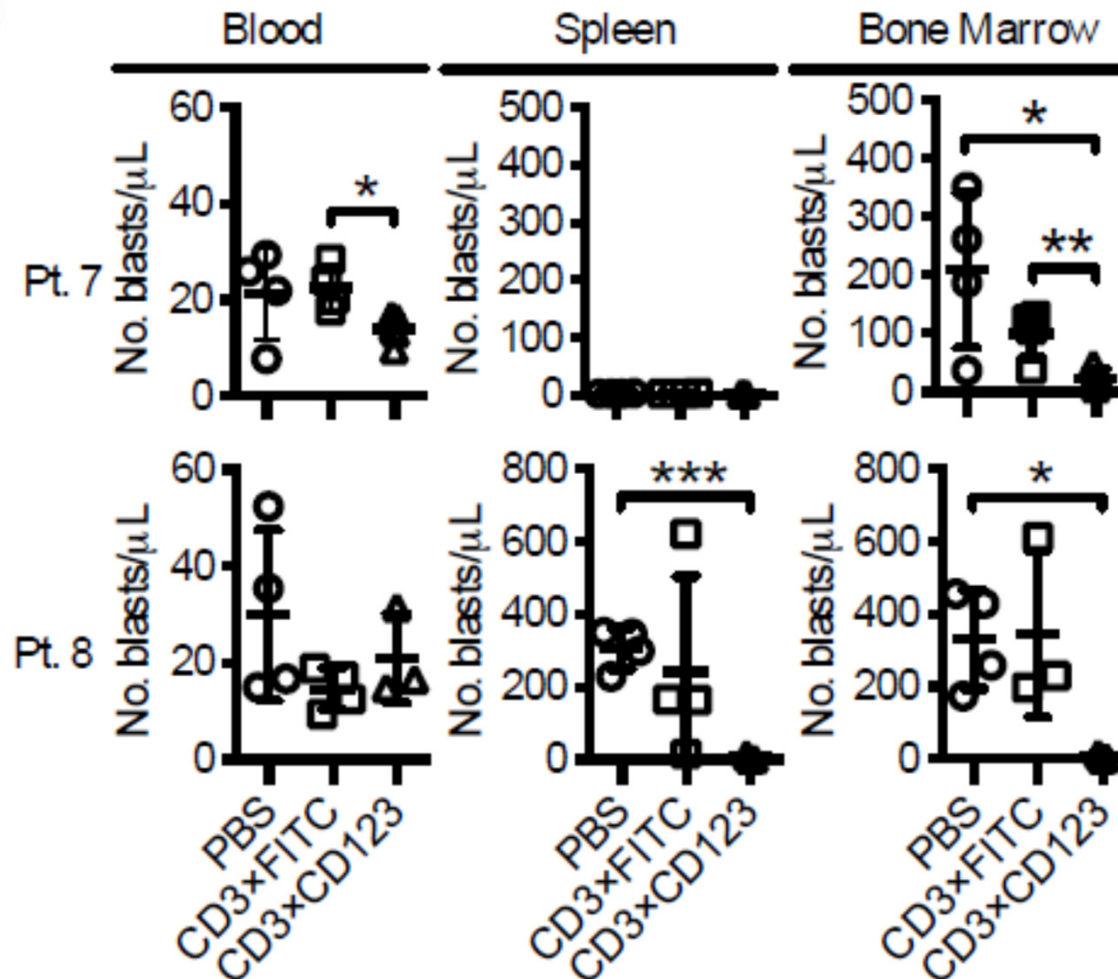
MGD006 Suppresses CD123+ Leukemia Xenografts



Irradiated NSG mice (n=5/group) injected with K562GFP-CD123 cells and treated with DARTs. Bioluminescence imaging on days 3, 12, 19, and 28 showed significant inhibition ($p < 0.0001$) of tumor growth in CD3×CD123 DART; *Al-Hussaini, et al. Blood* 2016,127:122-31

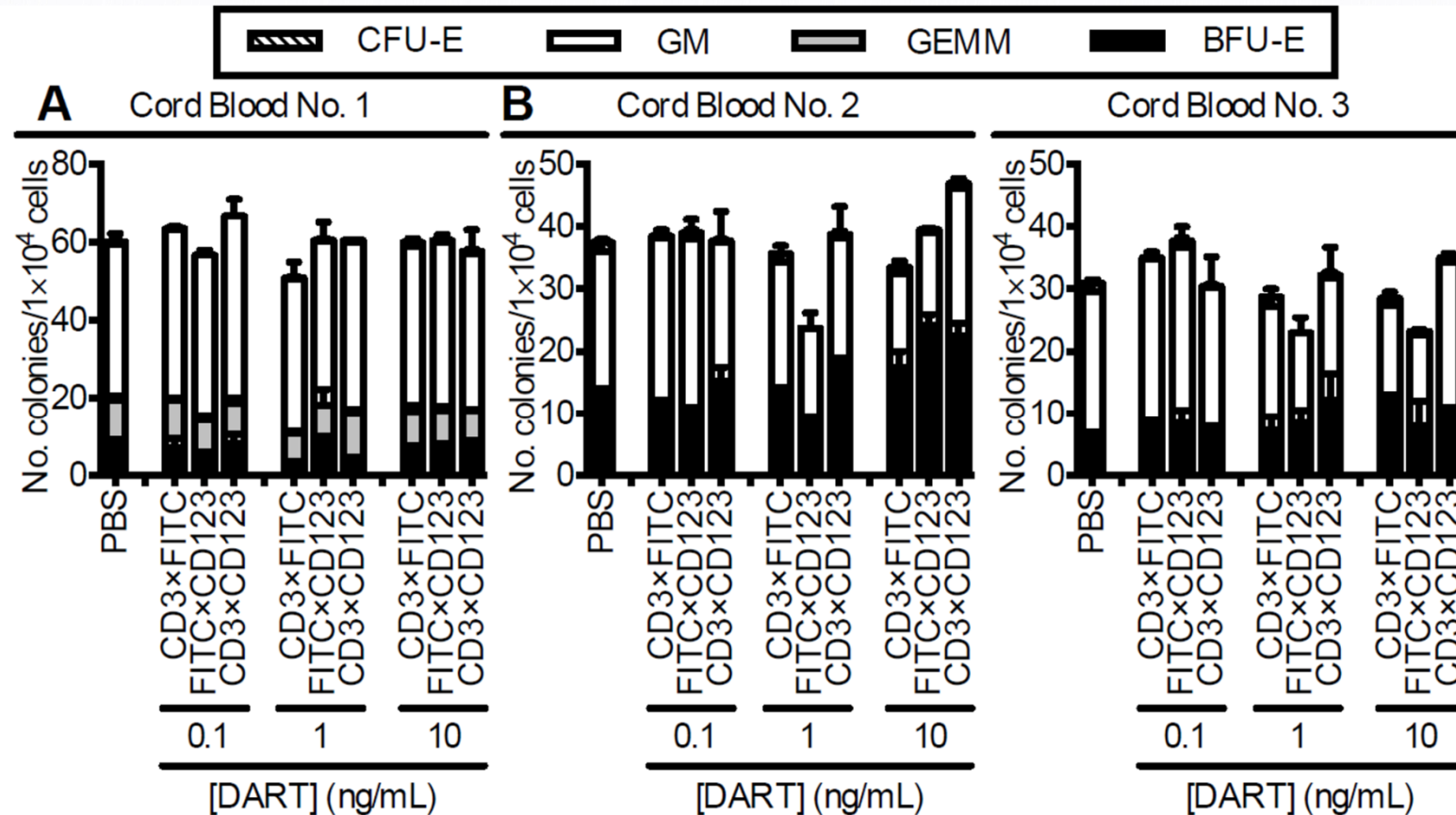
MGD006 Suppresses Leukemia Patient Xenografts

NSG mice reconstituted with human AML cells



Al-Hussaini et al. Blood 2016;127:122-31

MGD006 Shows Minimal/No Impact on Bone Marrow Precursors



- Cord blood cells from 3 healthy donors, incubated with agents for (A) 4 hours or (B) 18 hours
- Plated in methylcellulose-based medium; colonies were scored on day 7; bars = SD of duplicate plates

Al-Hussaini et al. Blood 2016;127:122-31

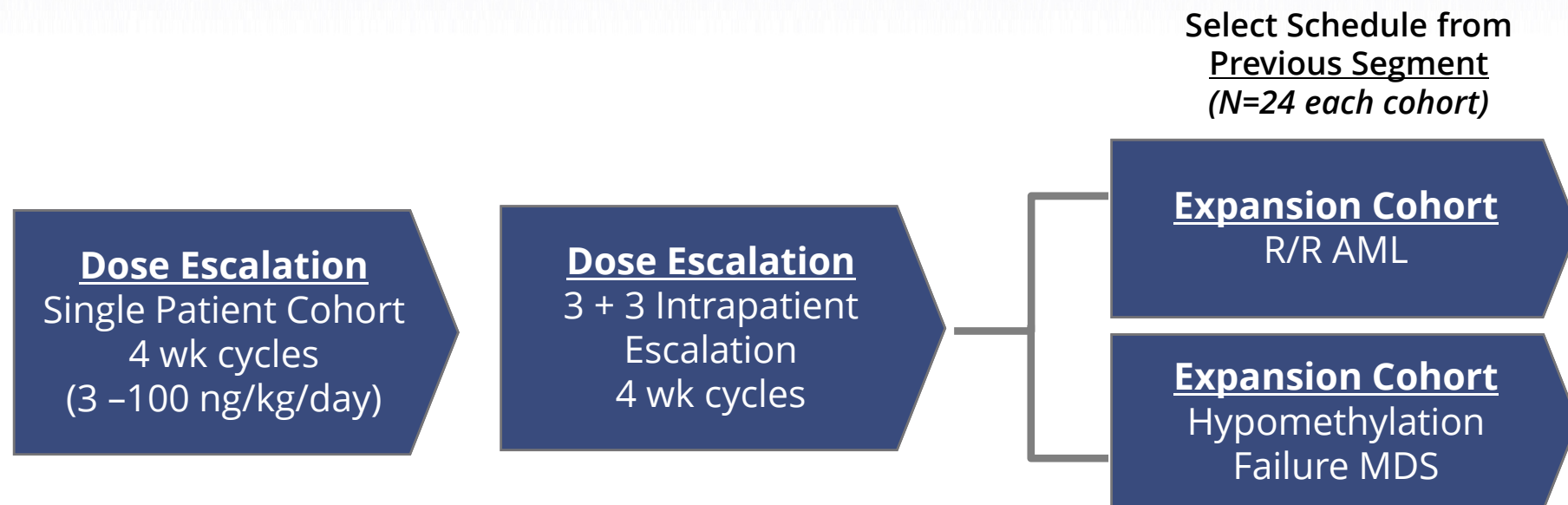
AML Treatment Overview

- Acute myeloid leukemia (AML): heterogeneous group of diseases with neoplastic infiltration of blasts in blood, bone marrow, viscera
 - 20,000 new cases in US (2016)
 - Incidence increases with age; median age at onset is 67 years
 - Overall 5-year survival rate is 26.6%
 - Untreated AML patients succumb within weeks
- Current therapy is suboptimal:
 - Standard therapy comprises “7+3” induction chemotherapy (cytarabine and daunorubicin) followed by consolidation chemotherapy +/- transplantation
 - Limited by toxicity and high rates of relapse
 - Salvage therapies compromised by short response duration & high relapse rate
- Large unmet need given toxicity and high rates of relapse with standard therapy

Key Goals for MGD006 FIH Study

- Define safety and preliminary clinical activity in patients with AML and MDS
- Optimize approach to delivery and supportive care
- Define consistent supportive care regimen to manage CRS and minimize corticosteroid use where possible to limit systemic immune suppression
- Define PK, PD and PK/PD relationships
- Position MGD006 for testing in other CD123+ therapeutic opportunities including ALL patients post-blinatumomab or post-CD19 CART cell therapy
- Set stage for follow-on mechanism-based combination studies with internal and/or external assets

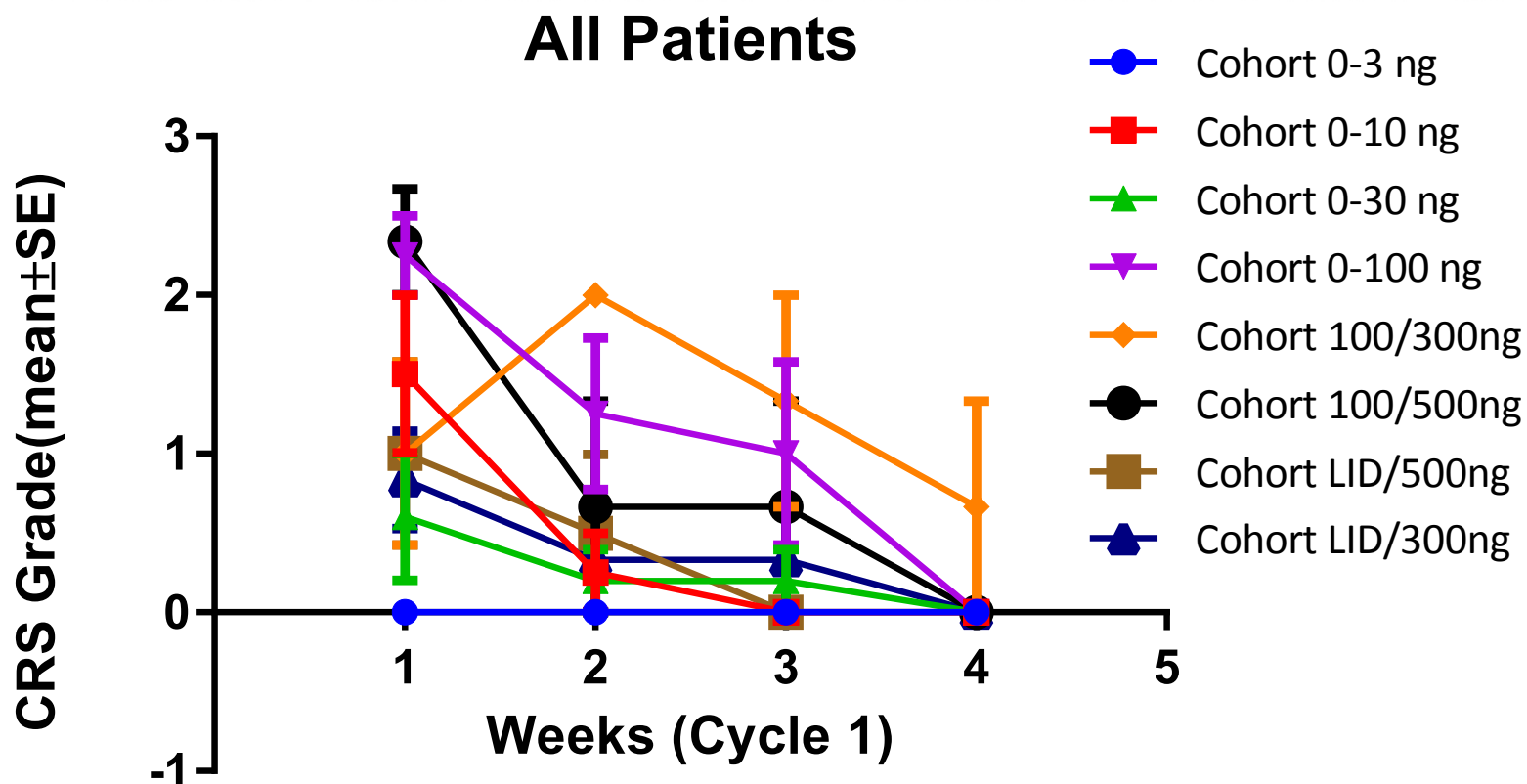
MGD006 (CD123 x CD3): Phase 1 Study in Dose Escalation



Patient Population: Patients with relapsed/refractory AML and hypomethylation failure Int-2/High Risk MDS

Dosing Regimen: Continuous intravenous infusion

Overview of CRS Across Dosing Cohorts to Date



- IRR/CRS is primary toxicity of significance
- Manifestations include fever, chills, hypotension, tachycardia

* LID, lead-in dose

MGD006: Evolution of CRS Management

Original Protocol:
No Prophylaxis/
Early Intervene

Anti-Cytokine Gr 4
CRS Only

Prophylactic
Premeds (incl.
steroid)

Early Anti-Cytokine
(for Gr 2 CRS)

Two-Step Dose (LID)
Escalation & New
CRS Grading (Lee, et
al. criteria)

Single Patient
Dose Escalation

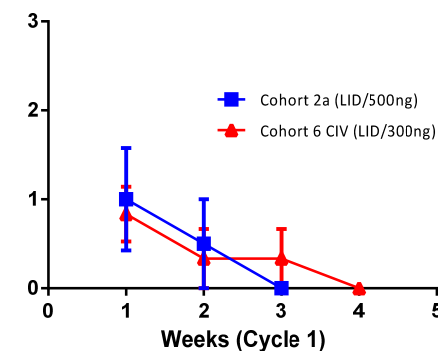
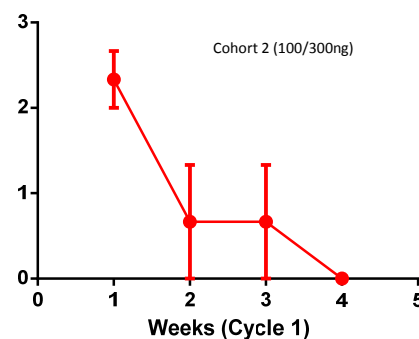
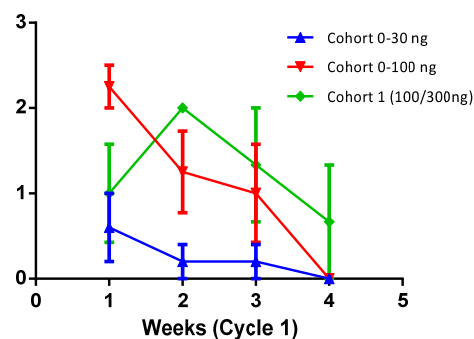
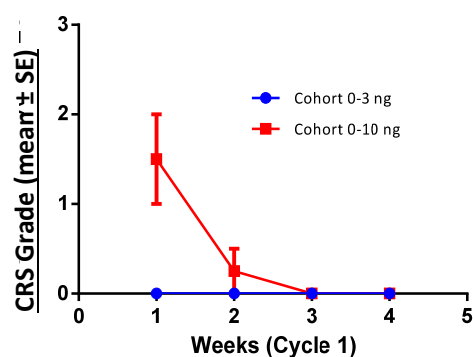
Multi-Patient Dose Escalation

No Prophylaxis

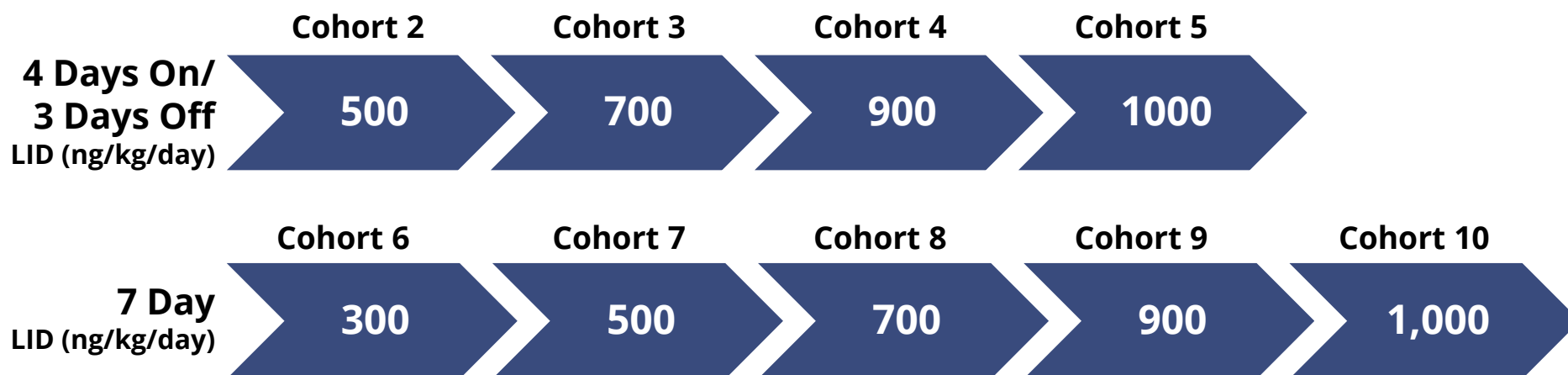
Prophylactic
Dexamethasone

Prophylactic Dexamethasone
+Anti-Cytokine

Prophylactic Dexamethasone
+Anti-Cyto +2-Step Escal.

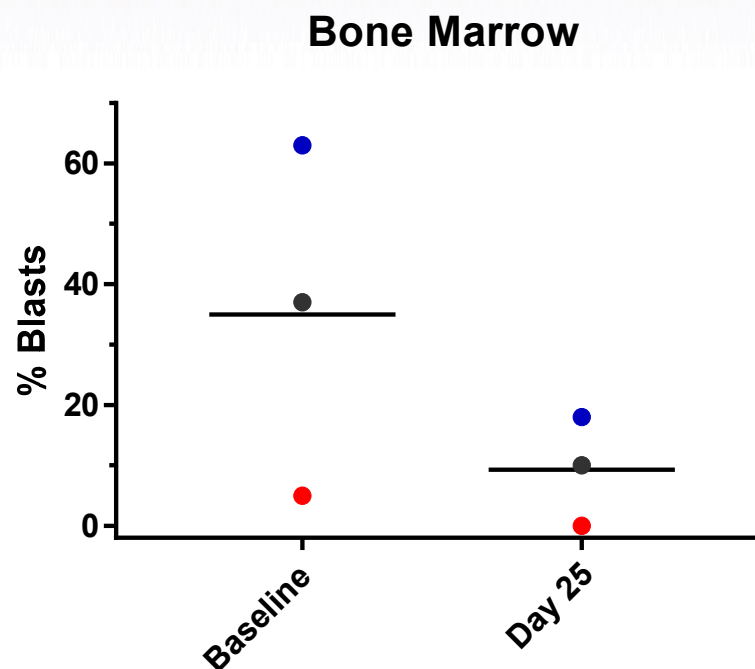
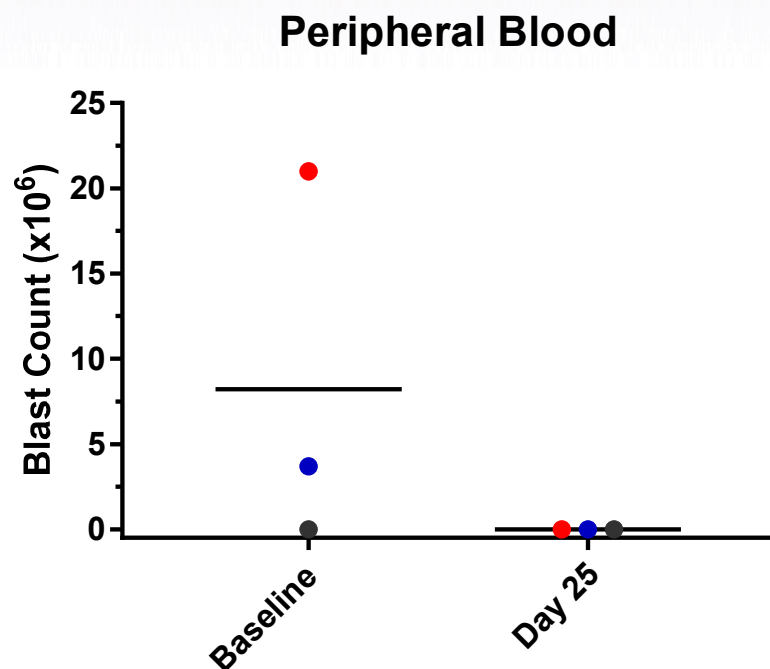


Current Two-Step Approach to Dose Escalation



- Lead-in-Dose (LID): 30 ng/kg/day x 3 days, 100 ng/kg/day x 4 days week 1, then:
 - Cohorts 2-5: Single Step-Up, 4-on 3-off schedule, Cycle 1+
 - Cohorts 6-10: Single Step-up for 21 days continuous infusion (Cycle 1) followed by 4-on 3-off schedule for Cycle 2 and beyond

MGD006: Decreased Blast Counts in 3 Patients



| Patient ID | Diagnosis | Cohort | Relevant Hx |
|---------------------------------------|-------------------------|----------------|-----------------------------------------------------------|
| 1 ● | AML M0 | 30ng/kg/d | Refractory >2 induction Tx |
| 2 ● | AML M2 | 100ng/kg/d | PR duration <6 months Refractory to 2 salvage attempts |
| 3 ● | AML <i>FLT3</i> mutated | 100/500ng/kg/d | CR duration <6 months |

MGD006: What Have We Learned?


- Defined safety profile at doses tested to date in 30 patients
- Refined supportive care to enable substantial limitation of CRS
- Positioned asset to enable outpatient administration after Cycle 1
- Characterized predictable PK properties
- Established biological and preliminary clinical activity in AML patients
- Mechanism-based rationale for combining MGD006 with anti-PD-1

MGD006: Next Steps

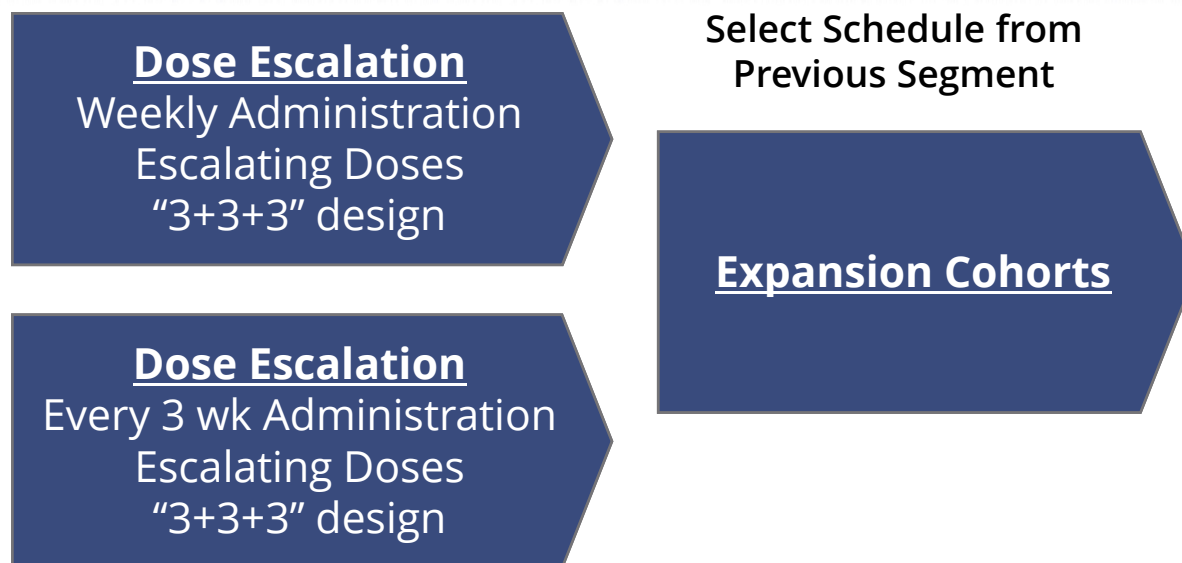
- Continue aggressive dose escalation given substantial progress in CRS control
 - Early anti-cytokine therapy and two-step intra-patient dose escalation
- Execution of cohort expansions in AML and MDS → positioned for acceleration guided by strength of efficacy signal
- Assess opportunity for clinical testing of combination with anti-PD-1
- Characterize potential role of MGD006 in treating/preventing antigen-loss relapse in ALL patients post CD19-CAR-T cells or blinatumomab
- Longer half-life version of MGD006 now established

MGD007 Clinical Update

MGD007: gpA33 x CD3 DART Molecule

| | | |
|---------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Candidate | <ul style="list-style-type: none"> Humanized, Fc-bearing gpA33 x CD3 DART |  |
| Rationale | <ul style="list-style-type: none"> gpA33 is homogenously expressed on >95% colorectal cancer <ul style="list-style-type: none"> - Expressed on cancer stem cells and differentiated cell populations - Normal tissue expression primarily restricted to intestinal epithelium | |
| Function/MoA | <ul style="list-style-type: none"> Redirected T-cell killing against cancer cells | |
| Indications | <ul style="list-style-type: none"> Lead: Colorectal cancer Other: Pancreatic and gastric cancers | |
| Development | <ul style="list-style-type: none"> Phase 1 study ongoing | |
| Partner | <ul style="list-style-type: none"> MacroGenics retains full rights in No. Amer., Japan, Korea & India Servier has option for all other territories | |

MGD007 (gpA33 x CD3): Phase 1 Study in Dose Escalation



- Objectives:** Establish safety, determine MTD, characterize PK, evaluate alternate schedules, and describe early evidence of anti-tumors activity
- Patient Population:** Patients with relapsed / refractory metastatic colorectal carcinoma
- Dosing Regimen:** Intravenous infusion, qW or q3W
- Evaluations:** RECIST and irRECIST

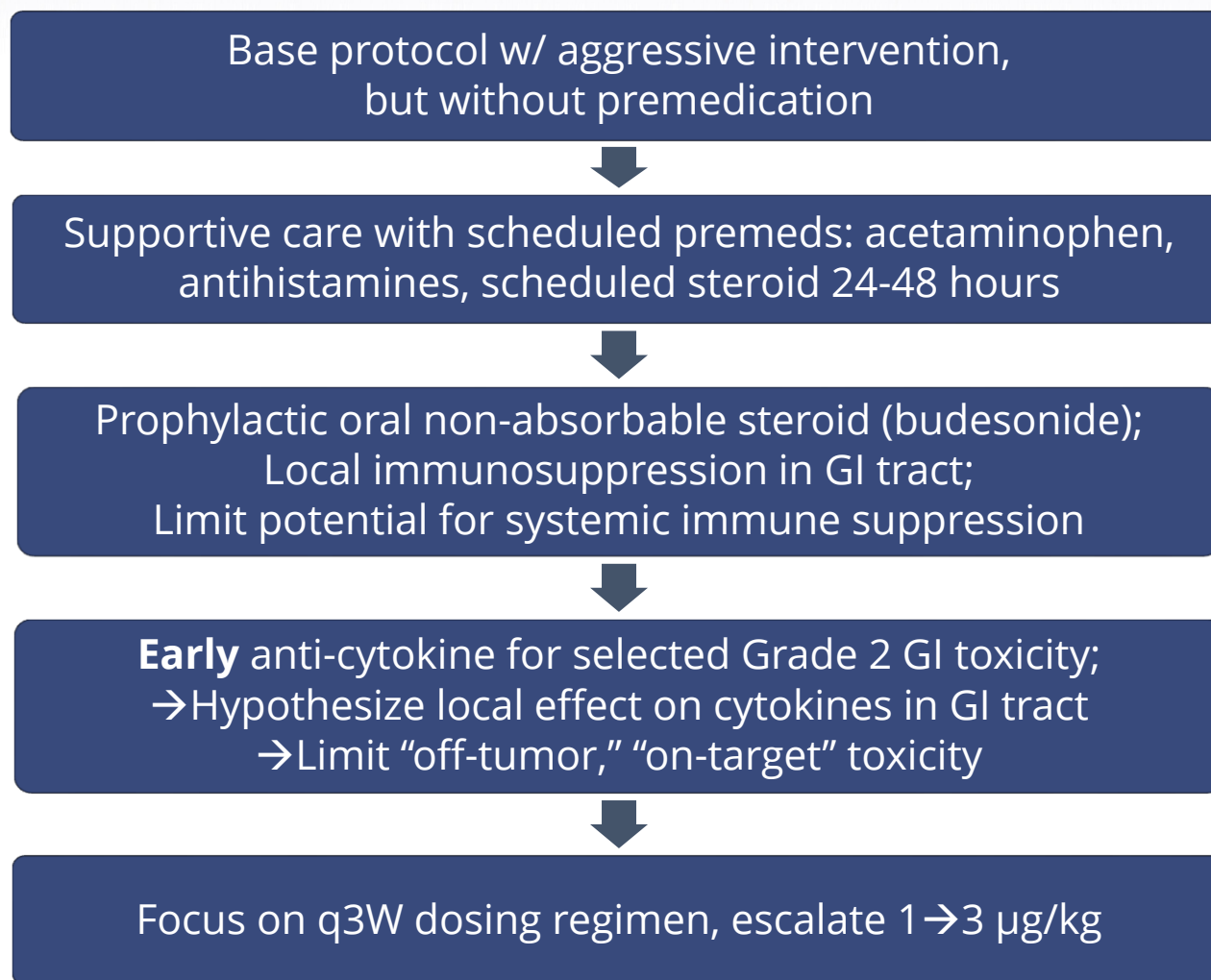
MGD007 Related Adverse Events

| Related Adverse Events* † | N = 30 | | Related Adverse Events* † | N = 30 | |
|----------------------------|-----------|----------|---------------------------|----------|----------|
| | All | ≥ Gr 3 | | All | ≥ Gr 3 |
| Diarrhea | 27 (90.0) | 7 (23.3) | Dizziness | 4 (13.3) | - |
| Nausea | 23 (76.7) | 6 (20.0) | Lymphopenia | 4 (13.3) | 3 (10.0) |
| Vomiting | 22 (73.3) | 6 (20.0) | Lipase Increased | 4 (13.3) | 1 (3.3) |
| Pyrexia | 12 (40.0) | - | Dyspepsia | 3 (10.0) | - |
| Abdominal Pain | 11 (36.7) | 2 (6.7) | Hyperglycemia | 3 (10.0) | - |
| Fatigue | 11 (36.7) | 3 (10.0) | Hyponatremia | 3 (10.0) | 1 (3.3) |
| Chills | 9 (30.0) | - | Hypophosphotemia | 3 (10.0) | 3 (10.0) |
| Dehydration | 7 (23.3) | 1 (3.3) | Cytokine Release Syndrome | 3 (10.0) | 1 (3.3) |
| Tachycardia | 7 (23.3) | 1 (3.3) | Influenza like illness | 3 (10.0) | - |
| Decreased Appetite | 6 (20.0) | - | Headache | 3 (10.0) | - |
| Hypocalcemia | 4 (13.3) | 1 (3.3) | Myalgia | 3 (10.0) | - |
| Lymphocyte count decreased | 4 (13.3) | 2 (6.7) | Leukopenia | 3 (10.0) | 2 (6.7) |

* MGD007 related adverse event ≥ 10% of patients as assessed by NCI CTCAE v4.03

† MedDRA Preferred Term

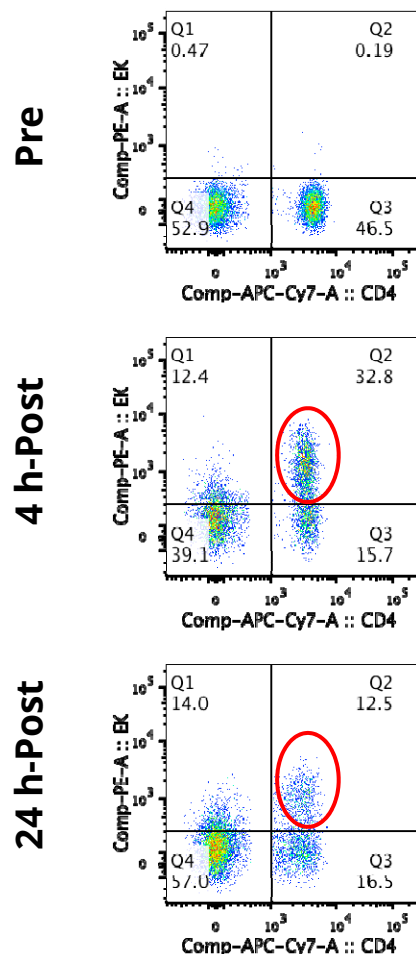
MGD007: Evolution of Supportive Care



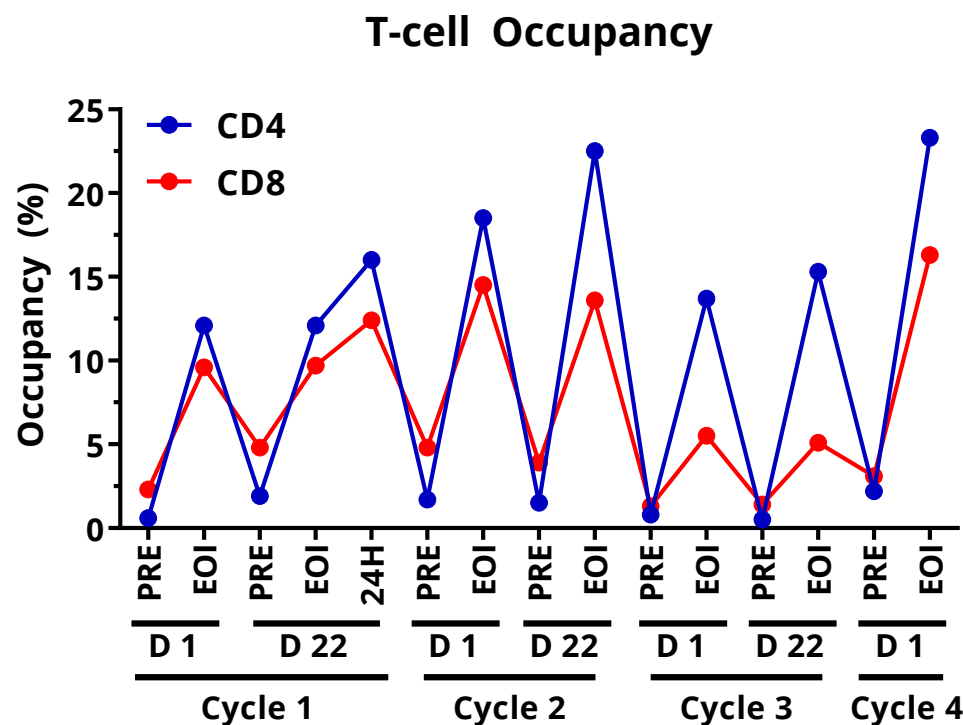
MGD007 Binds Circulating T Cells

Flow cytometry demonstrates consistent T-cell loading across multiple cycles

MGD007 Binding to CD4 Cells



MGD007, 0.6 µg/kg patient

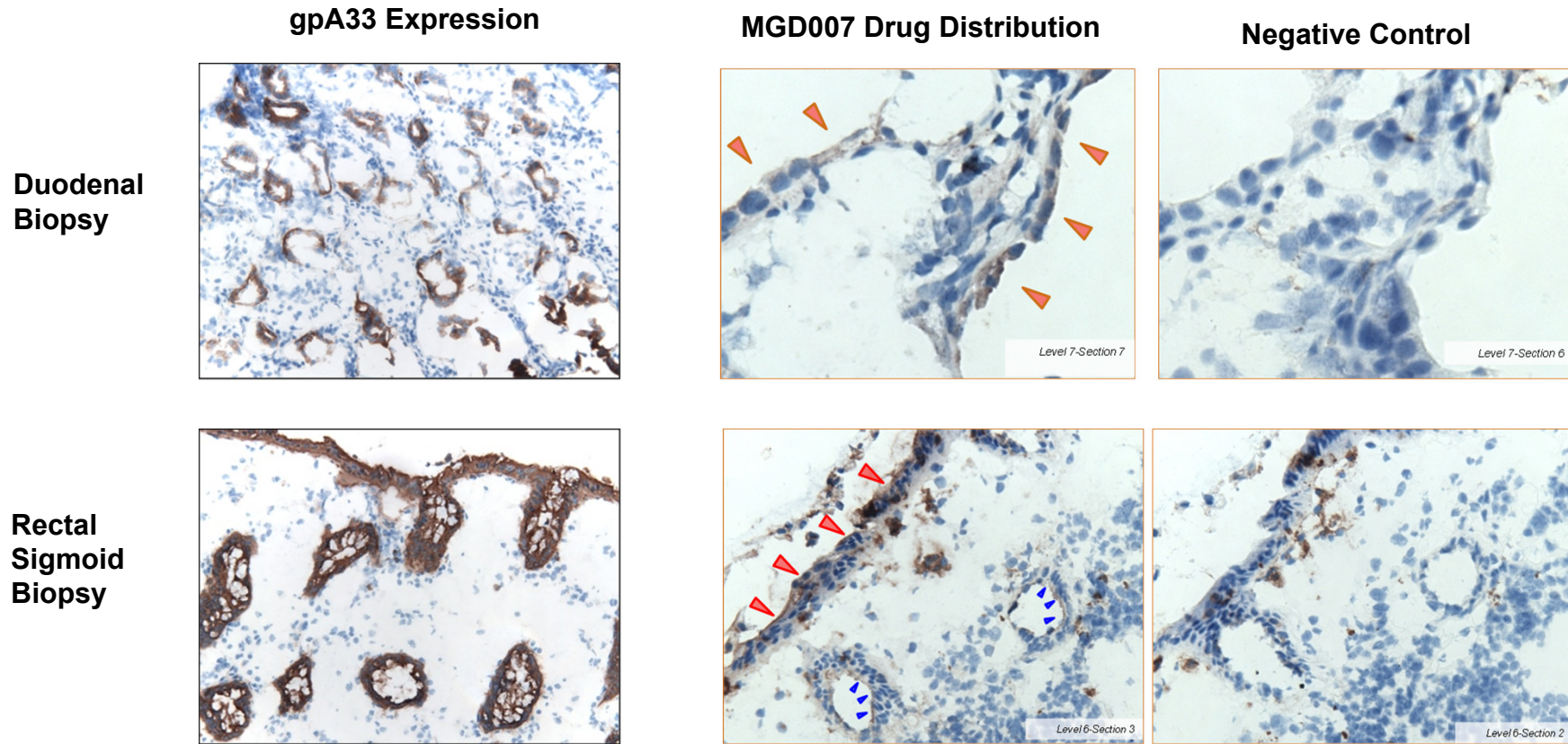


Pre = Pre-infusion; EOI = End of infusion (2h); 24h = 24h from EOI

MGD007, 1 µg/kg, representative patient
1 Cycle = 6 weeks

MGD007 Drug Distribution: gpA33 Target Cell Binding

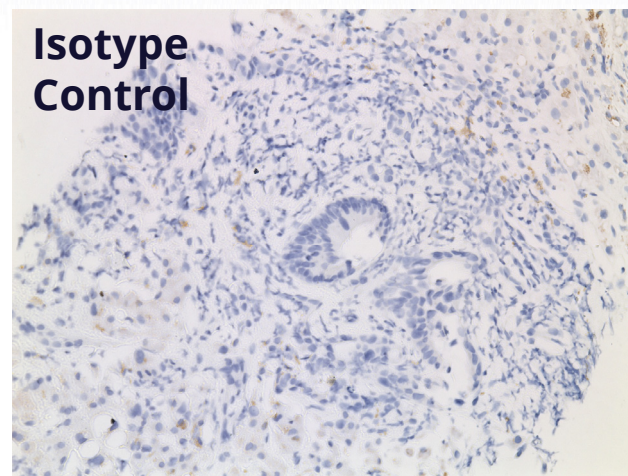
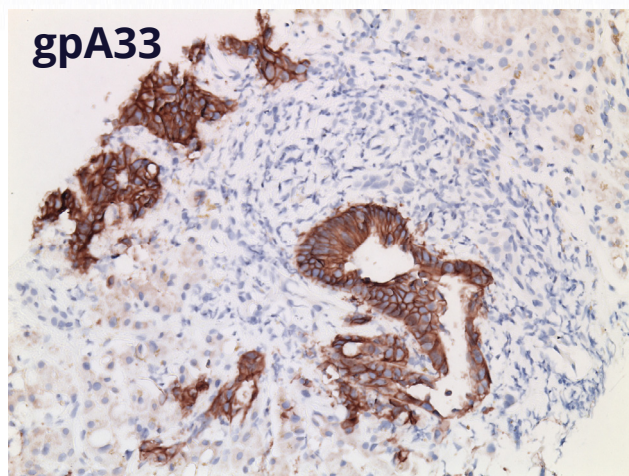
Evidence of MGD007 binding to upper & lower intestinal epithelium (3 µg/kg)



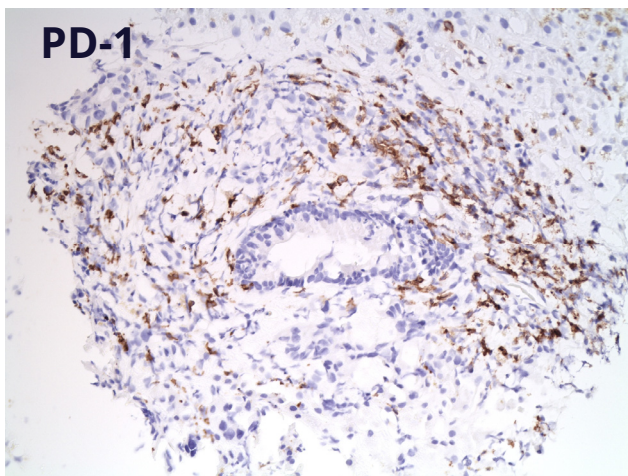
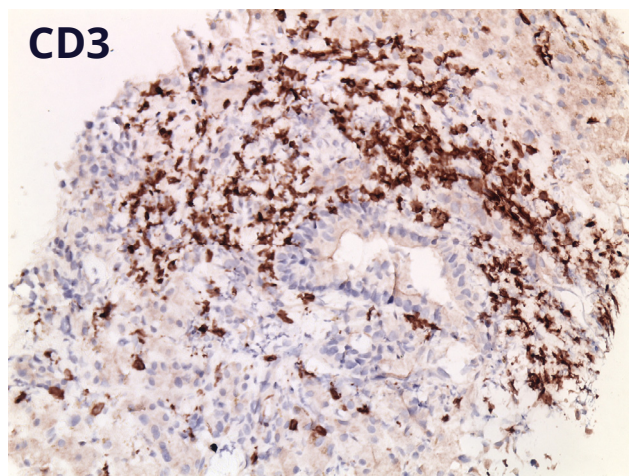
gpA33, CD3 and PD-1 Expression in CRC Patient Tumor Biopsy

Liver biopsy obtained 24 hours post MGD007 dosing (1 µg/kg)

*gpA33 expression
on colorectal cancer
liver metastasis*



*Sheet of CD3+ T
cells surrounding
gpA33+ve tumor
cells in colorectal
cancer liver
metastasis (subset
expressing PD-1)*

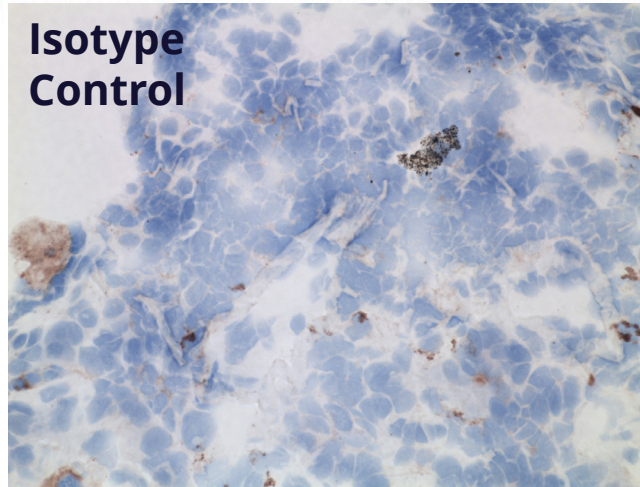
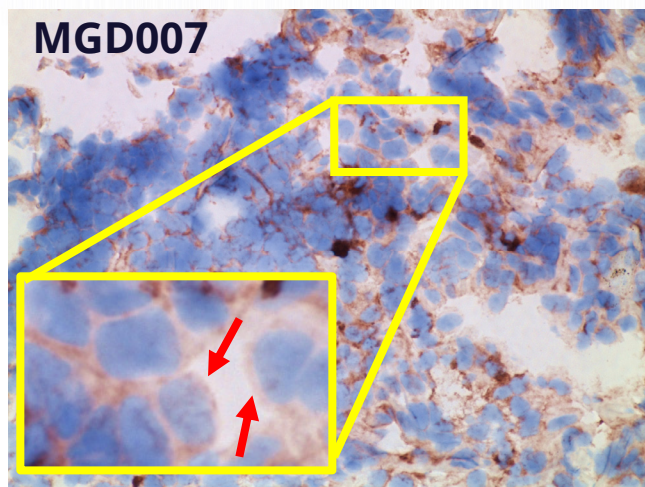


FFPE analyses; objective: 20x

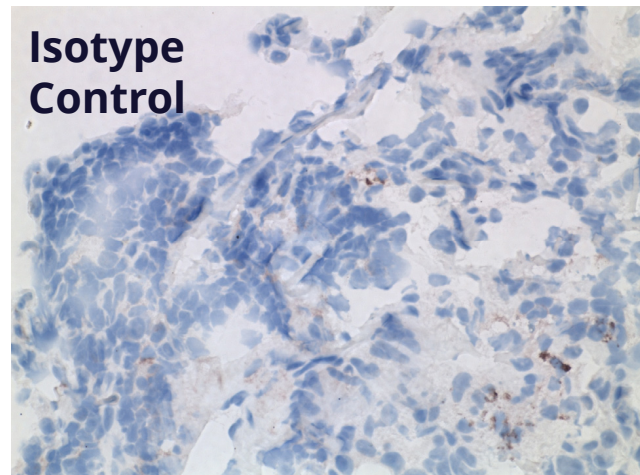
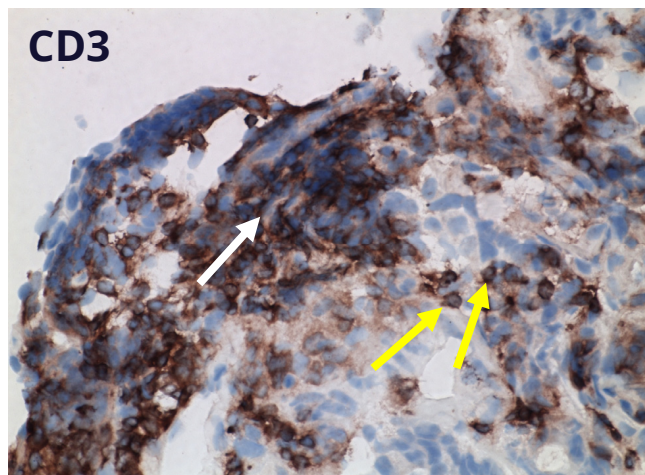
Drug On Target in Tumor Cells (via Biopsy)

Lung biopsy obtained 48 hours post MGD007 dosing (1 µg/kg)

*MGD007
detected on
membrane of
tumor cells (red
arrows)*



*Tumor infiltrating
T-cells (yellow
arrows) and
tumor-adjacent
lymphoid nodule
(white arrow)*

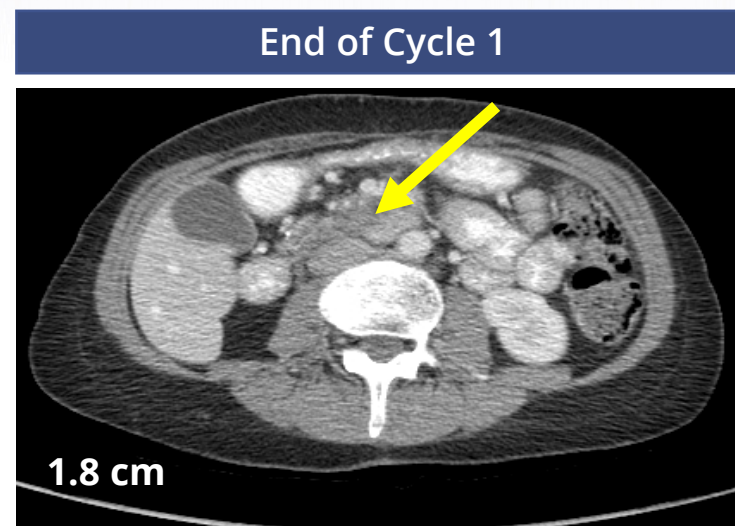
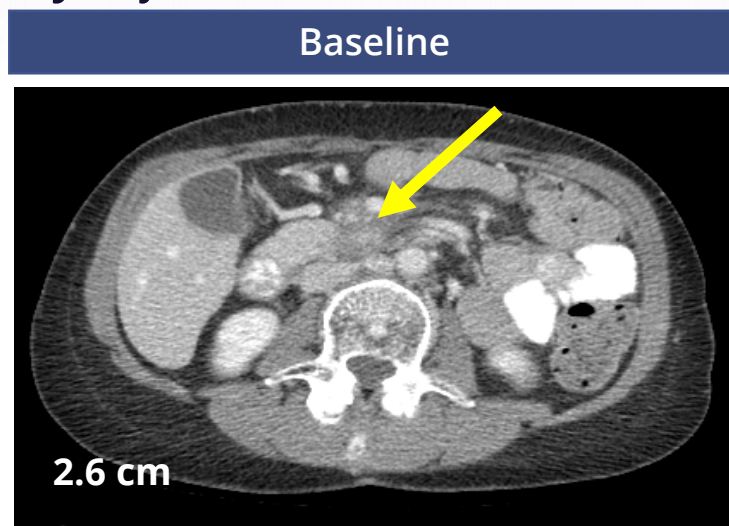


Fresh frozen analyses; objective 40x

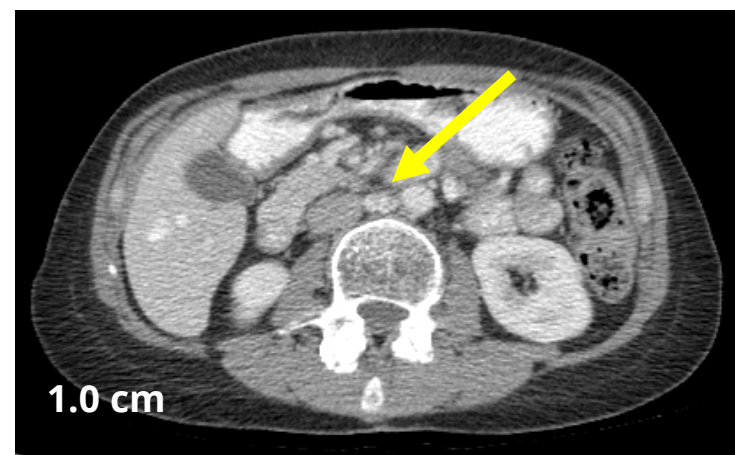
MGD007 Dose Escalation: Anti-tumor Activity in CRC

Case Study: 50 y/o female w/ MSI-low CRC w/ intra-abdominal metastasis

**Central
Mesenteric
Mass**



**Aortocaval
Lymph Node**



Prior treatment history: FOLFOX / irinotecan + bevacizumab / FOLFOX + aflibercept / regorafenib
Treatment & assessment: Received two doses of MGD007, **~32% reduction** in target lesions


MGD007: What Have We Learned to Date?

- Translational findings
 - Dose-dependent binding to CD4+ and CD8+ T-cells in peripheral blood
 - IHC demonstrates DART binding to tumor cells and gpA33+ intestinal epithelium
 - Evidence of T cell infiltration within tumor
 - Detectable levels of IL-6, IFN- γ and TNF- α in serum of patients treated with MGD007
- GI/constitutional symptoms reversible and consistent with target distribution
 - Diarrhea appears to be secretory in nature (distinct from checkpoint inhibitor colitis)
 - Current regimen can be delivered and managed in outpatient setting
 - Supportive care consisting of PO/IV corticosteroids, PO non-absorb steroid, anti-cytokine
- No hepatic, pulmonary, cardiac, renal or neurological toxicities related to MGD007

MGD010 Clinical Update

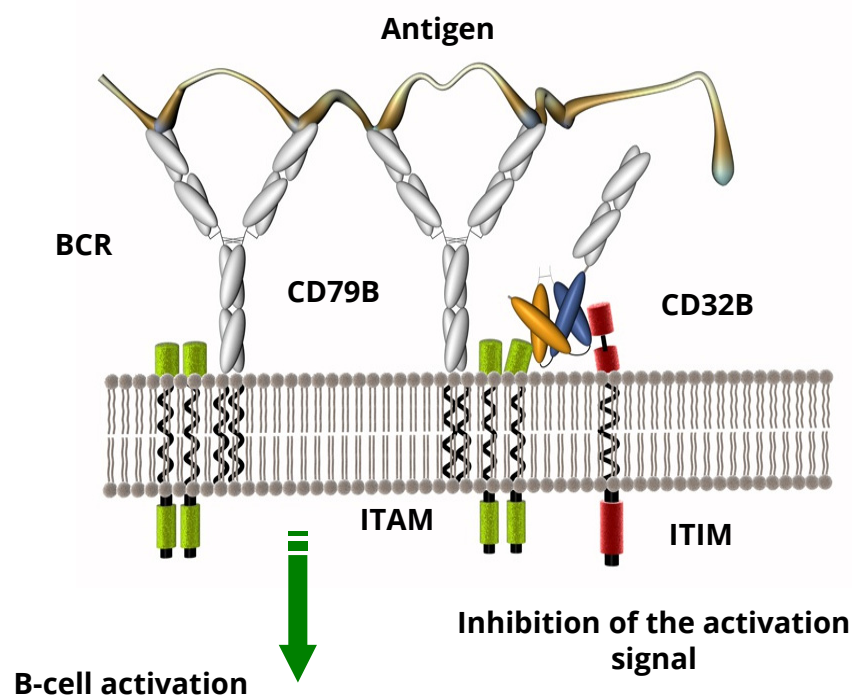
MGD010: CD32B x CD79B DART Product Candidate

Novel mechanism for treatment of autoimmune disorders

| | | |
|--------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Candidate | <ul style="list-style-type: none">• Humanized CD32B x CD79B DART with extended PK |  |
| Target/MoA | <ul style="list-style-type: none">• Co-ligation of CD32B and CD79B on B lymphocytes<ul style="list-style-type: none">– Triggering of negative CD32B-coupled inhibitory loop• Decrease B-cell activation without broad depletion• Rapid onset of action | |
| Development | <ul style="list-style-type: none">• Enrollment completed in Phase 1 study (healthy volunteers) | |
| Partner | <ul style="list-style-type: none">• MacroGenics retains global rights | |

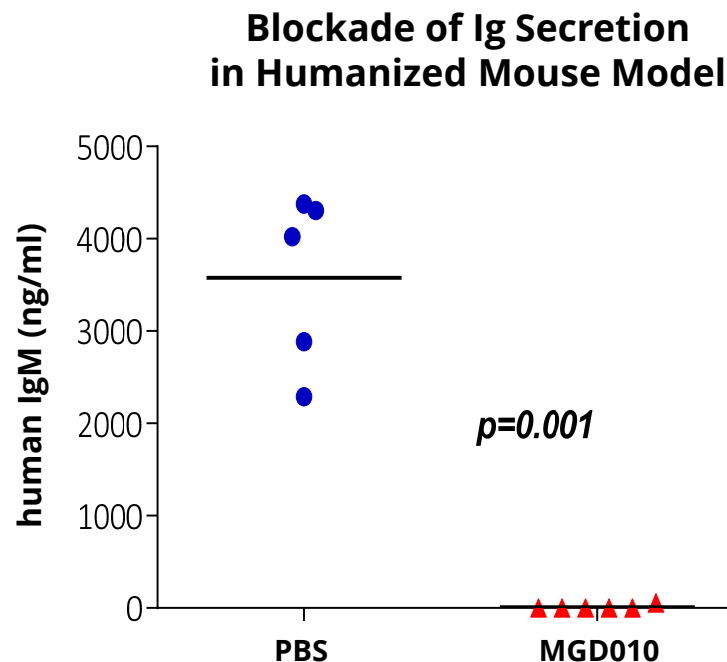
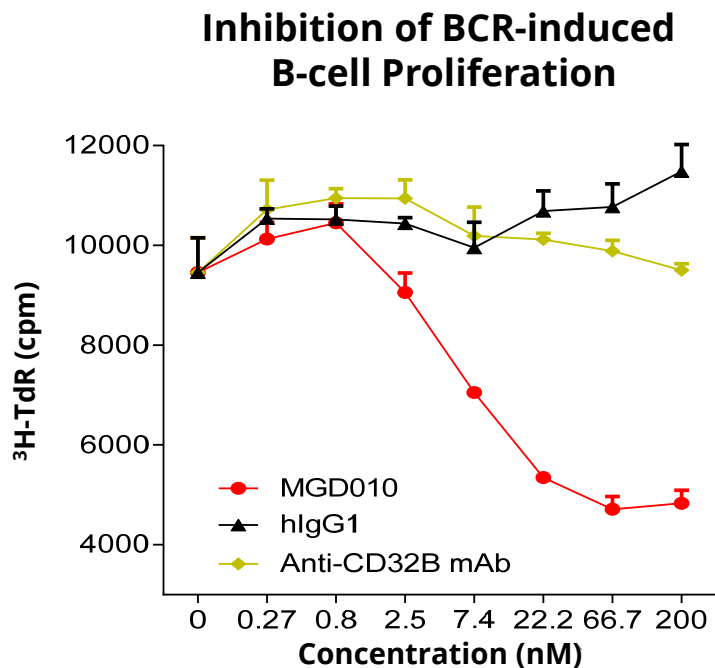
Novel Therapeutic Approach to Autoimmune Disorders

- B cells play an important role in immune tolerance and autoimmunity
 - CD32B (FcγRIIb): checkpoint molecule on B cells
 - CD79B: signal transducing component of B-cell receptor
- MGD010 inhibits B-cell activation
 - Co-ligation of CD32B with CD79B leverages natural physiologic B-cell inhibitory loop, delivering negative signal that limits B-cell activation
- MGD010 potential mechanistic benefits
 - Non-depleting intervention (vs. rituximab)
 - Rapid onset of activity (vs. belimumab)



MGD010-mediated Inhibition of B-cell Function

Inhibition of B-cell proliferation in vitro and immunoglobulin secretion in vivo



- Co-ligation of both targets is essential for functional activity of MGD010
 - Monospecific engagement of CD32B does not result in B-cell inhibition
 - Preclinical models confirm inhibitory properties of MGD010 with decrease in B-cell proliferation and suppression of immunoglobulin secretion

Phase 1 Study: Interim Results Presented at EULAR 2016

Single Ascending Dose in Healthy Subjects

Escalation Cohort (n=49)

Completed ✓

6 Escalating Doses
0.01 – 10 mg/kg

Expansion Cohort with Hep A Vaccination (n=24)

Fully Enrolled

10 mg/kg

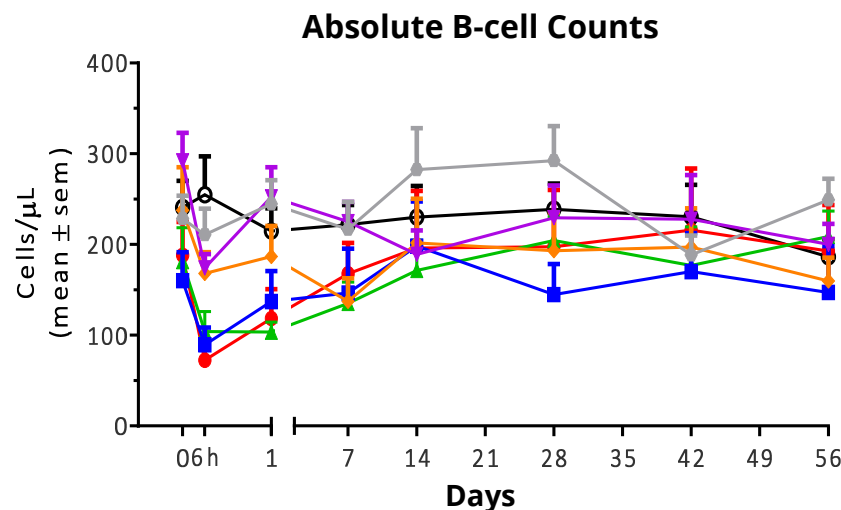
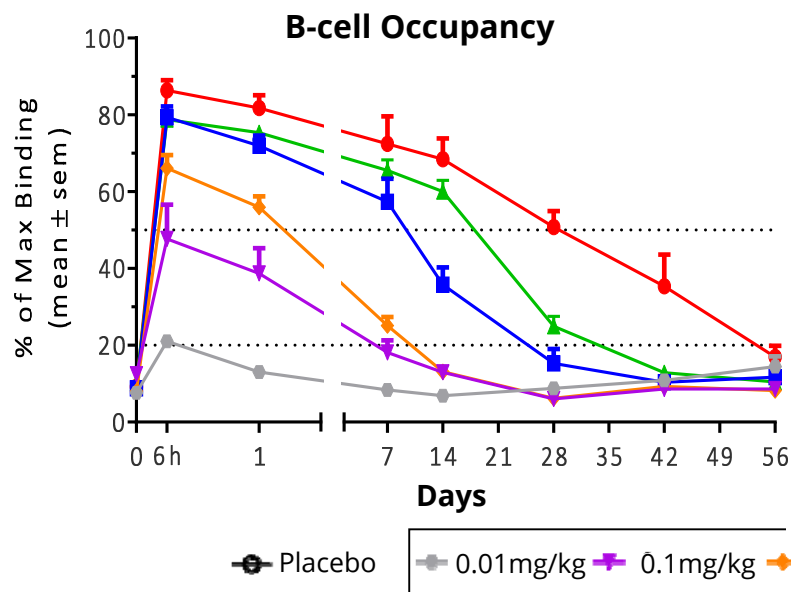
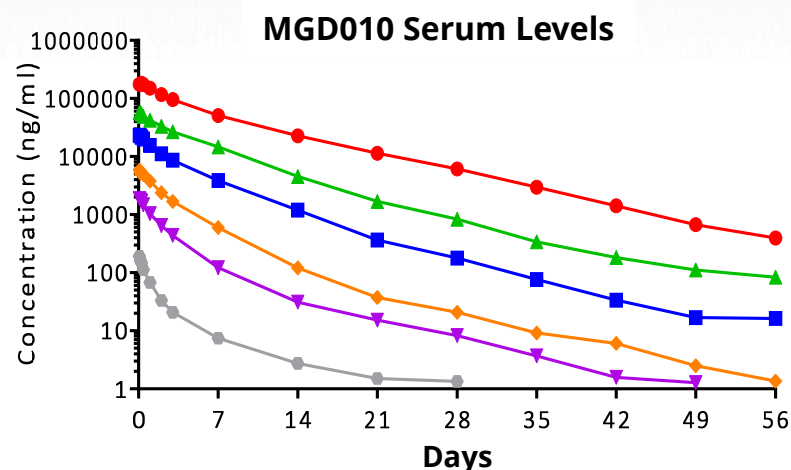
3 mg/kg

Placebo

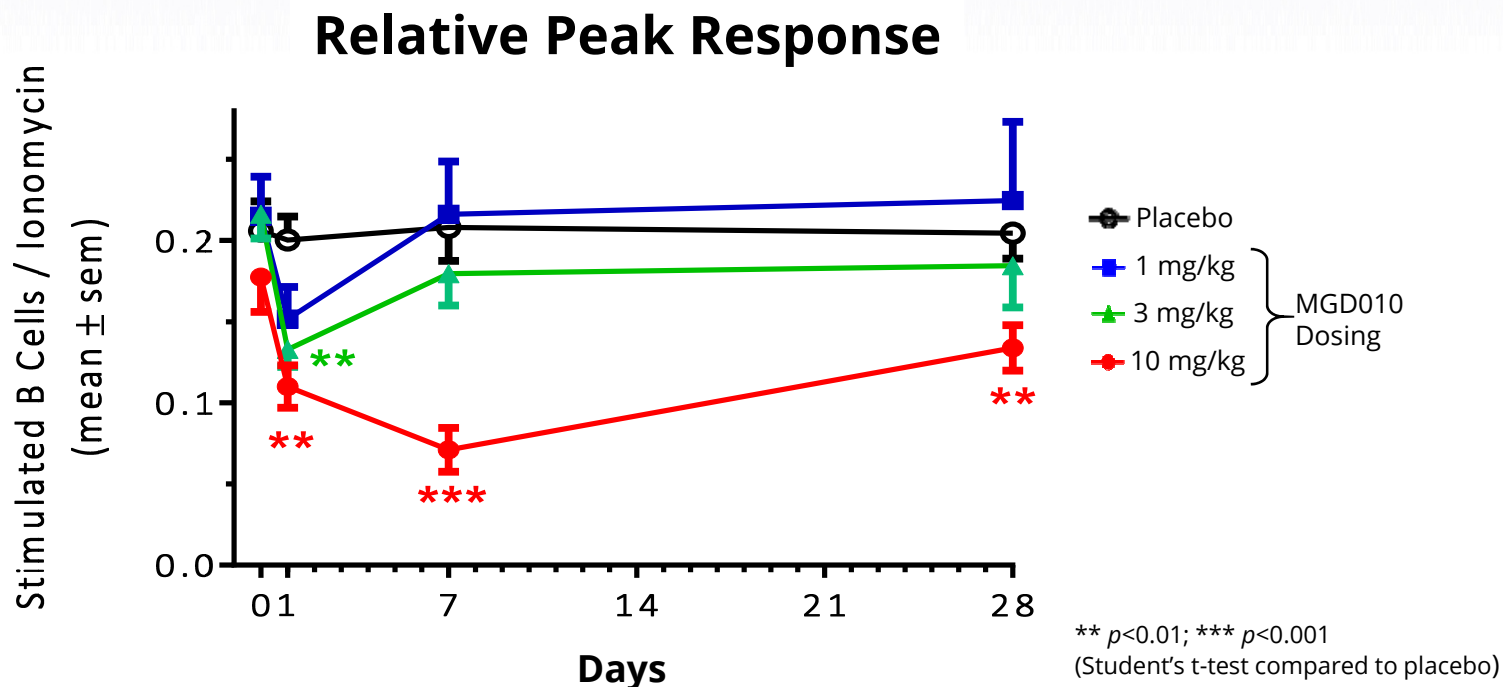
- **Primary Objective**
 - Assess safety and tolerability of single dose
- **Secondary Objectives**
 - Evaluate pharmacokinetics and pharmacodynamics effects
 - Evaluate potential anti-drug antibodies
- **Exploratory Objectives**
 - Evaluate binding and activation status on peripheral B cells and B-cell subsets
 - Assess immune phenotype, including modulation of B-cell subsets
 - Assess response of peripheral B cells to ex-vivo BCR stimulation

Pharmacokinetics and Circulating B-cell Occupancy

- MGD010 serum concentrations increase linearly with dose
 - Half-life: ~8 days at ≥ 1 mg/kg
- Maximum B-cell occupancy at doses ≥ 1 mg/kg
 - Sustained receptor occupancy beyond one week at doses ≥ 1 mg/kg
- No B-cell depletion or cytokine release (data not shown) at any dose levels



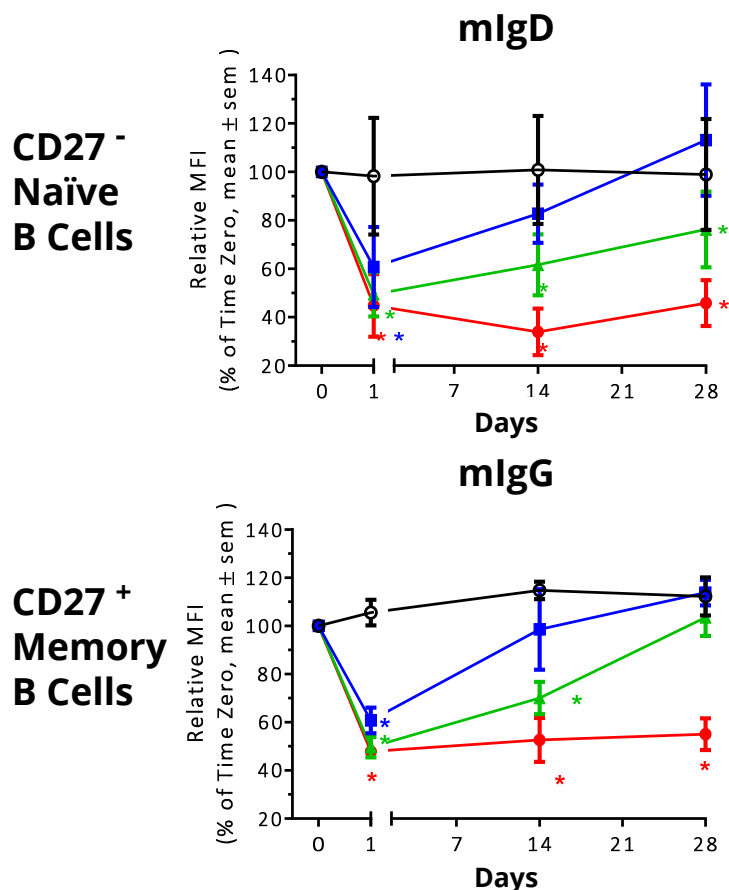
Treatment with MGD010 Inhibited B-Cell Activation



- PBMCs from enrolled subjects collected longitudinally after MGD010 treatment
 - Ca^{2+} flux (hallmark of B-cell activation) induced *ex vivo* by B-cell receptor ligation using anti-IgM
 - Data normalized to maximum Ca^{2+} permeability (maximum induction) via ionomycin
- Dose dependent B-cell inhibition demonstrated with increasing doses of MGD010
 - Inhibition sustained for several weeks at highest dose levels

MGD010 Modulated Cell Surface BCR and Serum Ig Levels

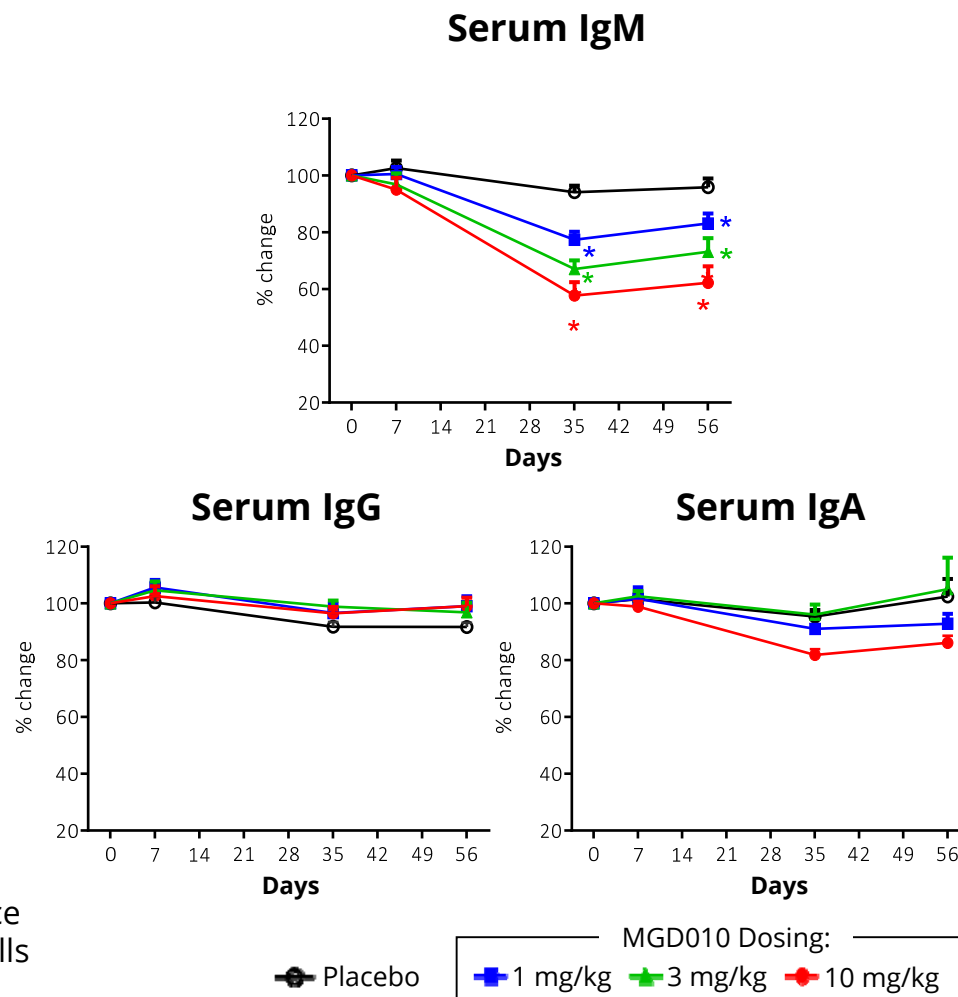
MGD010 Down-Regulation of Cell Surface Ig Expression



- Dose-dependent down modulation of cell surface BCR expression on both naïve and memory B cells

* $p < 0.05$ (Paired t-test compared to baseline)

MGD010 Modulation of Circulating Serum Ig Levels

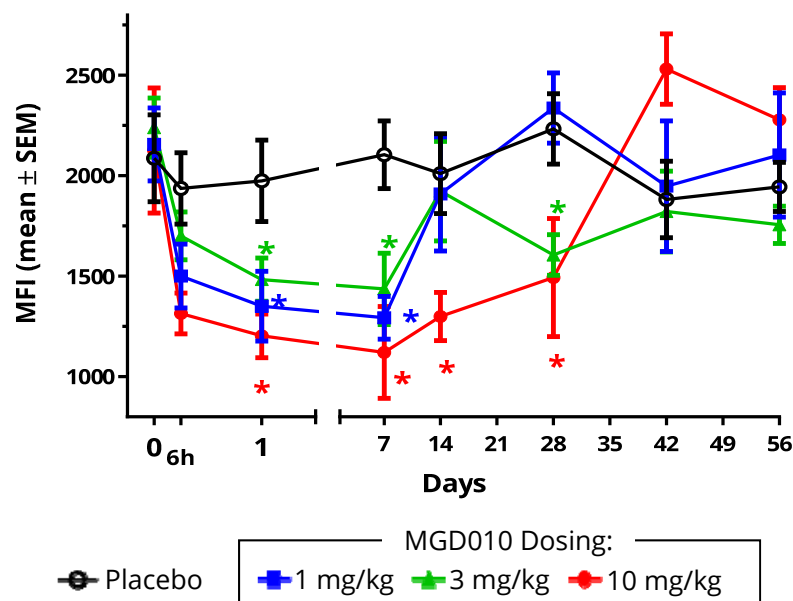


MGD010 Reduces CD40 Expression and Response

Potential impact on B-cell : T-cell interactions

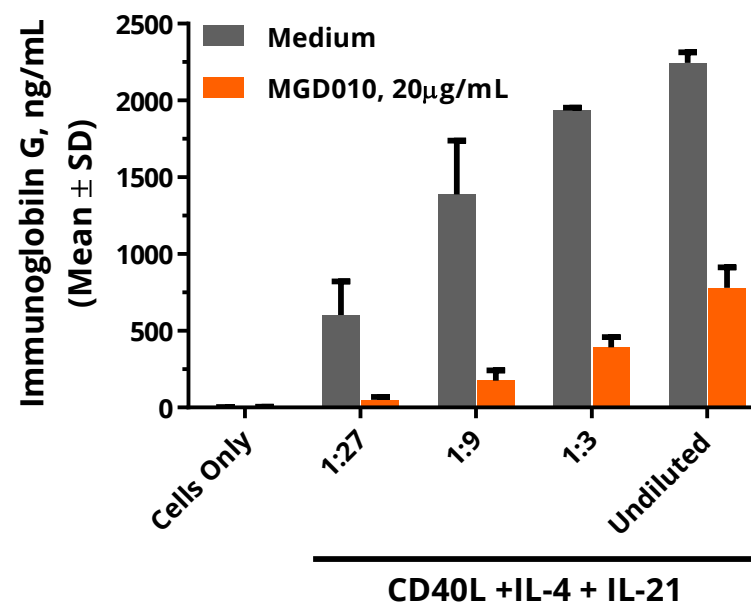
- CD40 is co-stimulatory molecule involved in T:B cell cross-talk
- CD40/CD40L interaction differentiates B cells & activates antigen presenting cells

Decreased CD40 Expression in Subjects Treated with MGD010



* $p < 0.05$ (Paired t-test compared to baseline)

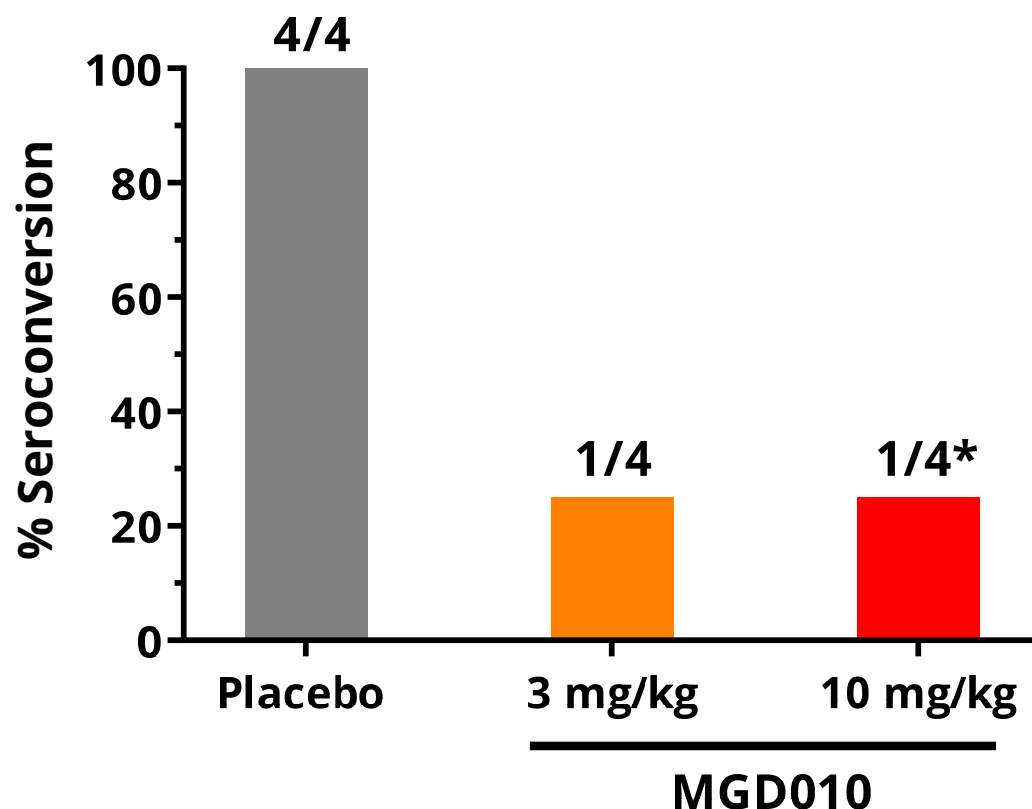
MGD010 Decreases CD40L-dependent IgG Production in vitro



- Purified human B cells exposed to CD40L (500ng/mL), IL-4 (100ng/mL, a Th2 cytokine) and IL-21 (20ng/mL, a Tfh cytokine) to induce differentiation towards Ig-producing cells
- IgG levels determined on day 5

MGD010 Inhibits Ag-specific Response in Healthy Volunteers

Response to hepatitis A vaccine (a model antigen) in Phase 1 expansion cohort



- Interim seroconversion data (day 56 post vaccination)
- Quantitative results pending

* One additional patient did not complete day 56 follow-up, but was negative until day 29

Exploring Broad Range of Potential Indications to Pursue

Larger, More
Established
Indications*

- Systemic Lupus Erythematosus (SLE)
- Multiple Sclerosis (MS)
- Rheumatoid Arthritis (RA)

Niche, Less
Established
treatment
options

- Sjogren's Syndrome (SS)
- Primary Vasculitis (e.g. Polymyalgia rheumatica/Giant cell arteritis/Behçets)
- Graft vs. Host Disease (GVHD)
- Myasthenia Gravis
- Pemphigus
- Neuromyelitis Optica
- Anti-NMDA receptor encephalitis
- Guillain-Barré syndrome
- Chronic inflammatory demyelinating polyneuropathy (CIDP)
- Grave's ophthalmopathy
- IgG4 RD
- Idiopathic thrombocytopenic purpura (ITP)

* Indications with currently approved and marketed agents

MGD010: Inhibits Multiple Aspects of B-Cell Function

- Well tolerated up to 10 mg/kg in healthy subjects in single dose study
- Inhibits antigen-specific response in healthy volunteers
- Sustained biological effects for as long as two months
- Activity consistent with preclinical models
 - No B-cell activation or cytokine release
 - No depletion of peripheral B cells
 - BCR saturated at ≥ 1 mg/kg with sustained receptor occupancy
- Down-modulates B-cell function at multiple levels
 - Reduction in BCR-induced Ca^{2+} mobilization
 - Decrease surface Ig expression and serum IgM levels
 - Down-modulation and inhibition of CD40 function
- Broad opportunity across multiple autoimmune disorders
- Upcoming milestone: report updated Ph. 1 study data (Hep A cohort) in 2017

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Welcome

Scott Koenig, M.D., Ph.D. – President & CEO, MacroGenics

Margetuximab: Potential Best-in-Class Anti-HER2 mAb

Jon Wigginton, M.D. – Senior VP, Clinical Development & CMO, MacroGenics

Comprehensive B7-H3 Franchise: Fc-Optimized mAb, DART and ADC

Paul Moore, Ph.D. – VP, Immunology & Cell Biology, MacroGenics

Jim Vasselli, M.D. – VP, Clinical Development, MacroGenics

DART and TRIDENT: Leading Multi-specific Antibody Platforms

Syd Johnson, Ph.D. – VP, Antibody Engineering, MacroGenics

Clinical DART Programs Update

Jon Wigginton, M.D. – Senior VP, Clinical Development & CMO, MacroGenics

Q&A / Break

"Combination Treatments with Checkpoint Blockade"

F. Stephen Hodi, Jr., M.D. – Director, Center for Immuno-Oncology, Dana-Farber Cancer Institute

Immuno-Oncology: Targeting Immune Regulators

Jon Wigginton, M.D. – Senior VP, Clinical Development & CMO, MacroGenics

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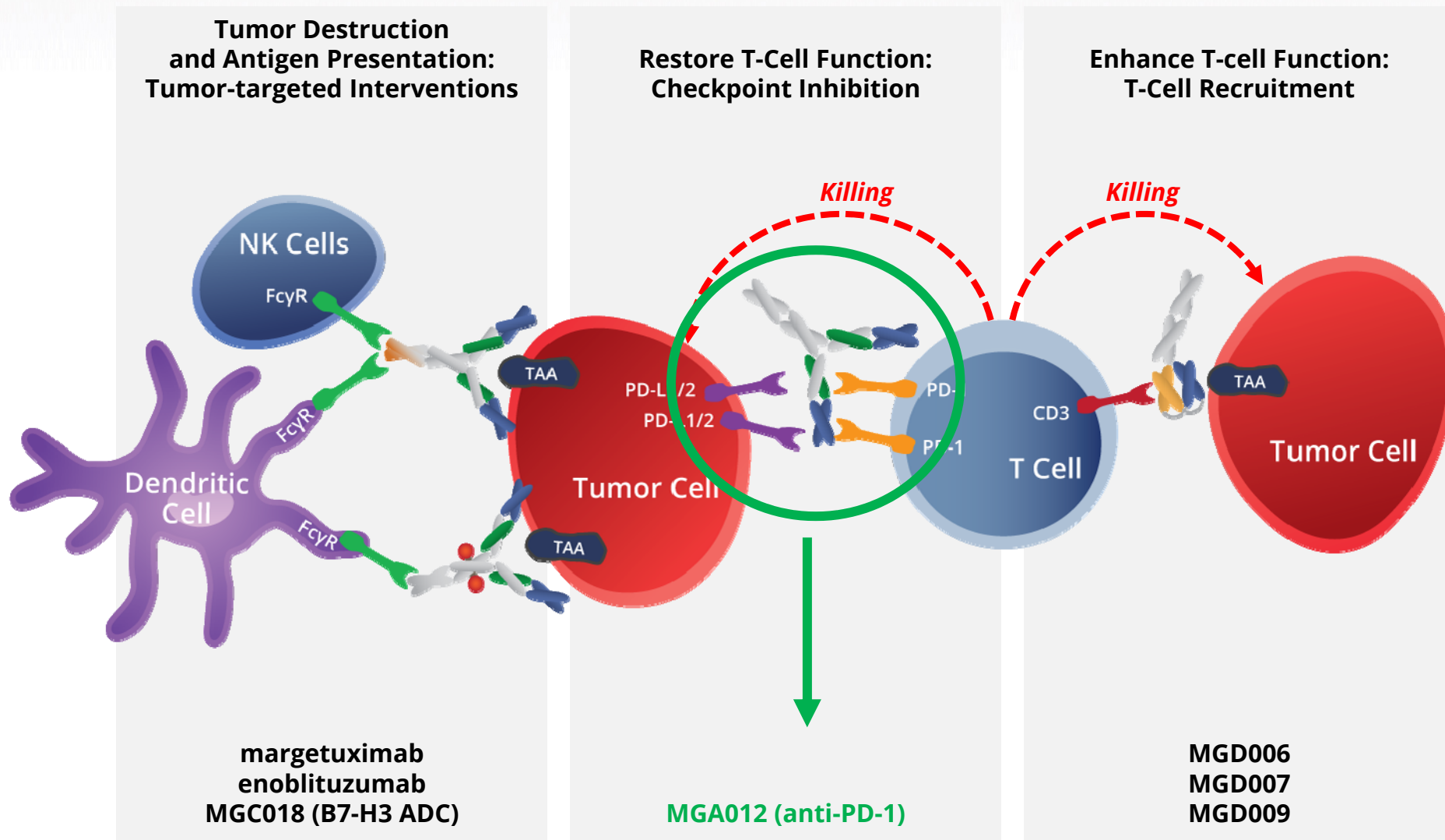
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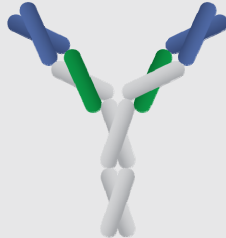
Integrating PD-1 Blockade into MacroGenics' Portfolio



TAA: tumor-associated antigen

MGA012: Anti-PD-1 Antibody

Introducing MGA012: Anti-PD-1 mAb

| | | |
|---------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Candidate | <ul style="list-style-type: none">• Humanized proprietary anti-PD-1 mAb<ul style="list-style-type: none">– Hinge stabilized humanized IgG4– Benchmarks favorably against leading mAbs |  |
| Rationale | <ul style="list-style-type: none">• Anti-PD-1 as mainstay of cancer immunotherapy• Basis for combination immunotherapy with proprietary assets• Potential commercial/reimbursement advantages | |
| Function/MoA | <ul style="list-style-type: none">• Blockade of PD-1 interaction with PD-L1 & PD-L2, which down-regulates T-cell activation• Disrupts negative signaling pathway in T cells directed against tumors (checkpoint inhibition) | |
| Indications | <ul style="list-style-type: none">• Multiple solid tumors | |
| Development | <ul style="list-style-type: none">• Phase 1 trial dosing ongoing | |
| Partner | <ul style="list-style-type: none">• MacroGenics retains global rights | |

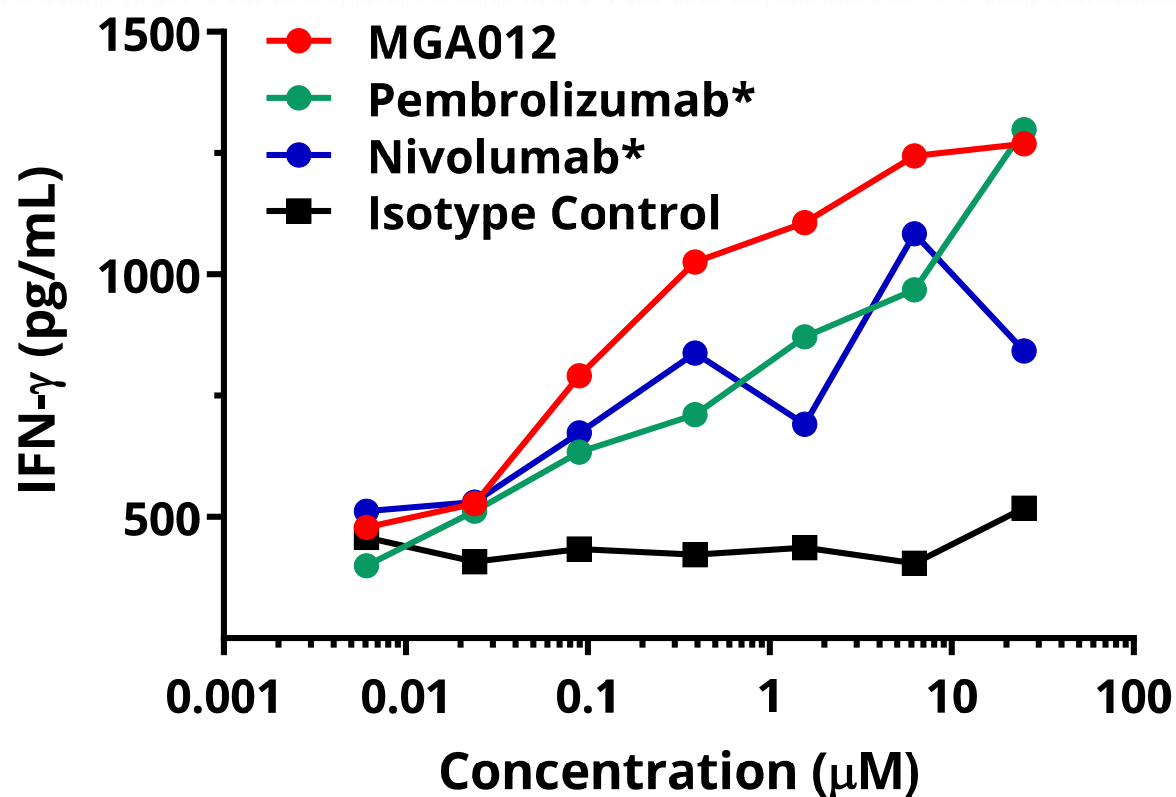
MGA012: Favorable Technical Profile

| MGA012 | MGA012 Compared to: | |
|-----------------------------------|---------------------|-------------|
| | Nivo* | Pembro* |
| Affinity for human PD-1 | >4x greater | >6x greater |
| Off-rate for human PD-1 | ~2x slower | ~6x slower |
| Cell binding (MFI) | > | Equivalent |
| PD-L1/PD-L2 binding blockade | > | > |
| T-cell activation (IFN γ) | Equivalent | Equivalent |
| PK in cynomolgus monkeys | > | Equivalent |

| MGA012 | Results |
|------------------------------------------------------------------------|-------------------------------------------------------------------------------|
| Tissue cross-reactivity | No unanticipated findings |
| Toxicology in cynomolgus monkeys: IV at 10, 40 or 150 mg/kg; QW x 4 | Well tolerated at all doses No unanticipated findings NOAEL = 150 mg/kg |
| Predicted half-life in humans | ~18 days |

*Replicas of nivolumab and pembrolizumab produced at MacroGenics

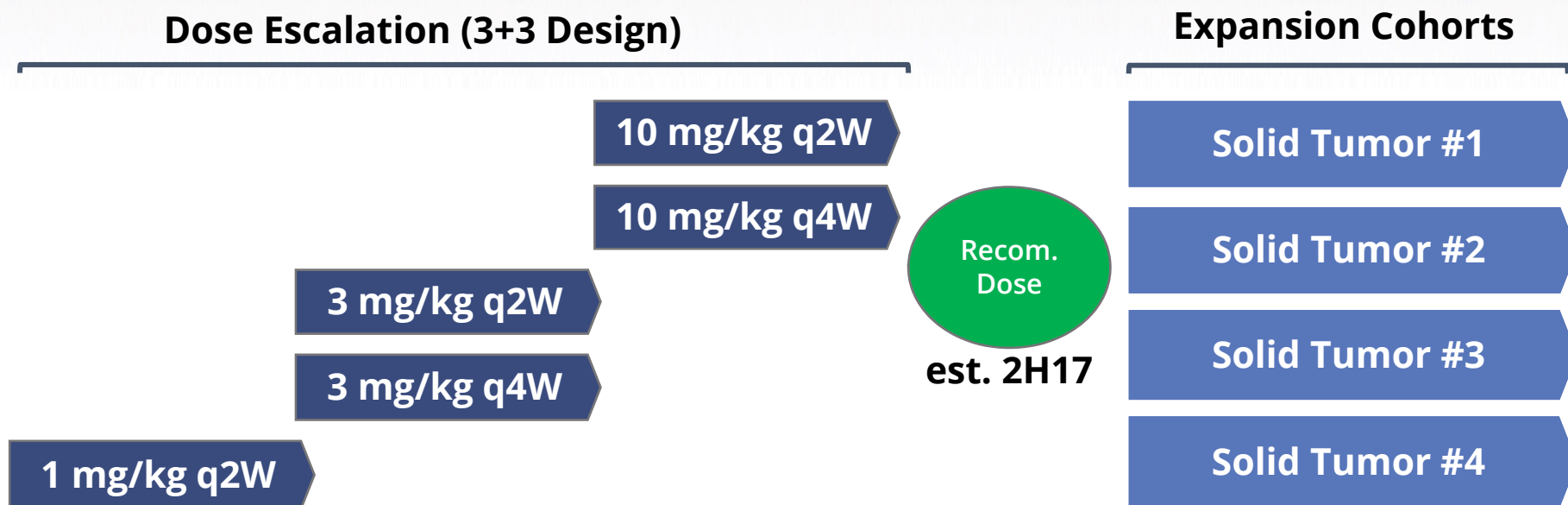
MGA012 Enhances Activation of SEB-stimulated Human T Cells



Human PBMCs were pre-stimulated with 0.5 ng/ml SEB for 48h and re-stimulated for 48h in presence or absence of indicated mAbs. IFN γ in supernatant was measured by ELISA.

**Replicas of pembrolizumab and nivolumab produced at MacroGenics*

MGA012 (Anti-PD-1): Phase 1 Study Design



Objectives: Establish safety profile and initial clinical activity
Confirm that MGA012 compares favorably to benchmark PD-1 data

Patient Population: Any relapsed / refractory advanced or metastatic solid tumor

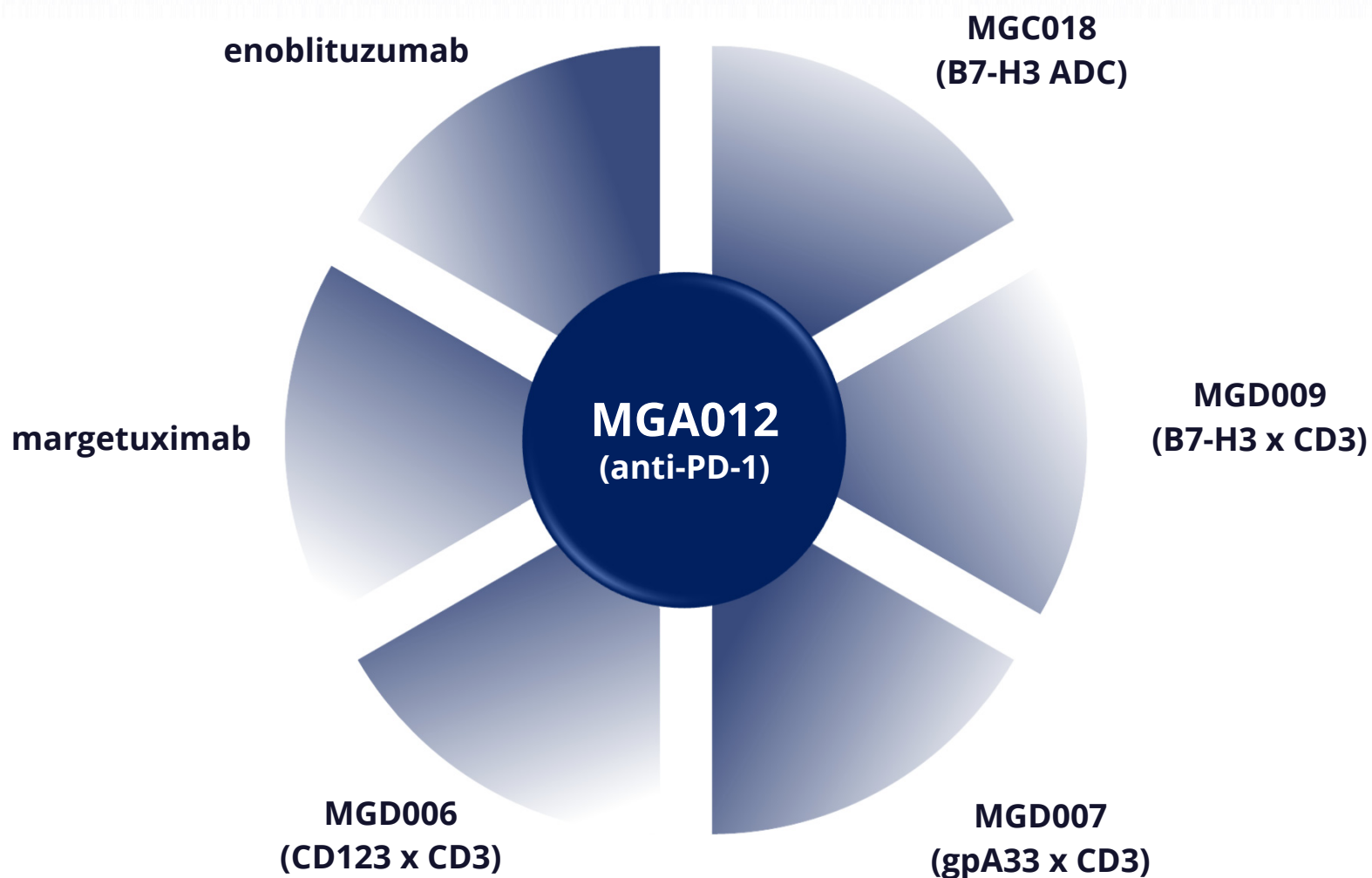
Dosing Regimen: 1-hr Intravenous infusion, q2W or q4W

Evaluations: RECIST and irRECIST

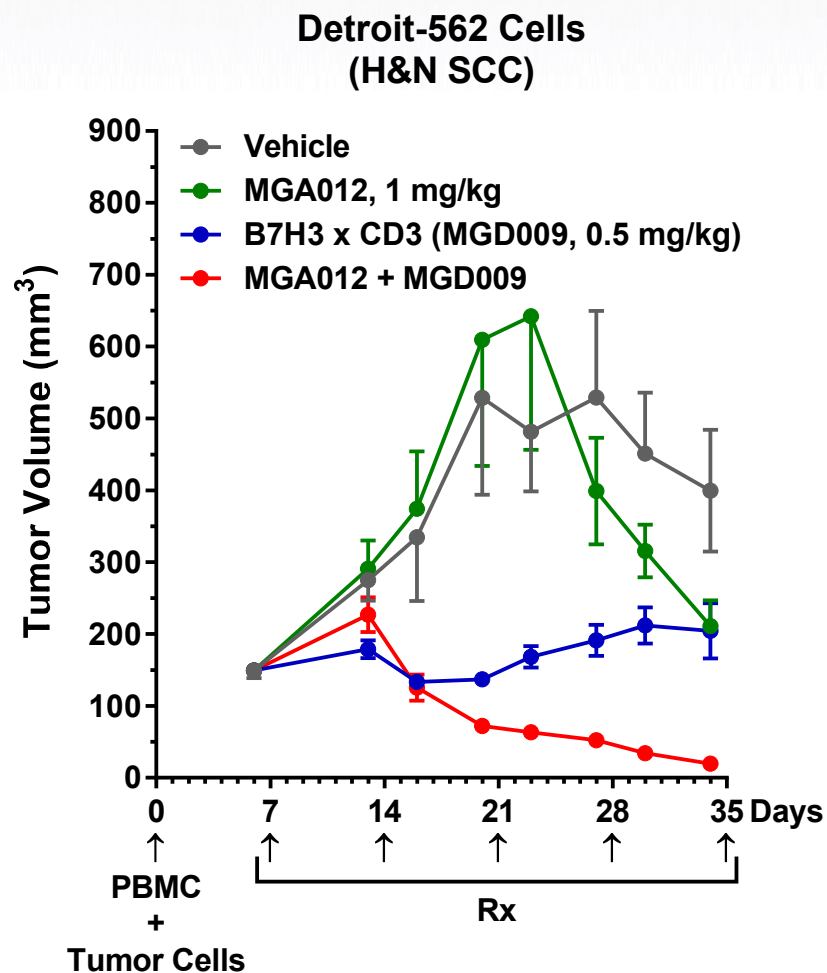
Site Deployment: ~30 Sites across United States, Europe and Australia

Enabling Multiple Combo Opportunities with MGA012

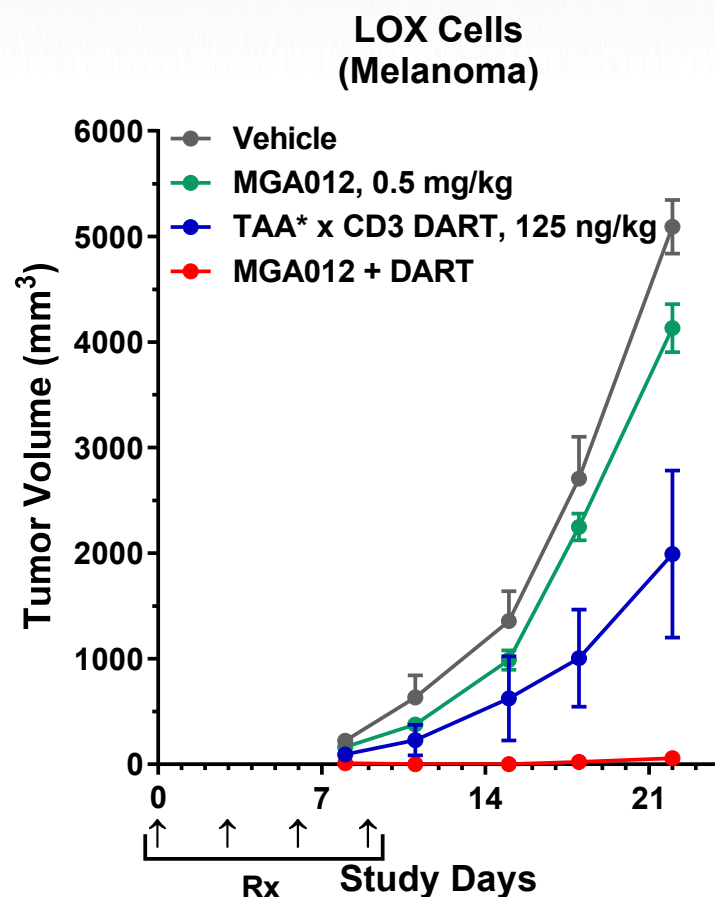
Primary goal: early combination with internal pipeline



MGA012 Enhances DART-mediated T-cell Killing in vivo

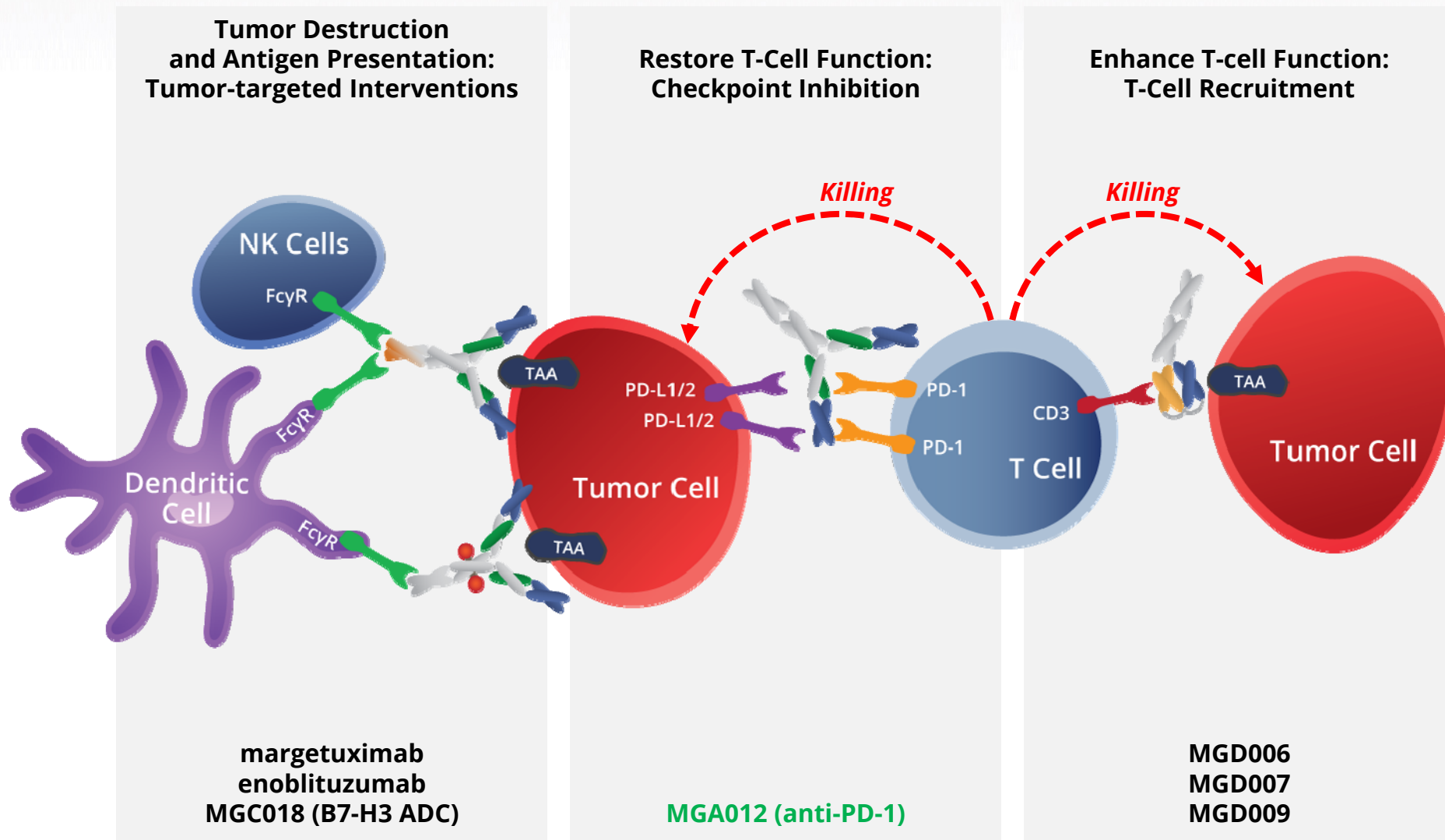


NSG MHC-I^{-/-} mice
 Detroit-562, 5x10⁶ cells, ID
 PBMC, 10⁶ cells, IP



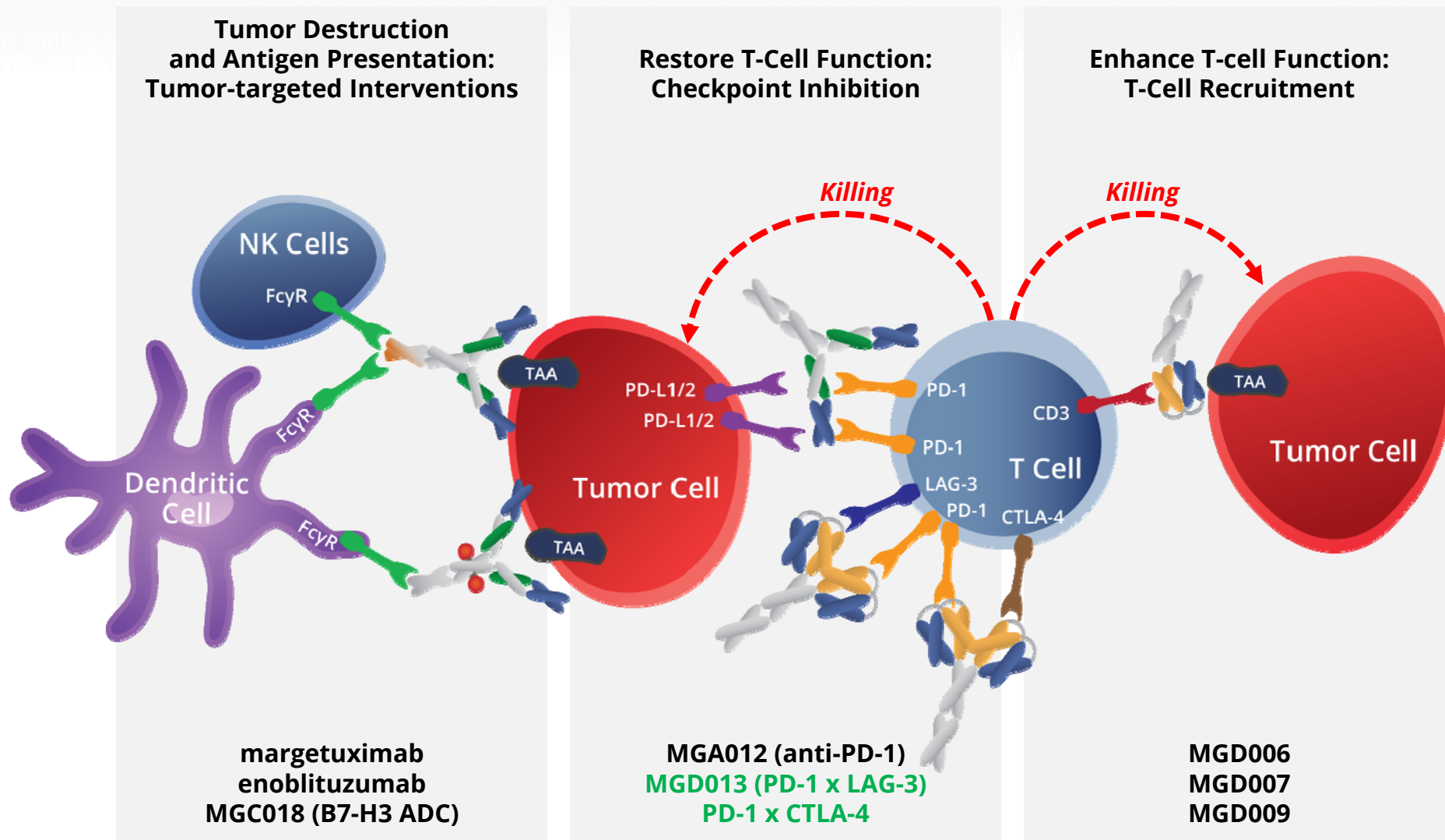
NSG mice co-mix model
 LOX cells, 2.5x10⁶ cells &
 activated human T cells, 1x10⁶ cells, SC
 * TAA: tumor-associated antigen

Integrating PD-1 Blockade in MacroGenics' Portfolio



TAA: tumor-associated antigen

Targeting Independent Pathways for Combinatorial Activity

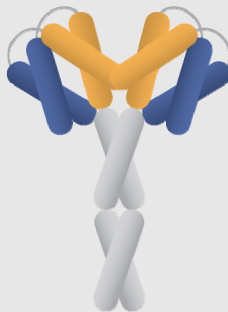


TAA: tumor-associated antigen

Combinatorial Checkpoint Inhibition

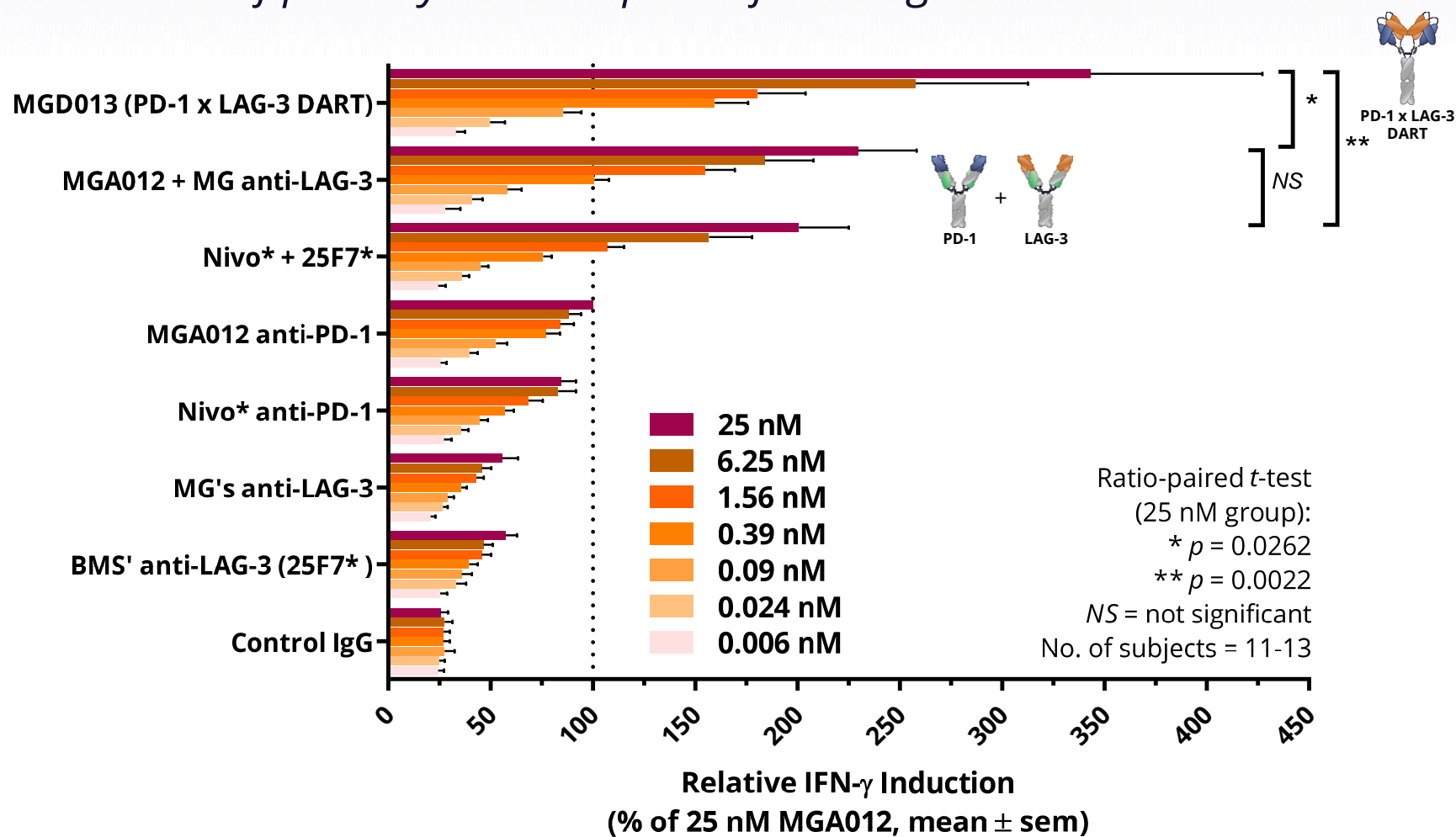
Strategy for enhancing antitumor adaptive responses

MGD013 Poised for Clinical Development in 2017

| | | |
|---------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Candidate | <ul style="list-style-type: none"> • Humanized, proprietary PD-1 x LAG-3 DART <ul style="list-style-type: none"> – Hinge-stabilized human IgG4 – Benchmarks favorably against leading mAbs |  |
| Rationale | <ul style="list-style-type: none"> • Coordinate blockade of two checkpoint co-expressed on T cells | |
| Function/MoA | <ul style="list-style-type: none"> • “Rejuvenation” of “exhausted” T cells | |
| Indications | <ul style="list-style-type: none"> • Multiple solid tumors and hematological malignancies | |
| Development | <ul style="list-style-type: none"> • IND targeted for 1H2017 | |
| Partner | <ul style="list-style-type: none"> • MacroGenics retains global rights | |

MGD013 Enhances TCR-driven Activation In Vitro

Enhancement of primary T-cell response following SEB stimulation



IFN_{γ} release by 25 nM MGA012 = 3276 ± 744 pg/mL

MGD013: Synergistic Checkpoint Inhibition

Pre-clinical development:

- Superiority compared to two stand alone mAbs
- Favorable toxicology profile in cynomolgus monkeys
- Projected human dosing at ≥ 2 week intervals
- IND-enabling activities & GMP manufacturing successfully completed

Clinical opportunities:

- Salvage patients who have progressed on prior checkpoint inhibitor
- Superiority opportunity against PD-1 mAb or PD-1 mAb + LAG-3 mAb combo

Advantages:

- Potential clinical superiority
- Simpler clinical development path than mAb combination
- Enhanced patient convenience
- Potential commercial advantages

PD-1 x CTLA-4 DART & TRIDENT Program

Tailoring valency to precise pharmacology

PD-1 x CTLA-4 Dual Checkpoint Targeting Rationale

- PD-1 and CTLA-4: clinically validated co-inhibitory molecules
- Complementary mechanisms of action:
 - Anti-PD-1: release of T-cell inhibition at tumor sites
 - Anti-CTLA-4: polyclonal activation/expansion
- Coordinated CTLA-4 and PD-1 blockade has achieved synergistic antitumor activity in clinic

Challenge - Maintain potency of combinatorial blockade via:

- **Full PD-1 blockade**
- **Tunable levels of CTLA-4 blockade**

PD-1 x CTLA-4 Dual Checkpoint Targeting Strategy

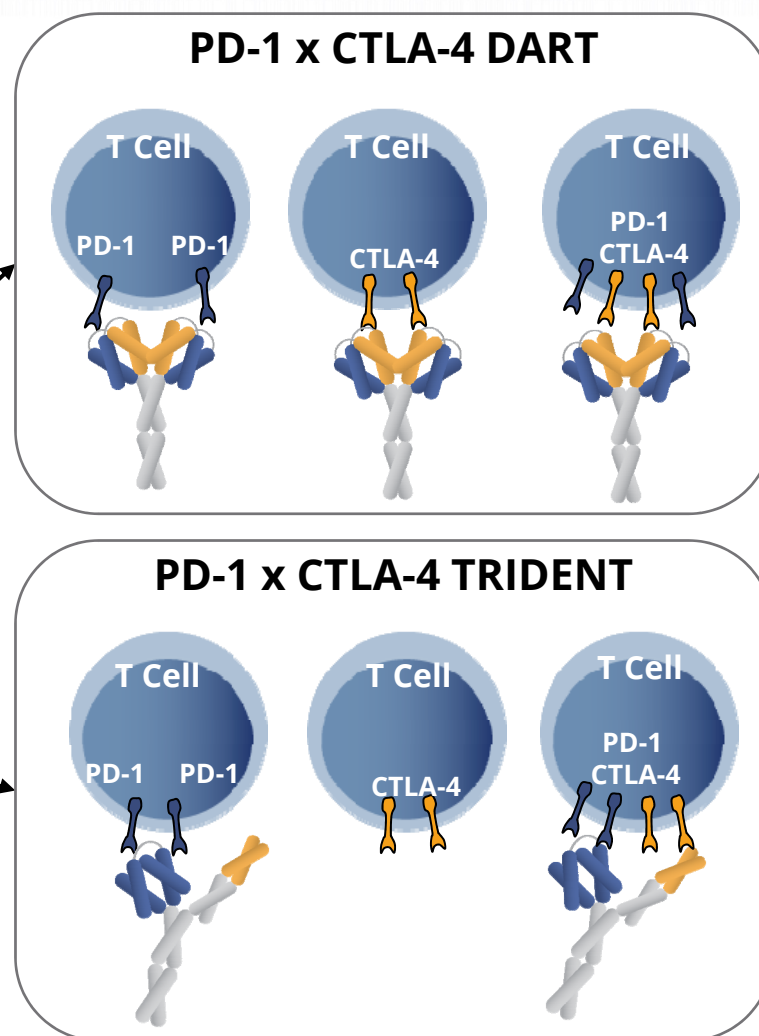
Tailoring valency to control stand-alone CTLA-4 blockade

PD-1 arm: Bivalent

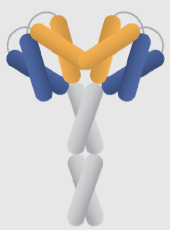
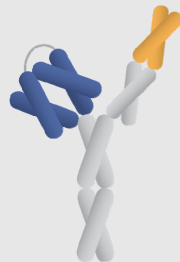
- Maintain full PD-1 blockade, irrespective of CTLA-4 co-expression

CTLA-4 arm: Variable valency

- **DART**: bivalent anti-CTLA-4
 - Full CTLA-4 blockade, irrespective of PD-1
- **TRIDENT**: Monovalent anti-CTLA-4
 - CTLA-4 blockade biased toward PD-1 co-expression



PD-1 x CTLA-4 DART / TRIDENT Program

| | | |
|--------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Candidates | <ul style="list-style-type: none"> Humanized anti-PD-1 x anti-CTLA-4 | |
| Constructs | <ul style="list-style-type: none"> Fc-DART (IgG4) PD-1 x CTLA-4 x CTLA-4 x PD-1  | <ul style="list-style-type: none"> TRIDENT (IgG4) PD-1 x PD-1 x CTLA-4  |
| Preferred Profile | <ul style="list-style-type: none"> Independent blockade of both PD-1 and CTLA-4 | <ul style="list-style-type: none"> Full PD-1 blockade independent of CTLA-4 expression CTLA-4 blockade biased toward co-expression with PD-1 |
| Indications | <ul style="list-style-type: none"> Multiple solid tumors and hematological malignancies | |
| Development | <ul style="list-style-type: none"> Candidate selection ongoing | |
| Partner | <ul style="list-style-type: none"> MacroGenics retains global rights | |

PD-1 x CTLA-4-mediated Enhancement of TCR Signal Transduction

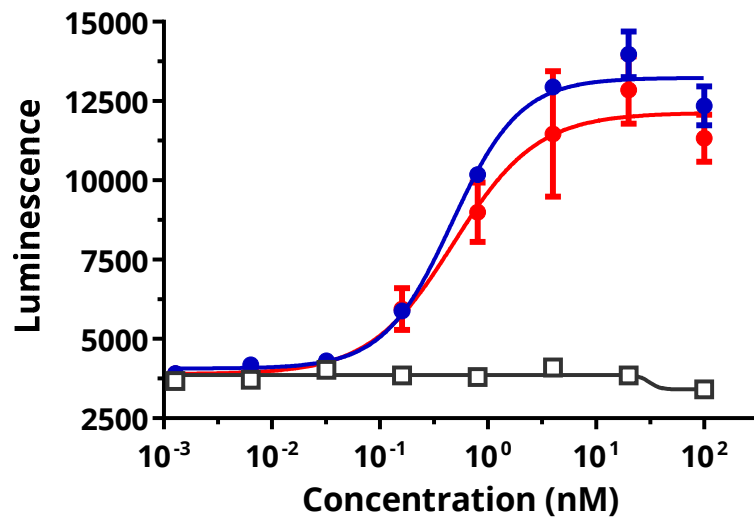
Differential CTLA-4 blockade by DART & TRIDENT molecules

IL-2/Luc-Jurkat
+ Test Articles

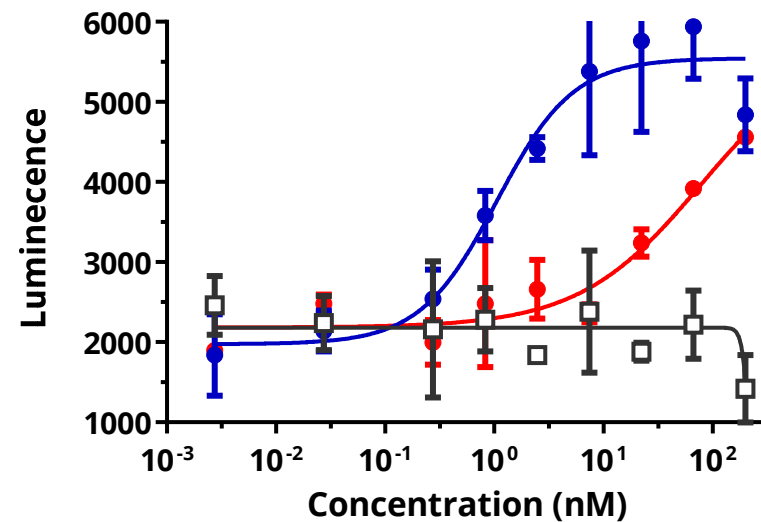
Stimulator cells
6 h @37C

Measure
Luciferase

PD-1 Reporter Assay



CTLA-4 Reporter Assay

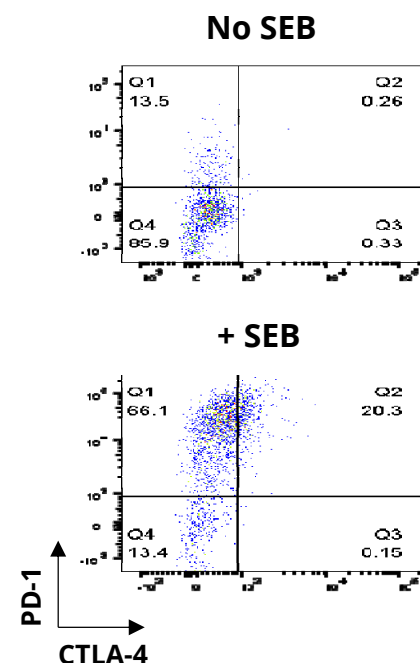
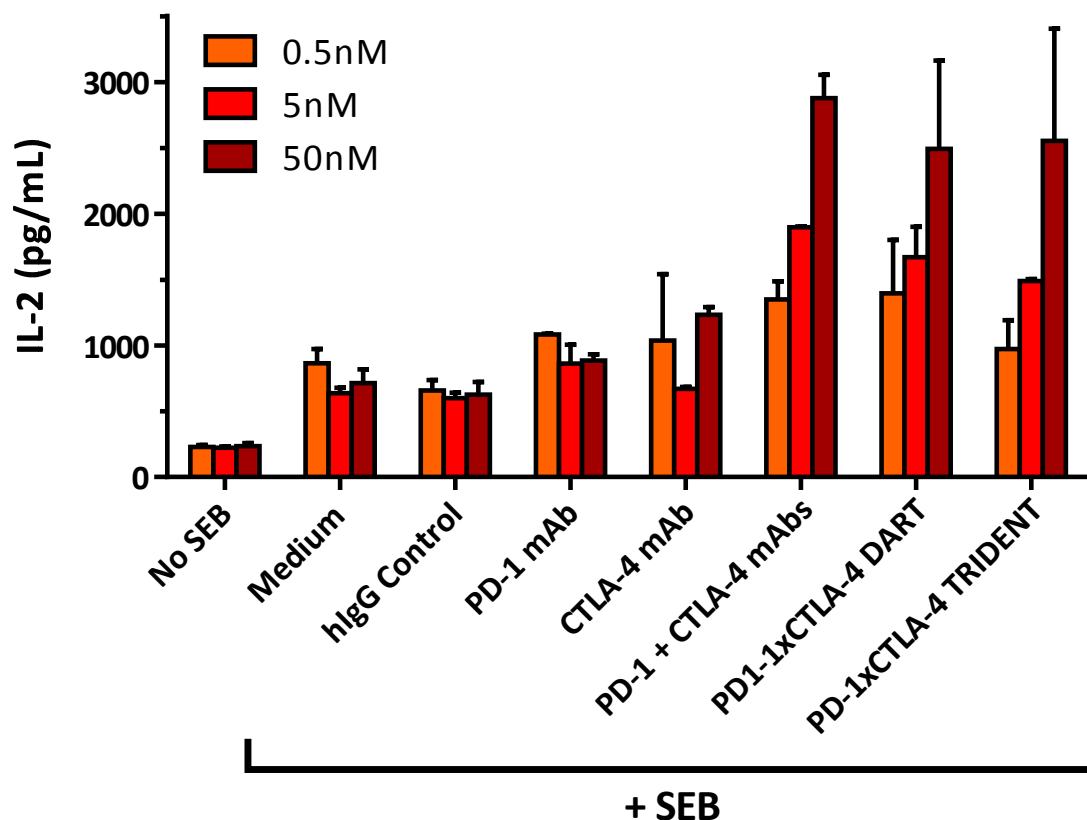


● PD-1 x CTLA-4 DART ● PD-1 x CTLA-4 TRIDENT □ hIgG Control

PD-1 x CTLA-4 DART & TRIDENT Enhance T-cell Responses

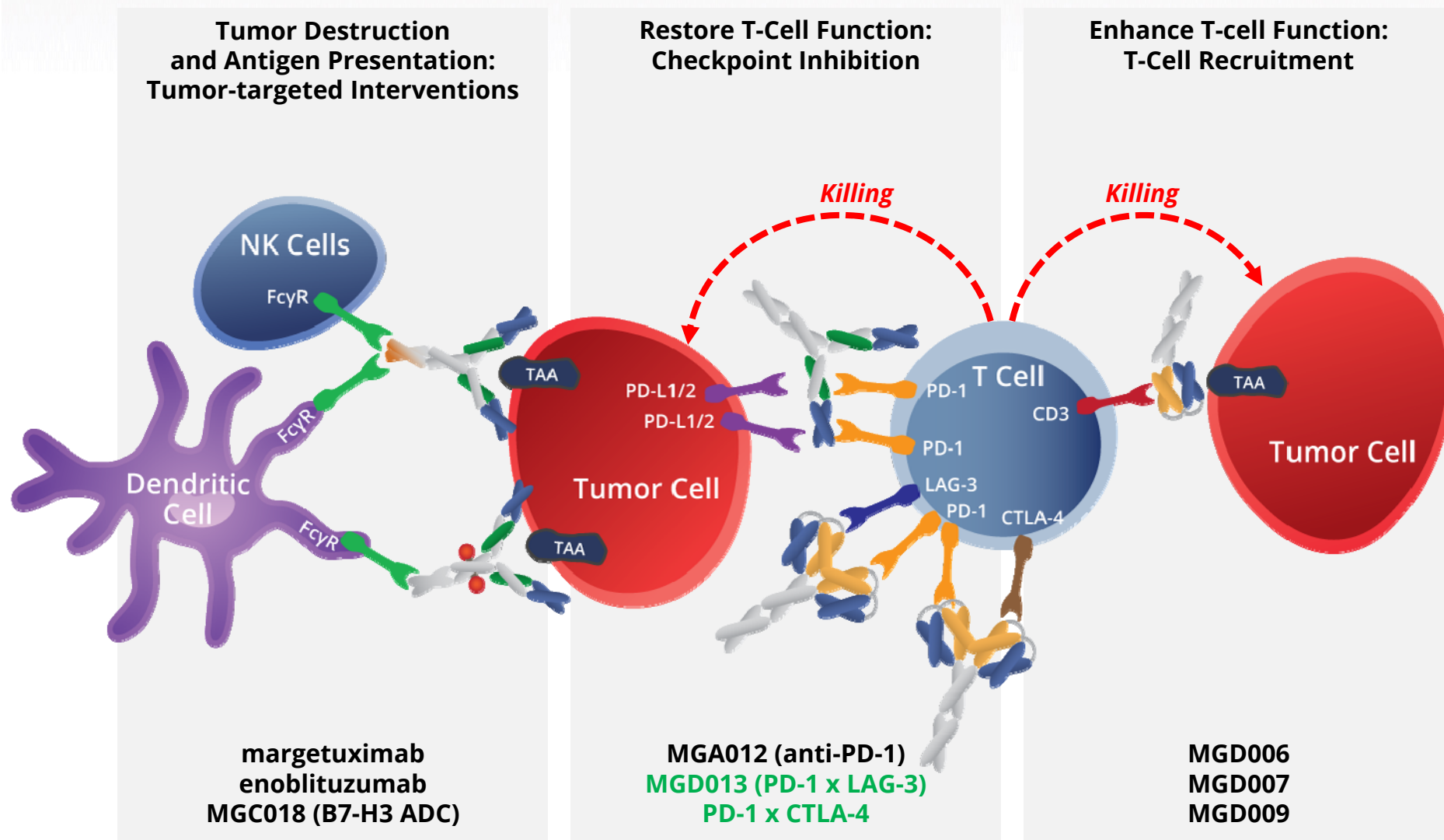
PD-1 x CTLA-4 DART & TRIDENT recapitulate individual mAbs' activity

Interleukin-2 Release Assay



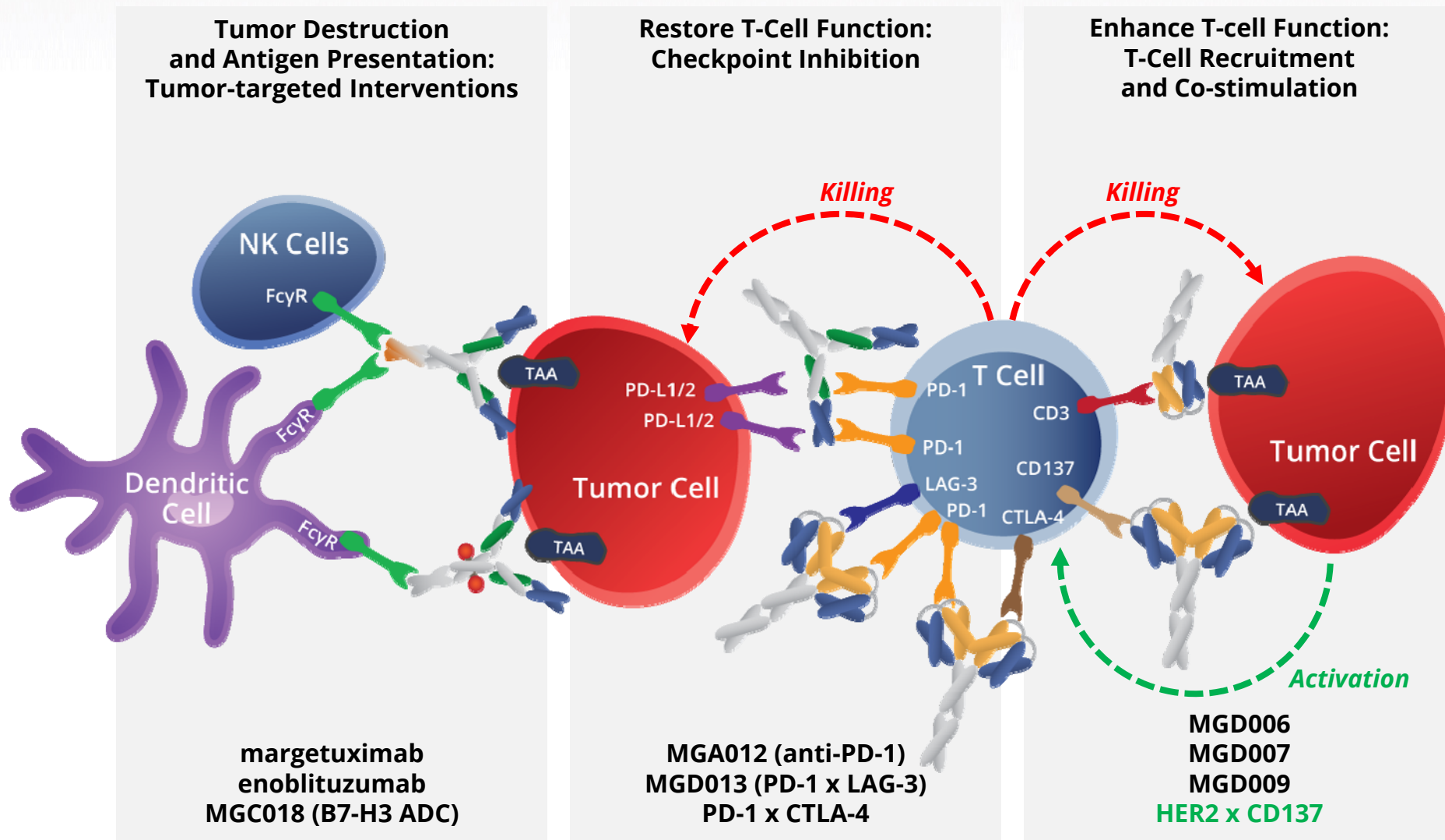
PBMCs were stimulated with 0.5 ng/ml SEB for 48 hours, harvested, washed and re-plated in 96-well plates with fresh SEB and the indicated molecules for an additional 48 hours

Targeting Independent Pathways for Combinatorial Activity



TAA: tumor-associated antigen

Targeting Independent Pathways for Combinatorial Activity



TAA: tumor-associated antigen

Tumor-cell Anchored T-cell Co-stimulation

Limiting generalized activation by targeting tumor micro-environment

CD137 (4-1BB): Potent Inducible Co-stimulatory Molecule

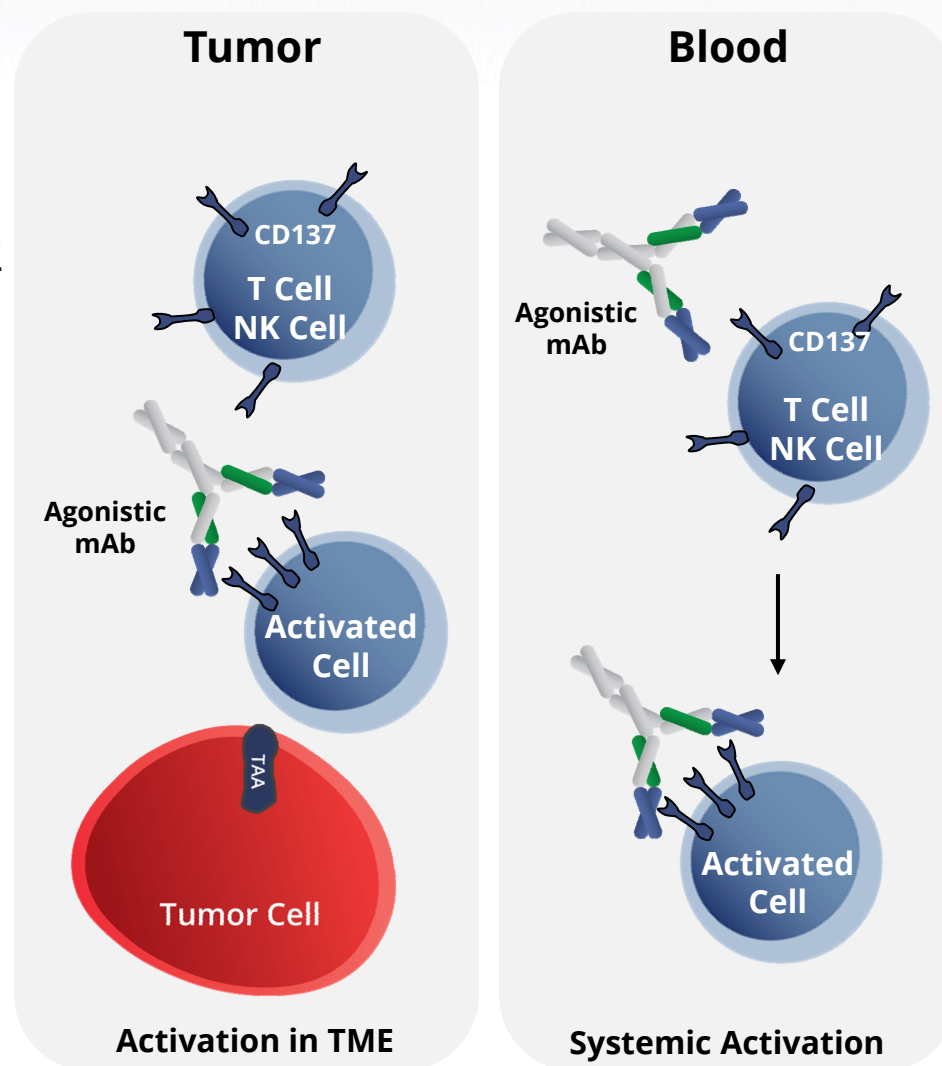
- Expressed upon activation of CD8, CD4, NK & dendritic cells
 - Potent co-stimulatory signal engineered in certain CAR-T cells
- Expressed by immune cells and vascular endothelium in tumor
 - **Induced expression on TILs** following MHC-peptide/TCR engagement
 - **Induced expression on NK cells** by mAb-opsonized tumor cells
- CD137L expressed by fraction of tumors, but insufficient to fully activate

CD137 activation results in:

- ↑ Endothelial adhesion molecules and chemokines
 - ↑ CD8 homing
- ↑ Immune-cell proliferation and anti-tumor cytolytic activity
- Countering of immune cell exhaustion and apoptosis
 - Synergy with adoptive T-cell therapy, anti-PD-1 or anti-CTLA-4 in mouse models
- ↑ ADCC by NK cells:
 - Synergy with rituximab, trastuzumab or cetuximab in mouse models

Agonistic anti-CD137 mAbs in the Clinic

- Urelumab (BMS, hulgG4)
- PF-05082566 (Pfizer, hulgG2)
- Single agent activity against melanoma and lymphoma in Ph. 1/2
- Urelumab associated with dose-dependent hepatitis (some fatal):
 - Passive accumulation in liver
 - Inflammation via liver-resident CD137+ cells (unidentified), enhanced by FcγRs



TAA: tumor-associated antigen

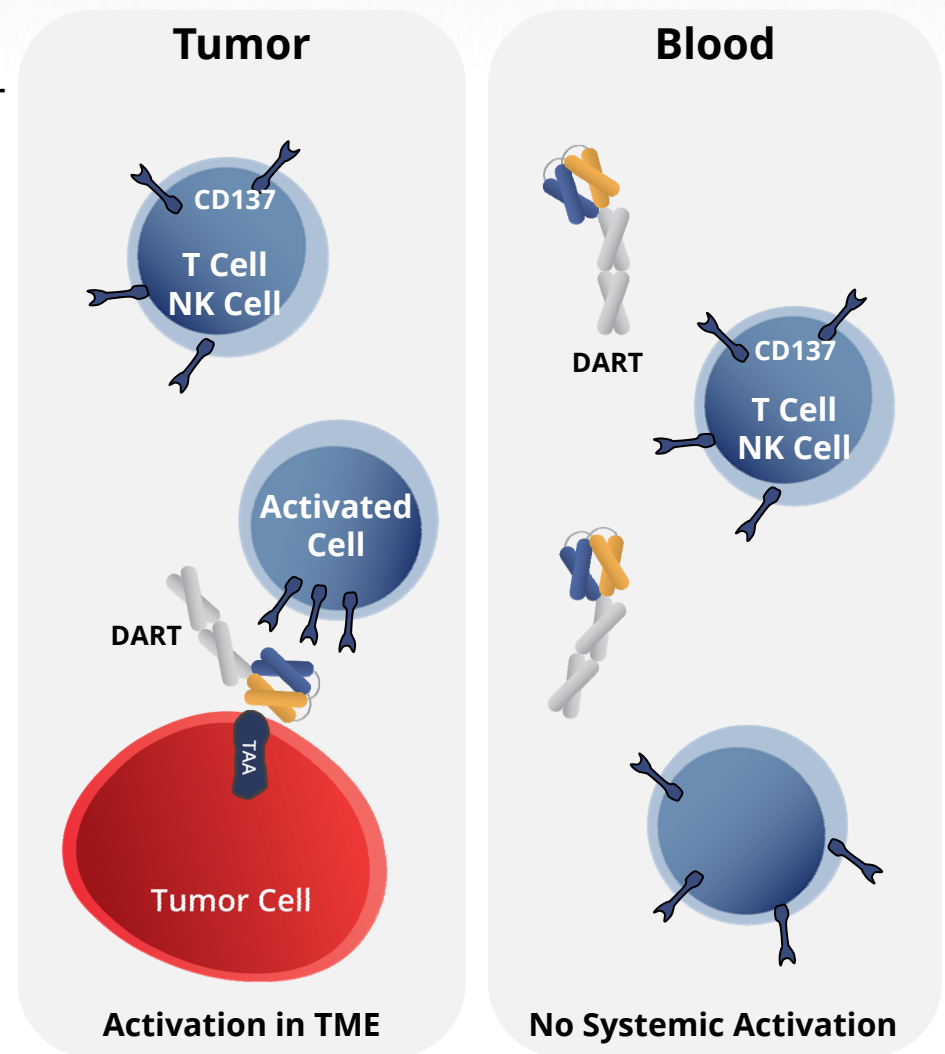
CD137-based DART: Building Tumor-anchored Activator

Challenge:

- Direct CD137 activation within tumor microenvironment
- Limit systemic effects of CD137 therapy

Solution:

- TAA x CD137 DART molecules



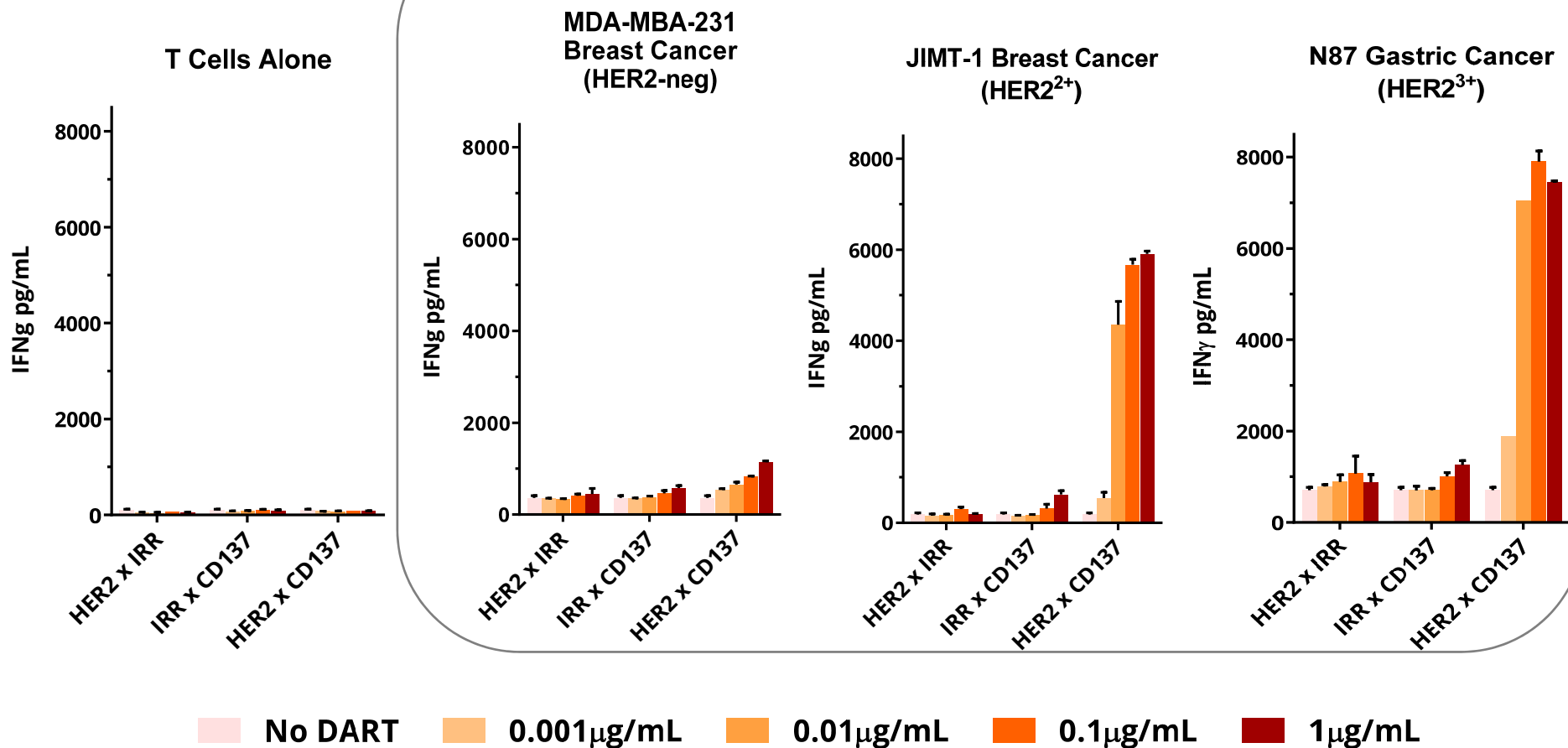
TAA: tumor-associated antigen

HER2 x CD137 DART Program

| | |
|-------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Candidates | <ul style="list-style-type: none"> • Anti-CD137 x humanized anti-HER2 <ul style="list-style-type: none"> – CD137: agonistic upon secondary clustering – HER2: epitope independent of margetuximab, trastuzumab & pertuzumab |
| Constructs | <ul style="list-style-type: none"> • Fc-bearing DART <ul style="list-style-type: none"> – <i>Null</i> Fc domain to eliminate FcR-mediated clustering |
| Preferred Profile | <ul style="list-style-type: none"> • Tumor antigen-dependent CD137-mediated agonistic activity <ul style="list-style-type: none"> – No systemic T-cell or NK-cell activation – Increased therapeutic window |
| Indications | <ul style="list-style-type: none"> • HER2⁺ amplified/non-amplified solid tumors • Combination therapy for solid tumors <ul style="list-style-type: none"> – Margetuximab, trastuzumab, pertuzumab – Checkpoint inhibitors |
| Development | <ul style="list-style-type: none"> • Candidate selection ongoing |
| Partner | <ul style="list-style-type: none"> • MacroGenics retains global rights |

HER2 x CD137 DART: HER2-dependent T-cell Activation

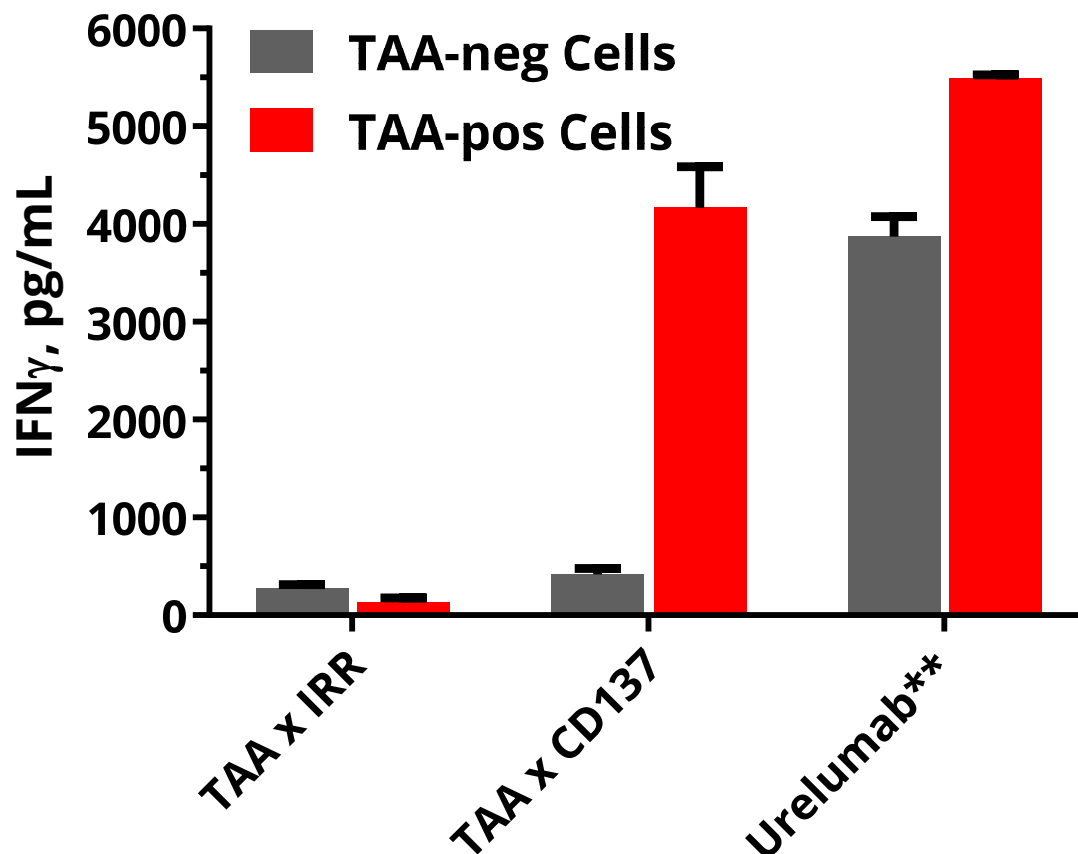
T Cells Co-cultured with Tumor Cells



T cells stimulated with aCD3 Beads (Beads/T = 1:1) ± HER2 x aCD-137 DARTs ± Tumor cells

DART Format: Plug-and-play for Additional Cancer Targets

TAA x CD137 DART: Co-stimulation in presence of TAA-positive cells*

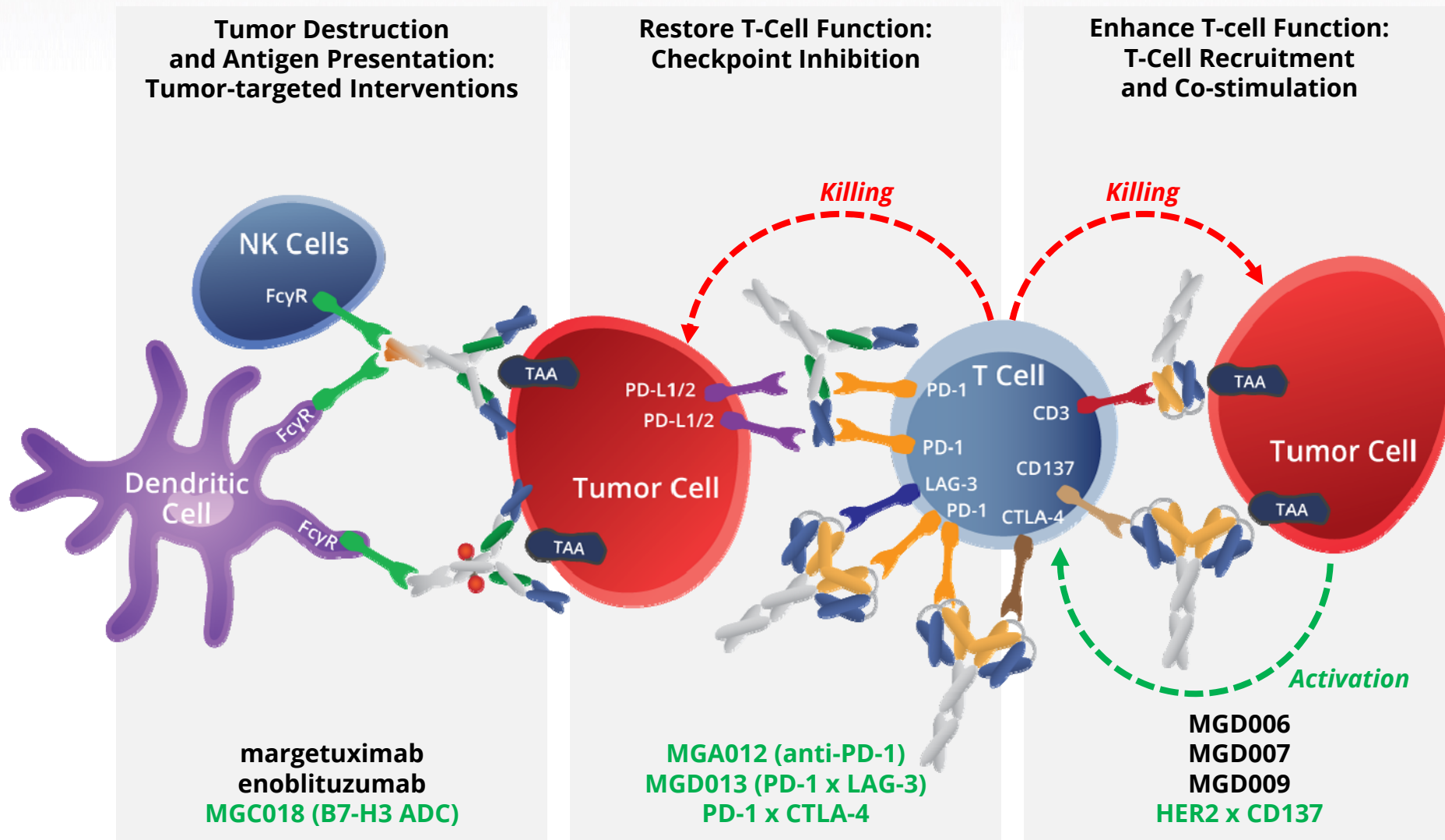


T cells stimulated with CD3 beads (beads : T cells = 1:1) \pm 0.1ug/ml DARTs or mAb

* TAA: tumor-associated antigen (undisclosed)

** Replica of urelumab generated at MacroGenics

Targeting Independent Pathways for Combinatorial Activity



TAA: tumor-associated antigen

Today's Agenda

Welcome

Scott Koenig, M.D., Ph.D. – President & CEO, MacroGenics

Margetuximab: Potential Best-in-Class Anti-HER2 mAb

Jon Wigginton, M.D. – Senior VP, Clinical Development & CMO, MacroGenics

Comprehensive B7-H3 Franchise: Fc-Optimized mAb, DART and ADC

Paul Moore, Ph.D. – VP, Immunology & Cell Biology, MacroGenics

Jim Vasselli, M.D. – VP, Clinical Development, MacroGenics

DART and TRIDENT: Leading Multi-specific Antibody Platforms

Syd Johnson, Ph.D. – VP, Antibody Engineering, MacroGenics

Clinical DART Programs Update

Jon Wigginton, M.D. – Senior VP, Clinical Development & CMO, MacroGenics

Q&A / Break

"Combination Treatments with Checkpoint Blockade"

F. Stephen Hodi, Jr., M.D. – Director, Center for Immuno-Oncology, Dana-Farber Cancer Institute

Immuno-Oncology: Targeting Immune Regulators

Jon Wigginton, M.D. – Senior VP, Clinical Development & CMO, MacroGenics

Ezio Bonvini, M.D. – Senior VP, Research & CSO, MacroGenics

Wrap-up / Q&A

Scott Koenig, M.D., Ph.D. – President & CEO, MacroGenics

Balanced Portfolio Across Novel and Validated Targets

- Three core franchises
 - HER2 (validated target)
 - B7-H3 (novel)
 - PD-1 (emerging backbone)
- Utilization of core technology platforms
 - Target discovery
 - mAb / Fc engineering
 - DART / TRIDENT multispecifics
- Fully-integrated drug development operations
 - Rapid throughput with >1 IND annually (6 INDs in last 3 years)
- Leveraging partnerships to secure non-dilutive capital, broaden portfolio and access external expertise

Breakthrough Biologics, Life-Changing Medicines®

Extending Our Portfolio Through Collaborations

Wholly Owned

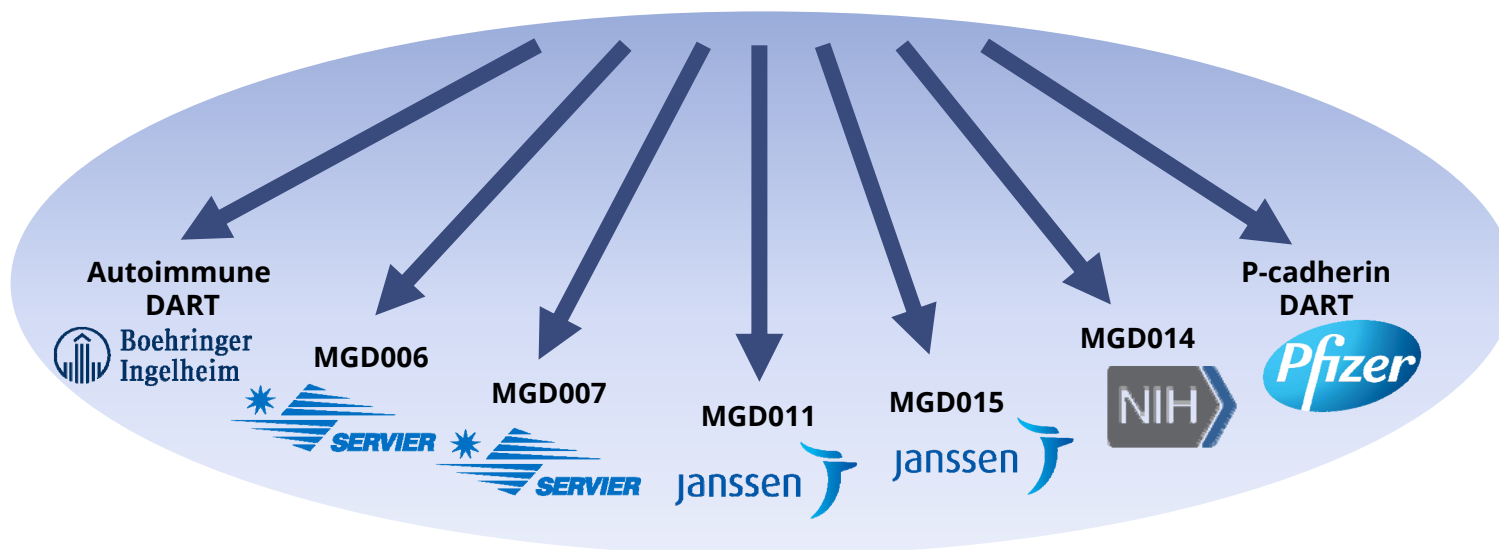
HER2
Franchise

B7-H3
Franchise

PD-1
Franchise

Partnerships Enable Additional Shots on Goal

Partner Portfolio



Key Upcoming Milestones

2017

- **Margetuximab**
 - Complete enrollment in Phase 1b/2 gastric trial
- **Enoblituzumab**
 - Complete enrollment in new expansion cohorts for bladder and prostate cancer
 - Define future development plans based on monotherapy and combination study results
- **Oncology DART Portfolio** (MGD006, MGD007, MGD009)
 - Establish dose and schedule, and define future development strategy based on results
 - Initiate expansion cohorts
- **MGD010**
 - Report updated Phase 1 study data (Hepatitis A cohort)
- **MGA012**
 - Define recommended dose and schedule
 - Initiate first combination study
- **Preclinical Pipeline**
 - File IND for MGD013 (PD-1 x LAG-3 DART)
 - File IND for MGD014 (HIV DART)

2018

- **Margetuximab**
 - Complete enrollment of SOPHIA study
- **Preclinical Pipeline**
 - File IND for MGC018 (anti-B7-H3 ADC)

Our Pipeline of Product Candidates

Nine clinical-stage programs with ≥ 1 new INDs annually

| Program (Target) | Indication | Pre-IND | Phase 1 | Phase 2 | Phase 3 | Partner | Our Commercial Rights |
|------------------------------|--------------------------|---------|---------|---------|---------|-------------|------------------------------------------|
| ONCOLOGY | | | | | | | |
| margetuximab (HER2) | Breast (HER2+) "SOPHIA" | | | | | Green Cross | Worldwide, excl. S. Korea |
| | Gastric (+pembrolizumab) | | | | | | |
| enoblituzumab (B7-H3) | Solid Tumors (mono.) | | | | | — | Worldwide |
| | Solid Tumors (+ipi.) | | | | | | |
| | Solid Tumors (+pembro.) | | | | | | |
| MGD006 (CD123 x CD3) | AML/MDS | | | | | Servier | North America, Japan, South Korea, India |
| MGD007 (gpA33 x CD3) | Colorectal | | | | | | |
| MGD009 (B7-H3 x CD3) | Solid Tumors | | | | | — | Worldwide |
| MGD011 (CD19 x CD3) | B-cell Malignancies | | | | | Janssen | U.S. Co-promote* |
| ▶ MGA012 (PD-1) | Solid Tumors | | | | | — | Worldwide |
| MGD013 (PD-1 x LAG-3) | Solid Tumors | | | | | — | Worldwide |
| ▶ MGC018 (B7-H3 ADC) | Solid Tumors | | | | | — | Worldwide |
| ▶ (PD-1 x CTLA-4) | Solid Tumors | | | | | — | Worldwide |
| ▶ (CD137 x HER2) | HER2+ Solid Tumors | | | | | — | Worldwide |

AUTOIMMUNE & INFECTIOUS DISEASES

| | | | | | | | |
|-------------------------------|-----------------------|--|--|--|--|-----------|-----------|
| teplizumab (CD3) | Type 1 Diabetes Prev. | | | | | NIDDK/NIH | Worldwide |
| MGD010 (CD32B x CD79B) | Autoimmune Disorders | | | | | — | Worldwide |
| MGD014 (HIV x CD3) | HIV | | | | | NIAID/NIH | Worldwide |

* MacroGenics has option to fund late-stage development in exchange for U.S. and Canada profit share.

"MGD" = DART

"MGA" = Antibody

"MGC" = ADC