MATINAS BIOPHARMA

Corporate Presentation

October 2015

OTCQB: MTNB

www.matinasbiopharma.com

Forward Looking Statement

This presentation contains "forward-looking statements" within the meaning of the Private Securities Litigation Reform Act of 1995, including those relating to the Company's product development, clinical and regulatory timelines, market opportunity, cash flow and other statements that are predictive in nature, that depend upon or refer to future events or conditions. All statements other than statements of historical fact are statements that could be forward-looking statements. Forward-looking statements include words such as "expects," "anticipates," "intends," "plans," "could," "believes," "estimates" and similar expressions. These statements involve known and unknown risks, uncertainties and other factors which may cause actual results to be materially different from any future results expressed or implied by the forward-looking statements. Forward-looking statements are subject to a number of risks and uncertainties, including, but not limited to, our ability to obtain additional capital to meet our liquidity needs on acceptable terms, or at all, including the additional capital which will be necessary to complete the clinical trials of our product candidates; our ability to successfully complete research and further development and commercialization of our product candidates; the uncertainties inherent in clinical testing; the timing, cost and uncertainty of obtaining regulatory approvals; our ability to protect the Company's intellectual property; the loss of any executive officers or key personnel or consultants; competition; changes in the regulatory landscape or the imposition of regulations that affect the Company's products; and the other factors listed under "Risk Factors" in our filings with the SEC, including Forms 10-K, 10-Q and 8-K. Investors are cautioned not to place undue reliance on such forward-looking statements, which speak only as of the date of this release. Except as may be required by law, the Company does not undertake any obligation to release publicly any revisions to such forward-looking statements to reflect events or circumstances after the date hereof or to reflect the occurrence of unanticipated events. Matinas BioPharma's product candidates are all in a development stage and are not available for sale or use.

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MTNB Overview

Clinical-stage biopharmaceutical company focused on identifying and developing safe and effective therapeutics for the treatment of serious and life-threatening infections

- Disruptive, proprietary lipid-crystal nano-encapsulation platform technology
- Lead program, MAT2203, an oral formulation of Amphotericin B for serious fungal infections to commence Phase 2a patient dosing Q4 2015; results expected in 2016
- MAT2203 granted QIDP and Fast Track designations August 2015
- MAT2501, an oral formulation of Amikacin for severe hospital-acquired bacterial infections scheduled for IND filing in 4Q 2015
- Experienced management team and board with track record of building companies

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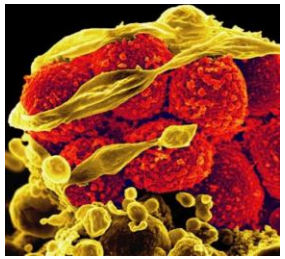
Antimicrobial Resistance is a Global Threat







CNN

"CDC sets threat levels for drug-resistant 'superbugs'"

BBC NEWS

"Superbugs to kill 'more than cancer' by 2050"

THE WALL STREET JOURNAL. WSJ

"WHO Calls for Action on Superbugs"

USA TODAY

"CDC sounds alarm on deadly, untreatable superbugs"

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Drug-resistance threat has led to strong government incentives and specific NIH support of MTNB technology

Anti-Infective Development Incentives

- Congressional initiatives:
  - GAIN: extra 5-year exclusivity (passed)
  - ADAPT: accelerated antibiotic development pathway (pending)
  - DISARM: improved reimbursement and pricing for antibiotics (pending)
  - Additional budgetary funding of $1.2 billion on annual basis for anti-infective development

NIH Stamp of Approval

NIH National Institute of Allergy and Infectious Diseases

- NIH SBIR grants and research contracts for development of:
  - Amphotericin B
  - Gram-negative Aminoglycoside antibiotics
    - Amikacin
    - Capreomycin

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Limitations of Current Anti-Infective Therapy

The Problem

- Insufficient coverage of Multidrug-resistant (MDR) fungal and bacterial infections
- Significant safety and tolerability concerns
- Lack of oral dosage forms to permit transition therapy

Cochleate Technology Offers Significant Clinical Improvement Potential

❯ Oral Administration

- Convenience; health economic benefit *vs.* IV-therapy in hospital

❯ Protects Organs

- Cochleates act as a shield for the body from toxic drugs, significantly reducing adverse effects

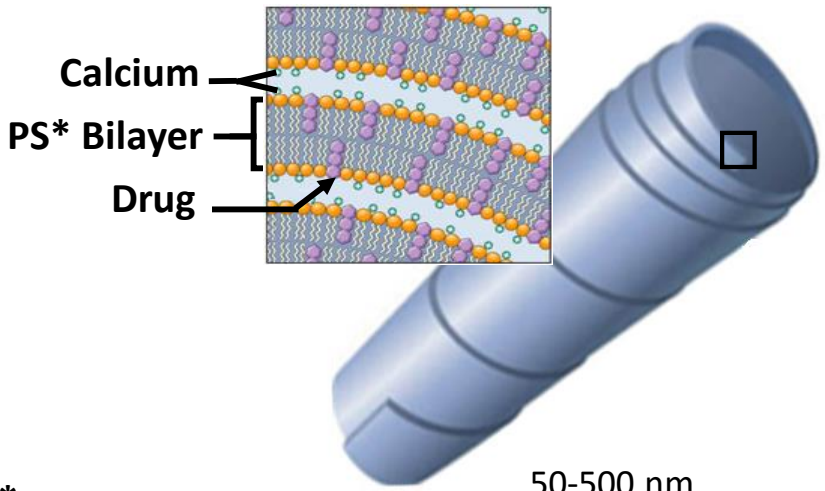
❯ Targeted Delivery

- Cochleates are carried directly to infection sites where payload is released resulting in rapid and significant tissue penetration

Cochleate Technology Mechanism of Action

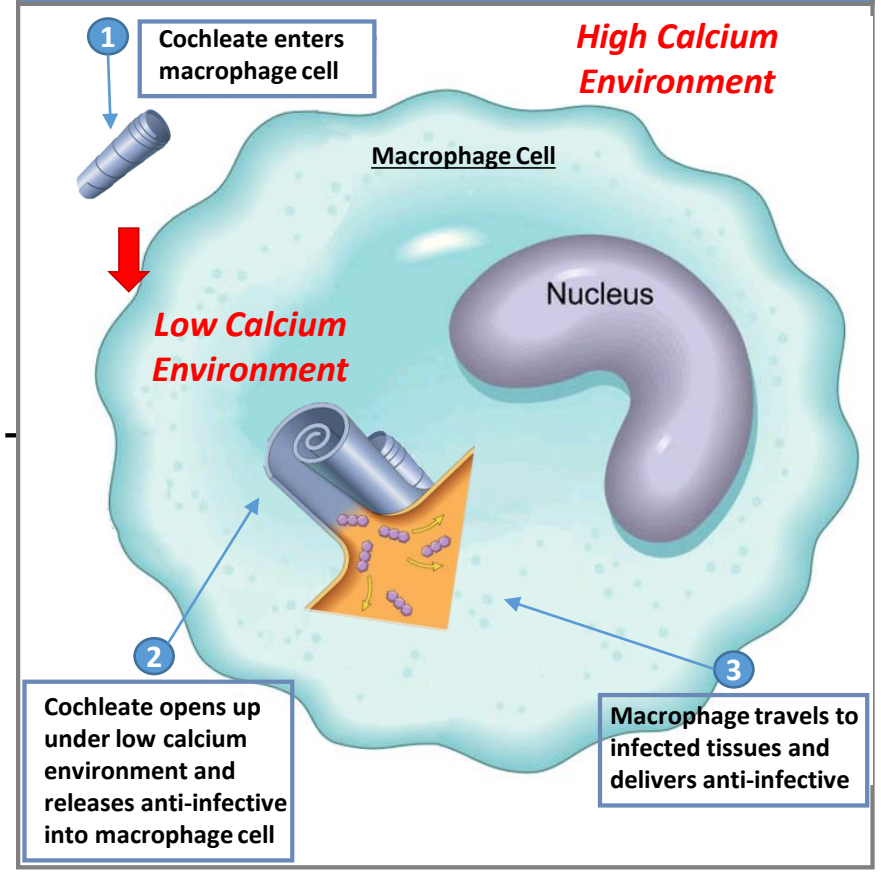
A platform drug delivery technology**…

1. ***Oral administration***
2. ***Reduces toxicity***
3. ***Targeted delivery***



* Phosphatidylserine

…that provides targeted delivery



***** Cochleate Platform patented delivery technology is under exclusive license from Rutgers University***

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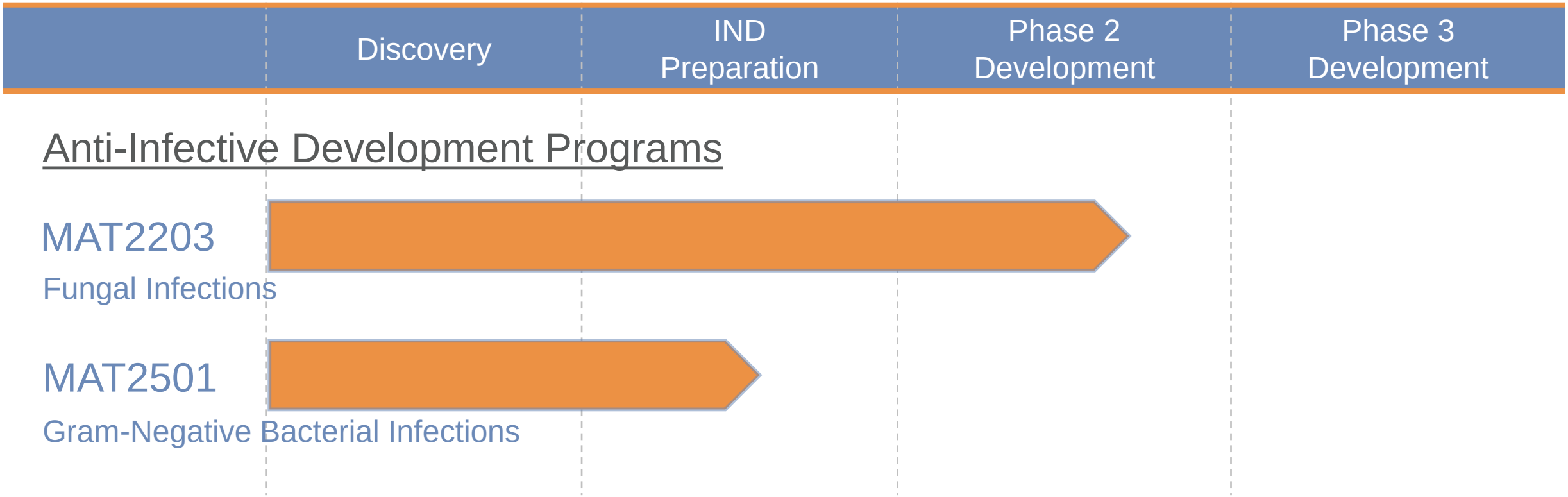
Lead Therapeutic Pipeline



Anti-Infective Development Programs

MAT2203

Fungal Infections

MAT2501

Gram-Negative Bacterial Infections

Metabolic/Cardiovascular Development Programs

Actively seeking partnering opportunities

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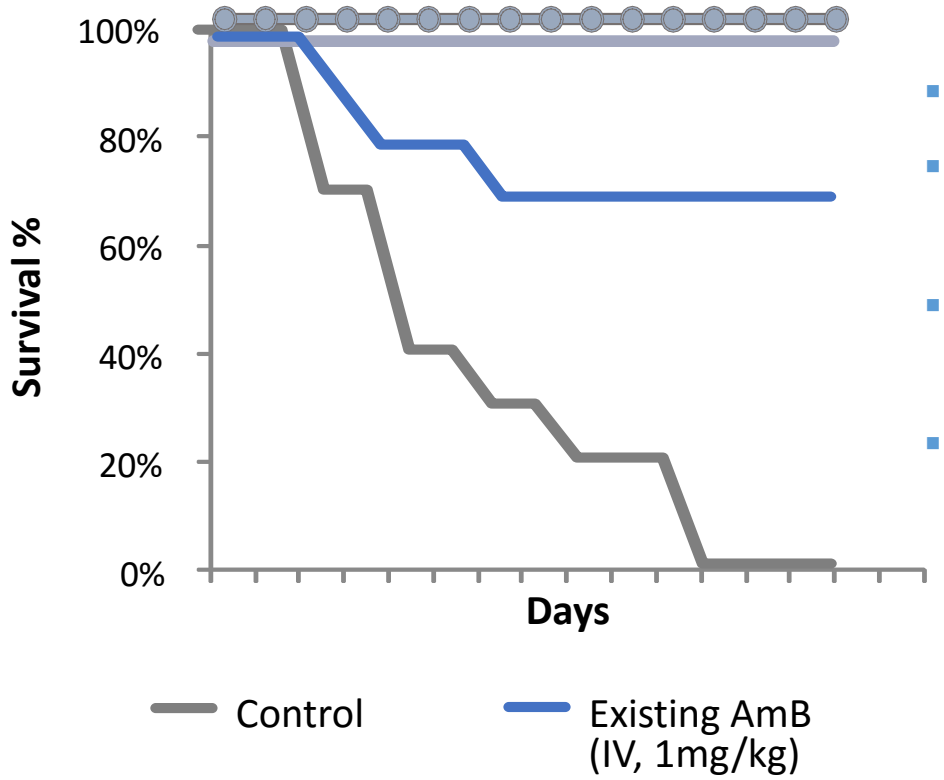
Targeted Therapy – Efficacy at a Lower Dose

Comparative Amphotericin B Study In Mouse Candidiasis Model



- ***Invasive Candidiasis mouse model at PHRI***
- ***Oral delivery of encochleated Amphotericin B vs. Injected Fungizone***
- ***Similar efficacy at significantly lower dose (0.5mg/kg versus 2mg/kg in comparator)***
- ***No noted toxicity with encochleated Amphotericin B***

Source: PHRI/Rutgers Studies in MAT2203 IND

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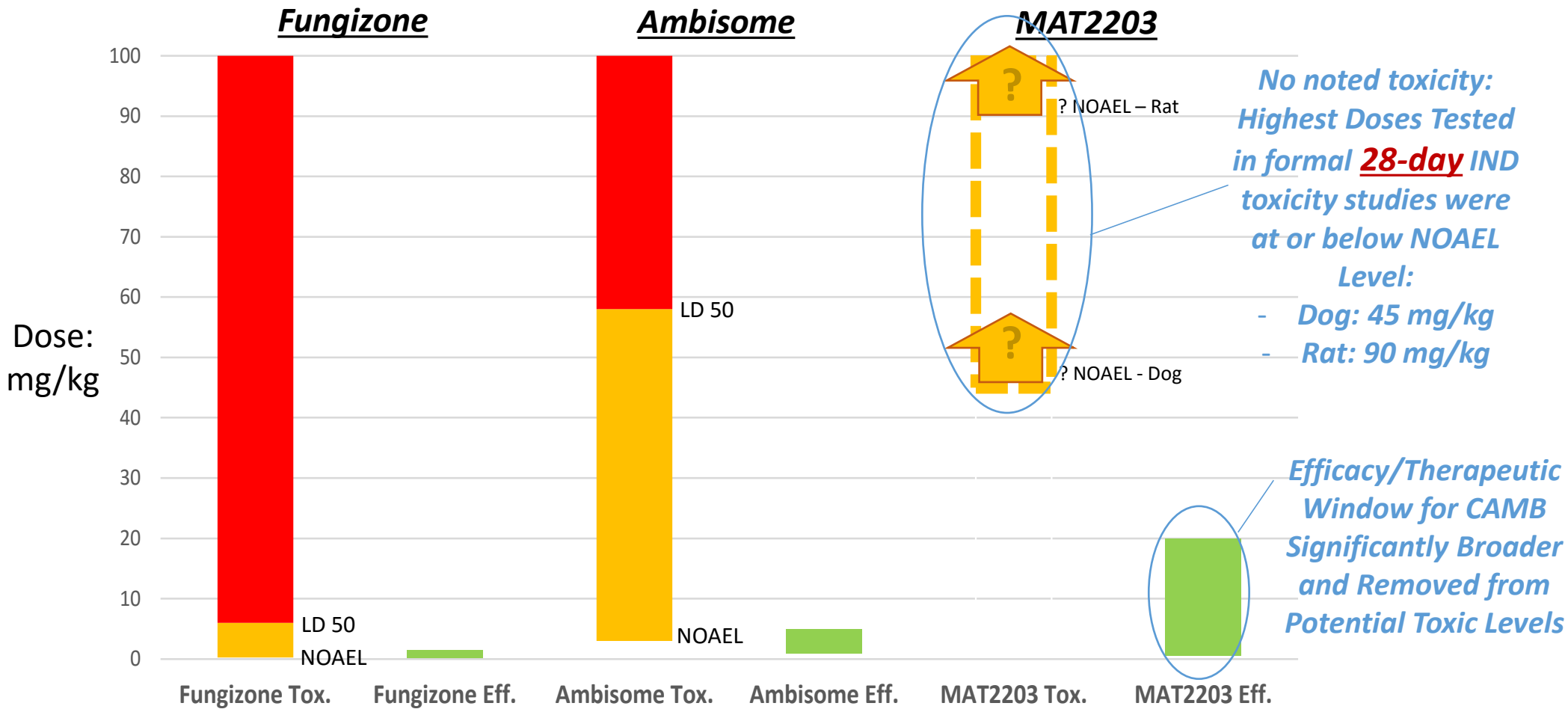
MAT2203: Significantly Lower Degree of Toxicity



Source: Monographs Fungizone and Ambisome, MAT2203 Pre-Clinical Studies

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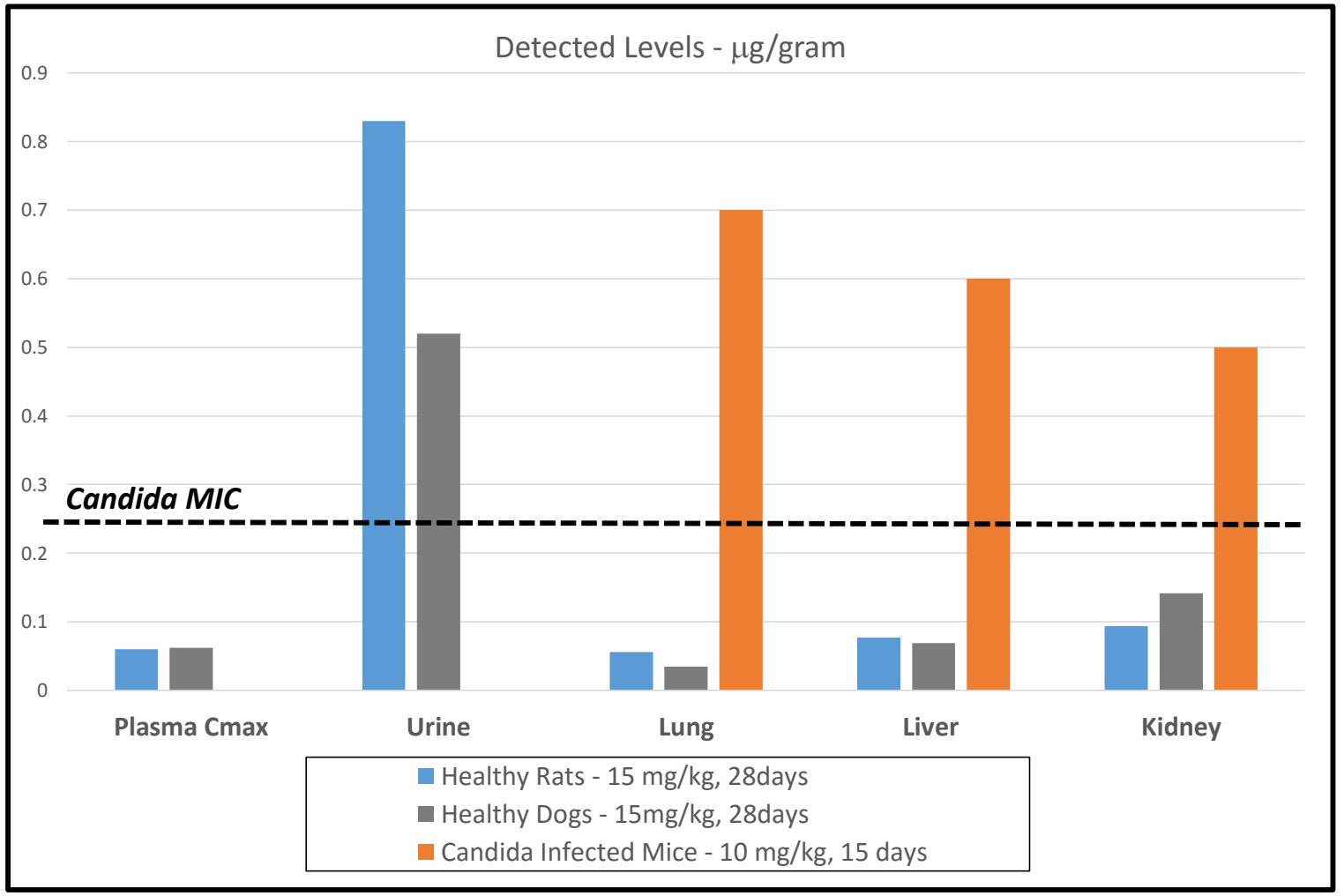
Targeted Therapy: Drug Levels High in Infected Tissues



Source: MAT2203 IND pre-clinical Studies

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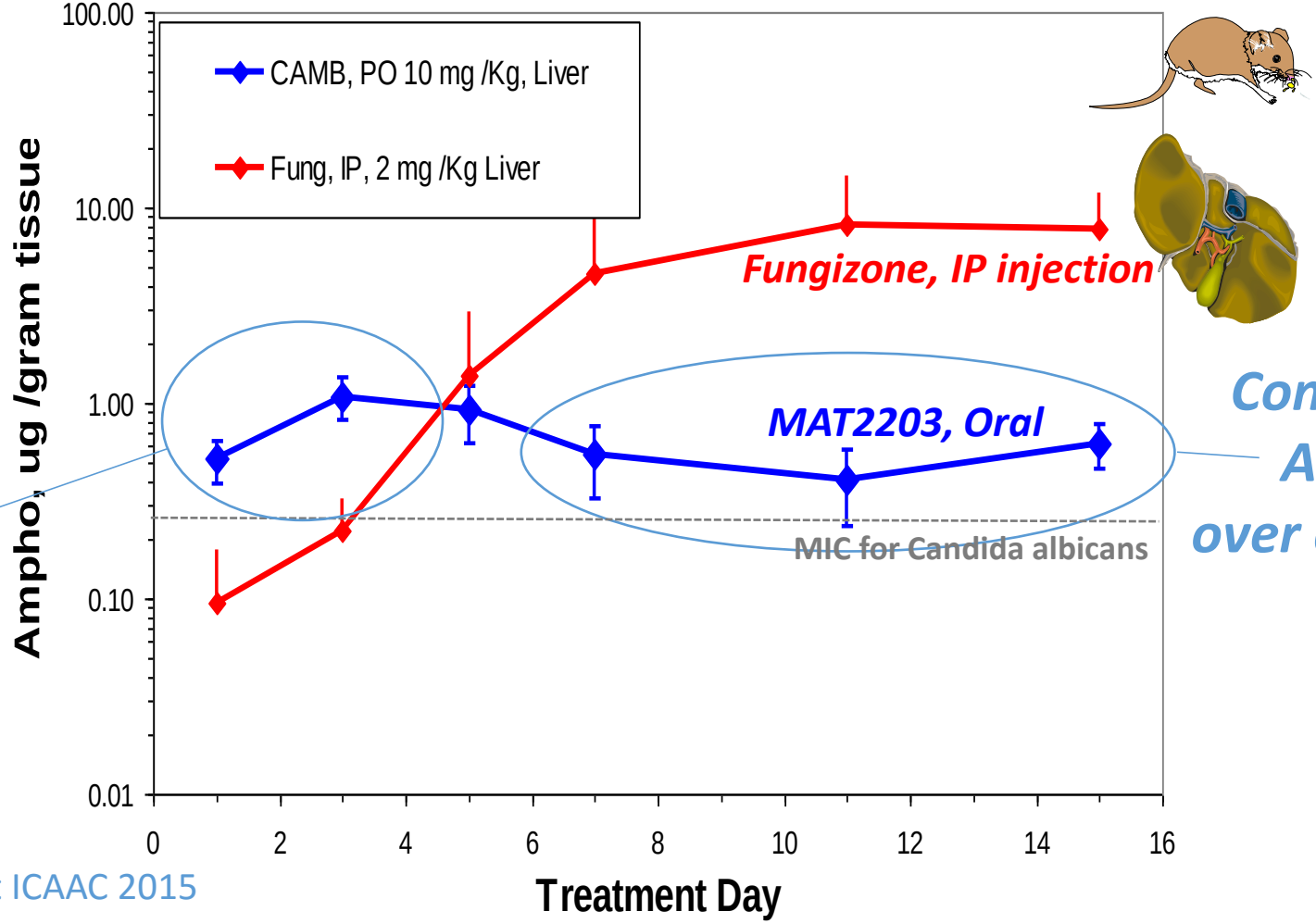
MAT2203: Significantly Improved Tissue Penetration Profile

Mouse Invasive Candidiasis Model – Liver Amphotericin Levels



Rapid Tissue Penetration

Controlled Levels of Amphotericin B over course of Therapy

Source: MAT2203 Abstract ICAAC 2015

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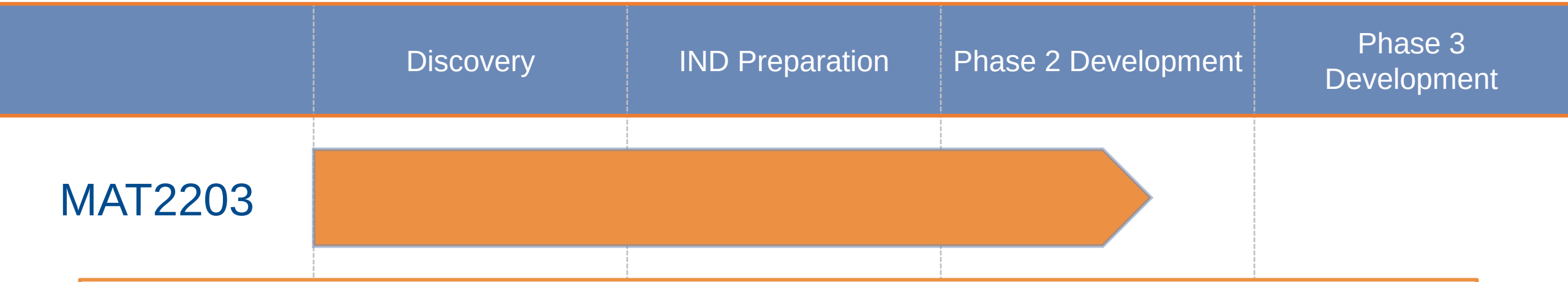
MAT2203 – Clinical Development Overview



- ✓ Successfully completed a range of efficacy animal studies at NIH with C-Amphotericin B
- ✓ Single-Dose Phase 1 study completed with favorable tolerability and no serious adverse events
- ✓ Increased production of C-Amphotericin B to ~800 doses/batch – semi-commercial scale

Next Steps:

- IRB approval of Phase 2a protocol announced in October 2015, with study commencing in Q4 2015 and data expected in 2016
- Engage with FDA on development program post-Phase 2a data

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MAT2203 Phase 2a Protocol

"A Phase 2a Efficacy, Safety, Tolerability and Pharmacokinetic Study of Encochleated Amphotericin B (CAmB) in Patients with Mucocutaneous (Esophogeal, Oropharyngeal, Vaginal) Candidiasis Who are Refractory to Standard or Tolerated Non Intravenous Therapies"

- Study designed to evaluate up to 16 patients to determine the efficacy, safety, tolerability and pharmacokinetics of oral MAT2203 in treating recurring or chronic mucocutaneous candidiasis infections.
- Subjects: hereditary immuno-deficiency patients with refractory candida mucocutaneous infections – most patients will be infected with azole-treatment-resistant candida
- Initial MAT2203 dose 200 mg/day, for 14 days
- If clinical response is significant, treatment will be extended to 28 days
- Patients with limited clinical response will be titrated to 400 mg/day or further titrated to 800 mg/day for an additional 14 days at each higher dose – total treatment up to 56 days
- Key study goals: (1) demonstrate anti-fungal efficacy with MAT2203 in patients, and (2) establish safety and tolerability profile at 28-56 days treatment duration

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MAT2203 Represents Groundbreaking Advancement in Anti-Fungal Treatment

- Significantly improved tissue penetration profile over current IV-only administration of Amphotericin B
- Demonstrated efficacy and little-to-no kidney toxicity in animal models as compared to current Amphotericin B therapy
- Differentiation supports potential to capture and expand $700MM global Amphotericin B market
- Granted QIDP and Fast Track designations in August 2015
- Development program to focus on indications with potential for Orphan Drug and Breakthrough Therapy designations
- MAT2203 commencing dosing in Phase 2a with NIH Q4 2015
- Phase 2a data expected 2016

The Drug Resistant Antibiotic Market

- Widespread use of antibiotics ($41 billion worldwide per IMS) has resulted in rapid increase of resistance to multiple antibacterial agents
- Gram-negative bacterial infections characterized as #1 unmet medical need by infectious disease specialists
- Effective first-line treatment of serious infections requires use of broad spectrum antibiotics
- Many strains of bacteria have mutated over time, developing resistance to existing drugs
- According to 2013 CDC report, 2 million people in the U.S. each year acquire serious infections that are resistant to one or more antibiotics

MAT2501 – Development Overview

MAT2501

C-Amikacin (broad spectrum aminoglycoside)

Potential to be first orally administered Amikacin without toxicity or side effects as seen with IV

Treating chronic and hospital-acquired gram-negative bacterial infections

Potential High-need Indications:

- Pulmonary infections – Non-Tuberculous Mycobacterium and Cystic Fibrosis associated lung infections
- Hospital acquired urinary track infections
- Ventilated patients in ICU or long-term care

	Discovery	IND Preparation	Phase 2 Development	Phase 3 Development
MAT2501				

✓ Completed proof-of-principle testing in animal models showing in vivo efficacy of oral C-Amikacin against Mycobacterium Avium; both disseminated and lung disease models)

Next Steps:

- Formal pre-clinical animal toxicology studies ongoing with NIH support
- IND filing expected 4Q2015
- Potential for QIDP, Orphan, Fast Track

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Cochleate Nanoparticle Delivery has Broad Utility with Potential for Orphan Drug Applications

	Collaborations	*In-Vitro*	Animal POC	IND-Prep	Human Studies
Amphotericin B	**NIH / PHRI**				
Amikacin	**NIH**				
Vaccines					
Ibuprofen					
Atovaquone	**NIH**				
Capreomycin	**NIH**				
Meropenem	**NIH**				
Anti-virals	**NIH**				

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Intellectual Property and Regulatory Exclusivity

- 17 issued and 20+ pending U.S. and foreign patents
  - Company controls prosecution
  - 10 patents issued within past 3 years; Patent protection currently extends through 2027
  - Pending applications can extend patent protection through 2033

- Potential for significant regulatory exclusivity (Orphan; GAIN)

Management Team

Strong development and commercialization track record

Roelof Rongen Co-Founder, Chief Executive Officer, Director	Reliant Pharmaceuticals, Inc.	Humira (adalimumab)
Jerome D. Jabbour, JD Co-Founder, Chief Business Officer & General Counsel	Reliant Pharmaceuticals, Inc.	Wockhardt
Raphael J. Mannino Chief Technology Officer	Rutgers New Jersey Medical School	biodelivery sciences
Douglas F. Kling SVP, Clinical Development and Project Management	Reliant Pharmaceuticals, Inc.	The Medicines Company
Abdel Fawzy, PhD Co-Founder, EVP, Pharmaceutical & Supply Chain Development	Reliant Pharmaceuticals, Inc.	DuPont Pharma
Gary Gaglione, CPA Chief Financial Officer, Vice President of Finance	Reliant Pharmaceuticals, Inc.	Roche

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Board of Directors

Herbert Conrad Chairman of the Board	Roche, PHARMASSET, Celldex therapeutics, Reliant PHARMACEUTICALS, INC.
James Scibetta Director	PACIRA PHARMACEUTICALS, INC., bioenvision, MERRIMACK PHARMACEUTICALS
Adam Stern Director	STERNAEGIS VENTURES, INVIVO THERAPEUTICS, organovo™, PROLOR BIOTECH Protein.Longevity.Redefined
Stefano Ferrari Director	bioseutica, KD Pharma The Purity Experts, SPA - Società Prodotti Antibiotici S. p. A.

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Prominent Scientific Advisory Board

J. Carl Craft, MD, Chair

- Former Chief Scientific Officer for Medicines for Malaria Venture (MMV)
- Former Venture Head at Abbott Laboratories Anti-Infective Development Group

David S. Perlin, Ph.D.

- Internationally renowned expert in infectious disease, with primary expertise in fungal infections and mechanisms of antifungal drug resistance
- Executive Director of the Public Health Research Institute (PHRI)
- Professor of Microbiology, Biochemistry and Molecular Genetics at New Jersey Medical School

Peter G. Pappas, MD, FACP

- Professor of Medicine in the Division of Infectious Diseases and Tinsley Harrison Clinical Scholar at the University of Alabama in Birmingham
- Principal Investigator for the Mycoses Study Group

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New anti-infective programs should bring substantial value appreciation potential to MTNB

MTNB Programs	COMPS		
MAT2203 C-Amphotericin B *Fungal Infections* - Entering Phase 2a	CIDARA THERAPEUTICS ~$170 million [CDTX] Novel Echinocandin *Fungal Infections* - Pre-IND Stage	basilea PHARMACEUTICA ~$1.0 billion [BSLN.SW] Isavuconazole *Fungal Infections* - NDA Approved	ANACOR PHARMACEUTICALS ~$5.2 billion [ANAC] Tavaborole *Topical Anti-Fungal* - Approved/Launched
MAT2501 C-Amikacin *Gram-Negative Bacterial Infections* - IND toxicology stage	insmed ~$1.1 billion [INSM] Inhaled Amikacin *Lung Infections* - Phase 3	TETRAPHASE PHARMACEUTICALS ~$284 million [TTPH) Eravacycline *cUTI.* - Phase 3	cellceutix ~$173 million [CTIX] Brilacidin *Skin Infections* - Phase 2

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Matinas BioPharma – Financial Snapshot

OTCQB	MTNB
Share Price	$0.77
Market Cap	~$44 million
Shares Outstanding	~57 million

As of October 19, 2015

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MTNB is a Compelling Opportunity

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