www.matinasbiopharma.com
NYSE AMERICAN: MTNB

MATINAS BIOPHARMA

Corporate Presentation
September 2019

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.

MATINAS BIOPHARMA

Company Overview

MAT9001

Cardiovascular and Metabolic Conditions

- Potential **best-in-class drug** focused on **multi-billion-dollar market**
- **Head to head data demonstrating superiority against market leading drug, Vascepa®**
- Key additional **head to head data vs. Vascepa®** expected in 2020.
- **Clear differentiation** from currently approved prescription **omega-3 products**

MAT2203

Oral, Non-toxic Delivery of Amphotericin B

- **Broad spectrum antifungal agent** with 50+ years of robust efficacy; Current use significantly limited by IV administration and significant renal toxicity
- **LNC Platform** technology provides for oral, targeted, non-toxic delivery to infected tissues
- **Financially supported** by the National Institutes of Health
- **EnACT** study set to **enroll patients** in September 2019

Key Milestones Position Company for Near-Term Value-Driving Events

November 2018

Positive REDUCE-IT data pivotal to relaunching development program for MAT9001, a potential best-in-class prescription-only omega-3

December 2018

Assembled world class Scientific Advisory Board to guide clinical development strategy of MAT9001

February 2019

Bolstered team with cardiovascular expert, James J. Ferguson III, M.D. as Chief Medical Officer to lead clinical development of MAT9001

March 2019

Closed $32MM financing led by fundamental institutional investors to fund MAT9001 through key data

September 2019

Start NIH-funded phase 1/2 EnACT study of MAT2203 in Cryptococcal Meningitis. Data expected in 1H 2021. Cohort updates throughout 2020

January 2020

Begin enrolling MAT9001 head-to-head study vs Vascepa (n=70). Data expected to read out in Q4 2020

Mid 2020

Expected end of phase 2 meeting with FDA for MAT9001. Expected to discuss Phase 3 program design.

2021

Expected start of two phase 3 programs for MAT9001 in patients with SHTG and HTG. Data expected in late 2022

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MAT9001
Overview

MAT9001 - Potential Best-in-class prescription-only Omega-3 fatty acid

Demonstrated Superiority Versus Vascepa® in a Head-To-Head Study

Recent Events in Cardiovascular Space Provide New Opportunity for MAT9001

November 2018: Positive CV outcomes data for Vascepa®

January 2019: Updated ADA Guidelines

August 2019: AHA Scientific Advisory

August 2019: Updated ESC Lipid Guidelines

Clear clinical development pathway

505(b)(2) - initial indication in patients with severe hypertriglyceridemia (≥500 mg/dL)

Outcomes trial not required for approval

Eligible for NCE

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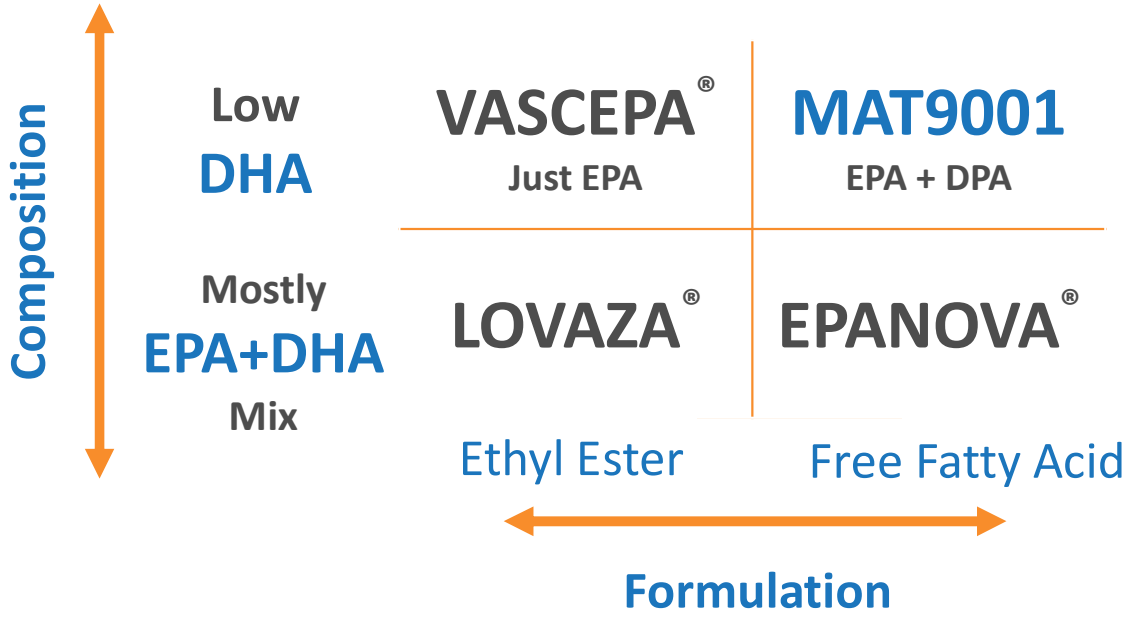
MAT9001 - Unique Prescription-Only Omega-3 Fatty Acid

MAT9001 | Specifically Designed to Treat Hypertriglyceridemia and Dyslipidemia

Differentiating Features

- Uniquely engineered omega-3 composition; highly bioavailable
- DPA - Highest potency and unique MOA



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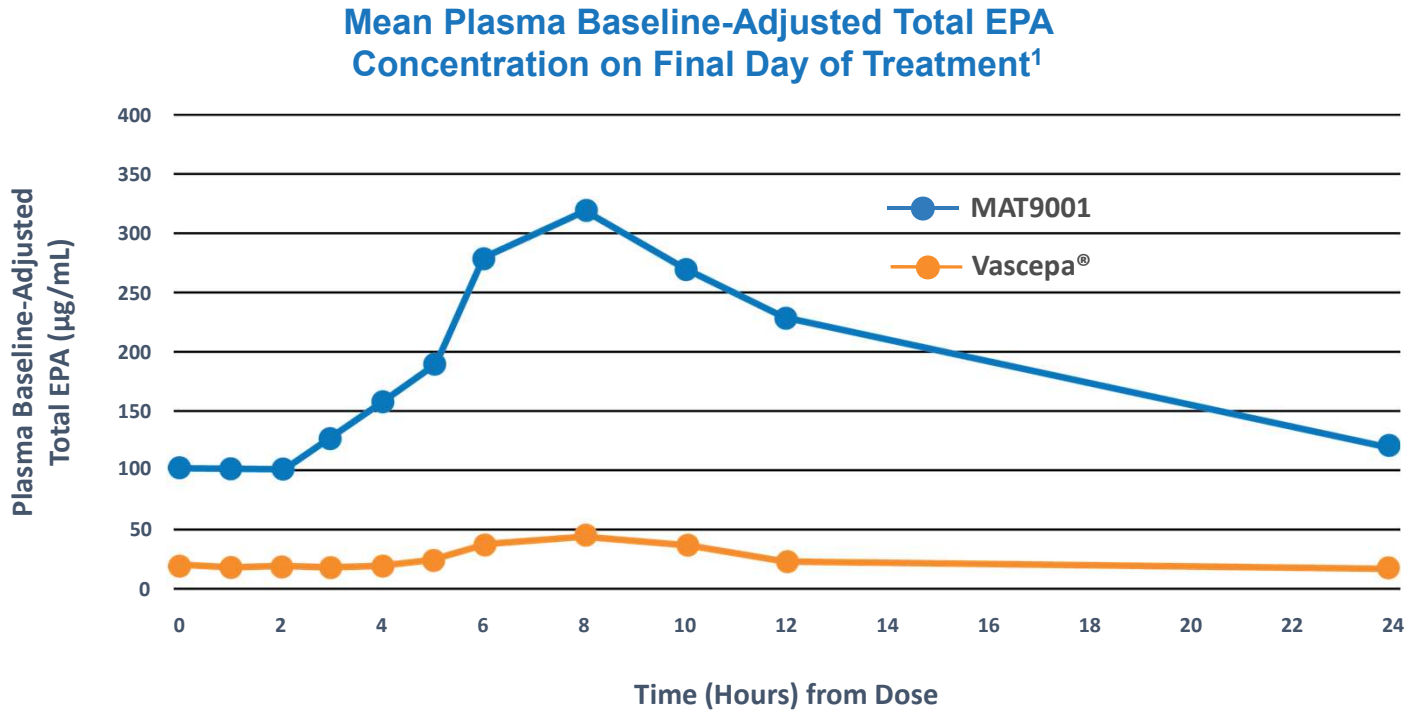
Substantially Higher Blood Levels of EPA with MAT9001 Over Vascepa®

Potential Implications for Future CV Outcomes



1: T=0 is drug administration on final day of treatment

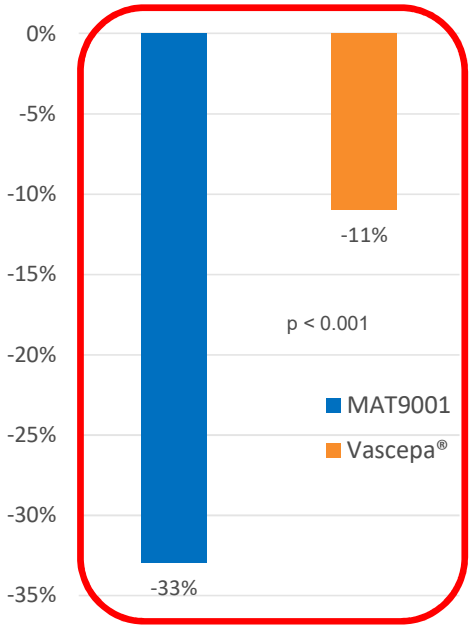
Demonstrated Superiority of MAT9001 Over Vascepa® in a Head-to-Head Study

Significant Reductions in Triglycerides, VLDL, Non-HDL-C, Total Cholesterol, ApoAI and ApoCIII

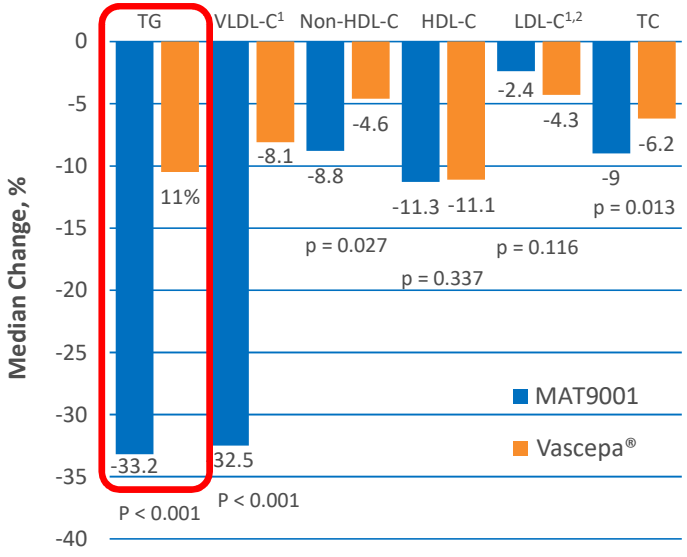
Additional Significant Reductions in PCSK9

Triglyceride Reduction

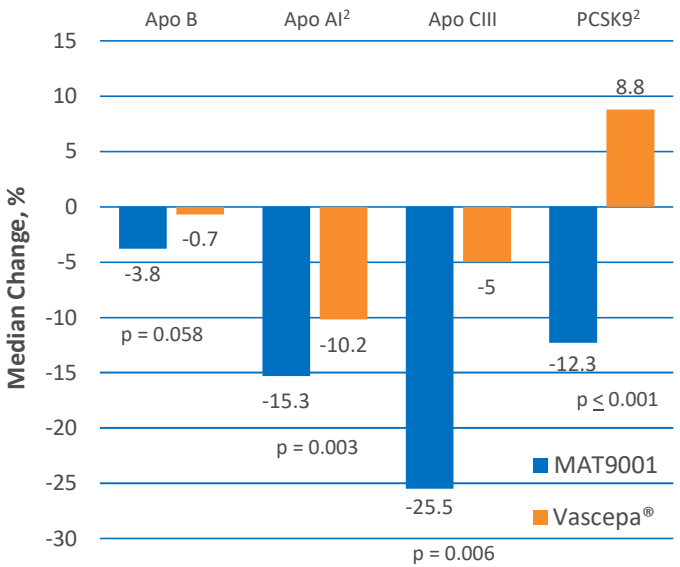
(Median % Change From Baseline)



Median % Changes from Pre-Treatment Values for Lipids



Median % Changes from Pre-Treatment for Apolipoproteins and PCSK9



1: Some values were not calculated because the TG concentration pre- or post-treatment was >400 mg/dL

2: Response variable was not normally distributed (Shapiro-Wilk p<0.01), analysis was completed using ANCOVA after rank transformation for between treatment comparisons

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Omega-3 U.S. Market Could Reach $10 Billion+ with 70 Million+ Patients

Vascepa® (icosapent ethyl)

- Approved for SHTG in 2012
- Est. 2019 Sales: ~$400+ million
- REDUCE-IT AdCom scheduled for November 14, 2019
- Generic entry in 2029
- NCE expires 2020

Epanova® omega-3-carboxylic acids

- Approved in SHTG 2014; unlaunched
- NCE expires 2019
- Data from 13,000+ patient STRENGTH outcome trial expected ~2020

CaPre®

- Phospholipid and OM3 from Krill
- Total omega-3 less than 400 mg/capsule
- Phase 3 data in SHTG expected late 2019 and early 2020

LOVAZA® omega-3-acid ethyl esters

- Approved in SHTG 2004
- 2013 sales: $1.1 billion
- IP expired
- Generic entry in 2013

Strong Evidence for Omega-3 class continues to build…

Updated ADA "Standards of Medical Care in Diabetes" – 2019

Based on findings from the Reduction of Cardiovascular Events with Icosapent Ethyl – Intervention Trial (REDUCE-IT), an additional recommendation has been officially added to the section "*Treatment of Other Lipoprotein Fractions or Targets*". The new recommendation reads as follows:

"In patients with ASCVD or other cardiac risk factors on a statin with controlled LDL-C, but elevated triglycerides (135-499 mg/dL), the addition of icosapent ethyl should be considered to reduce cardiovascular risk."

Diabetes Care 2019;42(Suppl. 1):S1–S2
https://doi.org/10.2337/dc19-SINT01

Level of evidence **A**

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Strong Evidence for Omega-3 class continues to build…

AHA Scientific Advisory – 2019

"The use of n-3 FA (4 g/d) for improving atherosclerotic cardiovascular disease risk in patients with hypertriglyceridemia is supported by a 25% reduction in major adverse cardiovascular events in REDUCE-IT (Reduction of Cardiovascular Events With EPA Intervention Trial), a randomized placebo-controlled trial of EPA-only in high-risk patients treated with a statin."

"We conclude that prescription n-3 FAs (EPA+DHA or EPA-only) at a dose of 4 g/d (>3 g/d total EPA+DHA) are an effective and safe option for reducing triglycerides as monotherapy or as an adjunct to other lipid-lowering agents."

Skulas-Ray AC et al ***Circulation***. 2019;140
DOI: 10.1161/CIR.0000000000000709

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Strong Evidence for Omega-3 class continues to build…

2019 ESC/EAS Guidelines for the management of dyslipidemias

Recommendations for drug treatment of patients with hypertriglyceridaemia

Recommendations	Class[a]	Level[b]
Statin treatment is recommended as the first drug of choice to reduce CVD risk in high-risk individuals with hypertriglyceridaemia [TG levels >2.3 mmol/L (>200 mg/dL)].[355]	I	B
In high-risk (or above) patients with TG levels between 1.5–5.6 mmol/L (135–499 mg/dL) despite statin treatment, n-3 PUFAs (icosapent ethyl 2×2 g/day) should be considered in combination with a statin.[194]	IIa	B
In primary prevention patients who are at LDL-C goal with TG levels >2.3 mmol/L (>200 mg/dL), fenofibrate or bezafibrate may be considered in combination with statins.[305–307,356]	IIb	B
In high-risk patients who are at LDL-C goal with TG levels >2.3 mmol/L (>200 mg/dL), fenofibrate or bezafibrate may be considered in combination with statins.[305–307,356]	IIb	C

Cardiovascular Risk Categories

Very High-Risk	People with any of the following: • Documented ASCVD, either clinical or unequivocal on imaging. – Documented ASCVD includes previous ACS (MI or unstable angina), stable angina, coronary revascularization (PCI, CABG, and other arterial revascularization procedures), stroke and TIA, and PAD. – Unequivocally documented ASCVD on imaging includes those findings that are known to be predictive of clinical events, such as significant plaque on coronary angiography or CT scan (multivessel coronary disease with two major epicardial arteries having >50% stenosis), or on carotid ultrasound. • DM with target organ damage (microalbuminuria, retinopathy, nephropathy), or at least three major risk factors, or early onset of T1DM of long duration (>20 years). • Severe CKD (eGFR <30 mL/min/1.73 m2). • A calculated SCORE >_10% for 10-year risk of fatal CVD. • FH with ASCVD or with another major risk factor.
High-Risk	People with: • Markedly elevated single risk factors, in particular TC >8 mmol/L (>310 mg/dL), LDL-C >4.9 mmol/L (>190 mg/dL), or BP >_180/110 mmHg. • Patients with FH without other major risk factors. • Patients with DM without target organ damage,[a] with DM duration >_10 years or another additional risk factor. • Moderate CKD (eGFR 3059 mL/min/1.73 m2). • A calculated SCORE >_5% and <10% for 10-year risk of fatal CVD.
Moderate-Risk	Young patients (T1DM <35 years; T2DM <50 years) with DM duration <10 years, without other risk factors. Calculated SCORE >_1 % and <5% for 10-year risk of fatal CVD.
Low-Risk	Calculated SCORE <1% for 10-year risk of fatal CVD.

European Heart Journal (2019)
doi:10.1093/eurheartj/ehz455

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MAT9001

Regulatory Strategy and Clinical Development Plan

Regulatory Strategy

Pursuing Streamlined 505(b)(2) Development Plan

Development Activities:

- 28-day comparative toxicology study – Completed June 2019
- Comparative bioavailability study – To Be Initiated in Q4 2019
- Head to Head Study vs. Vascepa expected to commence in January 2020; with topline data by Q4 2020
- Seek FDA End-of-Phase 2 meeting following comparative studies to set up program to commence Phase 3
  - Projected FDA meeting date Q2 2020
  - Present design of Phase 3 registration SHTG study at EOP2 meeting

Clinical Development Plan

Stage	Approval [505(b)(2) Pathway]	Market Differentiation
Preclinical	**Rat Toxicology Studies** • Toxicity parameters, toxicokinetics	
PK/PD Studies	**Phase 1 Comparator vs. Lovaza®** • Single dose comparative bioavailability (n=36) • Healthy volunteers **Drug-Drug Interaction Studies (TBD)** • Simvastatin: n=50 • Warfarin: n=40-50 • Aspirin: n=40-50	**Phase 2 PK/PD vs. Vascepa®** • PK/PD • Crossover • Patients with TG 175-499 (n=70) **MAT9001 (4g) vs Placebo in At-Risk HTG Patients** • 12-week study in 400 high risk, statin treated patients with TG 200 - 499 mg/dL (200 per group) • Primary endpoint: % change in TG (PD) • Additional safety • Positions MAT9001 for potential label for patients with TG 200-499 mg/dL
Pivotal Clinical	**MAT9001 (2g or 4g) vs Placebo in SHTG** • 12-week study in 270 patients with TG 500-2000 mg/dL (90 per group) • Primary endpoint: % change in TG	

Intellectual Property and Barriers to Entry

Omega-3 Portfolio

22 Patents

filed

2 Orange-book listable U.S. patents issued, extend to 2033

- **Q4 2014: U.S. 8,906,964**
- **Q3 2018: U.S. 10,058,521**
  - 4 additional U.S. patents pending, plus opportunity for composition claims depending on outcome of USPTO debate

Additional IP to be developed as clinical development plan progresses

NCE Exclusivity

The active moiety of MAT9001 is the entire mixture of omega-3 ingredients representing a single active ingredient, which makes MAT9001 eligible for 5-year NCE exclusivity

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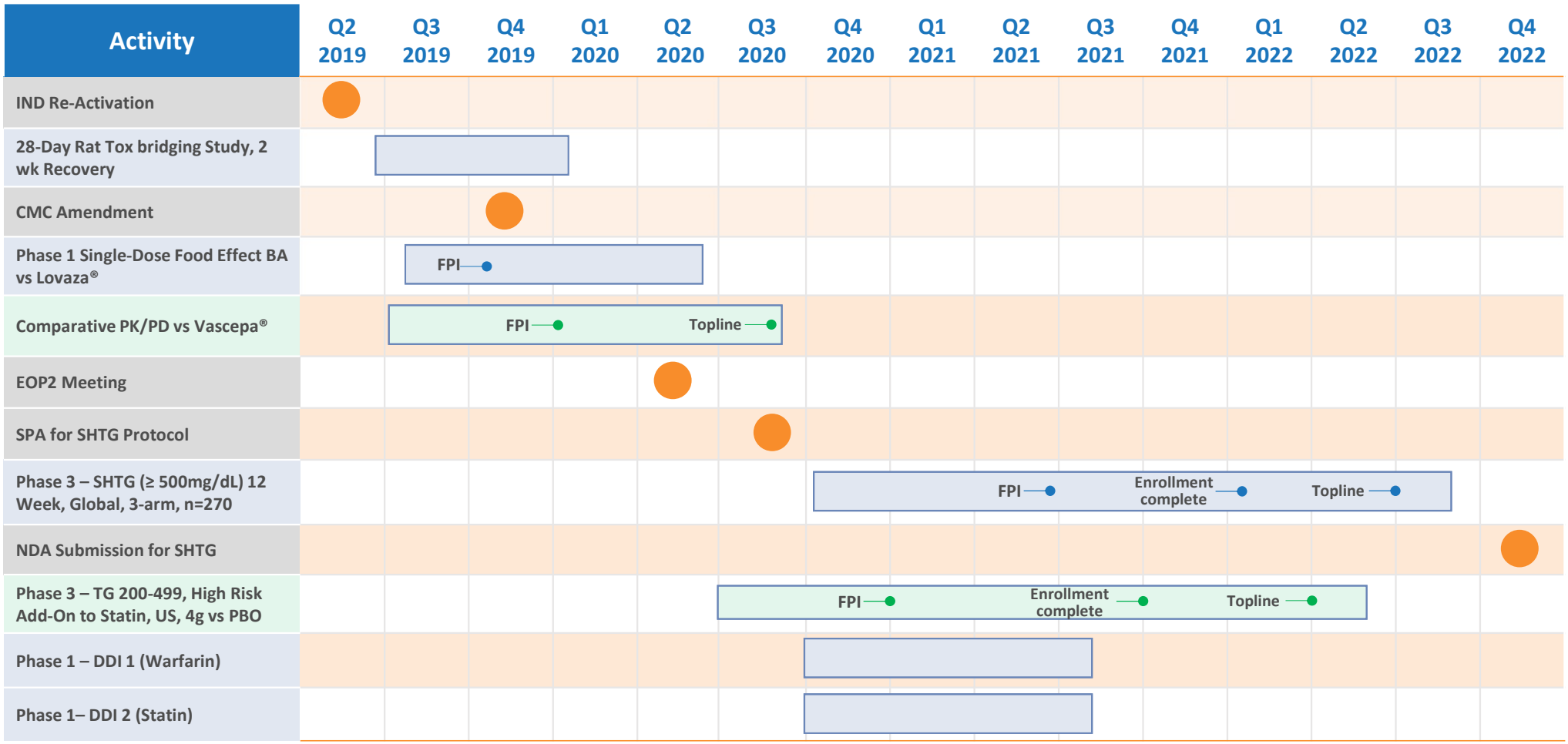
MAT9001 Development Timeline –On Schedule



MAT2203

MAT2203: A Novel Approach to Treating Invasive Fungal Infections

Positive FDA Meeting in June Set Stage to Advance Clinical Development Program in Cryptococcal Meningitis

Amphotericin B → **Broad Spectrum** Antifungal Agent → **Gold Standard** of treatment for immunocompromised patients

MAT2203 Demonstrated to be **Well Tolerated**

- **Two Phase 2** studies
- **Orally** administered
- No drug-related serious adverse events reported in either Phase 2 clinical study

LNC Platform Technology Benefits

- **Oral** bioavailability
- Reduction in toxicity and targeted delivery

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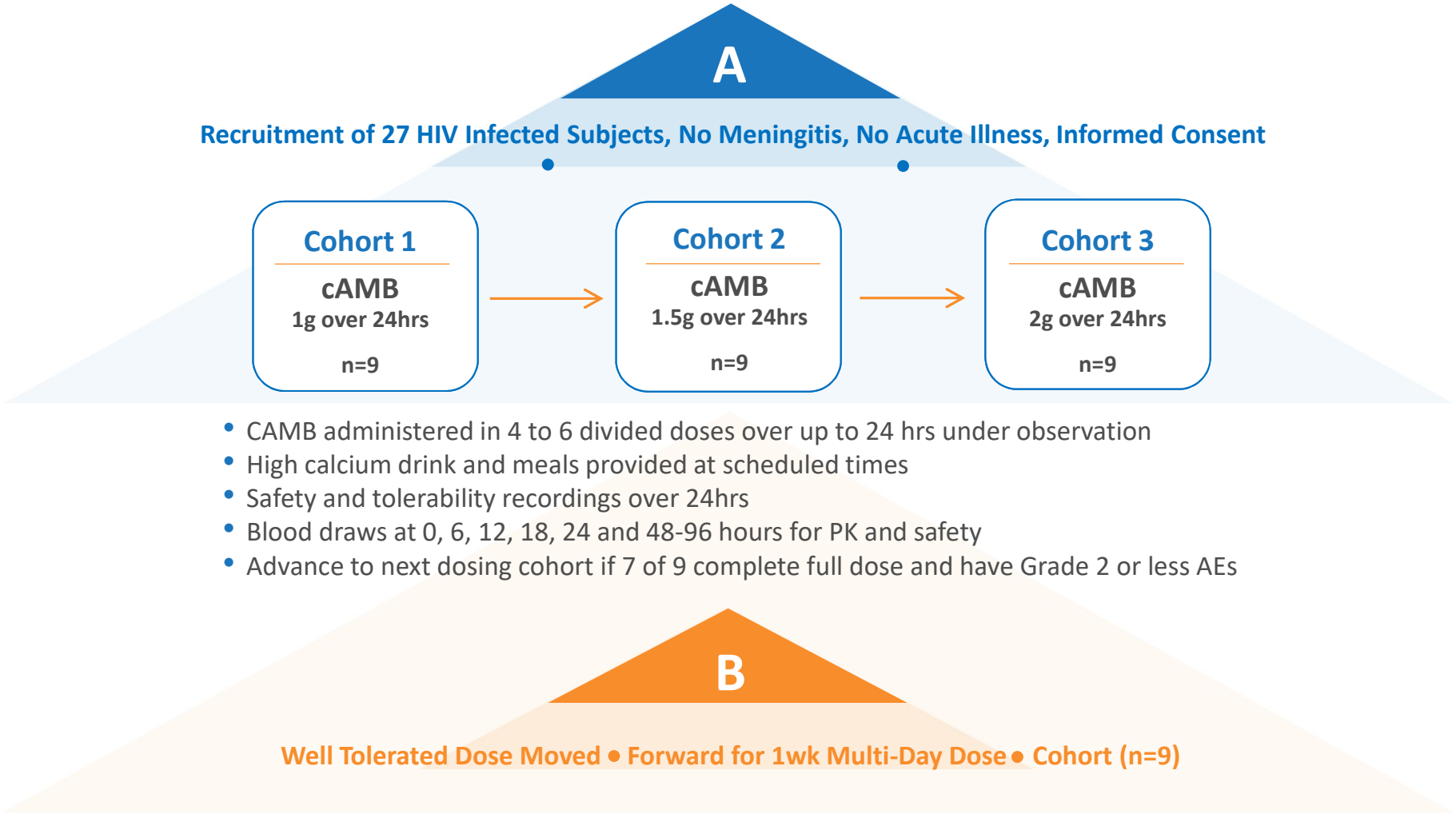
Pursuing Indication in Cryptococcal Meningitis

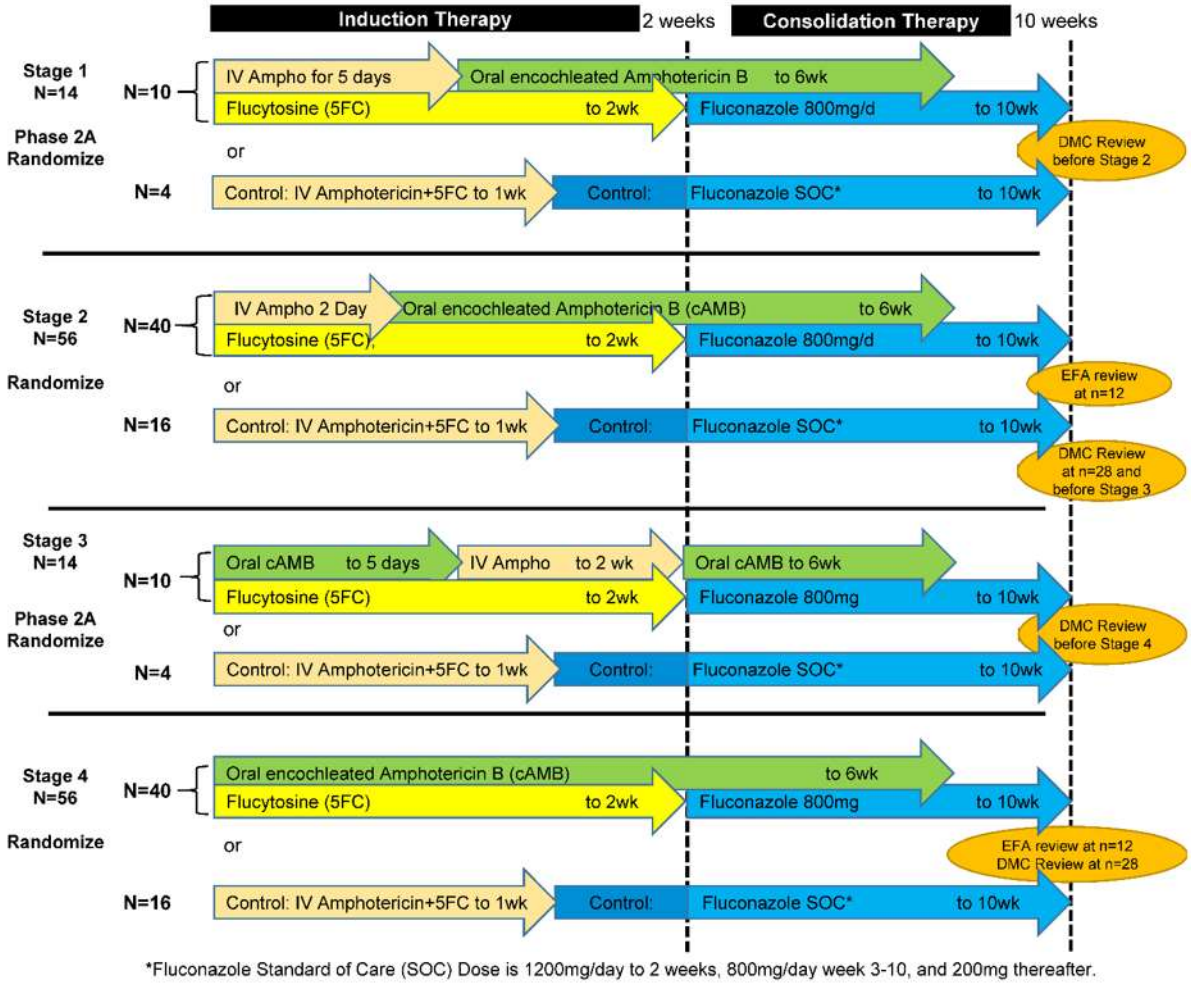
- **Potential to be the only oral antifungal agent for treatment of cryptococcal meningitis**
  - Strong preclinical Proof-of-Concept already established
  - 4th QIDP and Fast Track Designations received in July 2019 for Treatment of Cryptococcal Meningitis
- **Potential for streamlined development plan to approval**
  - Clinical studies can incorporate “early fungicidal activity” endpoint
- **NIH financial support through key efficacy data**
- **Additional opportunities in developed world**

EnACT: Phase 1 Safety and Tolerability in Subjects without Active Neuro-Infection



- CAMB administered in 4 to 6 divided doses over up to 24 hrs under observation
- High calcium drink and meals provided at scheduled times
- Safety and tolerability recordings over 24hrs
- Blood draws at 0, 6, 12, 18, 24 and 48-96 hours for PK and safety
- Advance to next dosing cohort if 7 of 9 complete full dose and have Grade 2 or less AEs

EnACT : Ph 2 safety, tolerability and efficacy of MAT2203 + 5-FC in HIV-infected pts w/ cryptococcal meningitis



*Fluconazole Standard of Care (SOC) Dose is 1200mg/day to 2 weeks, 800mg/day week 3-10, and 200mg thereafter.

- 100 pts receiving MAT2203 + flucytosine (5-FC) in 4 stages of escalating durations of MAT2203 and decreasing duration of IV Amphotericin B (AMB)
- 40 control pts receiving standard of care (IV AMB + 5-FC)
- 14 days for induction treatment in experimental arms, followed by consolidation (step-down) therapy for up to 10wks
- Will ultimately assess the potential for all-oral induction therapy w/ MAT2203
- Safety and efficacy monitored throughout study by independent Data Monitoring Committee

FPI estimated Q1 2020

Lipid Nano-Crystal (LNC) Platform

LNCs Enable Safe, Targeted and Intracellular Delivery of Potent Medicines

Highly Efficient, Physiologic and Nontoxic Drug Formulation Platform

Flexible administration

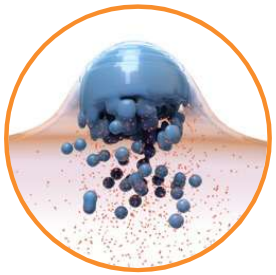
Oral
Intramuscular

Intravenous
Intranasal

NO evidence of immunogenicity

Reduced toxicity of drugs

Enter cells through **non-destructive, membrane fusion**



Physiologically targets activated cells

Ability to deliver a broad range of molecules

Validated in **multiple clinical** and **preclinical** studies

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LNC Platform Provides Opportunity for Value Driving Partnerships

Q1 2019: **Signed first** LNC Platform Research Evaluation of Oligonucleotide with **top global pharmaceutical company**

Q2 2019: **Signed** Research Collaboration with **ViiV Healthcare** to Evaluate Formulation of **Antiviral Drug Candidates**

ViiV Healthcare

Advancing Discussions with Multiple Strategic and Research Partners to Expand Potential Successful Application of LNC Technology

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Financial Snapshot - NYSE AMERICAN: MTNB

$32.4 Million Public Offering Completed March 2019

~$36.8M
Cash Balance as of 6/30/2019

~$112M
Market Cap[1]

~162M
Common Shares Outstanding

~600,000
Average Daily Trading Volume[1]

1: Based on September 4, 2019 closing price of $.69 per share

Leadership Team

Executive Officers

Jerome D. Jabbour
Co-Founder, Chief Executive Officer, Director

James J. Ferguson III, M.D., FACC, FAHA
Chief Medical Officer

Keith A. Kucinski, CPA, MBA
Chief Financial Officer

Theresa Matkovits, Ph.D.
Chief Development Officer

Raphael J. Mannino, Ph.D.
Chief Scientific Officer

Board of Directors

Herbert Conrad
Chairman of the Board

Matthew A. Wikler, M.D., MBA FIDSA
Director

Patrick G. LePore
Vice Chairman

Adam Stern
Director

Eric J. Ende, MBA, M.D.
Director

Jerome D. Jabbour
Co-Founder, Chief Executive Officer, Director

James S. Scibetta
Director

Positioning Our Lead Products for Near-term Success

MAT9001

Initiate comparative PK bridging study in Q4 2019

Patient pre-screening set to commence for head-to-head study vs. Vascepa → **Head-to-head dosing to commence Q1 2020 with topline data expected Q4 2020**

MAT2203

EnACT study initiation set for Q4 2019

Financially supported by NIH

→ **EnACT updates periodically throughout 2020**

Cash runway into 2021 - through multiple data milestones and class catalysts

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