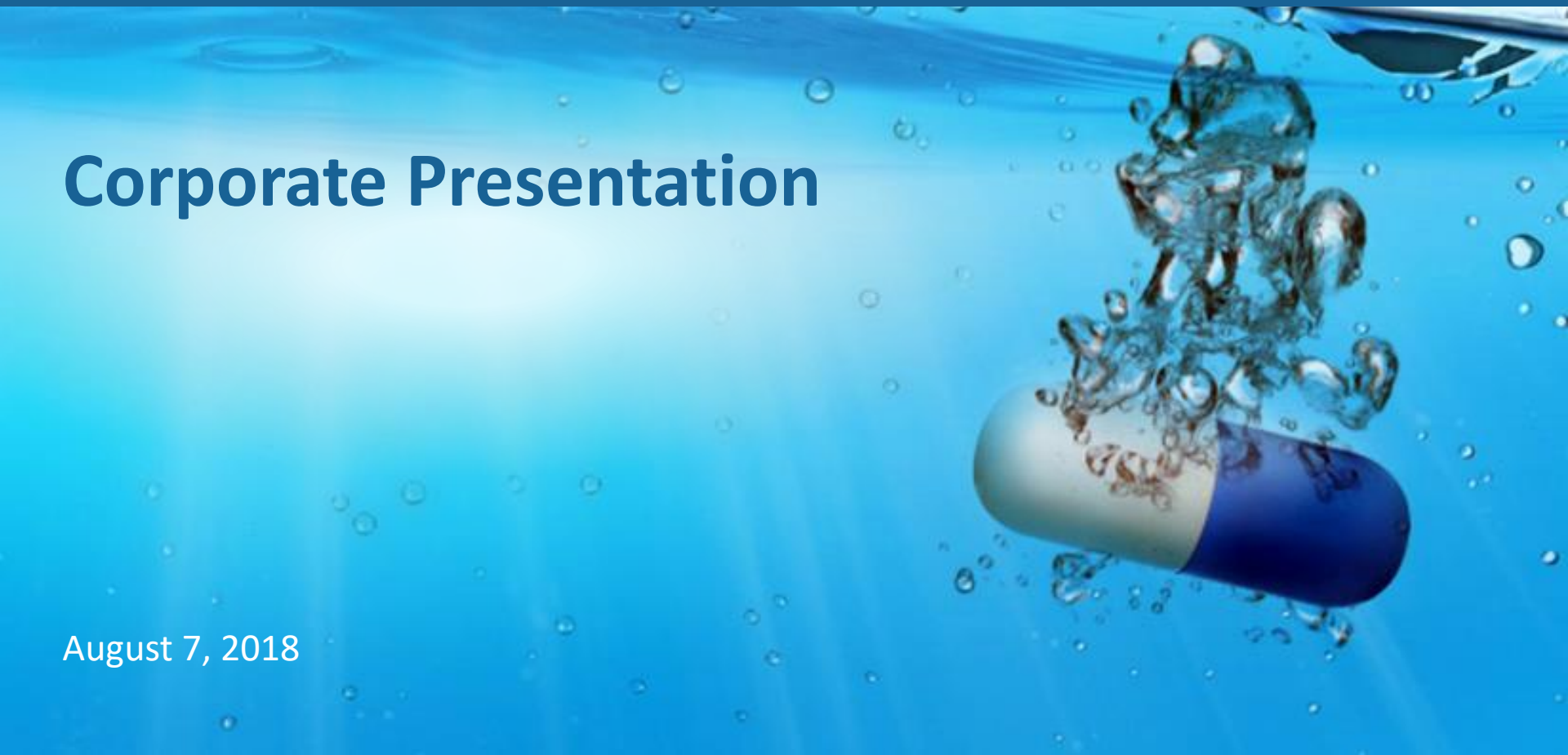
LIPOCINE®

ENHANCING HEALTH

Enabling oral drug delivery to improve patient compliance

Corporate Presentation



August 7, 2018

Forward-Looking Statements

This presentation contains forward-looking statements about Lipocine Inc. (the "Company"). These forward-looking statements are made pursuant to the safe harbor provisions of the Private Securities Litigation Reform Act of 1995. These forward-looking statements relate to the Company's product candidates, the expected timing of the FDA review process related to our resubmitted NDA for TLANDO™, clinical and regulatory processes and objectives, potential benefits of the Company's product candidates, intellectual property and related matters, all of which involve known and unknown risks and uncertainties. Actual results may differ materially from the forward-looking statements discussed in this presentation.

Accordingly, the Company cautions investors not to place undue reliance on the forward-looking statements contained in, or made in connection with, this presentation. Several factors may affect the initiation and completion of clinical trials, the potential advantages of the Company's product candidates and the Company's capital needs. Among other things, the projected commencement and completion of the Company's clinical trials may be affected by difficulties or delays. We may encounter delays or other issues in the FDA approval process, including that the FDA may determine there are deficiencies in our resubmitted NDA. We are also subject to risks related to the possibility of an advisory committee meeting related to TLANDO™. In addition, the Company's results may be affected by its ability to manage its financial resources, difficulties or delays in developing manufacturing processes for its product candidates, preclinical and toxicology testing and regulatory developments. Delays in clinical programs, whether caused by competitive developments, adverse events, patient enrollment rates, regulatory issues or other factors, could adversely affect the Company's financial position and prospects. Prior clinical trial program designs and results are not necessarily predictive of future clinical trial designs or results. If the Company's product candidates do not meet safety or efficacy endpoints in clinical evaluations, they will not receive regulatory approval and the Company will not be able to market them. The Company may not be able to enter into any strategic partnership agreements. The Company's commercial success depends on its ability to manufacture, market and sell products without infringing the proprietary rights of third parties. Operating expense and cash flow projections involve a high degree of uncertainty, including variances in future spending rates due to changes in corporate priorities, the timing and outcomes of clinical trials, competitive developments and the impact on expenditures and available capital from licensing and strategic collaboration opportunities. If the Company is unable to raise additional capital when required or on acceptable terms, it may have to significantly delay, scale back or discontinue one or more of its drug development or discovery research programs. The Company is at an early stage of development and may not ever have any products that generate significant revenue. The forward-looking statements contained in this presentation are further qualified by the detailed discussion of risks and uncertainties set forth in the Company's annual report on Form 10-K and other periodic reports filed by the Company with the Securities and Exchange Commission, all of which can be obtained on the Company's website at www.lipocine.com or on the SEC website at www.sec.gov. The forward-looking statements contained in this document represent the Company's estimates and assumptions only as of the date of this presentation and the Company undertakes no duty or obligation to update or revise publicly any forward-looking statements contained in this presentation as a result of new information, future events or changes in the Company's expectations.

Unique Specialty Pharmaceutical Company

Advanced Pipeline

Men's Health

Oral Testosterone Replacement Therapy ("TRT")

Oral Androgen Therapy for Fatty Liver Disease ("NAFLD"/ "NASH")

Women's Health

Oral Therapy for Prevention of Preterm Birth ("PTB")

Proprietary Drug Delivery Platform

Significant Unmet Need In Both Therapeutic Areas

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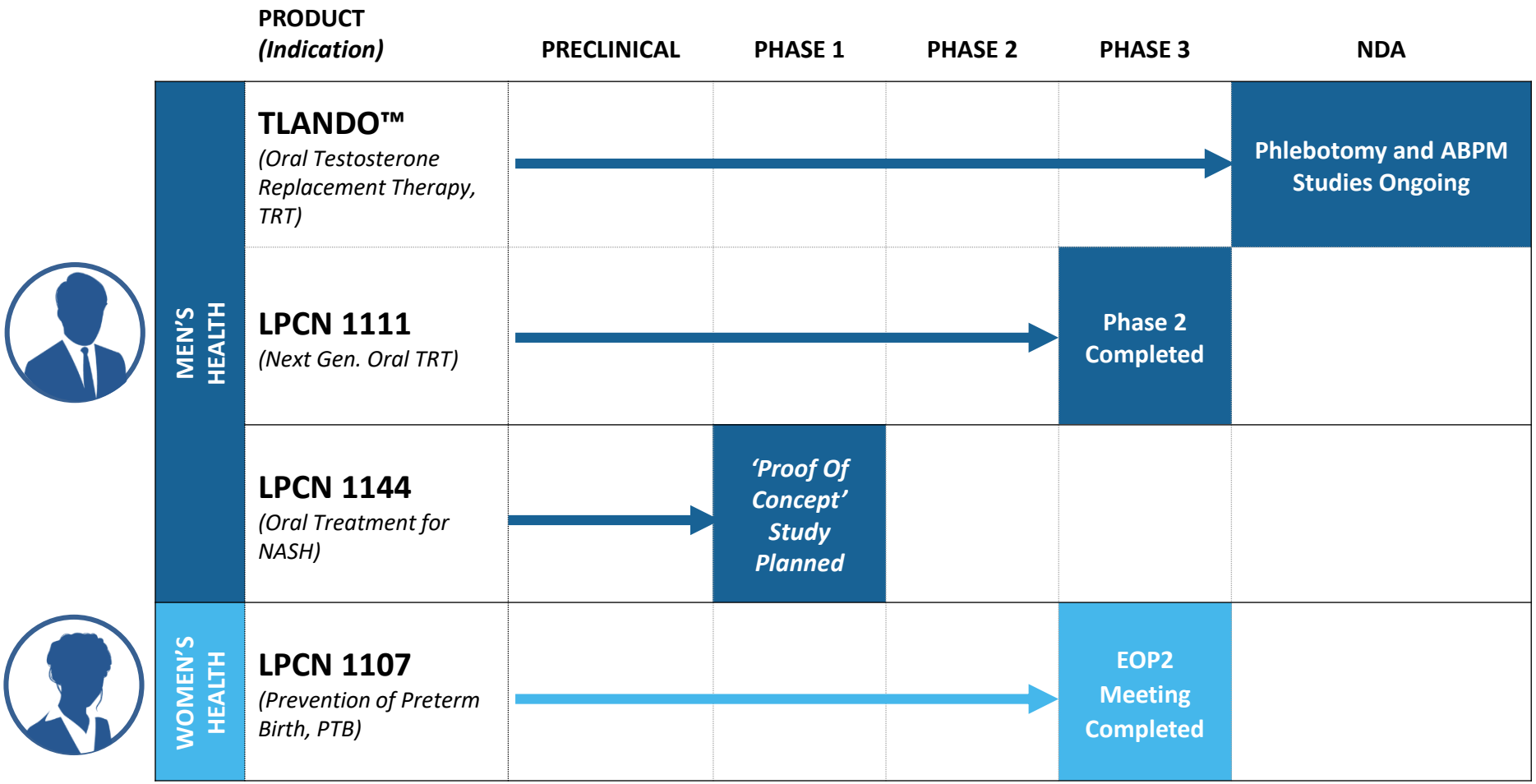
Late-Stage Pipeline

Oral Product Candidates Targeting Significant Opportunities



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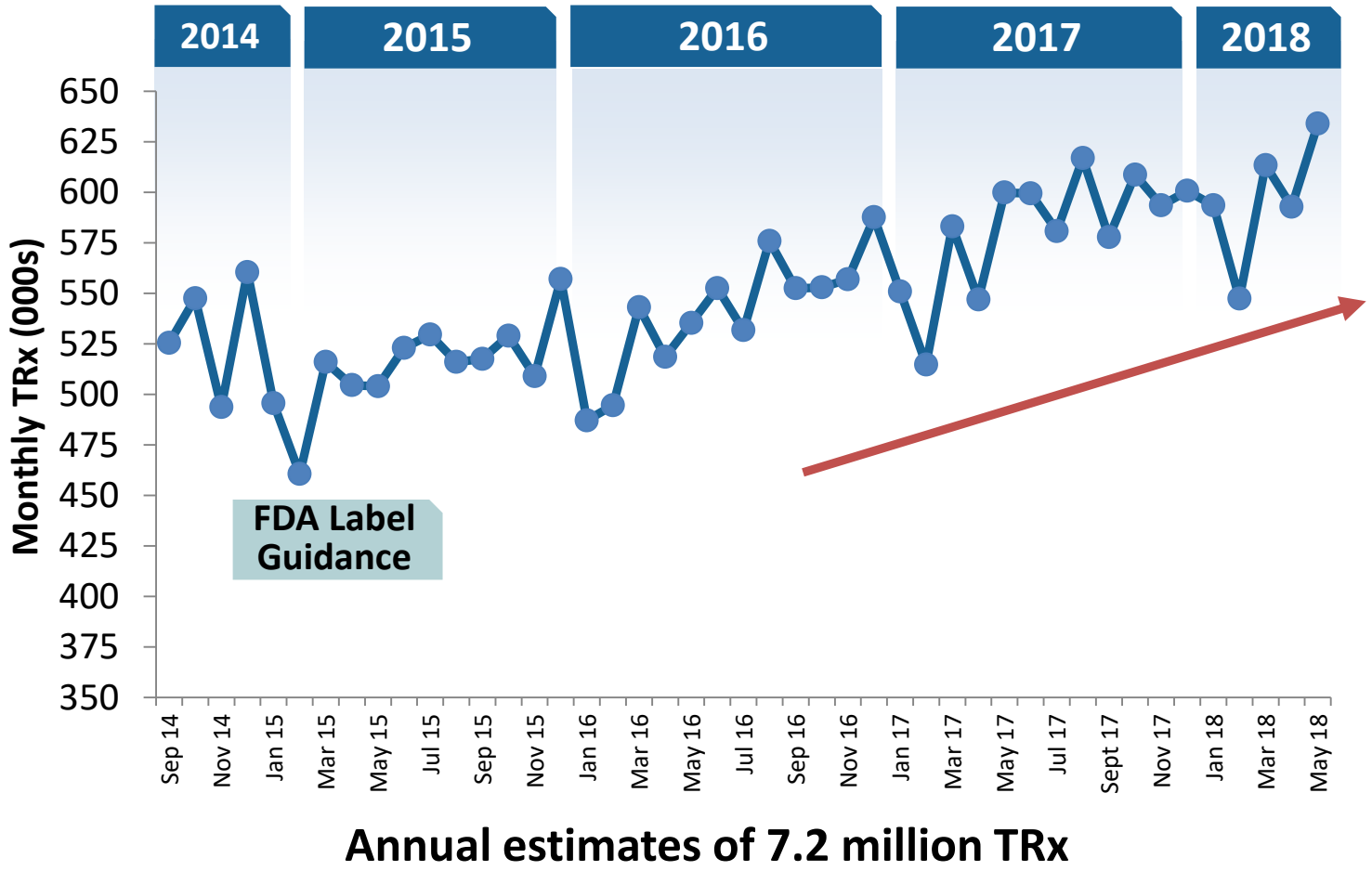
TLANDO™

Monthly TRT TRx Trend

TRT Market is Approaching Heights Experienced in 2013 and Growing



Annual estimates of 7.2 million TRx

Source: IMS database
TRx = Total prescriptions

2017 Gross Annual Sales - $1.7B

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Issues with Current Non-oral TRT Options

Potential Barrier To Newly Diagnosed and Existing Patients

- **Black Box Warning**
  - Secondary exposure to testosterone
  - Pulmonary oil micro embolism (POME) and anaphylaxis shock
- **Inconvenient application or painful injection**
- **Poor persistence reflects need for oral**
  - Average days on therapy is 100 days
- **More than 50% of patients need dosage adjustment**
  - Burdensome for patients due to multiple doctor visits

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TLANDO™: Path Forward for Resubmission Confirmed

Post Action Meeting Completed

Deficiencies and Plan for Resolution

Determine extent, if any, of ex vivo conversion of TU to T

- Definitive Phlebotomy study results expected by end of 4Q 2018

Obtain definitive evidence pre-approval via ambulatory blood pressure monitoring study to exclude whether TLANDO causes clinically meaningful increase in blood pressure

- ABPM Study (N=135, 4 month treatment) initiated based on FDA protocol feedback
- ABPM study projected for completion in 1Q 2019

Provide justification for non-applicability of Cmax based secondary endpoints

- Additional analyses of existing data for resubmission

Determine the appropriate stopping criteria that can be reproducibly and accurately identify patients who should discontinue use of TLANDO

- Additional analyses of existing data for resubmission

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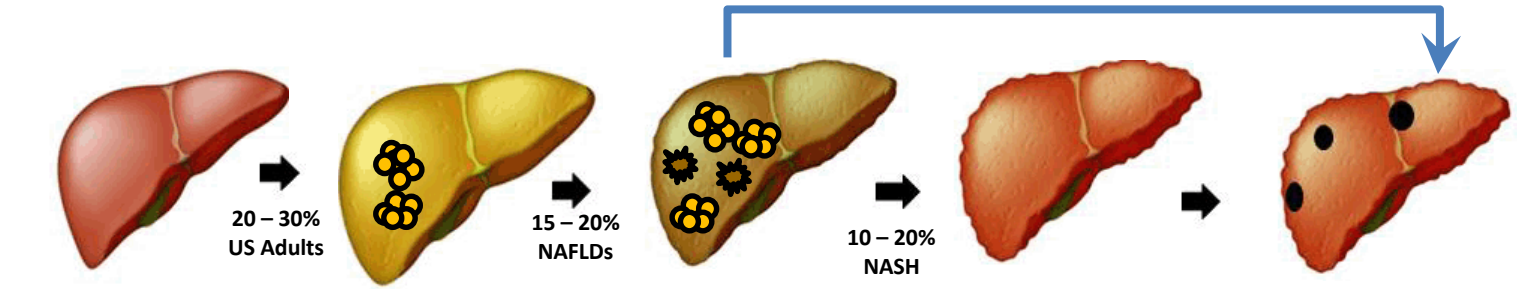
LPCN 1144

Non-Alcoholic Fatty Liver Disease (NAFLD)

Clinical Progression

Fatty liver is a reversible condition wherein large vacuoles of triglyceride fat accumulate in liver cells via the process of steatosis



Healthy Liver

Fatty Liver
- ↑ TGs
- ↑ Liver enzymes
- ↑ Liver fat

NASH Liver
- Steatosis
- Ballooning
- Inflammation
- Fibrosis

Cirrhotic Liver
- Late stage of fibrosis

Hepatocellular Carcinoma

No Approved Product

Eligible for Liver Transplantation

LFTs: Liver function test, especially Alaninine amino transferase (ALT) and Aspartame amino transferase (AST)
NASH: Non-alcoholic Steatohepatitis, TG: Triglyceride

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Fatty Liver Disease

Prevalence in US

- NAFLD prevalence in general population is estimated to be 20-30% in the Western world[1]

Estimated Prevalence of Fatty Liver Disease in US, 2015

US Patients	NAFLD	NASH Fibrosis (F2/F3)	Cirrhosis - Fibrosis (F4)	
			Compensated	Decompensated
Prevalence*	83.1 M	5.4 M	1.2 M	134 K

* Estes et.al. Hepatology, 2018

- By 2020, prevalence of NAFLD cirrhosis is set to overtake hepatitis B and hepatitis C related cirrhosis[2]
- The NASH market could peak at $30-40 billion by 2025[3]

1. Masarone et al, Rev Recent Clin Trials, 2014
2. Starley et al, Hepatol, 2010
3. Deutsche Bank industry report, “NASH – the next big global epidemic in 10 years?”, 2014

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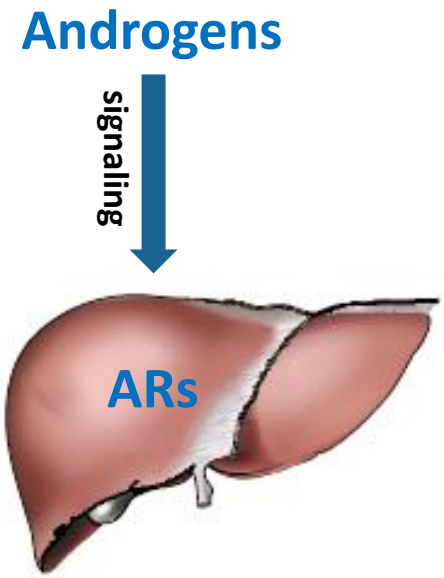
Androgen Receptor (AR) Effects

Regulation of Liver Metabolism*



- Regulate Lipid Homeostasis in the Liver
- Regulate Glucose Homeostasis in the Liver
- Regulate Cholesterol Homeostasis in the Liver

Androgens increase insulin receptor expression, decrease lipogenesis, and promote cholesterol storage in liver

* Shen M. and Shi H, Int J of Endocrinol, 2015

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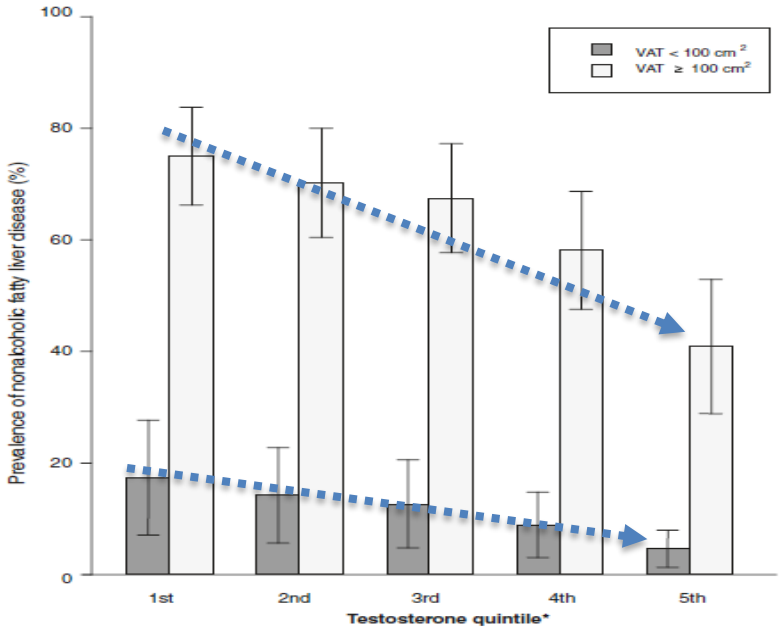
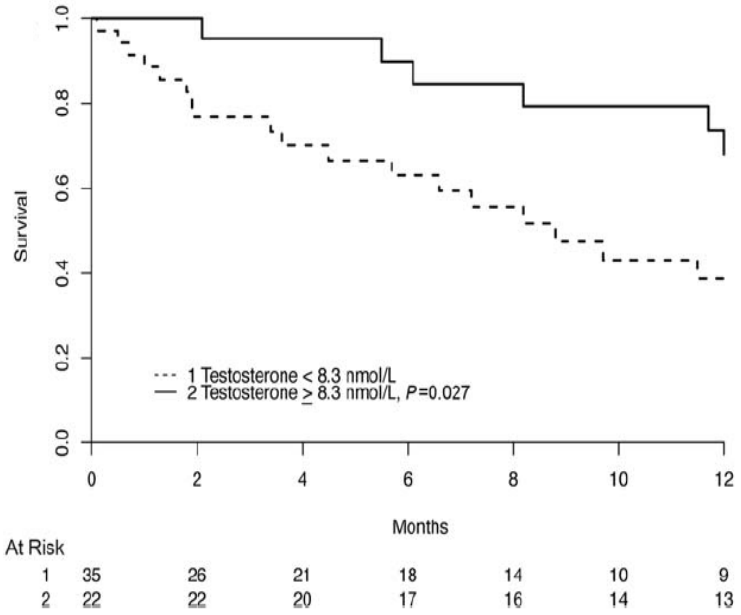
Testosterone (T)

Association with NAFLD and Cirrhosis

- NAFLD and T[1]



- Cirrhosis survival and T[2]



✓ After adjusting for age, smoking, diabetes, exercise, BMI, TG and HDL, the 1st (lowest) T quintile (110 – 317 ng/dL) have OR of 5.12 (2.43 – 10.77) for NAFLD compared to 5th (highest) T quintile (571 – 1343 ng/dL)

✓ Low T (<8.3 nmol/L; 239 ng/dL) remained a significant predictor of reduced survival in cirrhotic patients

1. Kim et al., Gastroenterol: 2012

2. Sinclair et al., Liver Trans: 2016

VAT: Visceral adipose tissue, OR: Odd Ratio,

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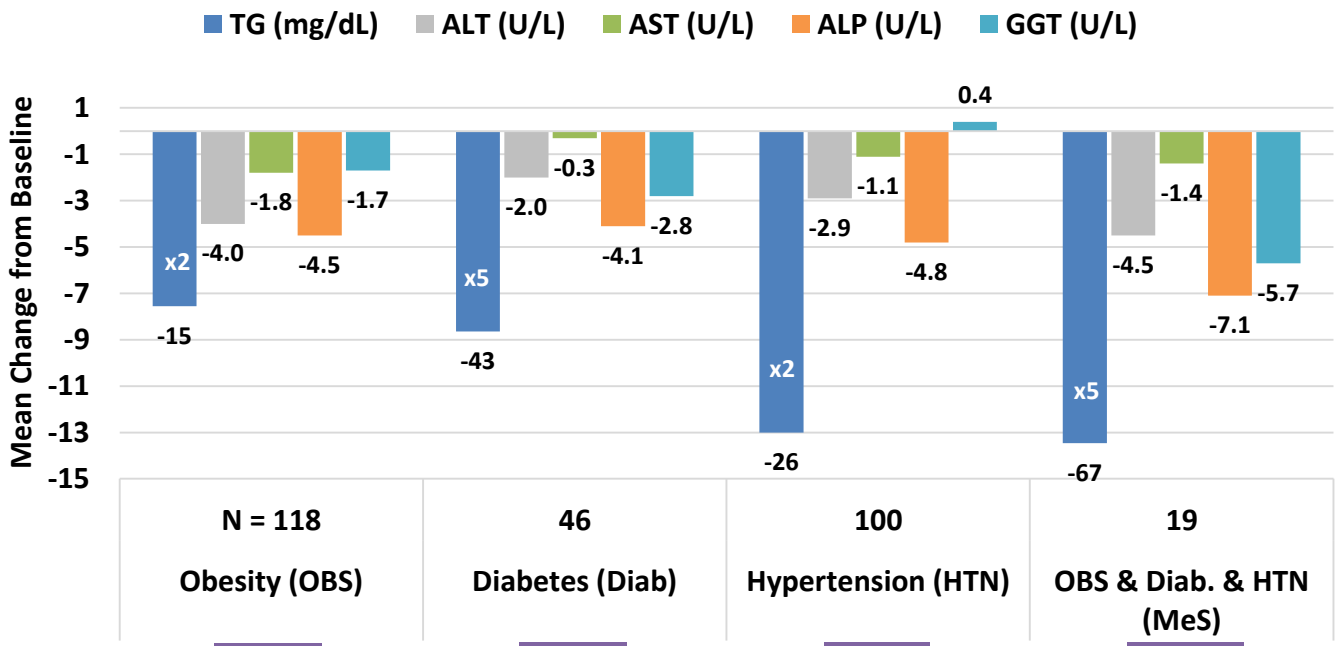
Consistent Lowering of Key Serum Biomarkers Levels

In Patients with Comorbidities Typical of NASH

- TG and Liver enzymes mean change from baseline (BL) post 52 week therapy*



*see appendix for study details

1. Machado et al, J Hepatol, 2006

2. Williams et al, Gastroenterol, 2011

3. Russo, J Clin Gastroenterol, 2017

Alanine amino transferase (ALT), Aspartate amino transferase (AST), Alkaline phosphatase (ALP), Gamma-glutamyl transpeptidase (GGT)

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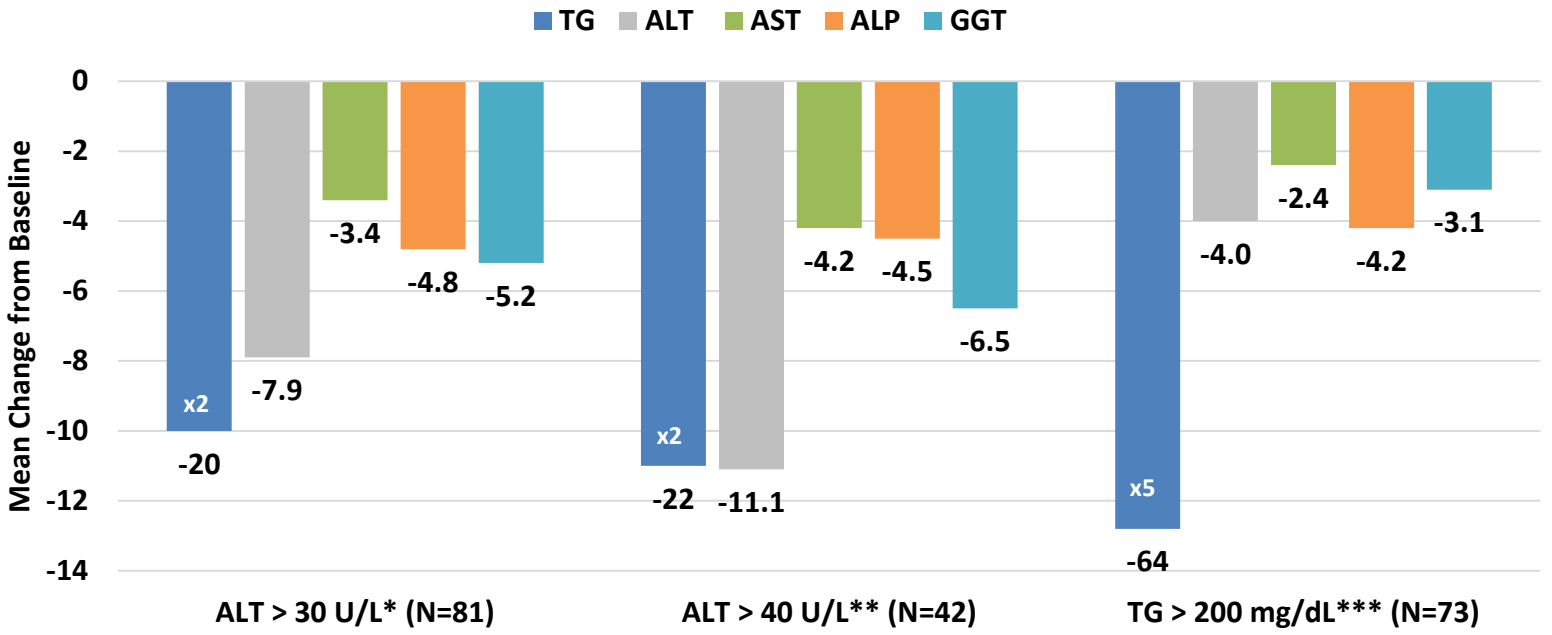
Significant Reduction of Key Serum Biomarker Levels

In Patients with Elevated ALT and TG at Baseline

- TG and liver enzymes mean change from BL to 52 week post-therapy from SOAR Trial (13-001 Study)†



* Barritt 4th et al, Contemp Clin Trials, 2017

** Sanyal et al, Hepatol, 2015

*** TG normal range 45 – 200 mg/dL

† See appendix for study details

Triglyceride (TG), Alanine amino transferase (ALT), Aspartate amino transferase (AST), Alkaline phosphatase (ALP), Gamma-glutamyl transpeptidase (GGT)

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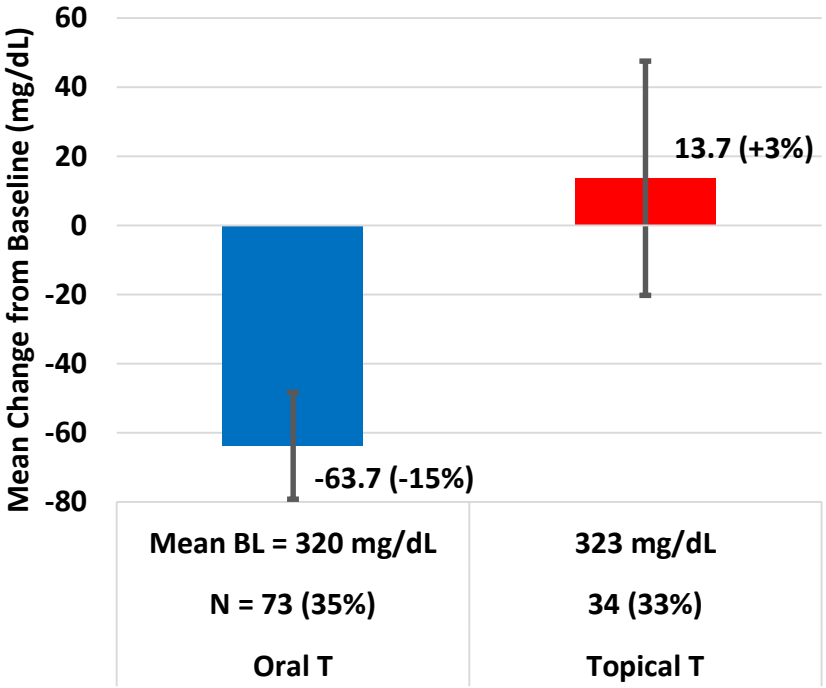
Lymphatic Oral T Therapy

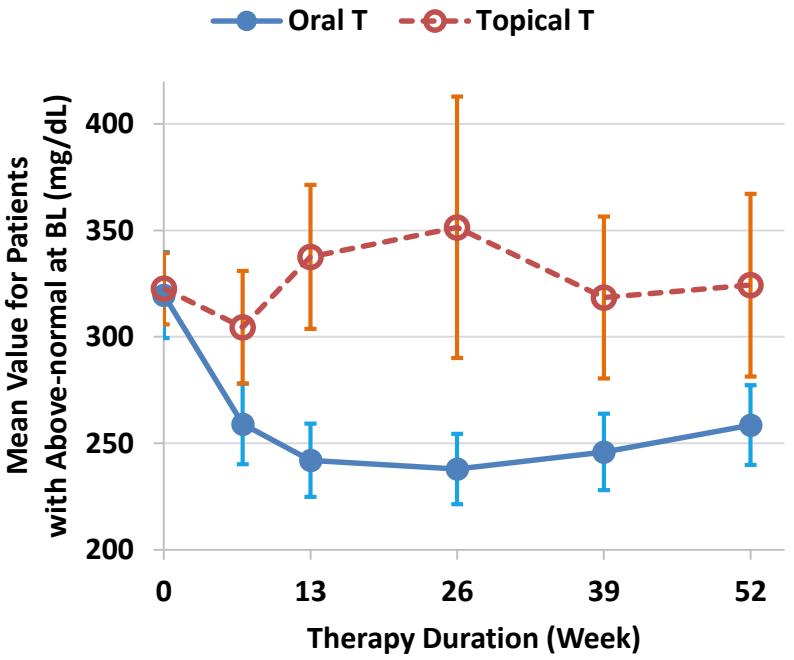
Unique Triglyceride (TG) Reduction

- Comparative mean TG change post therapy in patients on oral T vs non-oral T Therapy

TG Mean Change after 52 Week for Patients with Above-normal TG* at BL



TG Mean Value for Patients with Above-normal TG* at BL during 52 Week Therapy



* TG normal range: 45 – 200 mg/dL

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Summary of Clinical Key Serum Biomarkers

Results and Next Steps

Summary:

- Consistent lowering of key serum biomarkers levels in patients with comorbidities typical of NASH
- Significant reduction of key serum biomarkers levels in patients with elevated ALT and TG at baseline
- Unique TG reduction with lymphatic oral T therapy
- Consistent biomarker reduction independent of therapy duration/study

Next Steps:

- In-Vivo model Proof-Of-Concept (POC) study in biopsy-confirmed NASH
- POC clinical study assessing liver fat changes in imaging confirmed NAFLD/NASH patients

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LPCN 1111 QD

TLANDO

LPCN 1111

LPCN 1111: Next-Generation Oral TRT

Potential Once-Daily Dosing

- Novel prodrug of testosterone for oral delivery
- Once-daily potential expected to sustain and improve market share of oral T franchise
- Once-daily feasibility established in Phase 2a and 2b clinical trials
  - Single-daily oral dose provides T levels in eugonadal range
- Development status
  - Phase 2 study completed
  - FDA Guidance meeting for Phase 3 study design completed

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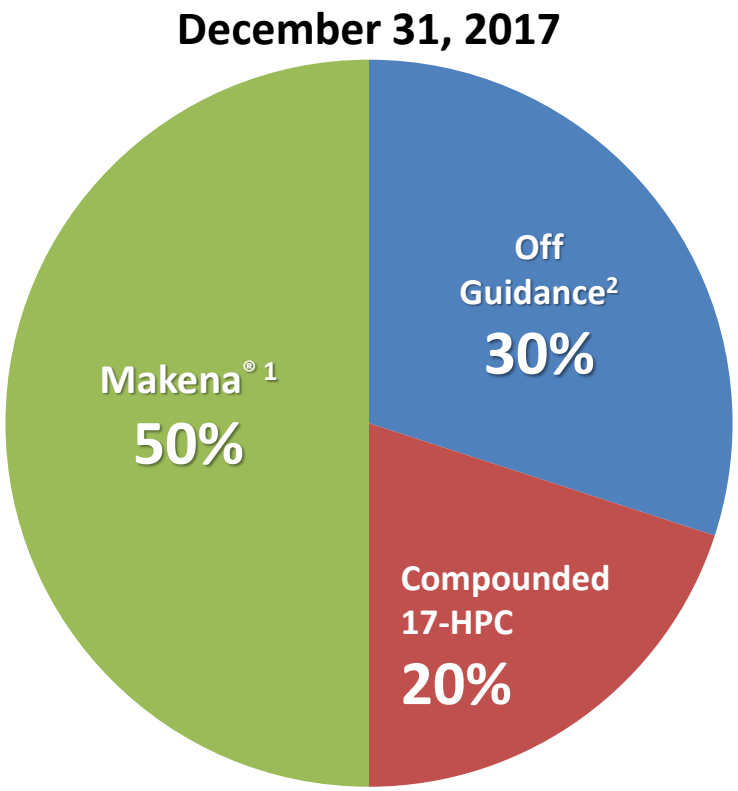
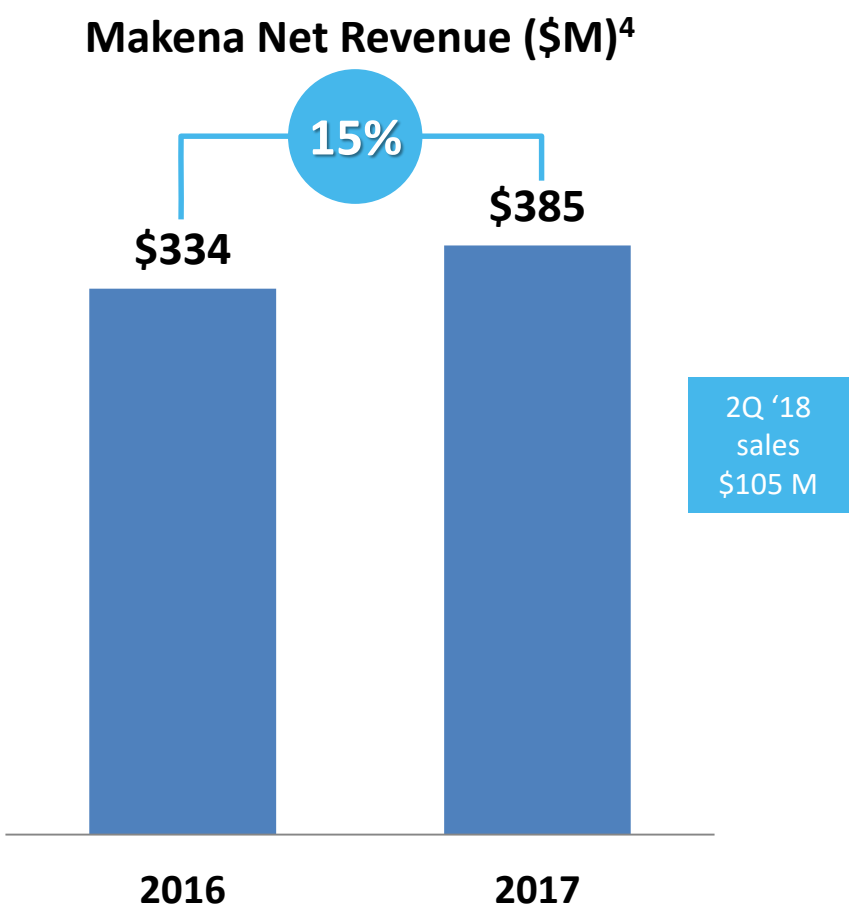
LPCN 1107

LPCN 1107: Prevention of Preterm Birth (PTB)

United States Market Landscape



$1B Market Opportunity[3]



1. Amag estimates Makena market share based on distributor dispensing data and all other market share based on physician market research data conducted by AMAG.
2. Off guidance represents patients treated outside of guidance of Society for Maternal Fetal Medicine, including patients treated with unapproved therapies and untreated patients.
3. Based on 140,000 patients, >16 injections/patient and net revenue of ~$425-$450/injection.
4. AMAG SEC filings

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LPCN 1107: First Oral PTB Candidate

Addresses Unmet Need

LPCN 1107- Oral HPC

- Potential for superior efficacy with Phase 3 target dose
- No patient discomfort upon administration
- Steady state achieved in 7 days
- Orphan drug designation
  - Major contribution to patient care
- Next steps:
  - Explore partnering opportunities

Upcoming Milestones

Near Term Value Drivers

	Event	Expected Timing
TLANDO™	Complete definitive phlebotomy study	**4Q 2018**
	ABPM study results	**1Q 2019**
LPCN 1144	Complete In-Vivo model Proof-Of-Concept study in biopsy-confirmed NASH	**4Q 2018**
	POC clinical study results in imaging-confirmed NAFLD/NASH patients	**1Q 2019**

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Key Financial Metrics

Stock Price, Market Cap, Cash Balance

Ticker Symbol	**LPCN (Nasdaq Capital Market)**
Closing Stock Price (8/1/18)	**$1.39/share**
Market Capitalization (8/1/18)	**$29.6 million**
Fully Diluted Shares Outstanding (6/30/18)	**25.2 million**
Cash Balance (6/30/18)	**$25.1 million***
Bank Debt (6/30/18)	**$10.0 million**

* $5 M restricted

Lipocine Investment Highlights

Innovative Technology with Advanced Products

Proven Proprietary Technology Platform

MEN'S HEALTH

- **TLANDO™**: Potential first oral TRT option
  - Differentiated product targeting ~$2.0 billion established US TRT market
- **LPCN 1144**: Oral androgen therapy for NASH
  - Positive clinical serum marker data in patients with typical comorbidities of NASH
- **LPCN 1111**: Next generation potential once-daily oral TRT option
  - Positive top-line Phase 2b study results

WOMEN'S HEALTH

LPCN 1107:
Orphan designated oral alternative for the prevention of preterm birth

- EOP2 meeting completed
- Phase 3 protocol submitted to FDA via Special Protocol Assessment

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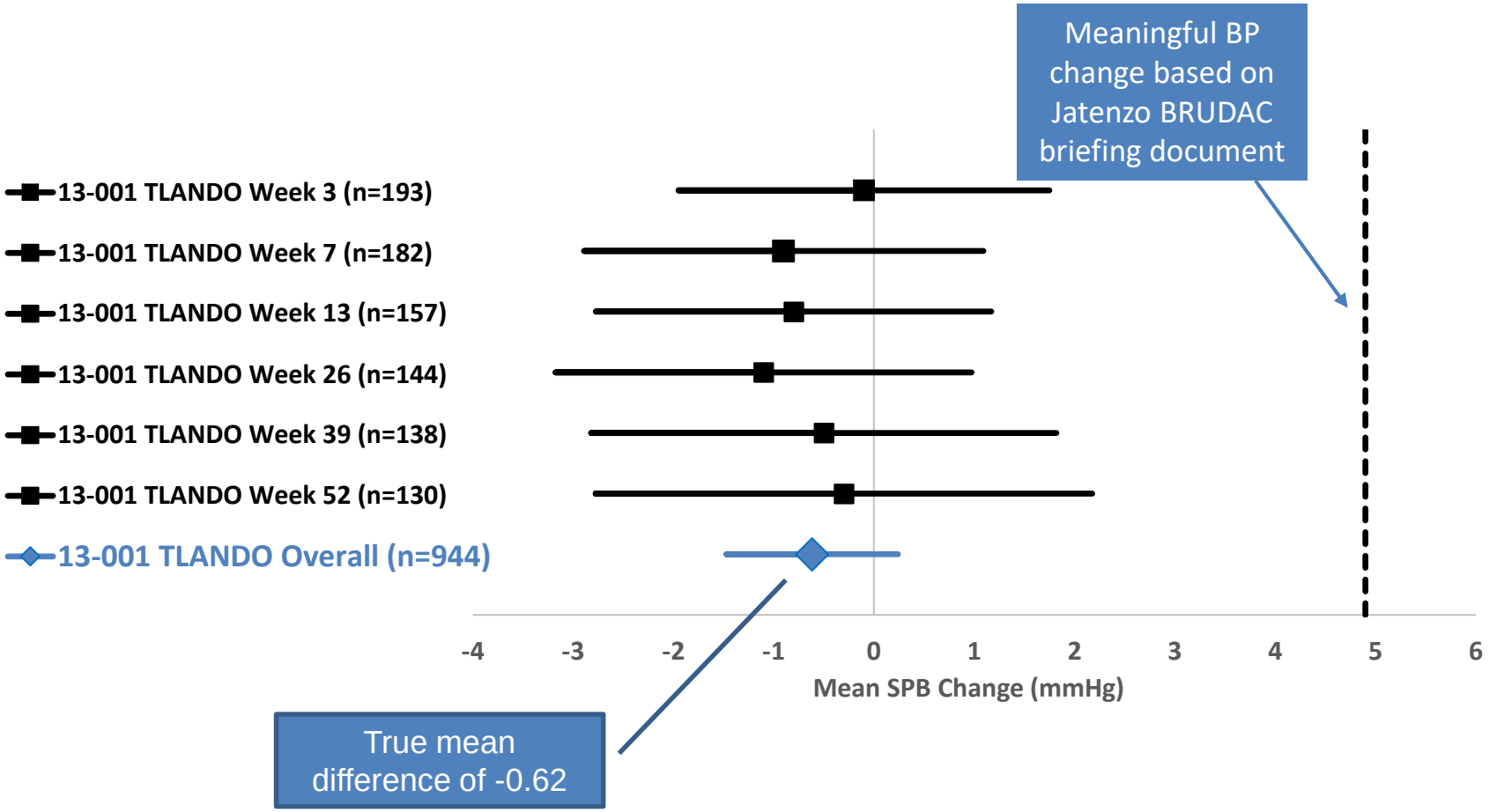
Appendix

TLANDO™ SOAR Study Blood Pressure Data

Systolic Clinic BP Measurement - Change From Baseline



Minimal change in BP from baseline at each visit throughout the SOAR study

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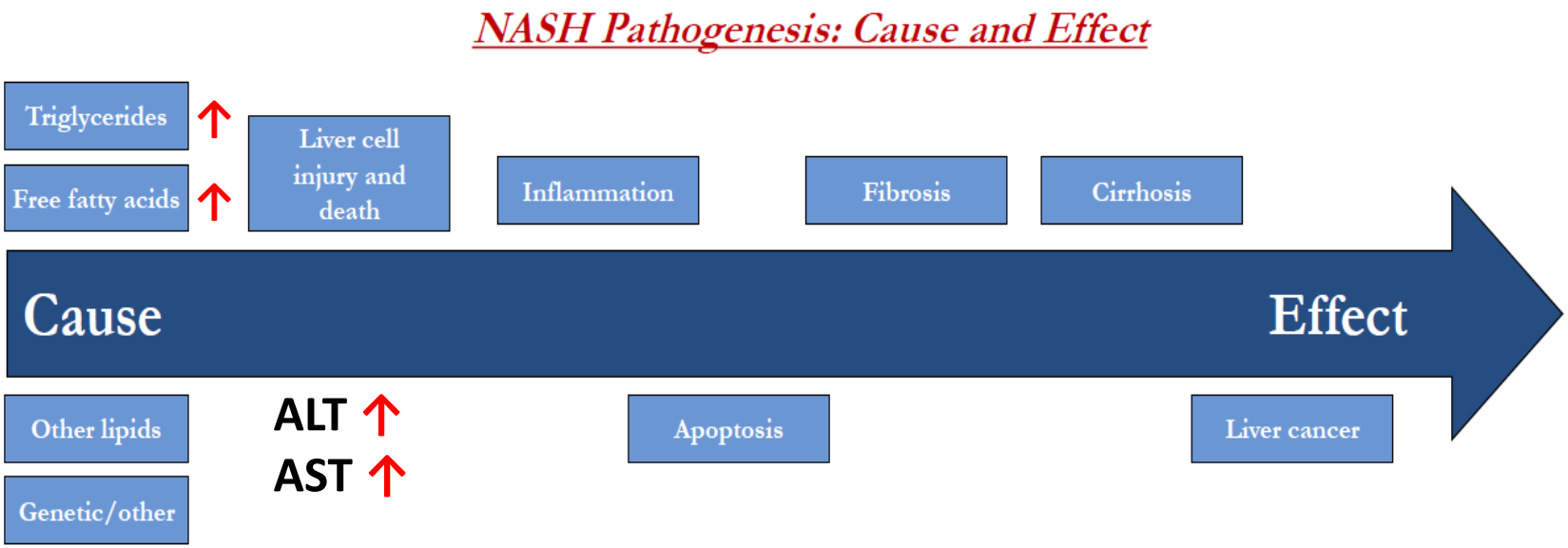
NASH Liver Disease Pathogenesis



Modified from Source: Evercore ISI Research

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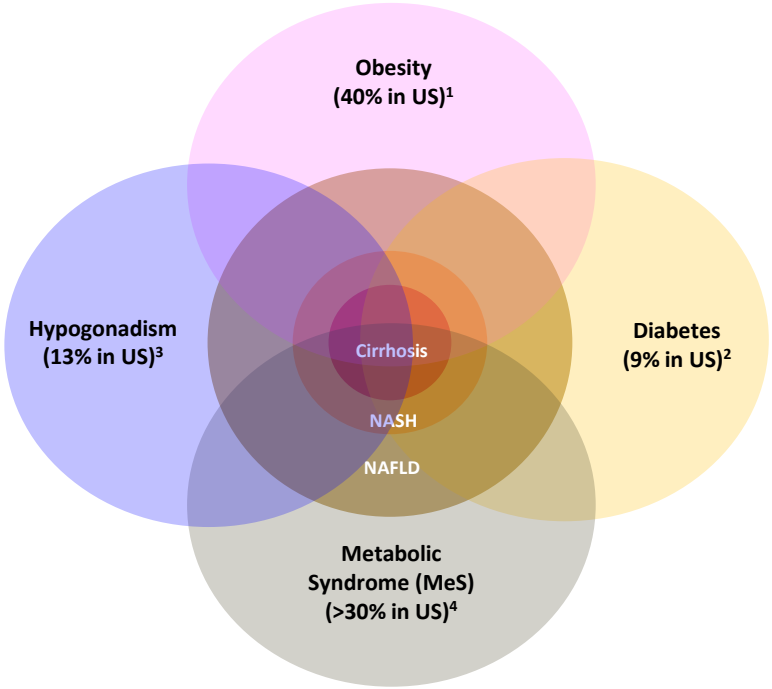
Comorbidities Prevalence and Fatty Liver Disease



1. CDC, Jun 2018
2. CDC, Jul 2017
3. Dandona and Rosenberg, Int J Clin Pract, 2010 (US Census Bureau, Aug 2008)
4. Moore et al, Prev Chronic Dis, 2017 (CDC)

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NASH-Comorbidity Association

Comorbidity	Prevalence of Comorbidity in NASH *	Prevalence of NASH in Comorbidity
Obesity	82%	37%[1]
Hypertension	68%	78%[2]
Diabetes	44%	25%[2]
Metabolic syndrome	71%	40%[3]

*Among biopsied NAFLD patients (Younossi et al, Hepatology, 2016)

Liver fat is correlated with components of metabolic syndrome[4]

1. Machado et al, J Hepatol, 2006
2. Williams et al, Gastroenterol, 2011
3. Russo, J Clin Gastroenterol, 2017
4. Rector et al, Gastroenterol, 2008

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Hypogonadism is Associated with Chronic Liver Disease[1]

Androgen receptor signaling appears to be a key impacting liver health in men.[2]

Androgen effects:

- **Alter lipid profile**:[3]
  - Potential to lower fatty acid, decrease lipid deposition/storage in liver, decrease lipogenesis, decrease lipolysis, increase fatty acid oxidation/glucose uptake
  - Influence adipose tissue (visceral adipose tissue lowering)
- **Promote cholesterol storage**: may influence microRNAs in the liver[4]
- **Anti inflammatory**: reduction in TNF-alpha, IL1-beta, and IL6[3]
- **Glucose homeostasis**: increase insulin receptor, reduce insulin resistance/increase insulin sensitivity; favorable impact on glucose metabolism[5]
- **Hemoglobin production**: induce erythropoiesis- anemia has impact on all cause mortality, INR changes[6]
- **Alter body composition and bone density**: increase lean muscle mass (stimulate satellite cells and myocyte precursor) and lower fat mass[7]

1. Kim et al, Male hypogonadism and liver disease in *Male hypogonadism and basic clinical and therapeutic*, Contemp Endocrin (2017) p219-234
2. Shen M and Shi H, Int J Endocrinol, 2015
3. Kelly DM and Jones TH, J Endocrinol, 2013
4. Delic et al, Steriods, 2010
5. Saad F, Adv Exp Med Biol, 2017
6. Bachman et al, J Gerontol Series a, 2013
7. Neto et al, Age (Dordr), 2015

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Study Details for Serum Biomarker Data Analysis

- **“Study of Oral Androgen Replacement (SOAR) Trial” or 13-001 Study** – 52 week therapy with oral T and topical active control in 314 hypogonadal subjects
  - Liver enzyme and lipid levels were monitored
  - Subgroup analyses with comorbid conditions typically associated with NAFLD and NASH

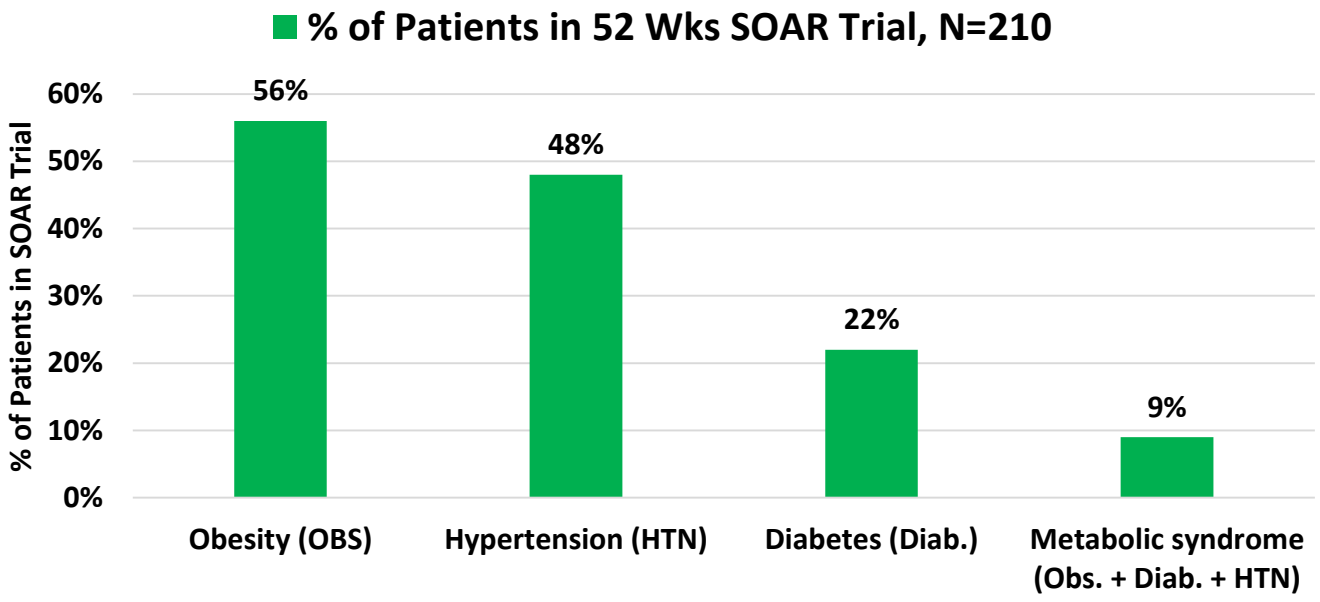
- **“Dosing Validation (DV) study” or 16-002 Study** – 3 week therapy with oral T in 94 hypogonadal subjects

52-Week SOAR Trial Demographics

Oral T versus Topical T

52 Wks SOAR Trial	Oral T (N = 210)	Topical T (N = 104)
Age (yrs), mean	52.6	54.2
Race, %		
Asian	1.4	2.9
Black or African American	15.2	9.5
White	81.9	87.6
Other	1.4	0
BMI (kg/m^2), mean	30.8	31.0
Weight (kg), mean	97.1	99.2
Comorbidity, %		
Obesity	56.2	62.5
Diabetes	21.9	34.6
Hypertension	47.6	47.1
TG at BL (mg/dL), mean	192	187

SOAR Trial Comorbidity Distribution



Typical NASH Prevalence:	37%[1]	78%[2]	25%[2]	40%[3]

1. Machado et al, J Hepatol, 2006
2. Williams et al, Gastroenterol, 2011
3. Russo, J Clin Gastroenterol, 2017

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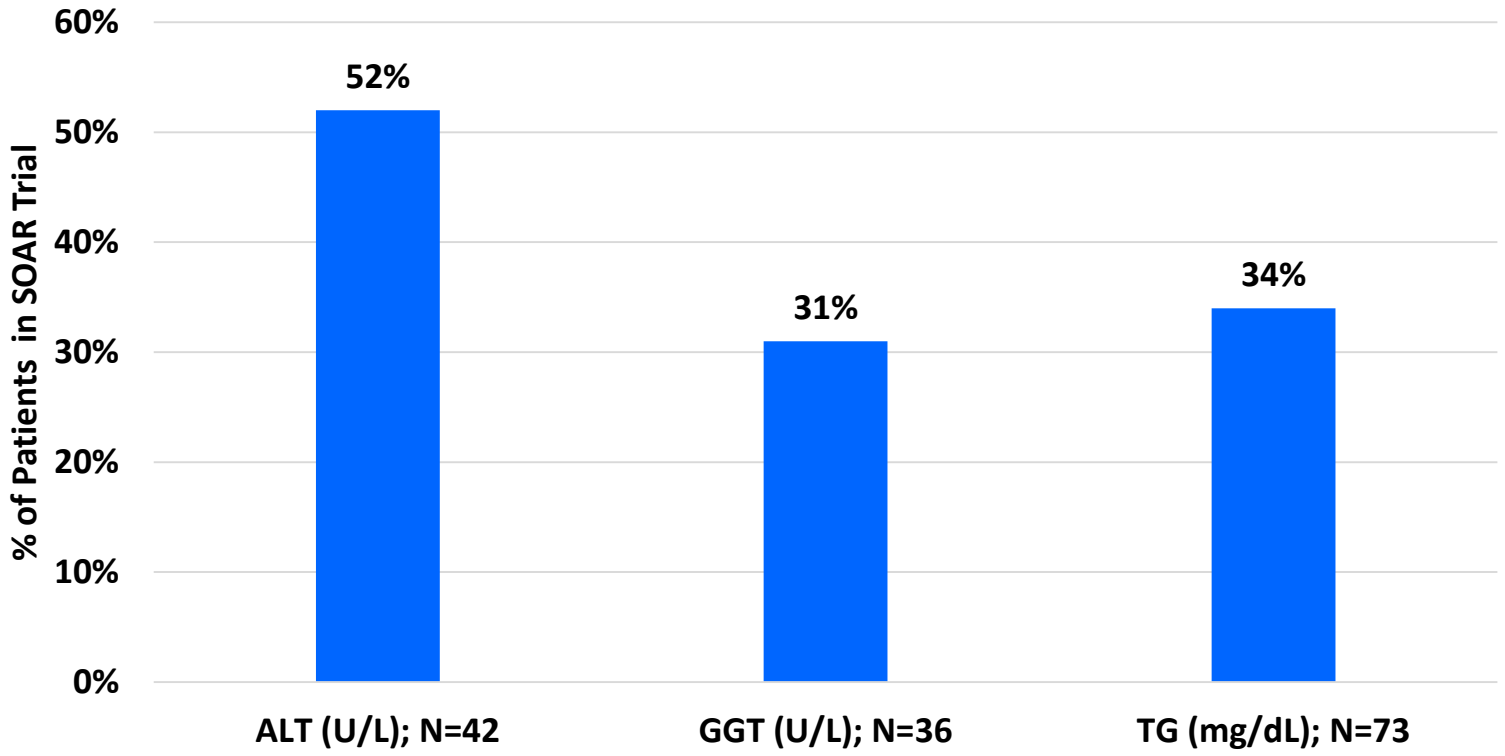
Mean Baseline Liver Enzymes and TG levels in Patients with Comorbidity Typical of NASH

SOAR Trial (13-001)	Overall (N=210)	Obesity (N=118)	Diabetes (N=46)	Hypertension (N=100)	OBS + Diab + HTN (N=19)
ALT (U/L)	30.5	33.3	29.4	29.0	30.2
AST (U/L)	24.2	24.7	21.1	23.5	22.4
ALP (U/L)	71.8	71.7	73.3	69.4	66.0
GGT (U/L)	36.2	36.8	41.7	34.3	29.4
TG (mg/dL)	192	205	209	187	253

Significant Number of Patients Shift from Above-Normal Levels at Baseline to Normal† Levels at End of Study*



* 52 Wk

† Normal range: ALT (10-40 U/L), GGT (10-49 U/L), TG (45-200 mg/dL)

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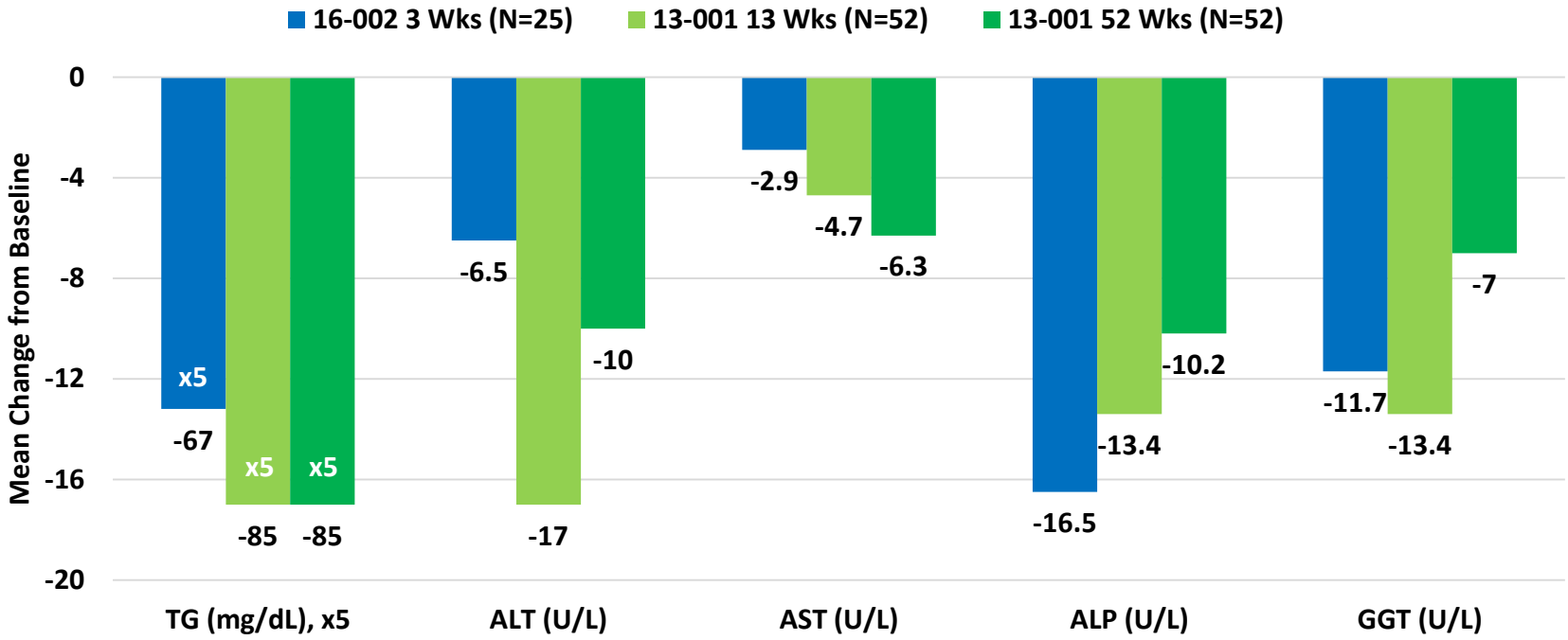
Consistent Marker Reduction Independent of Therapy Duration/Study

- TG and liver enzymes mean change post therapy in patients* with elevated serum markers in two separate studies



* Patients are for 4th Quartile (above or upper normal level) of each lab at baseline.

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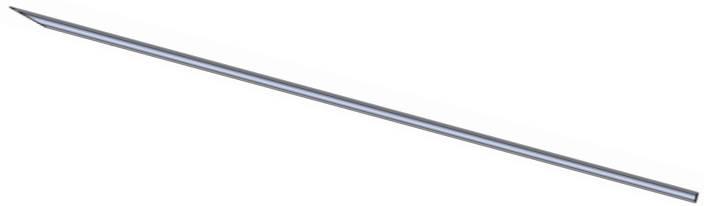
LPCN 1107: First Oral PTB Candidate

Characteristics Of The Only Approved Product Options for PTB

Makena 21 gauge needle



IM HPC, Makena®:

- 20-25% patients below reported better efficacy HPC level threshold
- Total of 18-22 injections
  - Injection location: Upper-outer quadrant of the gluteus maximus
  - Weekly visit to/by health care provider
  - ~35% of patients experienced injection site pain during clinical trial
  - ~17% of patients reported site swelling-much greater than placebo during clinical trial

SubQ HPC, Makena®:

- 20-25% patients below reported better efficacy HPC level threshold
- Total of 18-22 injections
  - Approved February 14, 2018
  - Auto injector-ready to use device
  - Injection location: Upper back of the arm
  - Weekly visit to/by health care provider
  - 37.3% of subjects identified injection site pain as a treatment emergent adverse event compared to only 8.2% of subjects in the IM arm

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LPCN 1107: Advancing to Phase 3 Readiness

Phase 3 Special Protocol Assessment – Progress

- **Concurrence with FDA to date:**
  - **Study Design Elements**
    - Single Phase 3 study
    - Open label, active comparator, two parallel arms (1:1 randomization)
    - General inclusion and exclusion criteria and treatment duration
    - LPCN 1107 dose of 800 mg BID
  - **Endpoints and Analysis**
    - Primary endpoint of proportion of PTB < 37 weeks
    - Non-inferiority margin of 7%
    - Secondary endpoint: Neonatal mortality and morbidity composite index
    - Interim analysis with ability to resize the study
      - Study size: 500 to 1000 subjects per arm
- **Open Items**
  - Data from food effect study to inform dosing instructions
  - Align on approach to fulfill infant follow up data requirement
- **Next Steps**
  - Continue Interactions with FDA on Phase 3 protocol via Special Protocol Assessment
  - Conduct Food/Fat Effect Study in preparation of Phase 3 study