



A clinical-stage biopharmaceutical company focused on the development of lipid-based prescription therapeutics for the treatment of cardiovascular and metabolic conditions and infectious diseases

BUSINESS UPDATE CONFERENCE CALL

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.

Agenda

- **MATINAS BIOPHARMA AND AQUARIUS SYNERGIES AND STRATEGY**
Roelof Rongen, Chief Executive Officer and Co-Founder
- **TECHNOLOGY, SCIENTIFIC PARTNERS, MATINAS BIOPHARMA**
Dr. Raphael J. Mannino, Founder of Aquarius and an Inventor of the Cochleate Bio-delivery Platform Technology
- **TRANSACTION SUMMARY AND FINANCIAL OUTLOOK**
Jerry Jabbour, Chief Business Officer and Co-Founder
- **Q&A**
- **CLOSING REMARKS**
Roelof Rongen

Roelof Rongen

*Matinas BioPharma and Aquarius Biotechnologies
Synergies and Strategy*

Aquarius Biotechnologies Highlights

- Novel lipid-crystal nano-particle cochleate formulation delivery platform with opportunity for broad use in anti-infectives
- Proprietary technology platform with broad application expected to drive a robust pipeline in high-value markets and niche, potentially orphan indications
- Lead program for oral administration of Amphotericin B antifungal (MAT2203) expected to enter Phase 2a in 2015 in collaboration with NIH
- Amikacin-based antibiotic potentially fulfilling significant need to treat life-threatening Gram-negative bacterial infections

Synergistic Lipid-Based Therapy Approach

Lipid-Based Therapies

Lipids as Pharmaceutically Active Compounds

- **MAT9001**
 - Severe hypertriglyceridemia
 - Other dyslipidemia
- **MAT8800**
 - Fatty Liver Disease

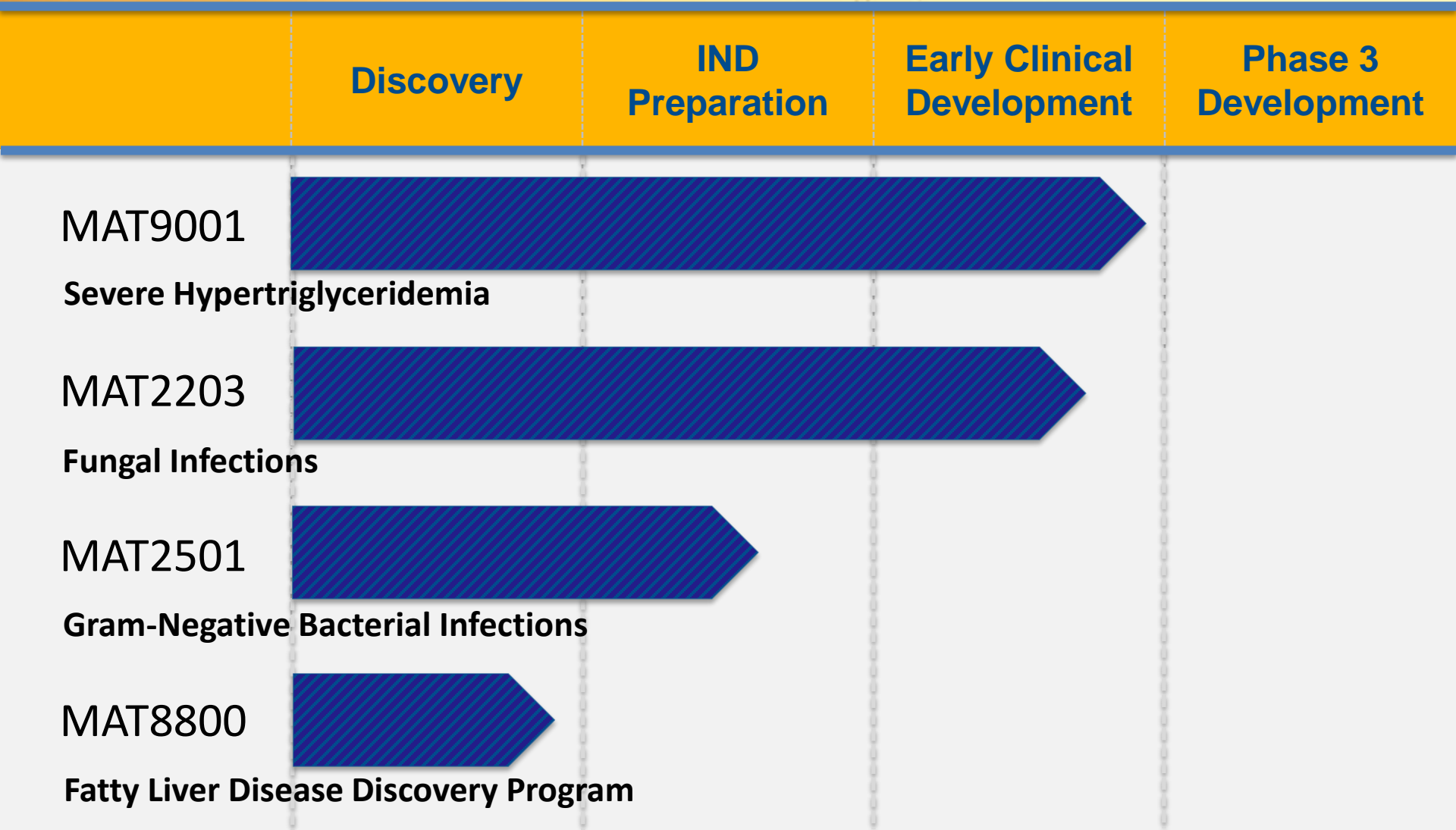
Clinical Stage Program

Lipids as “Nano-Particle” Delivery Vehicles

- **MAT2203 – C-Amphotericin B**
 - Broad Spectrum Fungicidal
- **MAT2501 – C-Amikacin**
 - Aminoglycoside Antibiotic (gram-)

Clinical Stage Program

Pipeline Expansion with Additional Clinical-Stage Opportunities with Potential to Drive Sustainable Value



MAT9001

*A Next Generation Prescription-only
Omega-3 Fatty Acid Medication*

MAT9001 – Program Achievements

- ✓ Promising results with DPA in pre-clinical studies
- ✓ Proprietary process for high purity DPA manufacturing, at GMP 10+kg scale
- ✓ Development of proprietary soft-gel formulation
- ✓ Formation of prominent Scientific Advisory Board
- ✓ Filed MAT9001 IND with FDA Q4 2014
- ✓ Commenced first human trial for MAT9001 in Canada Q4 2014
- ✓ Established robust MAT9001 IP estate:
 - Filed 22 patents across 3 families
 - One U.S. Patent issued Dec. 2014

Lead Product Candidate MAT9001 Remains a Priority



Next Steps:

- Comparative PK/PD crossover study ongoing in Canada – ~50 pts
- Protocol responses to FDA (comparative PK and animal tox)
- Conduct comparative PK and animal tox studies
- Submit results from PK and animal tox studies and Phase 3 protocol
- Initiate Phase 3, pending FDA process and funding
- Exploring other CV and dyslipidemia indications

MAT2203

***Amphotericin B Delivered in a Lipid-Crystal
Nano-Particle Cochleate Formulation
-- Broad-Spectrum Fungicidal Agent --***

Cochleate Technology Offers Significant Clinical Improvement Potential

Multi-Organ Protection

- Cochleates act as a shield for the body from otherwise toxic medicinal compounds

Targeted Delivery

- Cochleates are carried directly to infection sites

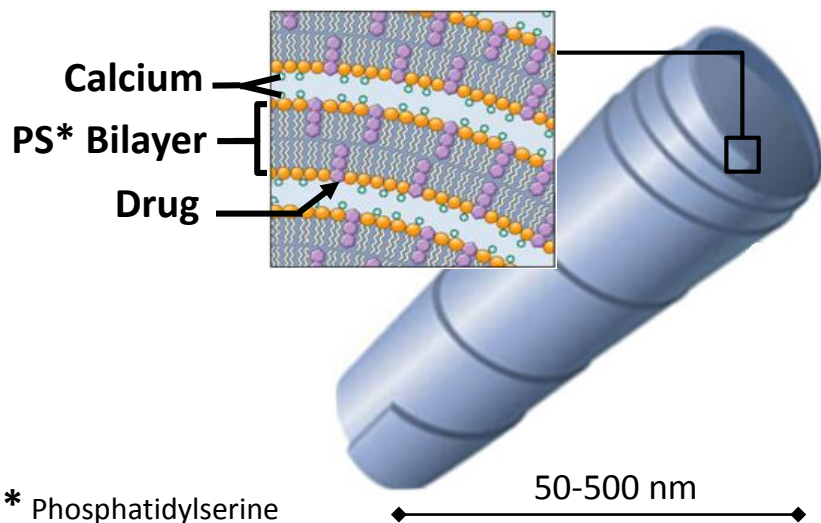
Oral Administration

- Efficacy demonstrated in *in-vivo* animal studies
- Safety demonstrated in Phase 1 human study

Cochleate Targeted Nano-particle Delivery Mitigates the Limitations of Amphotericin B

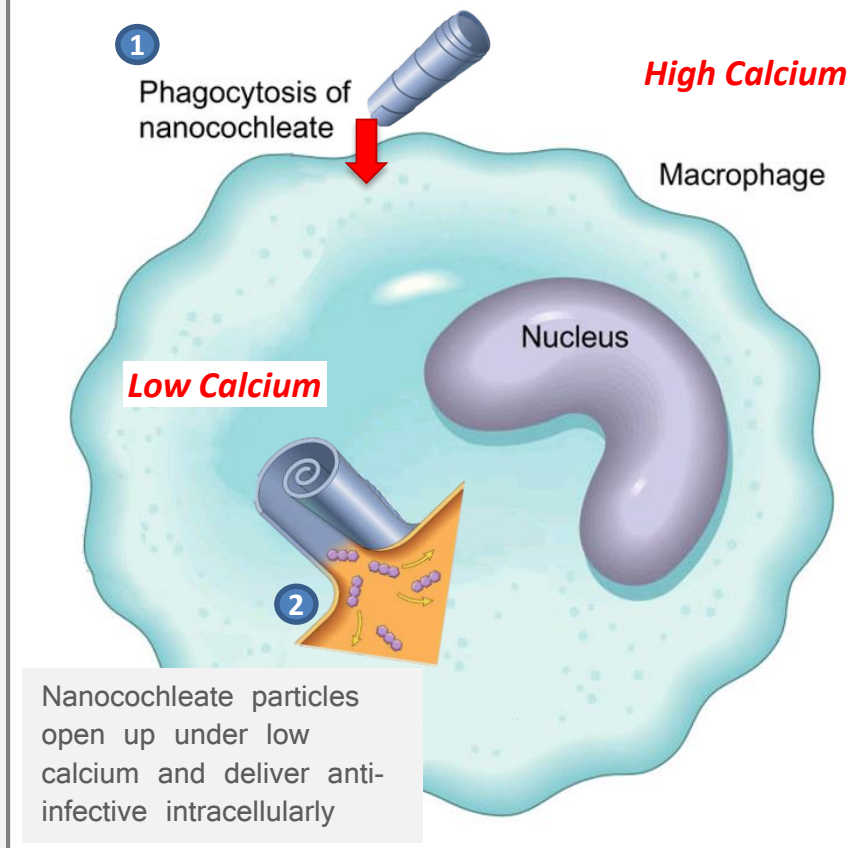
A platform drug delivery technology**...

1. **Reduces toxicity** by containing drug inside particle
2. Size and surface features facilitate **targeted delivery**
3. Potential for **oral administration**



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

...that provides targeted delivery



Scientific Merit of Cochleate Technology and Clinical Unmet Need has Led to Several NIH Collaborations

- NIH SBIR grants and research contracts towards encochleated Amphotericin B research
- NIH SBIR grants and research contracts toward encochleated Aminoglycoside antibiotics research
 - Amikacin
 - Capreomycin
- Discussion on Clinical Trial Agreement with NIH for Phase 2a clinical study with Amphotericin B in patients is ongoing
- Other projects under discussion/review

- Continuous stream of legislative initiatives to stimulate anti-infective development
- Significant government funding committed towards development of new anti-infectives

MAT2203 – Recent Significant Advancements

- ✓ Completed cryptococcal meningitis mouse studies at NIH with C-Amphotericin B
- ✓ Increasing C-Amphotericin B scale to ~800 doses/batch
- ✓ Preparing for C-Amphotericin B Phase 2a efficacy trial at NIH – refractory mucocutaneous candidiasis patients

Significant Clinical Need for Fungicidal Agents

Approximately 150,000 potential cases annually in the U.S. alone

Invasive Fungal Infections

- ✓ Cryptococcal Meningoencephalitis
- ✓ Aspergillosis

Patient Populations at High Risk for Fungal Infections

Hematological Malignancies

- ✓ Leukemias
 - ALL
 - AML

Stem Cell Transplants

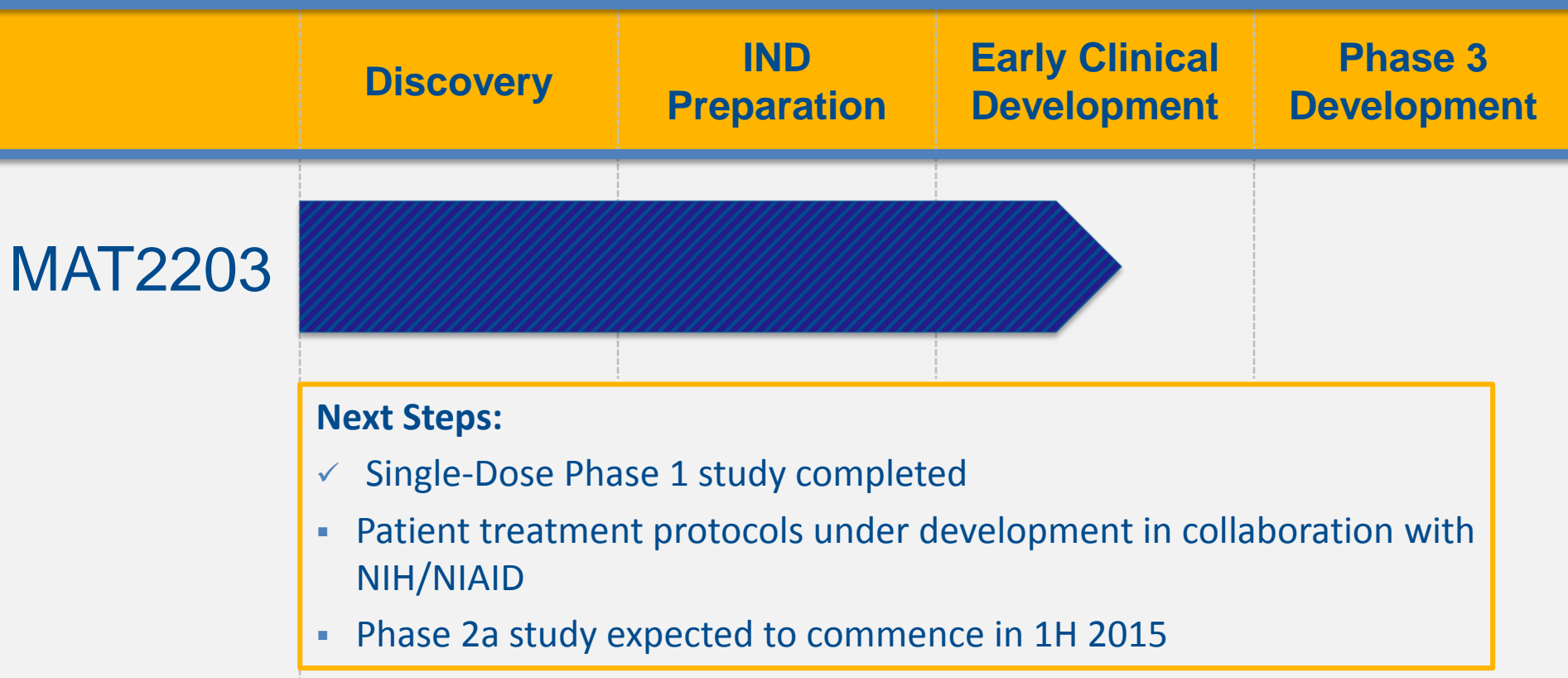
- ✓ Autologous
- ✓ Allogeneic

Solid Organ Transplants

- ✓ Kidney
- ✓ Liver
- ✓ Other

Potential to Address Orphan Indications

MAT2203 – Development Overview



MAT2501

***Amikacin Delivered in a Lipid-Crystal Nano-
Particle Cochleate Formulation
-- Gram-Negative Aminoglycoside Antibiotic --***

MAT2501 – Development Overview

MAT2501

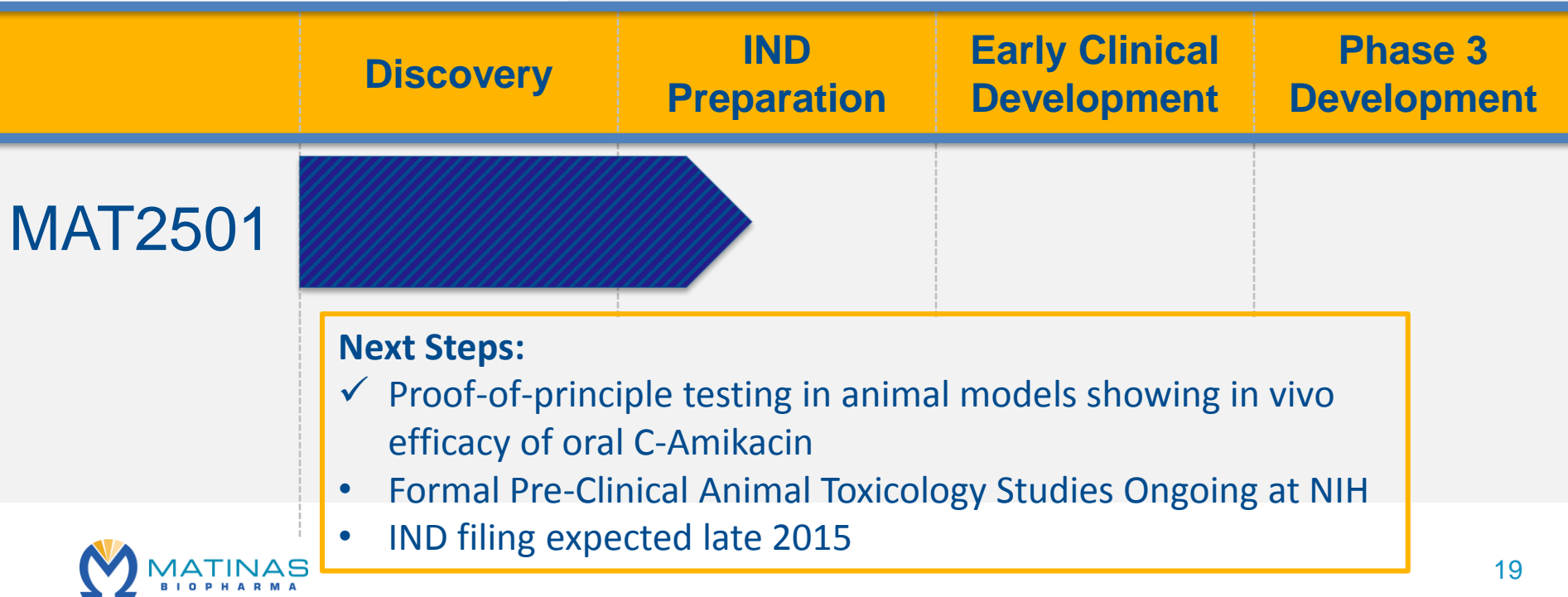
– C-Amikacin

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

Treating severe and hospital-acquired gram-negative bacterial infections

Potential High-need Indications:

- Cystic Fibrosis pulmonary infections
- Ventilated patients in ICU or long-term care
- Hospital acquired urinary track infections



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

	Collaborations	<i>In-Vitro</i>	Animal POC	IND-Prep	Human Studies
Amphotericin B	NIH / PHRI				
Amikacin	NIH				
Vaccines					
Ibuprofen					
Atovaquone	NIH				
Capreomycin	NIH				
Meropenem	NIH				
Curcumin					
Omega-3 FA					

Anti-Infective Companies Garner Significant Value

Company	Lead Program	Indication	Clinical Phase	Share Price*	Market Cap*
Achaogen (AKAO)	plazomicin	Serious bacterial infections due to Multi-Drug-Resistant Enterobacteriaceae	Phase 3	\$11.77	\$209M
Cempra (CEMP)	Solithromycin	Pneumonia (CABP) and urethritis	Phase 3	\$26.30	\$942M
Tetraphase (TTPH)	eravacycline	Serious Multi-Drug-Resistant bacterial infections	Phase 3	\$36.40	\$1.12B
Basilea (BSLN)	Isavuconazole	Antifungal	NDA	\$105.10	\$1.2B
Anacor (ANAC)	Kerydin™	Onychomycosis of the toenails due to Trichophyton rubrum or Trichophyton mentagrophytes	Approved	\$36.79	\$1.5B

Recently Materialized Transactions Validate Potential in Anti-Infectives Space

Recent Acquisitions in Antibiotics

Date	Company	Acquirer	Lead Program	Indication	Stage at time of deal	Deal Total
12/14	Cubist	Merck	Multiple Anti-infectives	Multiple	Launched/ Approved/ Phase 3	\$9.5B
11/14	Durata Therapeutics	Actavis	Dalvance	Gram-positive infection	Approved in US	\$675M
10/14	Optimer Pharmaceuticals	Cubist	fidaxomicin	Clostridium difficile-associated diarrhea	Launched in US	\$811M
8/13	Trius Therapeutics	Cubist	Sivextro	Gram-positive infections , MRSA	Phase 3	\$707M

MAT8800

Fatty Liver Disease Discovery Program

MAT8800 – Development Overview

MAT8800

- Proprietary Omega-3 Discovery Program

Unique Approach with omega-3 composition; differentiated from the bile-acid approach

Treating Fatty Liver Disease

NAFLD

- Common: 12% of U.S. population

NASH

- A leading cause of cirrhosis
- **NO APPROVED TREATMENT OPTION**



MAT8800

Discovery

IND
Preparation

Early Clinical
Development

Phase 3
Development

Next Steps:

- Animal studies ongoing
- Composition selection or further optimization
- Upon selection, pre-IND meeting with FDA and IND prep

Experienced Management Team and Board

Strong development and commercialization track record

Roelof Rongen

- President and CEO, Director

George Bobotas, PhD

- Chief Scientific Officer

Jerome Jabbour, JD

- Chief Business Officer & General Counsel

Abdel Fawzy, PhD

- EVP Pharmaceutical & Supply Chain Dev.

Gary Gaglione, CPA

- VP Finance, Acting CFO

Herbert Conrad, Chairman BOD

- Roche, Reliant, Pharmasset, Celldex, Dura, Bone Care

James Scibetta, Director

- CFO Pacira, Bioenvision/Genzyme, Merrimack

Stefano Ferrari, Director

- ProSPA, Bioseutica, KD-Pharma

Adam Stern, Director

- CEO SternAegis Ventures

Prominent Scientific Advisory Board

Dyslipidemia & Cardiovascular Diseases

Christie M. Ballantyne, MD, PhD, FACC, FNLA

- Baylor College of Medicine, Center for Cardiovascular Disease Prevention at the Methodist DeBakey Heart and Vascular Center, Lipid Metabolism and Atherosclerosis Clinic at Houston Methodist Hospital

Kevin Maki, PhD, FNLA

- DePaul University, Midwest Center for Metabolic & Cardiovascular Research, Great Lakes Clinical Trials, National Lipid Association's Expert Panel
-

Anti-Infectives

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

Raphael Mannino, PhD

- Associate Professor of Pathology and Laboratory Medicine at Rutgers University, New Jersey Medical School. Founder, former President, CEO, CSO and EVP of BioDelivery Sciences, Inc.

Raphael Mannino, Ph.D.

Technology, Scientific Partners, Matinas BioPharma

Jerry Jabbour

Transaction Summary and Financial Update

Q&A

Roelof Rongen

Closing Comments

MTNB Represents a Compelling Investment Opportunity

- ✓ Unique and differentiated expertise in lipidomics, lipid chemistry and lipid-based delivery
- ✓ Phase 2a and Phase 3 clinical development programs expected to commence in 2015
- ✓ Novel technology platform with broad application expected to drive a robust pipeline in high-value markets and niche, potentially orphan indications
- ✓ Strong patent estate across platforms with decades of know-how
- ✓ Multiple value-driving catalysts expected over next 12 months
- ✓ Experienced management and board with strong development and commercialization track record



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