



Unleashing the Targeted Power of ADCs

**Cowen 39th Annual
Healthcare Conference**

March 13, 2019

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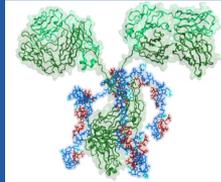
Forward-looking statements generally can be identified by terms such as “expects,” “anticipates,” “believes,” “could,” “seeks,” “estimates,” “intends,” “may,” “plans,” “potential,” “predicts,” “projects,” “should,” “will,” “would” or similar expressions and the negatives of those terms. The Company’s operations involve risks and uncertainties, many of which are outside its control, and any one of which, or combination of which, could materially affect its results of operations and whether the forward-looking statements ultimately prove to be correct. Factors that may materially affect the Company’s results of operations and whether these forward-looking statements prove to be correct include, among other things, that preclinical testing may not be predictive of the results or success of ongoing or later preclinical or clinical trials, that the development of the Company’s product candidates and new platforms will take longer and/or cost more than planned and that the identification of new product candidates will take longer than planned, as well as those listed in our Annual Report on Form 10-K filed on March 8, 2019, with the Securities and Exchange Commission (“SEC”) and subsequent SEC filings. Except as required by law, the Company assumes no obligation to update these forward-looking statements publicly, or to update the reasons actual results could differ materially from those anticipated in the forward-looking statements, even if new information becomes available in the future.

Copies of the Company’s Quarterly Report on Form 10-Q and our other SEC filings are available by visiting EDGAR on the SEC website at <http://www.sec.gov>.

Building a Leading ADC Company

XMT-1536 – Lead Asset in Proof-of-Concept (POC) Development

- Validated NaPi2b target
- First-in-class potential
- On track to achieve POC in 2019



Robust Discovery Effort Matching Target to Appropriate Platform

- Plan to disclose next clinical candidate in 2H 2019



Four Differentiated, Proprietary ADC Platforms

- Dolaflexin
- Dolasynthen
- Alkymer
- Immunosynthen

Wholly-owned Assets and Partnering Opportunities

- Product candidates and platform collaborations



Leadership Team

Highly Experienced in Oncology and Business

Management Team



Anna Protopapas
Chief Executive Officer



Eva Jack
Chief Business Officer



Michael Kaufman Ph.D.
Senior Vice President, CMC



Timothy Lowinger, Ph.D.
Chief Scientific Officer



David Spellman
Chief Financial Officer



Dirk Huebner, M.D.
Chief Medical Officer



Board of Directors

David Mott
Chairman



Lawrence Alleva
Director



Willard Dere, M.D., FACP
Director



Andrew Hack, M.D., Ph.D.
Director



Kristen Hege, M.D.
Director



Anna Protopapas
Director



Dolaflexin

Platform Incorporated Into XMT-1536

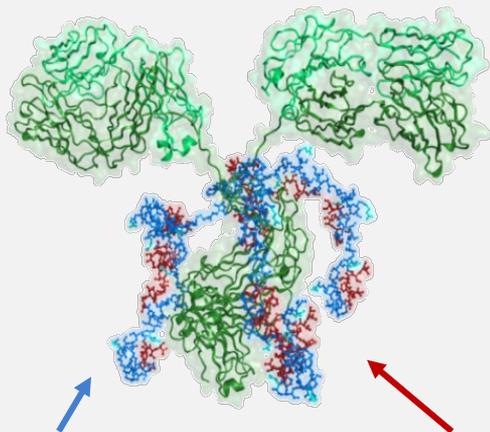


Novel Dolaflexin Platform Technology

Designed to Expand Therapeutic Index vs Other ADC Platforms

Significantly Higher Drug to Antibody Ratio (DAR)

DolaLock is Designed to Enhance Efficacy and Tolerability

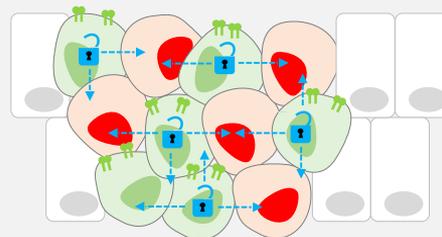


Fleximer® Polymer

- High DAR
- Optimal PK and drug-like properties
- Efficacy - against low antigen expressing tumors

DolaLock Payload

- Controlled bystander effect for **greater efficacy and tolerability**



AF-HPA:

Initial release after internalization in antigen expressing cell. Initial release product highly potent and freely cell permeable

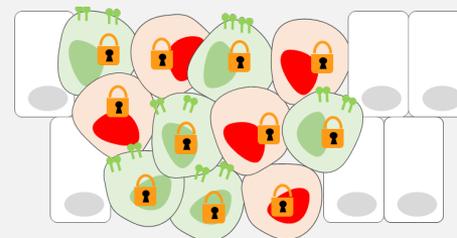


Intra-tumor metabolism



AF: Non cell permeable Active metabolite – highly potent and trapped in tumor; improved systemic tolerability

Locked in tumor
High intracellular potency with high systemic tolerability

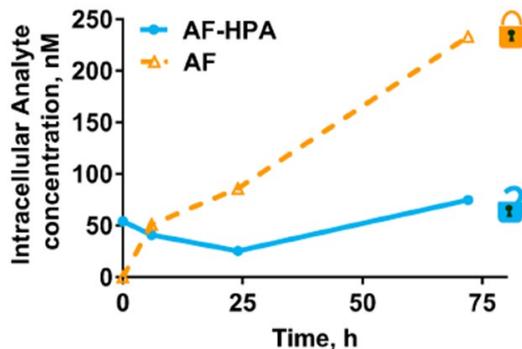


Benefit of bystander effect for greater efficacy

DolaLock Provides Prolonged Tumor Exposure and Improves Tolerability

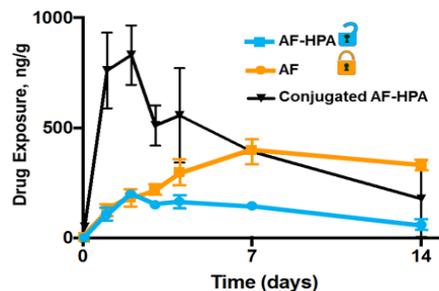
AF Is Not a Substrate of Pgp-1 Drug Efflux Pump

Dolaflexin-ADC in a Pgp-1 Positive Cell Line



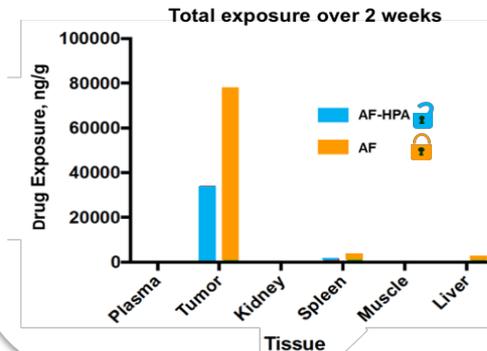
Tumor Exposure

after single dose to tumor-bearing mice



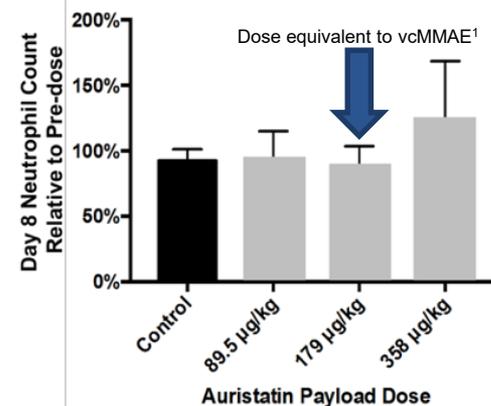
Tissue Exposure (AUC)

after single dose to tumor-bearing mice



Neutrophil Count

after single dose to non-human primates



No neutropenia even at doses twice that at which vcMMAE causes fatal neutropenia and sepsis¹

XMT-1536

**NaPi2b Targeted Therapy
Designed to Enhance Efficacy and Tolerability**



XMT-1536: A Dolaflexin ADC Targeting NaPi2b

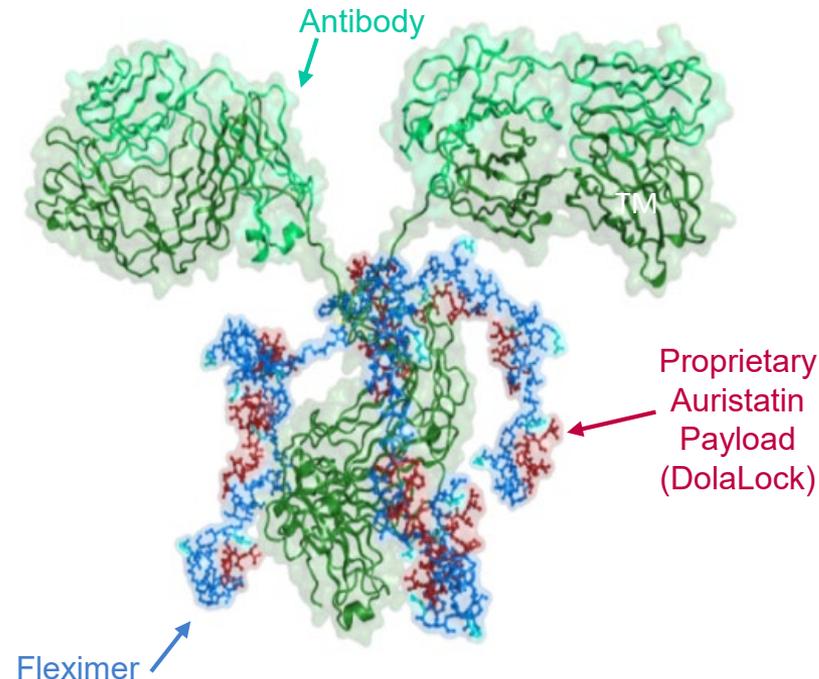
First-in-class Molecule, Target Expressed in Cancer Types with High Unmet Medical Need

- **Validated Drug Target**

- Transmembrane sodium-phosphate transporter
- Expressed in 87% of NSCLC adenocarcinoma, 96% of serous ovarian adenocarcinoma, 91% of papillary thyroid carcinoma¹
- Limited normal tissue expression

- **In-licensed Novel anti-NaPi2b Antibody**

- **Mersana Retains Full Global Rights²**



¹ Lin et al, *Clin Cancer Res* 2015, 21:5139-5150;

² Excluding Brazil

XMT-1536 is a First-in-Class Opportunity for a Clinically Validated Target

Lifastuzumab vedotin

Genentech-developed ADC using Seattle Genetics vc-MMAE platform



Pre-clinical and clinical tolerability limited by vc-MMAE toxicity

No significant target-related toxicity in either ovarian or lung patients

~40% overall response rate (ORR) in ovarian cancer in Phase 1; low NSCLC ORR in Phase 1

Ovarian cancer Phase 2 with positive trends on all efficacy endpoints

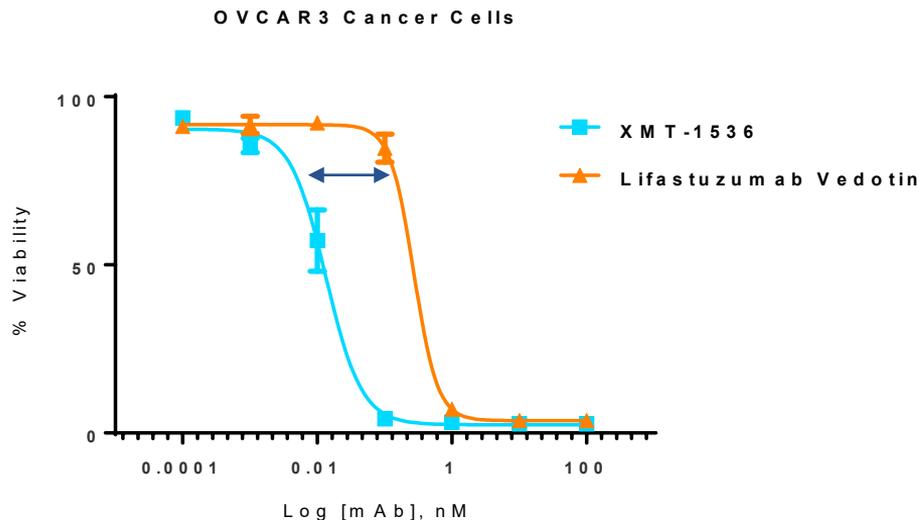
Development discontinued by Genentech

Appropriate target for ADC development but need for better tolerated platform

Evidence of efficacy but need for more potent platform

First-in-class opportunity for XMT-1536

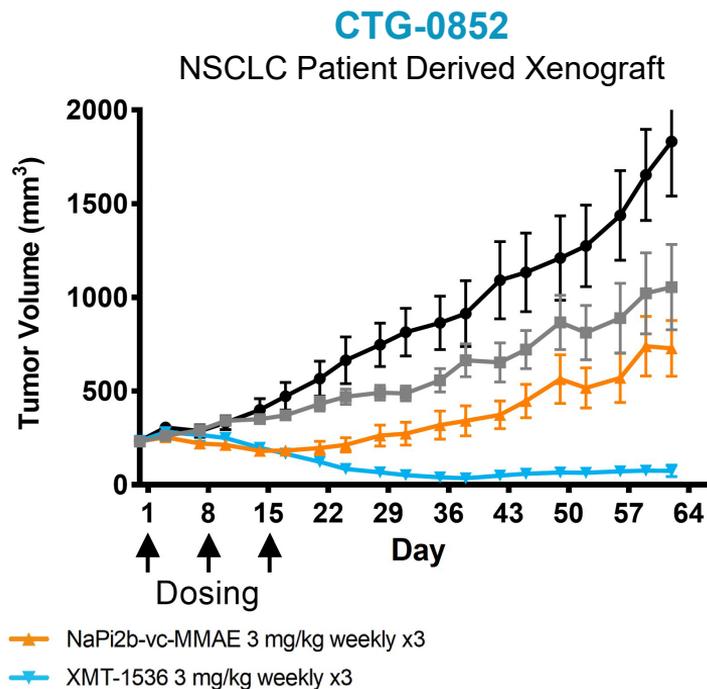
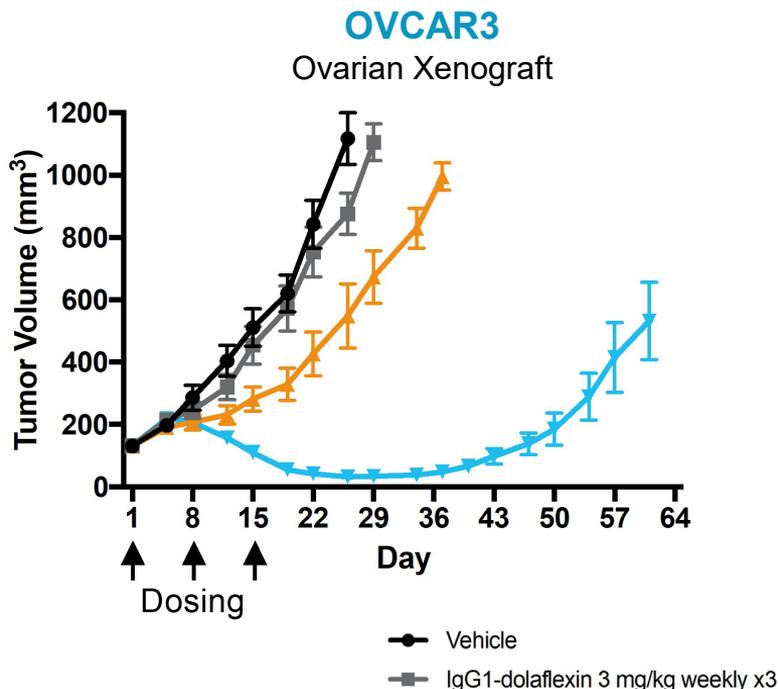
XMT-1536 is More Potent than Lifastuzumab Vedotin on a Payload and Antibody Basis



Potency: Direct Comparison

	IC50 <i>by Payload</i>	IC50 <i>by Antibody</i>
XMT-1536	0.13 nM	0.013 nM
Lifastuzumab vedotin	0.95 nM	0.27 nM
Increased Potency of XMT-1536	7-fold <i>by payload</i>	20-fold <i>by antibody</i>

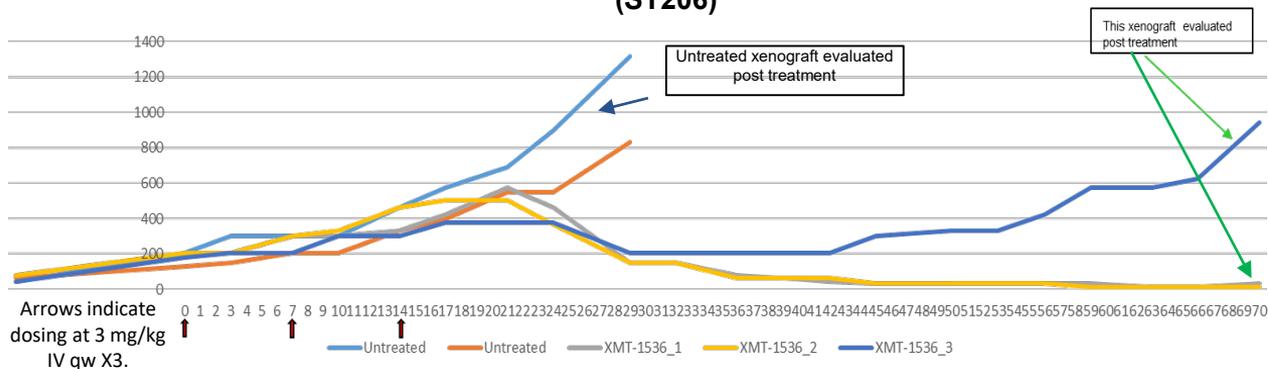
XMT-1536 Data Show Improved Efficacy to Genentech ADC in Head to Head Preclinical Studies



Comparing results from non-human primate toxicology studies, XMT-1536 exhibited a 1.5-fold higher HNSTD (payload dose) than lifastuzumab vedotin¹

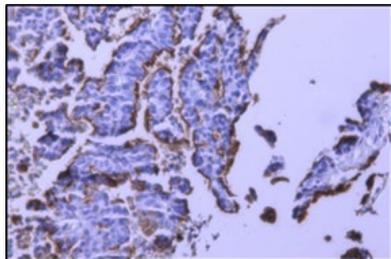
XMT-1536 Preclinical Studies Suggest NaPi2b Expression Retained Post Treatment

Ovarian Patient Derived Xenograft (ST206)

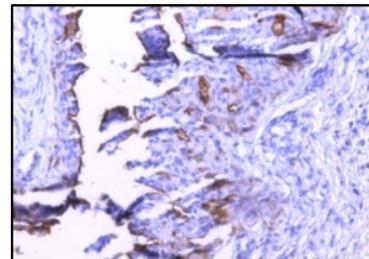
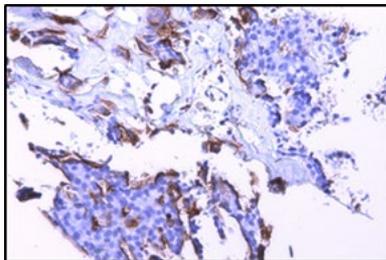


Tissue samples obtained from treated xenograft with delayed growth, treated xenograft with near CR and untreated xenograft

NaPi2b Expression
Untreated

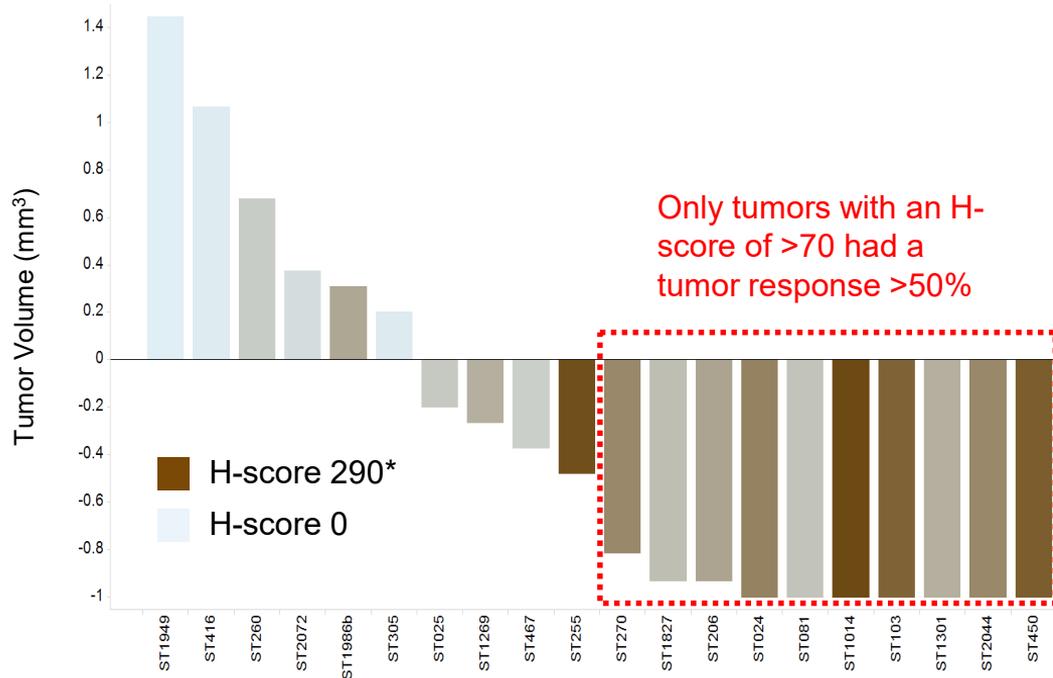


NaPi2b Expression
Post treatment



NaPi2b expression levels remained similar to untreated in both post treatment xenografts examined

NaPi2b Expression Levels Have Been Predictive of Response to XMT-1536 in Ovarian Cancer Patient Derived Models



- Proprietary research assay validated and used for retrospective evaluation of patients
- Preclinical data demonstrate NaPi2b expression highly correlated with response
- ~60% of ovarian cancer patients estimated to have NaPi2b expression with H-score >70, associated with deep responses in PDX models

XMT-1536: Targeting NaPi2b Addresses Two Areas of Significant Unmet Clinical Need

	Ovarian Cancer	Non Small Cell Lung Cancer (NSCLC)
Incidence (U.S.)	~24,000 ¹	~189,000 ⁴
Deaths Per Year (U.S.)	~14,000 ²	~ 132,000 ⁵
Frontline SOC	Debulking surgery plus systemic chemotherapy	PD1 + chemotherapy
Area of Unmet Need	Resistant to platinum based therapy	Following PD1 + platinum treatment failure
Target Population Treatment Options	(Platinum Resistant OC) Single agent chemotherapy, e.g. PLD, weekly Paclitaxel, Topotecan, Gemcitabine, PARP	(2 nd Line NSCLC Adenocarcinoma) Docetaxel, Premetrexed, Gemcitabine, or Docetaxel + Ramucirumab
Approximate Treatment Outcome	ORR ~10-20% ³ med PFS ~ 3-4 mos ³ med OS ~12 mos ³	ORR ~10-20% ³ med PFS ~ 3-4.5 mos ³ med OS ~ 8-10 mos ³

¹Based on CancerMPact® Patient Metrics for US, Western Europe, and Japan, accessed in March 2018.

²<https://cancerstatisticscenter.cancer.org/#/>

³Hanna et al. JCO 2004 & Garon, Lancet 2014 & Pujade, JCO 2014 & Gordon, JCO 2001 & Rose, Gynecol Oncol 2003 & Sehouli, JCO 2011 & Mutch, JCO 2007 & Ferrandina, JCO 2008.

⁴Globoscan 2012 & SEER.

⁵Estimate based on 85% NSCLC incidence and total lung cancer death cases in the US in 2017 of 155900 deaths

XMT-1536 Dose Escalation Ongoing

Target to Complete Dose Escalation and Initiate Dose Expansion Cohorts in 2Q 2019

2018 / 1H 2019

2Q 2019

2H 2019 / 1H 2020

Dose Escalation: 3 week dosing			Dose Escalation: 4 week dosing		
	mAb Dose, mg/ m ²	mAb Dose, mg/ kg		mAb Dose, mg/ m ²	mAb Dose, mg/ kg
DL4	20.0	0.54	DL4-A	20.0	0.54
DL5	30.0	0.81	DL5-A	30.0	0.81
DL6	40.0	1.08	DL6-A	36.0	0.97
Completed			Further Dose Escalation		

Phase 1 Dose Escalation

- Ongoing in ovarian and lung cancers and certain rare tumors (endometrial, papillary renal, papillary thyroid and salivary duct)
- No pre-selection for NaPi2b expression; retrospective testing based on archival tissue

2Q 2019 Anticipated Milestones

Establish
Recommended
Go Forward
Dose & Regimen

Report
Dose Escalation
Data

Initiate Expansion
Cohorts

- Platinum-resistant ovarian cancer
- NSCLC Adenocarcinoma in PD1 failure

Execute on
Expansion
Studies

Dolaflexin Safety Profile Easily Monitored; High Consistency between Early Clinical and Preclinical Data

Current Clinical Study Data Show:

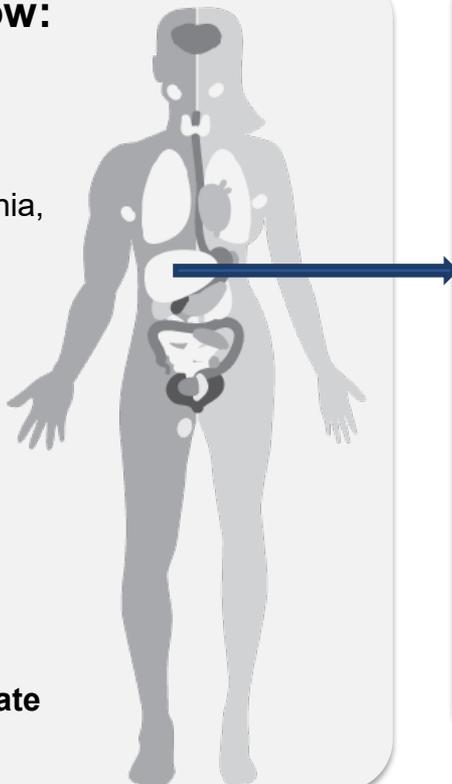
No observations of toxicities associated with other ADC platforms to date

- No evidence of clinically relevant neutropenia, neuropathy, ocular toxicity or pneumonitis

Dolaflexin Platform Characteristics

- Favorable PK profile
- Highly stable in circulation
- Transient AST¹ elevations that can be clinically monitored and managed with dose and regimen modifications

No observation of on-target toxicities to date



Preclinical Studies Demonstrate Depletion of Kupffer Cells Results in Transient AST Elevations

- Kupffer cells are involved in AST clearance; transient elevation is consistent with a change in clearance kinetics by hypertrophy of Kupffer cells in liver
- Transient elevations of AST were observed preclinically in animals and were not associated with hepatic necrosis based on histopathology
- AST elevations peak at day 8 and return to baseline by next dose and as Kupffer cells recover

XMT-1536 Conclusions and Path Forward

XMT-1536

- First-in-class molecule addressing unmet needs
- Lifestuzumab Vedotin provides clinical validation of target
- Preclinical data demonstrate greater efficacy, improved tolerability and prolonged exposure in tumor

Dose Escalation: Defining a Go Forward Dose

- Dose escalation data to date indicate good tolerability; MTD has not been reached
- Clinical activity observed in heavily pretreated, unselected patients at 20 mg/m² and above
- Findings to date support primary objective of moving into expansion cohorts upon dose selection

Dose Expansion: Defining Profile of XMT-1536

- Expansion cohorts to focus on more homogenous patient cohorts in ovarian cancer and NSCLC adenocarcinoma
- Design to facilitate understanding of efficacy, duration of response and correlation with NaPi2b expression

ADC Platforms

Leveraging Our ADC Platforms to Generate a
Differentiated Pipeline of ADCs



Using Highly Differentiated ADC Platforms to Create a Pipeline of Clinically Meaningful Candidates

Dolaflexin

- High DAR
- Potential to increase efficacy against low expressing antigens
- DolaLock payload

Dolasynten

- Precise DAR
- Enables homogeneous ADCs
- DolaLock payload

Alkymer

- Designed to broaden addressable indications
- Alkylating payload

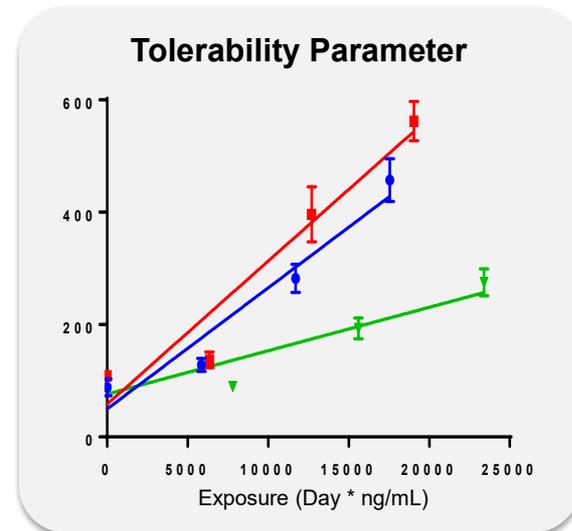
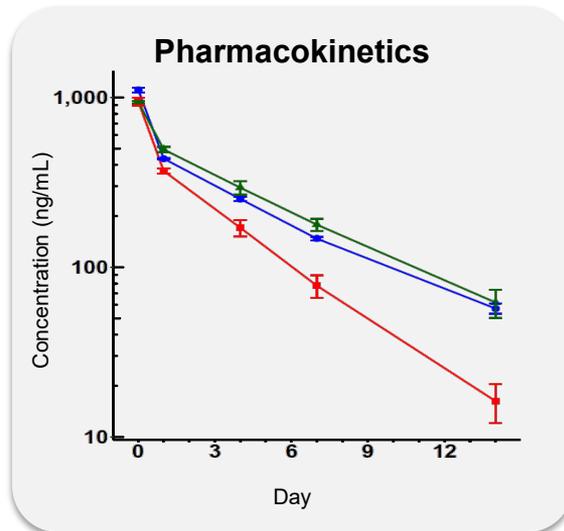
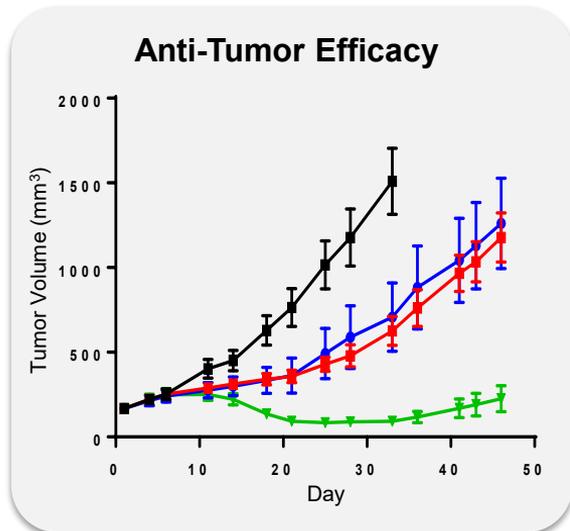
Immunosynthen

- Designed for localized and controlled harnessing of the immune system
- Immunostimulatory payload

Proprietary platforms to address broad unmet patient needs

Dolasynten: Precise Control to Create Optimal ADC

Critical Attributes Matched to Antibody and Target



■ Vehicle

▼ Dolasynten ADC 1

■ Dolasynten ADC 2

● Dolasynten ADC 3

Corporate Summary



Key 2019 Goals & Milestones

XMT-1536

- Select go forward dose and initiate expansion cohorts in 2Q 2019
 - Planning to report Phase 1 dose escalation data in 2Q 2019
-

ADC Candidate

- Planning to disclose next clinical candidate in 2H 2019
-

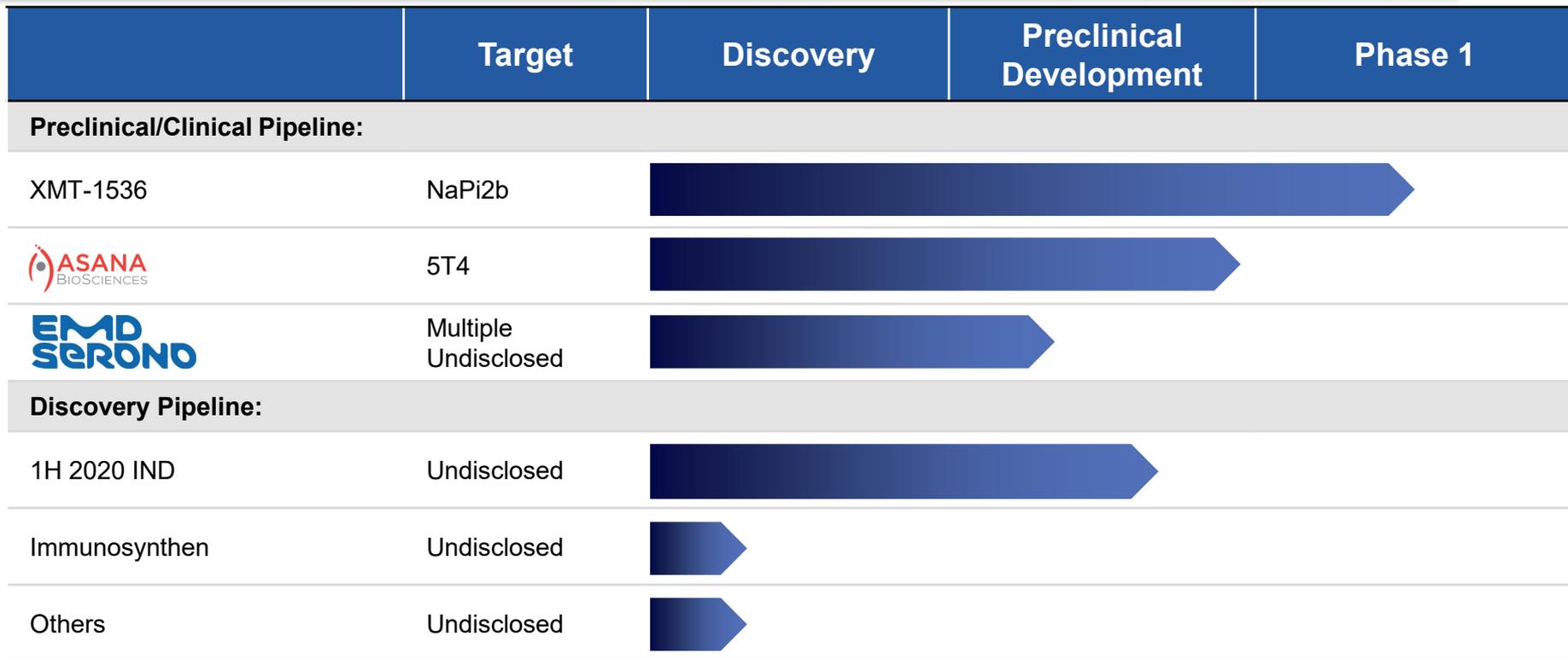
R&D

- Continue to leverage our proprietary, differentiated platforms to build a robust pipeline of ADC candidates
 - Disclose progress on platforms and programs at scientific meetings throughout 2019
-

Corporate

- Proactively evaluate potential for strategic collaborations that maximize the value of Mersana's pipeline and platforms
- Continue to recruit and retain top talent and maintain a culture focused on scientific excellence, execution and patient needs

Robust Pipeline Focused on Clinically Meaningful Cancer Therapies



\$70M in cash* as of Q4 2018; \$~98M in gross proceeds from March 2019 financing extends cash runway into at least mid-2021

*Cash, cash equivalents and marketable securities as of December 31, 2018



Unleashing the Targeted Power of ADCs