UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
Washington, D.C. 20549

FORM 8-K

CURRENT REPORT
Pursuant to Section 13 or 15(d)
of the Securities Exchange Act of 1934

Date of Report (Date of earliest event reported): February 24, 2014

Mast Therapeutics, Inc.
(Exact name of registrant as specified in its charter)

Delaware	**001-32157**	**84-1318182**
(State or other jurisdiction of incorporation)	**(Commission File Number)**	**(IRS Employer Identification No.)**

12390 El Camino Real, Suite 150, San Diego, California	**92130**
(Address of principal executive offices)	**(Zip Code)**

Registrant's telephone number, including area code: (858) 552-0866

Not Applicable
Former name or former address, if changed since last report

Check the appropriate box below if the Form 8-K filing is intended to simultaneously satisfy the filing obligation of the registrant under any of the following provisions:

☐ Written communications pursuant to Rule 425 under the Securities Act (17 CFR 230.425)

☐ Soliciting material pursuant to Rule 14a-12 under the Exchange Act (17 CFR 240.14a-12)

☐ Pre-commencement communications pursuant to Rule 14d-2(b) under the Exchange Act (17 CFR 240.14d-2(b))

☐ Pre-commencement communications pursuant to Rule 13e-4(c) under the Exchange Act (17 CFR 240.13e-4(c))

Item 8.01. Other Events.

Beginning on February 24, 2014, the information attached as Exhibit 99.1 to this report relating to Mast Therapeutics, Inc. (the "Company") and its development programs will be presented from time to time by the Company at various investor and analyst meetings.

Item 9.01. Financial Statements and Exhibits.

(d) Exhibits.

The list of exhibits called for by this Item is incorporated by reference to the Exhibit Index filed with this report.

By filing this report, including the information contained in Exhibit 99.1 attached hereto, the Company makes no admission as to the materiality of any information in this report. The information contained in Exhibit 99.1 hereto is summary information that is intended to be considered in the context of the Company's filings with the U.S. Securities and Exchange Commission (the "SEC"), including its Annual Report on Form 10-K filed on March 19, 2013, its quarterly reports on Form 10-Q for the periods ended March 31, 2013, June 30, 2013 and September 30, 2013, and other public announcements that the Company makes, by press release or otherwise, from time to time. The Company undertakes no duty or obligation to publicly update or revise the information contained in this report, although it may do so from time to time as it believes is appropriate. Any such updating may be made through the filing of other reports or documents with the SEC, through press releases, or through other public disclosure.

Forward-Looking Statements

Mast Therapeutics cautions you that statements included in this report, including in Exhibit 99.1 attached hereto, that are not a description of historical facts are forward-looking statements that are based on the Company's current expectations and assumptions. Such forward-looking statements include, but are not limited to, statements regarding the Company's development and regulatory strategies and commercialization plans for its product candidates, including MST-188 in sickle cell disease, arterial disease, heart failure, and AIR001, as well as the timing of activities related to those plans. Among the factors that could cause or contribute to material differences between the Company's actual results and the expectations indicated by the forward-looking statements are risks and uncertainties that include, but are not limited to: the uncertainty of outcomes in ongoing and future studies of its product candidates and the risk that its product candidates may not demonstrate adequate safety, efficacy or tolerability in one or more such studies, including MST-188 in the EPIC study; the potential for delays in the commencement or completion of clinical studies, including as a result of difficulties in obtaining regulatory agency agreement on clinical development plans or clinical study design, opening trial sites, enrolling study subjects, manufacturing clinical trial material, completing manufacturing process development activities, and being subject to a "clinical hold"; the risk of suspension or termination of a clinical study, including due to lack of adequate funding or patient safety concerns; the potential for institutional review boards or the FDA or other regulatory agencies to require additional nonclinical or clinical studies prior to initiation of planned phase 2 clinical studies of MST-188 in any particular indication in which the Company determines to develop MST-188, including heart failure, which likely would increase the total time and cost of development in the indication; the risk that clinical studies of the Company's product candidates are not successfully executed and/or do not successfully demonstrate the drug's safety or efficacy; the risk that, even if clinical studies are successful, the FDA determines they are not sufficient to support a new drug application; the risk that even if clinical studies of a product candidate in one indication are successful, clinical studies in another indication may not be successful; the Company's reliance on contract research organizations (CROs), contract manufacturing organizations (CMOs), and other third parties to assist in the conduct of important aspects of development of MST-188, including clinical studies, and regulatory activities for its product candidates and that such third parties may fail to perform as expected; the Company's ability to obtain additional funding on a timely basis or on acceptable terms, or at all; the potential for the Company to delay, reduce or discontinue current and/or planned development activities, including clinical studies, partner its product candidates at inopportune times or pursue less expensive but higher-risk and/or lower return development paths if it is unable to raise sufficient additional capital as needed; the risk that the FDA and regulatory agencies outside of the U.S. do not grant marketing approval of a product candidate, on a timely basis, or at all; the risk that the Company is not able to adequately protect its intellectual property rights relating to the MAST platform, MST-188 or AIR001 and prevent competitors from duplicating or developing equivalent versions of its product candidates; the risk that, even if the Company successfully develops and obtains marketing approval for its product candidates, it may not realize commercial success with its products and may never generate revenue sufficient to achieve profitability; and other risks and uncertainties more fully described in the Company's periodic filings with the SEC and press releases.

You are cautioned not to place undue reliance on forward-looking statements, which speak only as of the date they are made. Mast Therapeutics does not intend to revise or update any forward-looking statement set forth in this report to reflect events or circumstances arising after the date hereof, except as may be required by law. This caution is made under the safe harbor provisions of Section 21E of the Securities Exchange Act of 1934, as amended, and Section 27A of the Securities Act of 1933, as amended.

SIGNATURES

Pursuant to the requirements of the Securities Exchange Act of 1934, the registrant has duly caused this report to be signed on its behalf by the undersigned hereunto duly authorized.

Mast Therapeutics, Inc.

February 24, 2014

By: /s/ Patrick L. Keran
Name: Patrick L. Keran
Title: President and Chief Operating Officer

Exhibit Index

Exhibit No.	Description
99.1	Mast Therapeutics, Inc. corporate overview presentation, February 24, 2014

MAST THERAPEUTICS, INC.

NYSE MKT: MSTX

Corporate Overview

February 24, 2014

Forward-Looking Statements

This presentation includes forward-looking statements about our business prospects, financial position, and development of MST-188 and AIR001 for therapeutic use in humans. Any statement that is not a statement of historical fact should be considered a forward-looking statement. Because forward-looking statements relate to the future, they are subject to inherent risks, uncertainties and changes in circumstances that are difficult to predict. Actual events or performance may differ materially from our expectations indicated by these forward-looking statements due to a number of factors, including, but not limited to, results of our pending and future clinical studies, the timeline for clinical and manufacturing activities and regulatory approval; our dependency on third parties to conduct our clinical studies and manufacture our clinical trial material; our ability to raise additional capital, as needed; our ability to establish and protect proprietary rights related to our product candidates; and other risks and uncertainties more fully described in our press releases and our filings with the SEC, including our quarterly report on Form 10-Q filed with the SEC on August 5, 2013.

We caution you not to place undue reliance on any of these forward-looking statements, which speak only as of the date of this presentation. We do not intend to update any forward-looking statement included in this presentation to reflect events or circumstances arising after the date of the presentation, except as may be required by law.

Corporate Overview

- **Publicly-traded biopharmaceutical company based in San Diego**

- **Developing MST-188 for diseases with high unmet need;**
  - Near-term focus on rare ("orphan") diseases
    - Sickle Cell Disease (SCD)
    - Acute Limb Ischemia (ALI)
  - Longer-term growth into larger markets
    - Heart Failure
    - Stroke

- **Recently acquired Aires Pharmaceuticals (AIR001)**
  - Phase 2 asset in Pulmonary Hypertension (PH)
  - Complementary to MST-188

Lead Program
MST-188

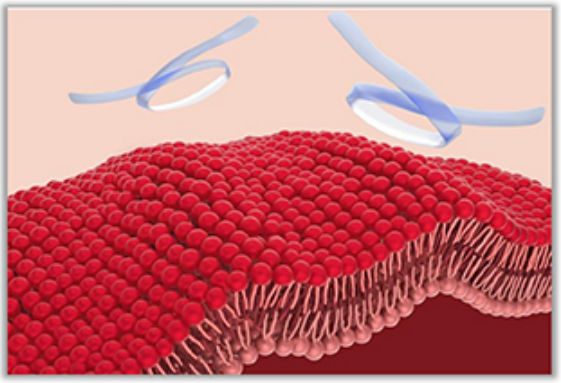
MST-188 Overview

API Structure:	$HO-(CH_2CH_2O)_{79}-(CH_2\underset{\displaystyle CH_3}{\underset{|}{C}}HO)_{30}-(CH_2CH_2O)_{79}-H$
CMC:	Large polymer (8,500 Daltons) manufactured by chemical synthesis and proprietary purification process
Drug Product:	Formulated as a clear, buffered solution
Administration:	IV infusion

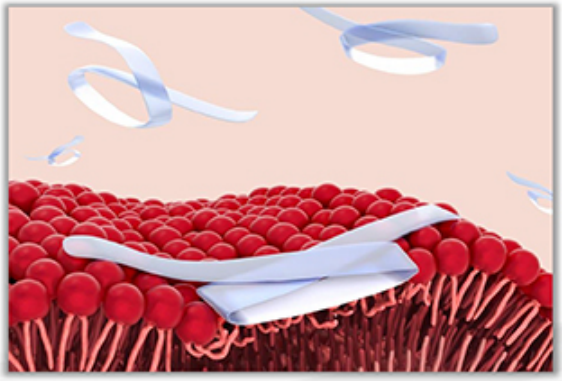
MST-188 Mechanism of Action

Hydrophobic core adheres to hydrophobic domains in circulation (e.g., damaged cell membranes)

No Affinity for Healthy Cell Membranes...

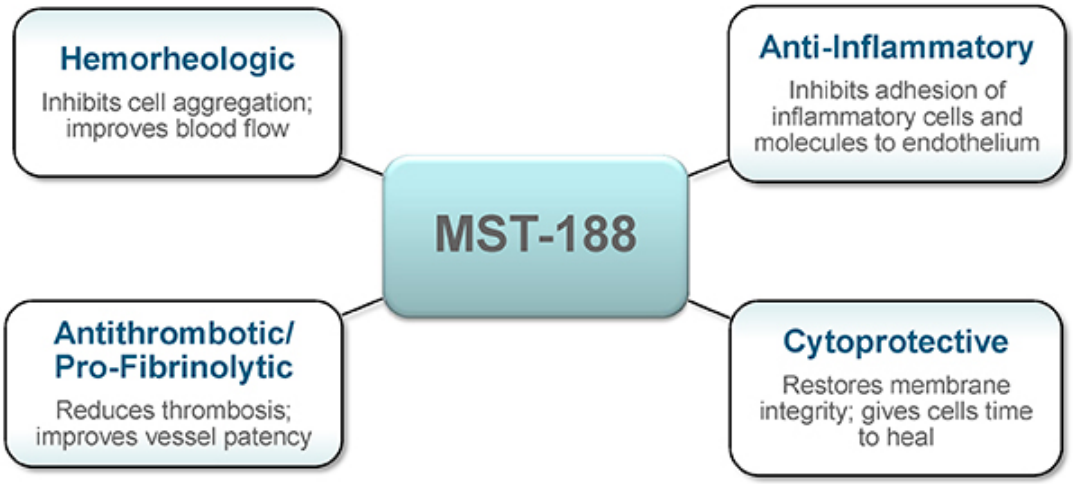


But Adheres to Damaged Cell Membranes

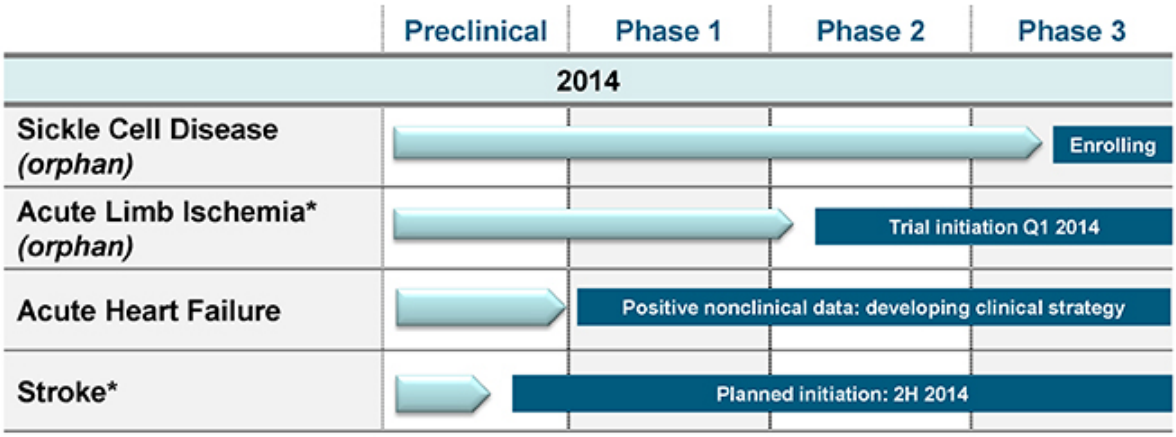


MST-188 Pharmacodynamics

Biophysical mechanism confers multiple pharmacodynamic features



MST-188 Clinical Development



In combination with thrombolytics

Sickle Cell Disease

Overview of Sickle Cell Disease

- **A chronic, genetic disorder and rare (orphan) disease**
  - Affects 90,000 to 100,000 people in the U.S.*
  - Characterized by severe deformation (i.e., "sickling") of red blood cells
- **Hallmark of disease is a "vaso-occlusive crisis"**
  - Exceedingly painful condition
  - Leading cause of hospitalization
- **Significant unmet need**
  - No approved agents to shorten duration or severity of crisis
  - Standard of care (hydration and analgesics) unchanged for >10 years
- **Vaso-occlusion is associated with early death**
  - Obstructed blood flow -> hypoxia -> tissue death -> organ failure*
  - Average age at death; 42 years (males), 48 years (females)*

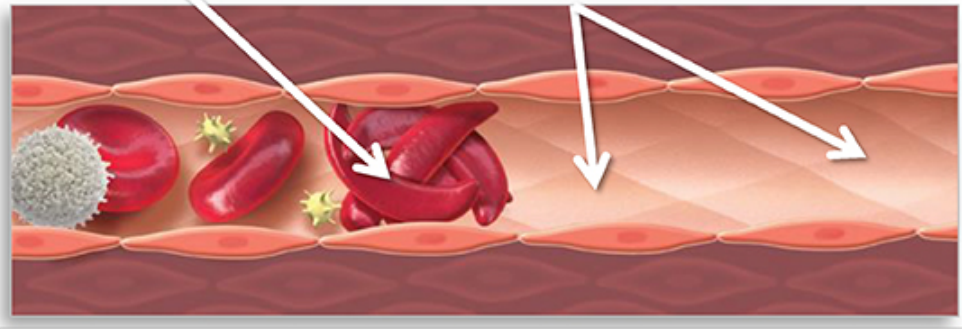
MAST THERAPEUTICS, INC.

*Sources: Centers for Disease Control and Prevention, Powars, D.R., et al., Outcome of Sickle Cell Anemia A 4-Decade Observational Study of 1056 Patients, Medicine, Vol. 84, No. 6, Nov. 2005: 363-376; Panepinto, J.A., Variation in Hospitalizations and Hospital Length of Stay in Children With Vaso-Occlusive Crises in Sickle Cell Disease, Pediatric Blood Cancer, 2005; 44:182-186

Role of MST-188 in Sickle Cell Disease

Vaso-Occlusion:
- Adhesion of poorly-deformable, "sticky" cells to endothelium
- Physical entrapment of rigid, sickled cells and vessel obstruction

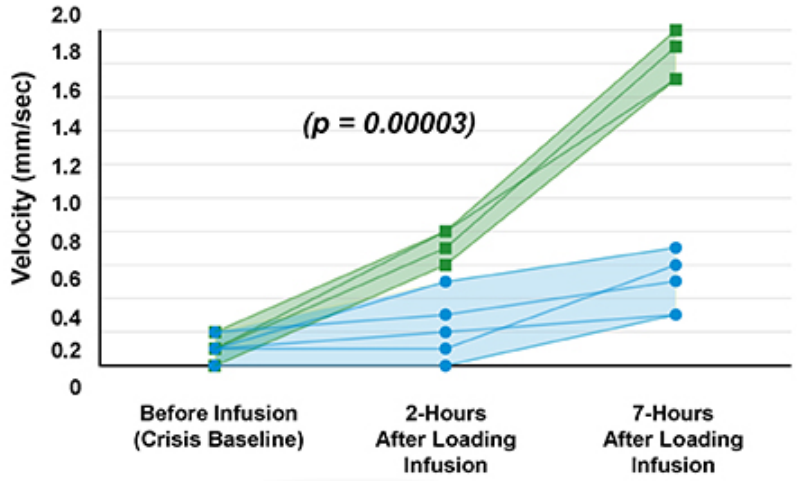
Ischemia:
- RBCs cannot traverse occlusion to deliver oxygen to tissue, resulting in ischemia, hypoxia and infarction



MST-188:
- Reduces adhesion of cells to endothelium (anti-inflammatory)
- Reduces RBC aggregation, improves RBC deformability, lowers viscosity, and restores flow (rheologic)

MST-188 Improves Blood Flow

MST-188 improved microvascular blood flow in SCD patients in crisis



Red cell velocity (mm/s) measured by video microscopy in nine sickle cell patients with vaso-occlusive crisis.

Source: J. Investig. Med. 2004;52(6):402-6

Phase 2 Study

- Randomized, double-blind, placebo-controlled, multi-center study of MST-188* in SCD patients hospitalized for crisis
- MST-188 significantly improved important efficacy parameters

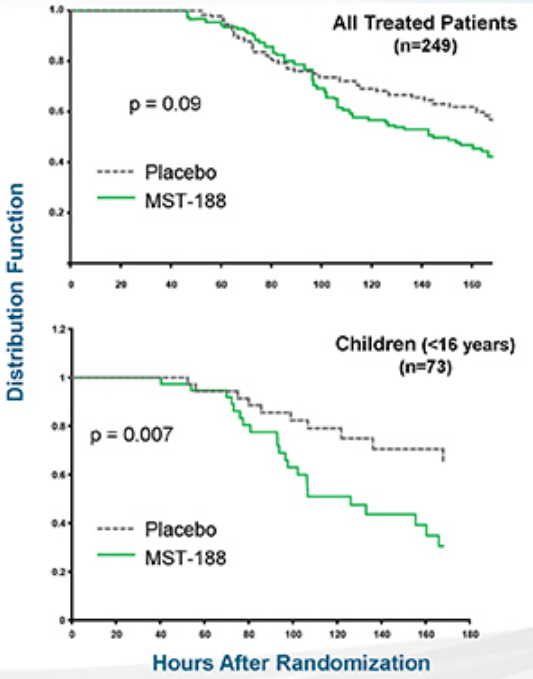
	Subjects Who Received Full Dose±		
	MST-188* (n=18)	Placebo (n=13)	*p* value±±
Duration of Crisis	44 hours	80 hours	0.025
Duration of Hospitalization	5 days	7 days	0.111
Total Analgesic Use	34mg	145mg	0.045
Parenteral Analgesic Use	27mg	133mg	0.022

± Excludes patients who had drug administration errors or incomplete pain assessments (16), who withdrew consent (2) and who withdrew because of injection site pain after 15 minutes of infusion. Subjects were excluded equally (n=9) between MST-188 and placebo.
±± Proportional hazards model adjusted for baseline pain.

Source: Blood, September 1, 1997 – Vol 90, No. 5
* 1st generation (non-purified) formulation

Phase 3 Study

- Randomized, double-blind, placebo-controlled, multi-center study of MST-188 in 255 patients with SCD
- Time-to-event analysis demonstrates consistent trend in achievement of crisis resolution
- Original statistical plan, which required 350 patients, was reduced by almost 30% by prior sponsor (capital constraints), lowering statistical power.
- Observation period was stopped at 168 hours ("right censoring"), diminishing observable treatment differences



Source: JAMA, November 17, 2001 – Vol 286, No. 17

Phase 3 Study

- Responders analysis (proportion of patients responding at a point in time) is not impacted by "right-censoring" (discontinuation of observation period)
- MST-188 significantly increased the proportion of patients achieving crisis resolution at 168 hours (end of the observation period)

Group	MST-188	Placebo	*p* Value
All treated patients (n=249)	51.6%	36.6%	0.02
Patients <16 years (n=73)	59.5%	27.8%	0.009

Source: JAMA, November 17, 2001 – Vol 286, No. 17

Evaluation of Purified 188 In Crisis (EPIC): Pivotal Phase 3 Study Design

- **Randomized, Double-Blind, Placebo-Controlled, Multicenter**
  - 388 patients
  - Standard of care +/- MST-188
- **Primary Efficacy Assessment**
  - Duration of crisis (from randomization to last dose of parenteral opioid)
- **Secondary Efficacy Assessments**
  - Re-hospitalization for crisis within 14 days
  - Occurrence of acute chest syndrome
- **Power**
  - 90% power to detect a 16-hour difference (p=0.05)
  - 85% power to detect a 24-hour difference (p=0.01)

EPIC Success Factors

- **Enrollment on-track at 6-months** *(announced Jan 2014)*
  - 40 U.S. sites opened in 2013
  - First ex-U.S. sites opened Q1 2014

- **Most Advanced New Drug in SCD**
  - Potential to be first approved drug to treat an on-going vaso-occlusive crisis
  - Substantial head start versus other SCD drugs in development

- **Positive Factors for Regulatory Decision-Making**
  - Significant unmet need – standard of care unchanged for years
  - Increased reliance on disease experts in rare disease
  - Support for MST-188 among medical / advocacy communities
  - Fast Track designation
  - Orphan Drug designation
  - Healthcare disparity

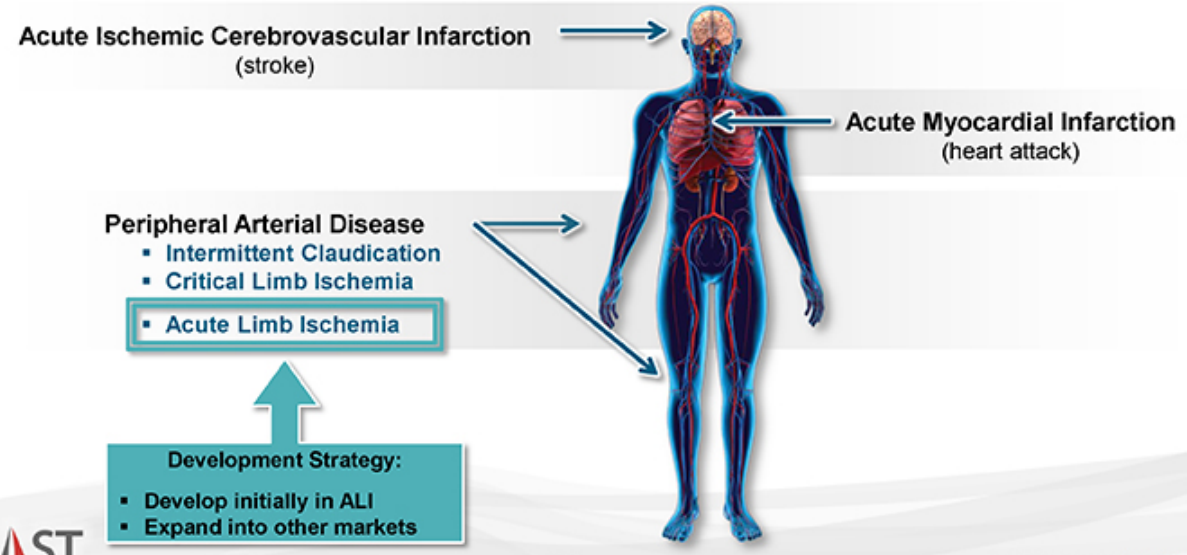
Arterial Disease

(MST-188 In Combination with Thrombolytics)

- Acute Limb Ischemia
- Stroke

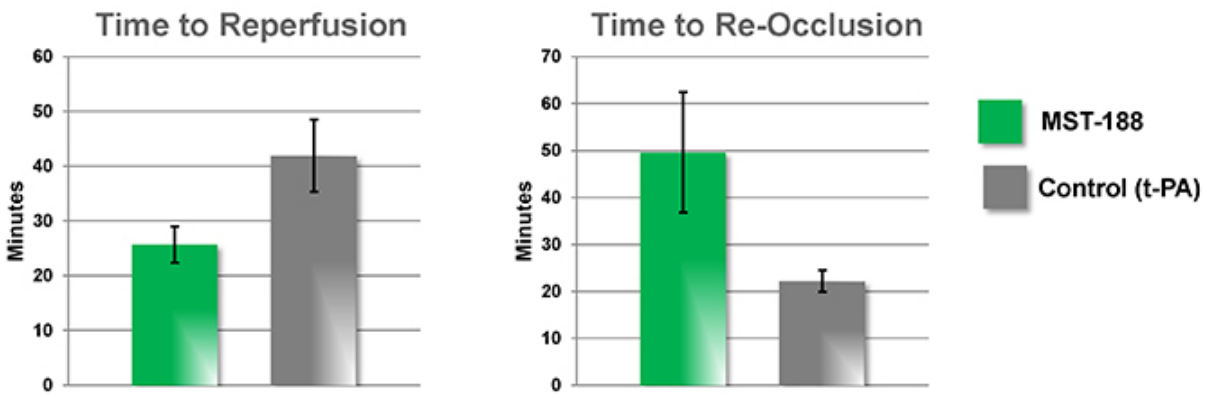
Overview of Arterial Disease

- A progressive circulatory problem in which obstructed arteries reduce blood flow to tissues
  - Thrombolytic agents (tPA) are used to treat acute complications
  - Significant morbidity and mortality



MST-188 Improved t-PA Effectiveness

Animals randomized to t-PA (n = 10) or t-PA + MST-188 (n = 10)



Source: Data on file

MST-188 Showed Synergy with Thrombolytics in Heart Attack

Parameter	MST-188*	Control	Difference	*p* Value
Myocardial Infarct Size (median)	16%	26%	38% reduction	0.031
Myocardial Salvage (median)	13%	4%	125% increase	0.033
Ejection Fraction (median)	52%	46%	13% improvement	0.020
Incidence of Reinfarction	1%	13%	92% reduction	0.016

Source: Circulation 1996; 94: 298-307

- 1st generation (non-purified) formulation
- N=114

Planned Phase 2 Study in ALI

- **Clinical Proof-of-Concept Study**
  - Biomarkers
  - Clinical outcomes
- **Study Design**
  - Dose-finding, randomized, double-blind, and active-controlled
  - Rutherford Class 2A / 2B and catheter-directed thrombolysis
  - t-PA +/- low or high dose MST-188
  - 60 subjects (20 per arm)
- **Timing**
  - Protocol submitted to FDA
  - Initiation: Q1 2014
  - Enrollment: ~18 months
- **Data can be supportive of clinical development in stroke**

Heart Failure
(Acute Decompensation)

Overview of Heart Failure

- **Chronic condition characterized by decreasing heart function**
  - Heart cannot pump enough blood to meet the body's needs
  - Cardiac deterioration following myocardial injury (e.g., heart attack) or increased cardiac workload (e.g., high blood pressure or valve disease)
  - Primary clinical symptom is difficulty breathing (fluid in lungs – "congestive")
- **Significant Unmet Medical Need**
  - Leading cause of hospitalization of elderly
  - Leading healthcare cost in U.S. and Europe
  - High rates of re-hospitalization and mortality
- **Substantial and Growing Market Opportunity**
  - > 5 million individuals with heart failure in the U.S.
  - $32 billion to treat heart failure in the U.S.
- **Acute Decompensation**
  - Each decompensation contributes to a downward spiral of worsening heart failure and damage to vital organs, decreasing survival probability following the next event

MST-188 Data in Heart Failure

- **MST-188 Improved Cardiac Function in an Established Animal Model of Chronic Heart Failure**
- **Immediate and durable reductions in troponin and NT-proBNP**
  - Statistically significant at 2-weeks post administration
- **Potentially Novel Mechanism of Action**
  - Durable effect may indicate direct improvement in cardiac function
  - MST-188's membrane-sealing activity may restore weakened cardiac cell membranes, minimizing calcium overload injury
- **Next Steps**
  - Conferring with experts on clinical development strategy

AIR001

(sodium nitrite) inhalation solution

AIR001

- **Intermittently delivers nebulized formulation of nitrite**
  - AIR001 converted to nitric oxide
  - Beneficial effects include dilation of blood vessels, reduction of inflammation and undesirable cell growth
- **Orphan drug status in U.S. and EU for treatment of Pulmonary Arterial Hypertension (PAH)**
- **Development to date has been focused primarily in PAH**
  - Safety data in more than 120 subjects (well-tolerated)

Pulmonary Hypertension

Overview of Pulmonary Hypertension

- **High blood pressure affecting the blood vessels in the lungs**
  - Leads to shortness of breath, dizziness, fainting, leg swelling, etc.
  - May result in heart failure

- **World Health Organization (WHO) defined classifications[1]**
  - WHO Group 1 (Pulmonary arterial hypertension or PAH)
    - Idiopathic, familial, or associated with other diseases
  - WHO Group 2 (PH associated with left heart disease)
  - WHO Group 3 (PH associated with lung disease and/or hypoxemia)
  - WHO Group 4 (PH due to chronic thrombotic and/or embolic tissue)
  - WHO Group 5 (PH due to unclear multifactorial mechanisms)

- **PAH is a rare/orphan disease**
  - Approximately 100,000 patients in U.S. & Europe
  - Significant market opportunity (~$3Bn sales)

[1] Simonneau G, Robbins I, Beghetti M. et al. Updated clinical classification of pulmonary hypertension. *J Am Coll Cardiol 2009; 54: S43-S54.*

AIR001 for Pulmonary Hypertension

- **A phase 2 study in PAH was discontinued just prior to acquisition (capital constraints)**
  - Results will supplement AIR001 safety data and provide insight into PAH opportunity
  - Data expected Q2 2014

- **Planned expansion of an ongoing Phase 2a study in PH**
  - Evaluate whether AIR001 can reduce wedge pressure and right atrial pressure in WHO Group 2 patients
  - Data expected summer 2015

MSTX Financial Overview

- Cash/investments at 12/31/13: >$44 million
- Market capitalization: ~$85 million*
- Shares outstanding: ~103 million*
- Average daily volume (3 mo): ~3.5 million*
- No debt
- Evaluating strategic partnerships

Upcoming News & Events

Open First EPIC Site Outside the U.S.	Q1 '14
Initiate Phase 2 Study in Acute Limb Ischemia	**Q1 '14**
Outcome from U.S. Adopted Names Council Review of Unique Designation for Purified Poloxamer 188	Q1 '14
Submit Abstract with Heart Failure Study Biomarker Data to Major Medical Conference	**Q2 '14**
Request Orphan Designation for ALI in EU (Received in U.S.)	Q2 '14
Initiate Nonclinical POC Study in Stroke	**Q2 '14**
Report Results from Phase 2 study of AIR001 in PAH	Q2 '14

Mast Investment Summary

- **A Leader in Areas of Significant Unmet Need**
  - Sickle Cell Disease: Most advanced new drug in development (Phase 3)
  - Acute Limb Ischemia: Initiating Phase 2 study in Q1 2014
  - Heart Failure: potential new mechanism with durable effects
- **Recently acquired Aires Pharmaceuticals (AIR001)**
  - New opportunities in pulmonary hypertension & PH with left heart disease
- **Cash and marketable securities**
  - Over $44 million at 12/31/13
- **Non-Dilutive Financing Opportunities**
  - Strategic partnerships