MERRIMACK®

A Fully Integrated Cancer fighting Company.

September 2013

Forward Looking Statements

This presentation contains forward-looking statements that involve substantial risks and uncertainties. All statements, other than statements of historical facts, contained in this presentation, including statements regarding our strategy, future operations, future financial position, future revenues, projected costs, prospects, plans and objectives of management, are forward-looking statements within the meaning of the Private Securities Litigation Reform Act of 1995, as amended. The words "anticipate," "believe," "estimate," "expect," "intend," "may," "plan," "predict," "project," "target," "potential," "will," "would," "could," "should," "continue" and similar expressions are intended to identify forward-looking statements, although not all forward-looking statements contain these identifying words. We may not actually achieve the plans, intentions or expectations disclosed in our forward-looking statements, and you should not place undue reliance on our forward-looking statements. Actual results or events could differ materially from the plans, intentions and expectations disclosed in the forward-looking statements we make.

These forward-looking statements include, among other things, statements about: our plans to develop and commercialize our most advanced product candidates and companion diagnostics; our ongoing and planned discovery programs, preclinical studies and clinical trials; our anticipated milestones; adequacy of funding for Merrimack's foreseeable and unforeseeable operating expenses and capital expenditure requirements; and the success or consummation of potential business development activities. For more information regarding important factors that we believe could cause actual results or events to differ materially from the forward-looking statements that we make, see the "Risk Factors" section of our Quarterly Report on Form 10-Q filed with the Securities and Exchange Commission, or SEC, on August 8, 2013 and other reports we file with the SEC. Any forward-looking statement contained in this presentation reflects Merrimack's views as of the date of this presentation with respect to future events and Merrimack assumes no obligation to publicly update or revise these forward-looking statements for any reason, or to update the reasons actual results could differ materially from those anticipated in these forward-looking statements, even if new information becomes available in the future, except as otherwise required by applicable law.

Investment Highlights

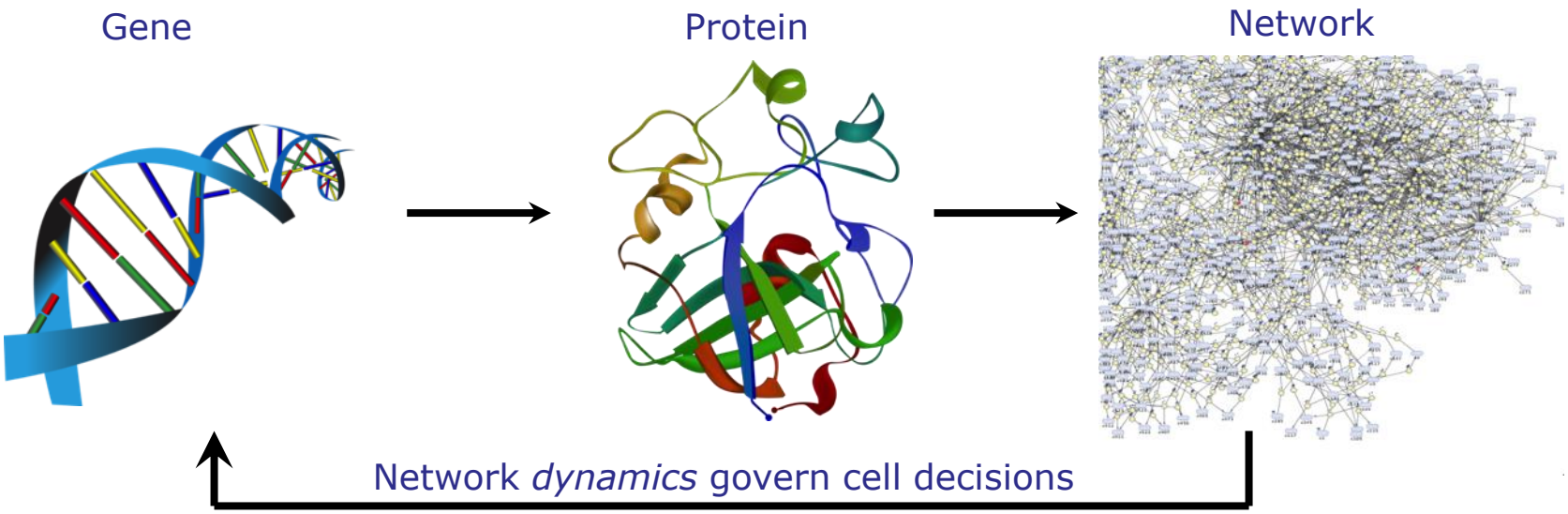
- Expertise in multispecific antibodies and targeted nanotherapeutics discovery/development
  - Systems biology-based R&D leverages signaling networks expertise and high throughput computational biology to discover novel therapeutics
- Six compounds in the clinic and a broad preclinical pipeline
- **MM-121** ErbB3 MAb for solid tumors (Sanofi-partnered)
    - **Multiple Phase 2 data readouts expected during Fall 2013 (ovarian, ER/PR+ breast, non-small cell lung)**
- **MM-398** irinotecan nanotherapeutic in P3 for pancreatic cancer
- Cash runway into 2015

Oncology Pipeline

	Candidate	Design	Target	Trial[(1)]	Preclinical	Phase 1	Phase 2	Phase 3
Signaling Inhibitors	MM-121	Monoclonal antibody	ErbB3	P1 combo: 48% ORR 70% CBR				SANOFI
	MM-111	Bispecific antibody	ErbB3 & ErbB2	P1 combo: 42% ORR 52% CBR				
	MM-151	Oligoclonal antibody	EGFR	P1 mono: TBA				
	MM-141	Bispecific tetravalent antibody	IGF-1R & ErbB3	P1 mono: TBA				
	MM-131	Multispecific antibody	Undisclosed	N/A				
Nanotherapeutics	MM-398	Nanotherapeutic targeted irinotecan	Topo I inhibition / DNA replication	P2 mono: 25% 1 yr OS 5.2 mos median OS 50% DCR				
	MM-302	ErbB2 Ab targeted nanotherapeutic doxorubicin	Topo II inhibition / DNA replication	P1 mono: 17% ORR 46% CBR				
	MM-310	Antibody targeted nanotherapeutic	Undisclosed	N/A				

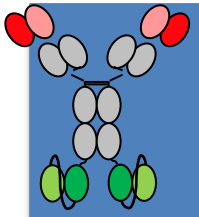
(1) Selected trials: MM-121 plus paclitaxel in ErbB2 (HER2) negative breast, ovarian and other gynecological cancers; MM-111 plus multiple anti-cancer therapies in ErbB2 (HER2) positive solid tumors; MM-398 monotherapy in pancreatic cancer; MM-302 monotherapy in ErbB2 (HER2) positive breast cancer

Systems Biology Approach to R&D



- Discovery focused on entire signaling networks, not individual molecules, to increase precision
- Platform couples high throughput quantitative biology with computing to build predictive models of biological networks
- Models and simulation drive target discovery, drug and diagnostic engineering, and predictive development
- Expertise in signaling networks including growth factors, death factors, DNA repair, and cytokines

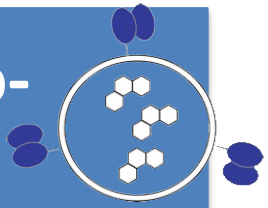
Two Differentiated Drug Technologies



Multispecific Ab

- Antibody engineering capabilities
- Novel antibody designs:
  - bispecific targeting two receptors on same cell
  - tetravalent antibody
  - oligoclonal antibody
  - antibody targeted nano-carriers

Targeted Nano-therapeutics

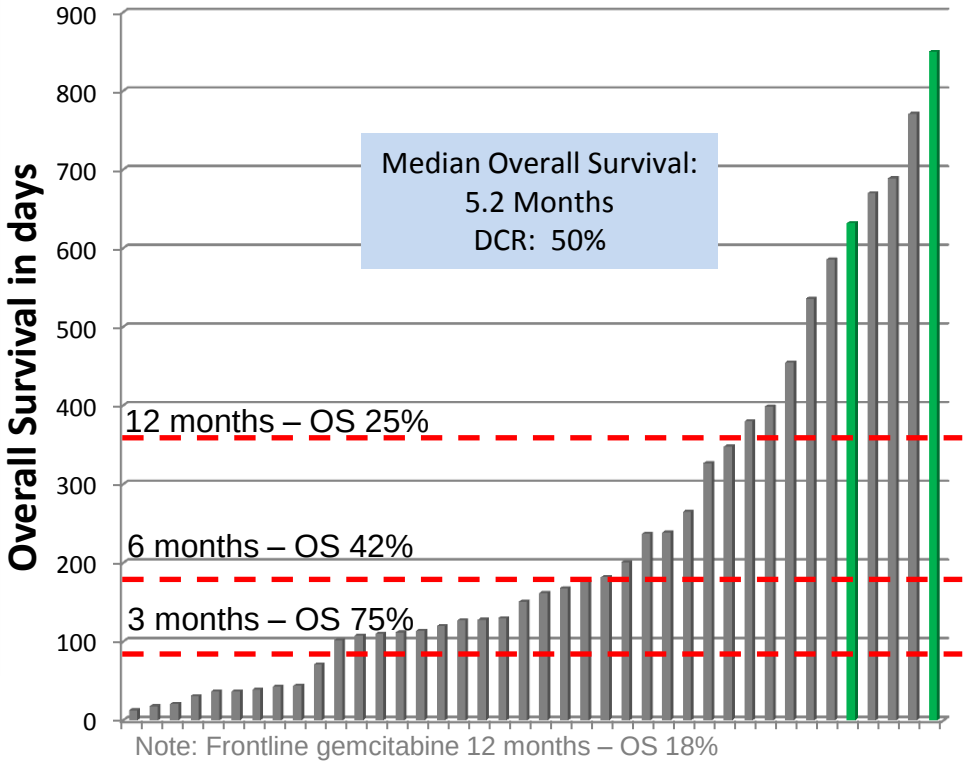


- A version of Antibody Drug Conjugates with:
  - greater tumor specificity
  - greater duration of exposure
  - thousands fold increase in payload
- Reduced systemic exposure
- Broad delivery technology: small molecules, RNAi and gene therapy

MM-398

- Nanotherapeutic encapsulation of irinotecan
- Engineered for increased drug deposition, local activation of SN38, and prolonged cytotoxic effects
- Diagnostic approach: utilize imaging agent to identify responders
- Taiwan Partner: PharmaEngine

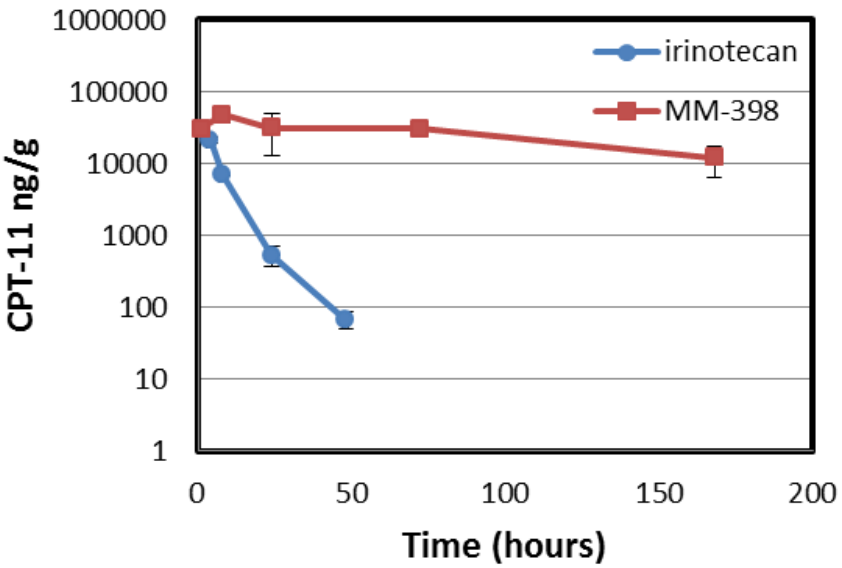
Second Line Pancreatic Cancer
Single arm, MM-398 monotherapy (120 mg/m^2 q3w)
(data as of May 31, 2012)



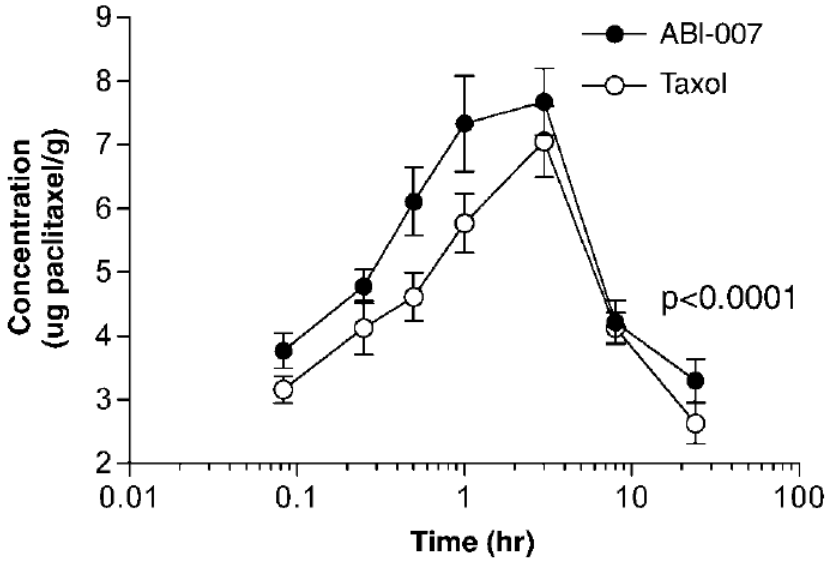
British Journal of Cancer, August 2013

MM-398 Increases the Amount of Active Drug Available at the Tumor Site Compared to Other Encapsulated Agents *In Vitro*

MM-398: Sustained intra-tumor levels



Abraxane® intra-tumor levels



Desai et al. (2006) Clin Cancer Res 12, 1317-1324.

	$t_{1/2}$ (h)	AUC_{∞}(µg*h/ml)
CPT-11	.27	6
MM-398	10.7	2134

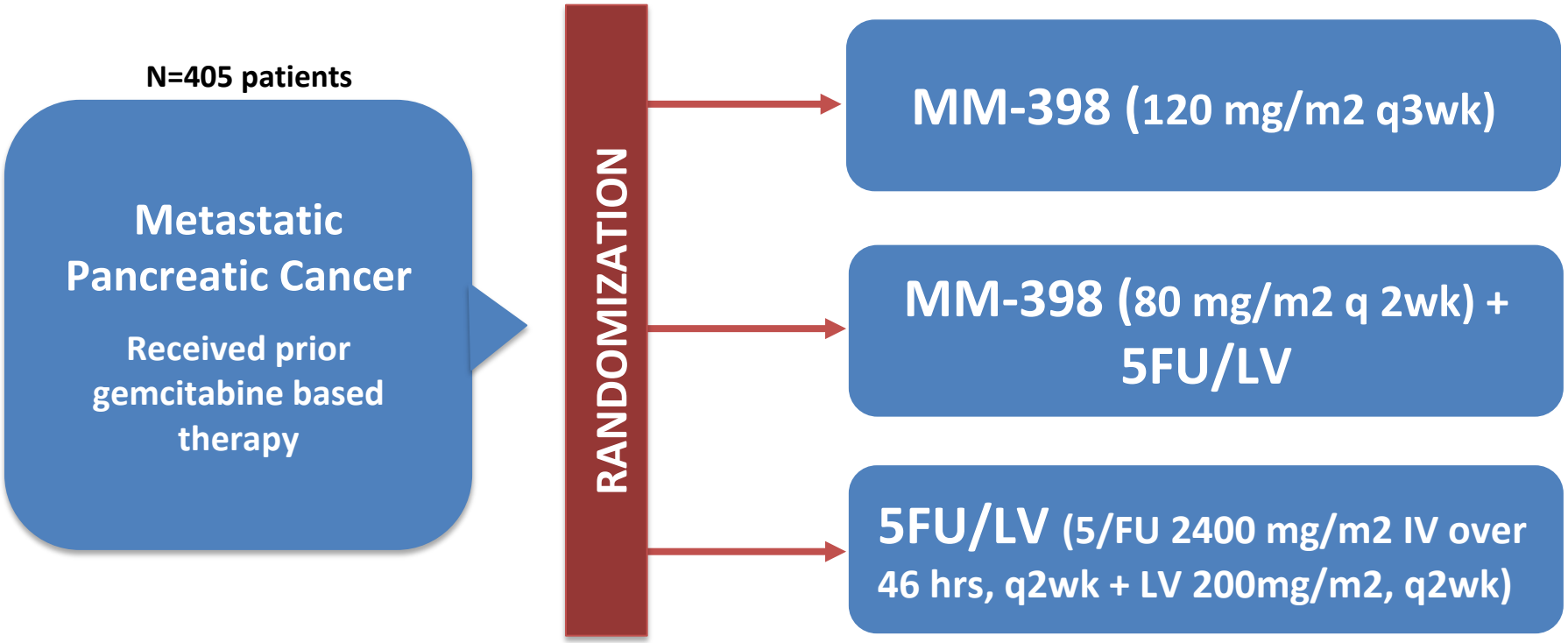
	$t_{1/2}$ (h)	AUC_{∞}(µg*h/ml)
Taxol	7.24	5.85
Abraxane	11.42	4.59

Sparreboom et al Clin Cancer Res 2005;11:4136-4143

Phase 3 Pancreatic Study Design

- Trial designed to determine the efficacy and safety of MM-398 alone or in combination with 5FU/LV versus an infusion of 5FU/LV
- Study design reviewed by US FDA and EMEA; plan to file for mono and/or combination arms with met endpoints
- Primary endpoint: OS (4.5 mos mono, 6 mos combo vs 3 mos control)

NAPOLI-1 (NAnoliPOsomaL Irinotecan) Trial



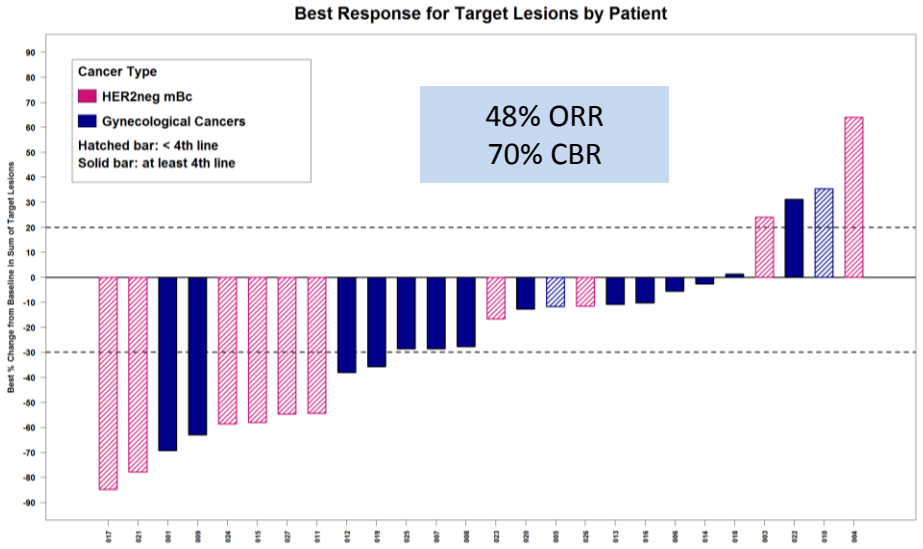
MM-398 Update

- Achieved NAPOLI-1 enrollment target of 405 patients in August 2013
- Expect top line data from study Q4 2013 or Q1 2014
- Study overseen quarterly by independent Data Safety Monitoring Board (DSMB)
  - DSMB's primary mission is safety; also reviews event rates
  - Has authority to recommend continuation/cessation
  - Last review July 2013: no unexpected toxicities; recommended that study continue

MM-121

- Monoclonal Ab to ErbB3 - plays central role in survival and resistance
- Co-opted by EGFR & ErbB2
- Translational focus in clinical program testing pre-specified biomarkers for ErbB3 dependency
- Goal to stratify patients in next phase clinical studies
- Global partner: Sanofi

MM-121 + paclitaxel Phase 1 study
Ovarian and Breast Cancer Patients



Presented at ESMO 2012

MM-121 Translational Focus

Clinical Hypothesis

- ErbB3 plays an important role in resistance across tumor types
- When ErbB3 is active, treatment with 121 provide clinical benefit

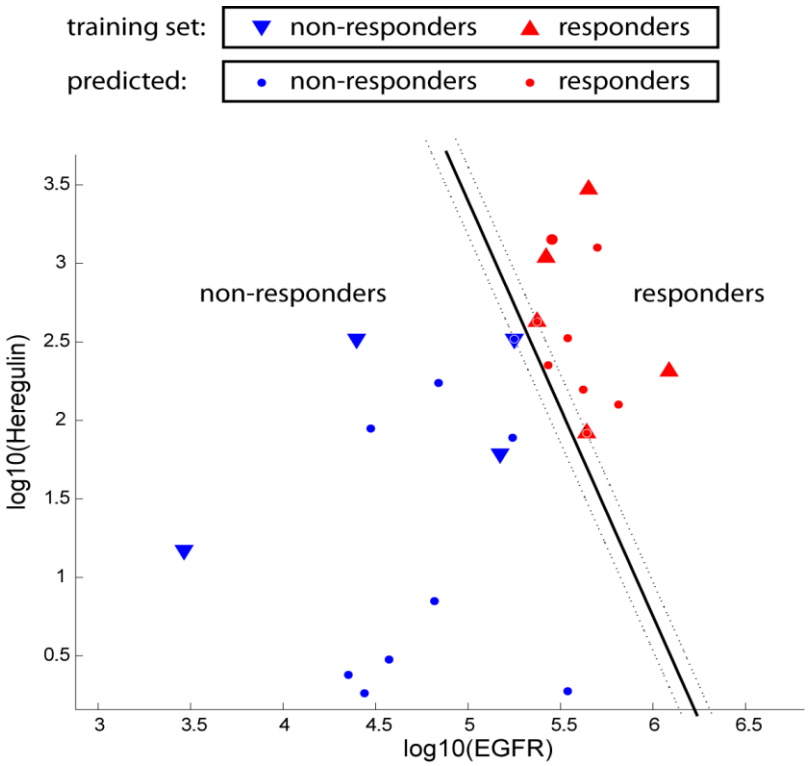
Translational Strategy

- Trials designed to assess the activation & prevalence of ErbB3 signaling
- Testing pre-selected biomarkers validated preclinically & set as a secondary endpoint
- Unprecedented collection of biopsies/samples (~ 760 patients across 7 global trials)

What to Expect

- Population endpoints will be driven by prevalence – which will vary
- Opportunity to identify sub-populations and confirm diagnostic hypothesis

MM-121 *In Vivo* Stratification



Merrimack developed a set of biomarkers based on a network analysis understanding that have been preclinically validated on a wide range of tumor models to predict 121 efficacy.

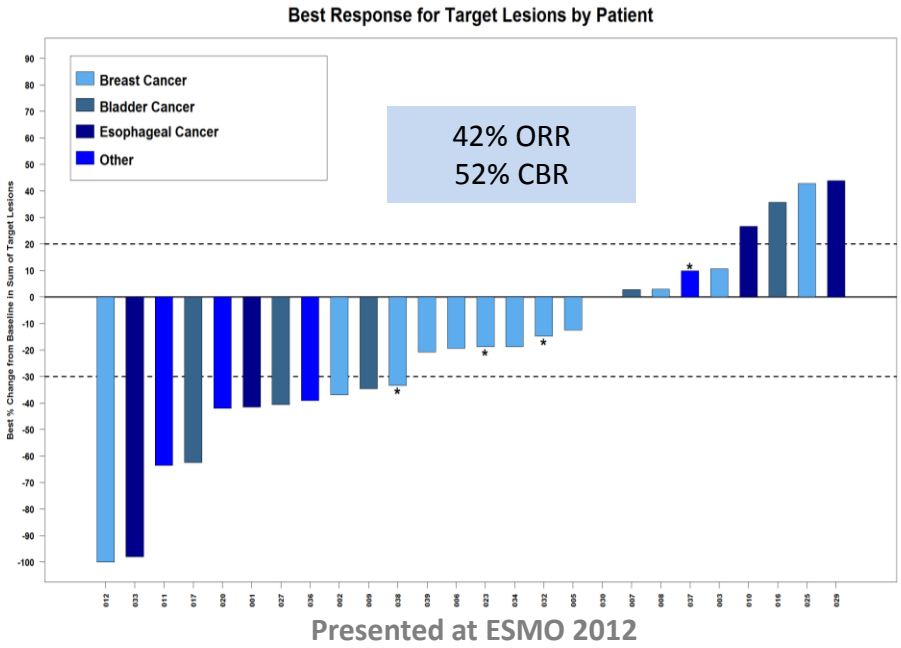
MM-121 Update

	Phase 2: ER/PR+ Breast Cancer	Phase 2: NSCLC wtEGFR	Phase 2: ER/PR+ Breast Cancer	Phase 2: Ovarian Cancer	Phase 2: Triple-negative Breast Cancer
Line of Therapy	Second line metastatic	Second line (no prior EGFR therapy)	Neo-adjuvant	Second line metastatic	Neo-adjuvant
Regimen	MM-121 + exemestane	MM-121 + erlotinib	MM-121 + paclitaxel	MM-121 + paclitaxel	MM-121 + paclitaxel
No. of Patients	118	133	100	223	~100
Fully Enrolled	√	√	√	√	
Expected Data Read Out	Fall 2013	Fall 2013	Top line: Fall 2013; Add'l biomarkers: 2014	Fall 2013	2014
Trial Status	Monitoring board recommended study continuation	Unlikely to meet primary endpoint; focus on biomarkers	Monitoring board recommended study continuation	Unlikely to meet primary endpoint; focus on biomarkers	Monitoring board recommended study continuation

MM-111

- HER2-3 bispecific Ab
- Engineered against hyperactive HER2/HER3/HRG trimer
- Superior signaling inhibitor to current agents in preclinical studies
- Global Phase 2 targeting traditional HER2 adaptation and “non-traditional” HER2 patients
- Diagnostic approach: Stratifying based on HER2 and other biomarkers
- Wholly owned

MM-111 + Multiple Combinations Phase 1
HER2+ Patients in Multiple Solid Tumors

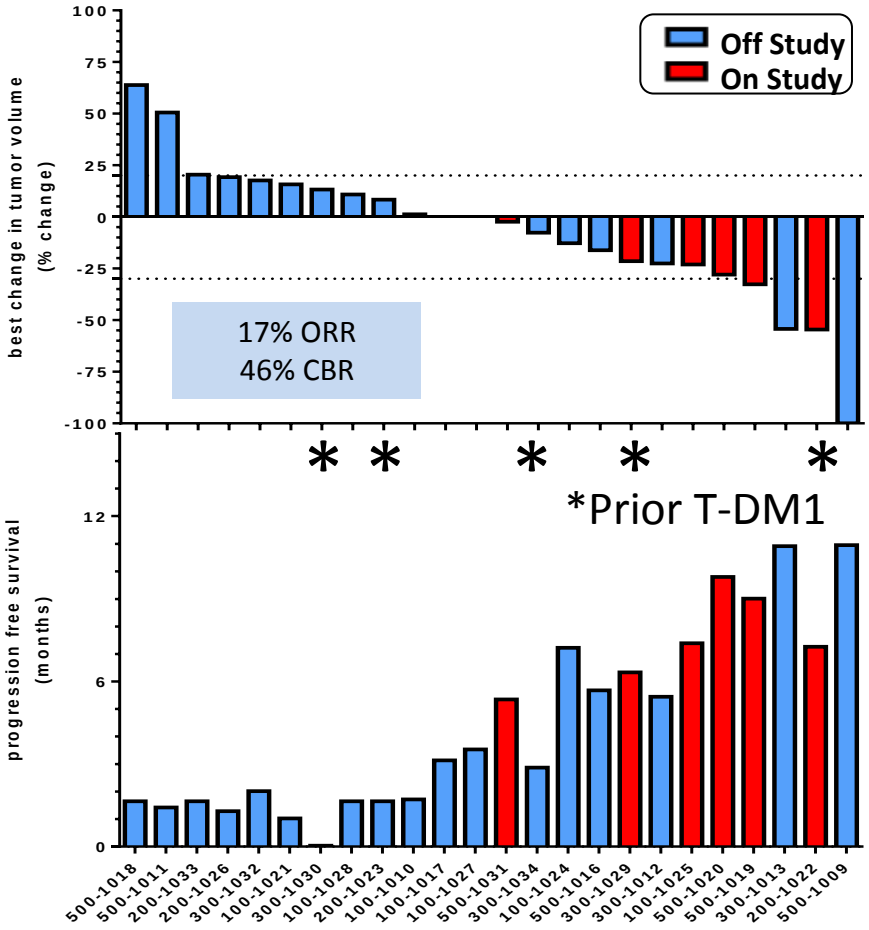


Presented at ESMO 2012

MM-302

- ErbB2 Ab targeted nanotherapeutic encapsulation of doxorubicin
- Engineered for local accumulation & retention (10x) and maximal potency/cell uptake
- Designed to address cardiotox issues of combinations
- Diagnostic approach: PET/MRI imaging with copper labeled molecule
- Wholly owned

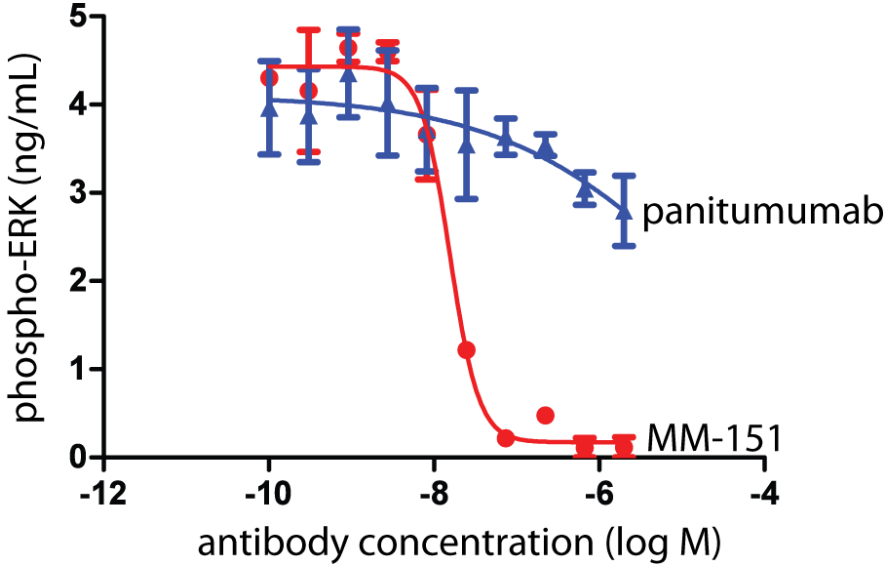
MM-302 Monotherapy Phase 1
HER2+ Breast Cancer Patients



MM-151

- Oligoclonal antibody combination designed to fully inhibit EGFR
- Superior signal inhibition, ligand antagonism, and receptor down-regulation in preclinical studies
- ADCC/CDC (fully human IgG1's)
- Targeting wtEGFR LC & CRC
- Diagnostic approach: biomarker assays testing levels of high vs low affinity ligands
- Wholly owned

MM-151 inhibits high-affinity ligand signaling through EGFR in vitro



Presented at World Lung Cancer Conference 2011

Business Development

Pipeline Collaborations

- Robust platform provides opportunity for product licensing
- Considering multiple types of transactions
  - Deals covering one or multiple products
  - Deals with regional vs. global commercial players
- Preference to retain US/EU marketing rights

Platform Collaborations

- Leverage broad platform technologies and know-how into revenue opportunities to fund R&D
- Pursuing collaborations in specialty pharmaceuticals
- Considering arrangements to use our manufacturing capabilities to manufacture drug product on behalf of third party pharmaceutical companies

Financial Summary

Financials

- Cash runway into 2015
  - 6/30/13 cash and investments: $62M
  - Completed $154M financing in July 2013
    - $29M equity
    - $125M convertible debt
  - Decrease in cash and investments from Q1 to Q2 of $25M
- Shares outstanding: ~102M as of 8/31

Sanofi MM-121 Partnership

- Worldwide co-development
- $530M in milestones
  - $60M upfront
  - $410M development and regulatory
  - $60M sales and commercial
- MACK executes Phase 2
- Co-promote in US
- Includes diagnostic
- Double digit royalties

Multiple Data Read Outs Expected Near Term

- Top line data for four Phase 2 studies for MM-121 including biomarker sub-population
  - Second line ER/PR+ breast cancer
  - Second line ovarian cancer
  - Second line wtEGFR non-small cell lung cancer
  - Neo-adjuvant ER/PR+ breast cancer
- Phase 1 data for MM-302
  - Presentation at San Antonio Breast Cancer Symposium
- Top line data for Phase 3 study of MM-398 in second line pancreatic cancer

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A Fully Integrated Cancer Company

Eight Candidate Oncology Pipeline

- 6 clinical programs w/ 20+ clinical indications
- 2 pre-IND programs and a robust discovery capability
- Developing companion diagnostics for all oncology products

Two Differentiated Drug Technologies

- Multispecific antibodies
- Targeted nanotherapeutics

Transformative R&D Platform

- Systems biology-based approach to R&D
- Integrated engineering, computing, and biology discovery engine
- Bench to bedside capabilities spanning discovery, development, manufacturing, and clinical