pharmaceuticals

INVESTOR PRESENTATION

JULY 2022

Making Smart Chemical Changes to Create Improved Novel Therapeutics

DISCLAIMERS

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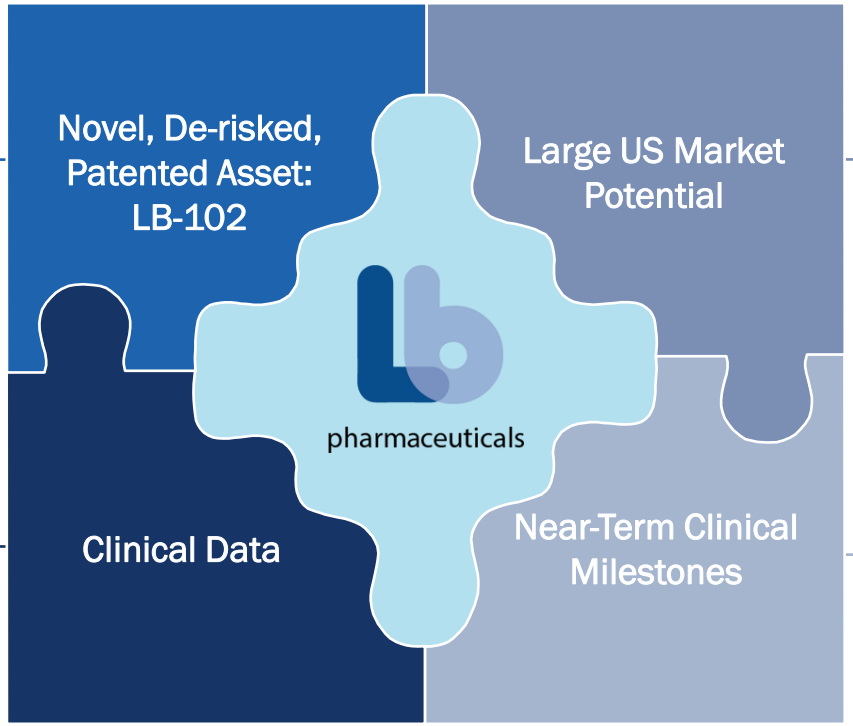
LB PHARMACEUTICALS INVESTMENT HIGHLIGHTS

CNS-focused biotech building a pipeline of potential best-in-class therapies for the US market

Lead asset, **LB-102,** is a novel benzamide leveraging the demonstrated efficacy and safety of amisulpride for the treatment of schizophrenia

N = 80 Phase 1 studies showed LB-102 safe, well-tolerated, and bound $D_{2/3}$ at desired occupancy to treat SCZ



LB-102 has potential to exceed $1 billion in annual US sales (based on EU comparison)

Phase 2 study, planned for Q4 2022, could validate LB-102 as an important therapy for schizophrenia patients

LB PHARMACEUTICALS BUSINESS STRATEGY

- CNS-focused development stage company intent on building a pipeline of improved versions of effective drugs that are commercially unavailable in the US

- Lead asset LB-102 is a methylated version of amisulpride, one of the leading anti-psychotics in use worldwide for the treatment of schizophrenia

    - LB-102 was designed to be effective at lower doses than amisulpride, which could improve safety and tolerability

    - LB-102 is a novel chemical structure with composition of matter patents issued in the US and abroad

    - Even if clinically equivalent to amisulpride, LB-102 would be one of the most effective antipsychotics on the US market with IP until at least 2037 and potential to yield $1 billion in annual sales based on ex-US market data*

- First-in-class team of executives, board members, and advisors with extensive experience in drug development in the psychiatric arena

* Based on a 2% market share of 65 million antipsychotic Rx per year in US (IMS, 2019 data) at an average price of $2,000 per month

MANAGEMENT TEAM

Zachary Prensky, Chief Executive Officer & Co-Founder

- Managed family office from 1997-2015
- Portfolio responsibilities included oversight of all biotechnology investments

Anna Eramo, M.D., Chief Medical Officer

- Former Clinical and Medical Affairs head at Lundbeck
- Has 18 years of global CNS experience; oversaw US development of brexpiprazole
- Trained clinical psychiatrist

Andrew Vaino, Ph.D., Chief Science Officer

- Chemistry PhD from Queen's University with two decades experience in biotech
- MBA from UC Irvine
- Inventor of two molecules studied clinically

Marc Panoff, Chief Financial Officer

- Previously CFO of Retrophin - raised $150 million in equity and debt financings and uplisted company to Nasdaq Global Market
- Previously CFO of Neurologix and Nephros

BOARD OF DIRECTORS

Zachary Prensky, CEO and Co-Founder

Robert Ruffolo, Ph.D., D.Sc. (h), D.Eng. (h), F.C.P.P.

- Former President of R&D, Wyeth Pharmaceuticals
- Previously SVP and Director, Biological Sciences, Worldwide, SmithKline Beecham Pharmaceuticals (now GlaxoSmithKline)

Piero Poli

- Owner and CEO of Rivopharm SA, a Swiss company that has developed over 25 molecules and registered generic products throughout Europe, including amisulpride

Vincent Grattan, R.Ph

- Co-Founder and senior consultant
- PA registered pharmacist currently employed by MHM Services, responsible for all facets of drug utilization management collaborating with a team of 300+ clinicians; 20 years of psychopharmacology experience

Edmund Sullivan, Founding Investor

- Formerly at Citigroup and Cowen & Company

SCIENTIFIC ADVISORS

John M. Kane, M.D., Chairman

- Vice President, Behavioral Health Sciences, Northwell Health; Chairman of Psychiatry, Zucker Hillside Institute

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- Medical Director, Recognition and Prevention Program, The Zucker Hillside Hospital; Professor, Center for Psychiatric Neuroscience, The Feinstein Institute for Medical Research

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Ira Glick, M.D.

- Professor of Psychiatry and Behavioral Sciences, Stanford University School of Medicine

Herbert Meltzer, M.D.

- Professor of Psychiatry & Behavioral Sciences, Pharmacology and Physiology, Northwestern University

LB PHARMACEUTICALS – FINANCING HISTORY

Financing Round	Date(s)	Gross Amount Raised	Milestones Achieved
Seed Rounds	2015 - '17	$1.9M	LB-102 Invention and *in-vitro* studies 3 animal SCZ pre-clinical studies Initial CMC Formulation
Series A	2017 - '18	$8.4M	Completion of all IND-enabling studies Successful Phase 1 clinical trial in 64 healthy volunteers Successful completion of Phase 1 trial (safety/PK) in 64 healthy volunteers
Convertible Notes	2020	$10.0M	Successful Phase 1b PET imaging study (dopamine receptor occupancy) in 16 healthy volunteers Successful completion of two long-term toxicity studies in dogs and rats Production of LB-102 tablet for Phase 2 drug product Phase 2 clinical trial preparation; CMO hire, CRO engagement, site selection
Totals		*$20.3M*	*LB-102 Phase 2 Ready*

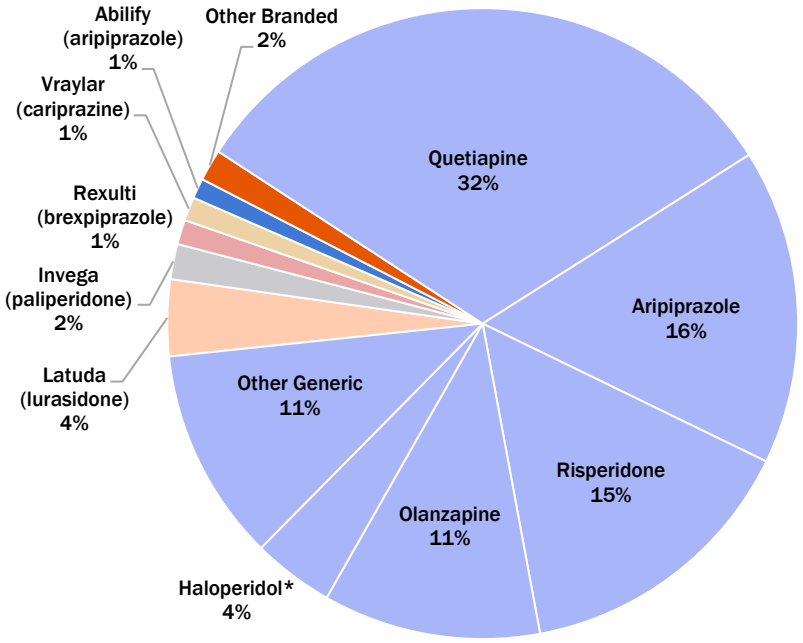
SCHIZOPHRENIA

- Schizophrenia (SCZ) is a chronic and debilitating disease affecting approximately 1% of the US population[1]
  - 100,000 new SCZ patients diagnosed per year[2]
  - SCZ patients have profoundly diminished quality of life
    - Fewer than 20% hold full-time employment;[3] increased odds of arrest[1]
  - Life expectancy of SCZ patients is reduced by 10-20 years compared to the general population[4]
    - Approximately 5% SCZ patients die of suicide[5]
  - Disease defined by three major groups of symptoms
    - Positive symptoms: delusions, hallucinations, agitation
    - Negative symptoms: lack of social engagement, depression
    - Cognitive symptoms: memory deficits, impaired executive functions

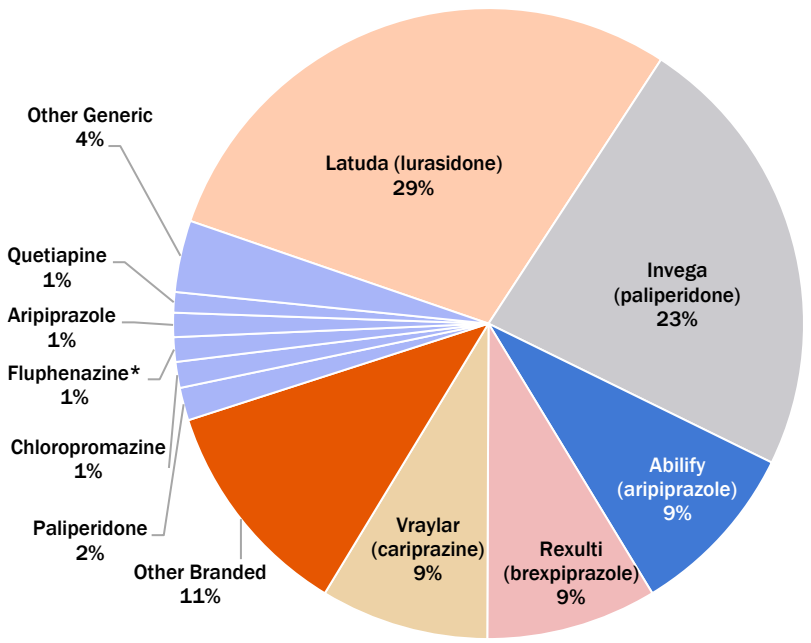
1 About Schizophrenia - Schizophrenia & Psychosis Action Alliance (sczaction.org)
2 Schizophrenia Symptoms, Patterns and Statistics and Patterns (mentalhelp.net)
3 The Atlantic, "Job Hunting with Schizophrenia", Maria Hengeveld, July 28, 2015
4 Moradi et al. 2018
5 Palmer et al. 2005

US ANTIPSYCHOTIC MARKET LANDSCAPE[(1)]

US Antipsychotic Market: ~67mm Retail TRx



US Antipsychotic Market: ~$12bn Sales



Represents generic TRx / Sales

* Indicates typical (first-generation) product

- Branded antipsychotic drugs generate ~$11 billion in sales annually in the US
- Despite limited efficacy, and a crowded generic market, new branded antipsychotics such as Latuda, Vraylar, and Rexulti are approaching or have achieved > $1 billion each in annual sales in the US

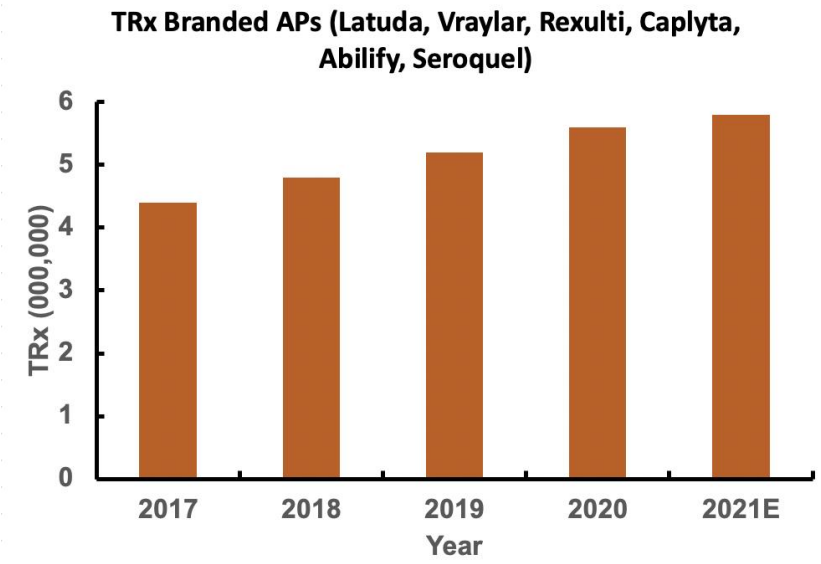
Notes: (1) Source: IMS 2019 data including all dosage forms; (2) Source: *J. Clin. Psychiatry*, 77, 764-771

SCHIZOPHRENIA – UNMET MEDICAL NEED

- Despite 20+ FDA approved drugs, SCZ patients don't get adequate help
  - An estimated 50% of patients with SCZ do not take their prescribed medications as directed[1]
  - Up to 75% of SCZ patients cycle through multiple drugs within 18 months, with up to 60% failing to find an effective therapy[2]

Standard of care treatments do not adequately treat a heterogeneous patient population; alternative novel treatments are badly needed

Branded Rx growing



Phase 2 data price catalyst[3]

Share Price Pre/Post P2 SCZ Data

Company	Phase 2 Announcement	PANNS Δ From BL	Share Price Increase	Mkt Cap Increase ($B)
KRTX	11/18/19	-17.4	5.5x	2
CERE	6/29/21	-19.5*	2.4x	2.2

* 30 mg QD

1 About Schizophrenia - Schizophrenia & Psychosis Action Alliance (sczaction.org)
2 Patel et al. P&T 2014 Sep; 39(9): 638–645.
3 Shows percentage change of closing share price and market capitalization for two companies upon annoucement of successful Phase 2 clinical studies for schizophrenia during 2019-2021. Source: NASDAQ.

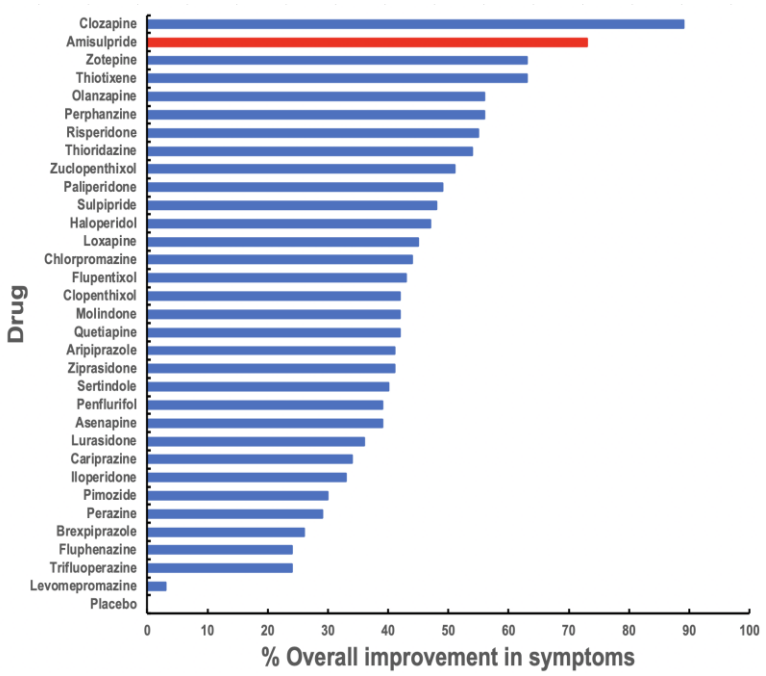
AMISULPRIDE BACKGROUND

- Amisulpride is a benzamide indicated for the treatment of schizophrenia in Europe since 1986
    - Patented and developed by Synthélabo (acquired by Sanofi)
    - Selective D_2 (K_i = 2.8 nM)/D_3 (K_i = 3.2 nM) and $5HT_7$ (K_i = 31 nM) antagonist
    - In July 2000 Sanofi announced it would discontinue development of amisulpride in the US based on IP
- Amisulpride has generated over 2.5 million prescriptions annually for the past three years in Europe
- 35 years of clinical use demonstrates an excellent efficacy/safety profile

AMISULPRIDE COMPARATIVE EFFICACY/SAFETY

Meta-Analysis of 32 Schizophrenia (SCZ) Drugs[1] (n = 53,500)

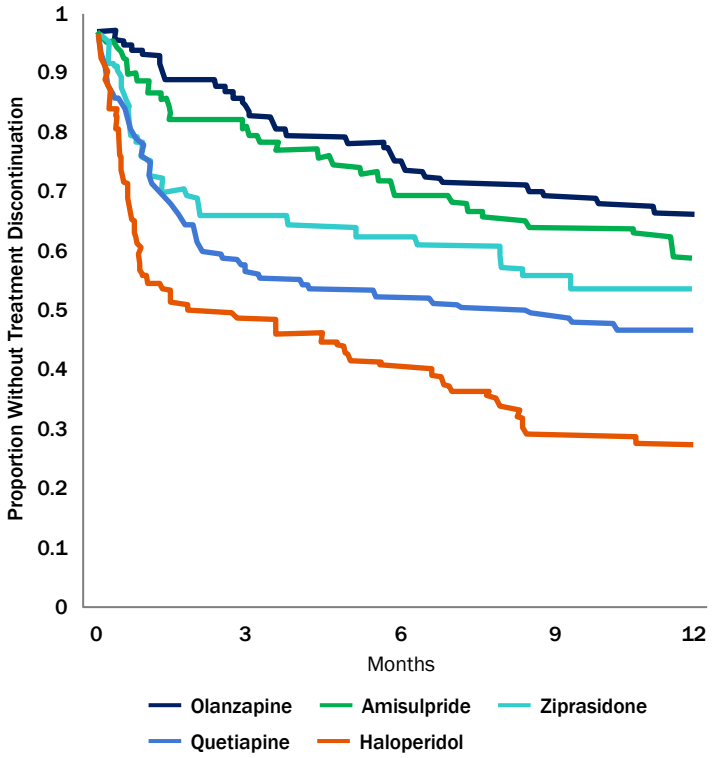
Antipsychotic Efficacy



Amisulpride is one of the most effective antipsychotics in the world

EUFEST Study[2] (Clinical Trial of 5 SCZ Drugs in First Episode) (n = 498)

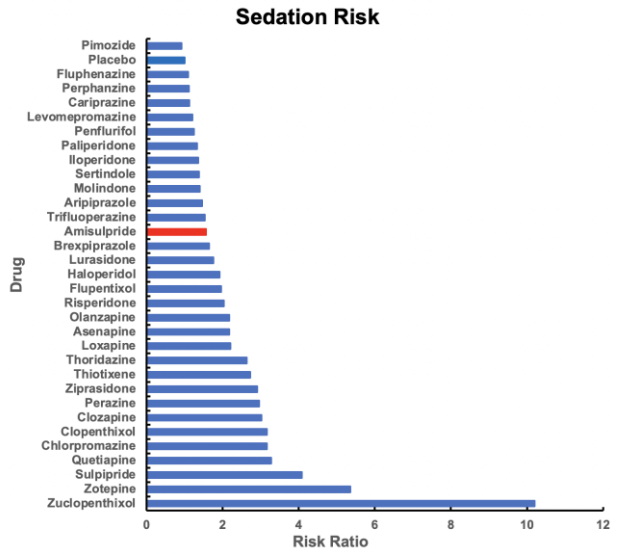
All-Cause Discontinuation

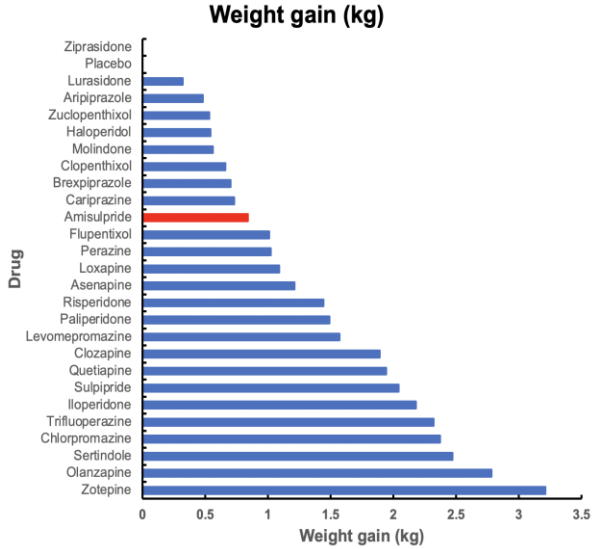


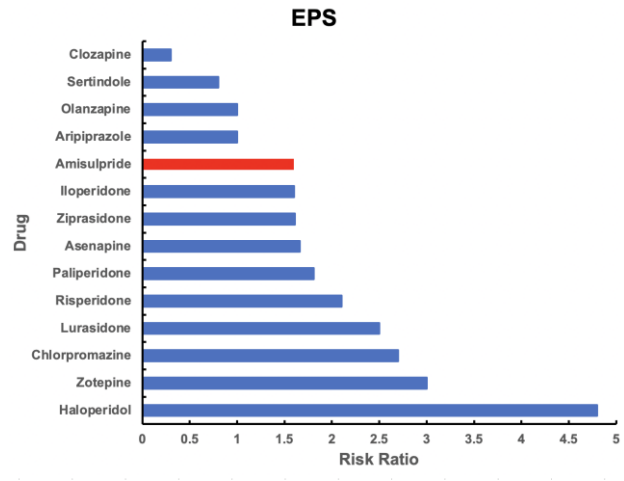
Amisulpride is one of the best tolerated antipsychotics

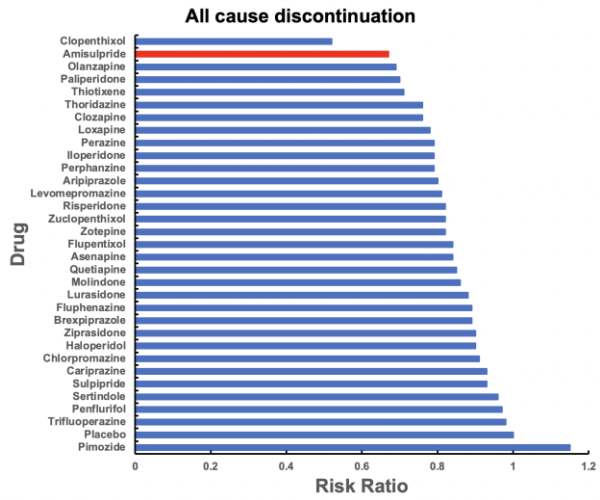
Notes: (1) Source: *Lancet*, **2019**, *394*, 939-951; (2) Source: *Lancet*, **2008**, *371*, 1085-1097

AMISULPRIDE COMPARATIVE SAFETY









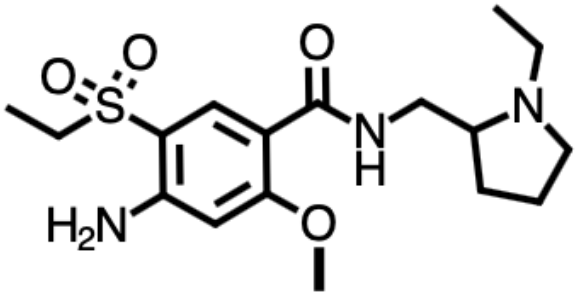
- All cause discontinuation combines efficacy and tolerability. When reported separately, more patients dropped out due to inefficacy (40%) than due to adverse events (20%)

* Lancet, 2019, 394, 939-951

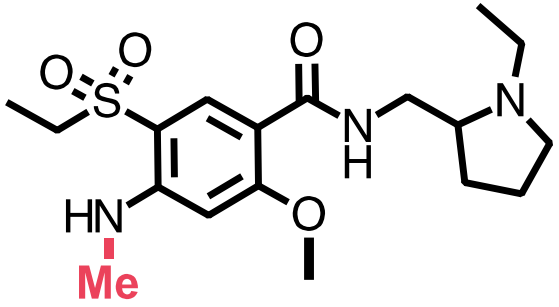
LB-102 OVERVIEW

LB-102 is a methylated version of amisulpride

Amisulpride (1983)



LB-102 (2016)



- Novel chemical structure with chemical properties designed to improve amisulpride's efficacy and safety
- Safe and well-tolerated in two (n = 80) Phase 1 clinical studies
- Three US and four ex-US composition of matter patents covering LB-102 issued extending to at least 2037
- CNS receptor binding profile similar to amisulpride: high selectivity for $D_{2/3}$ and $5HT_7$
- LB-102 same as/better than amisulpride in preclinical animal models of SCZ

LB-102 KEY DIFFERENTIATORS

- Superior efficacy than most recently launched antipsychotics and other compounds in development

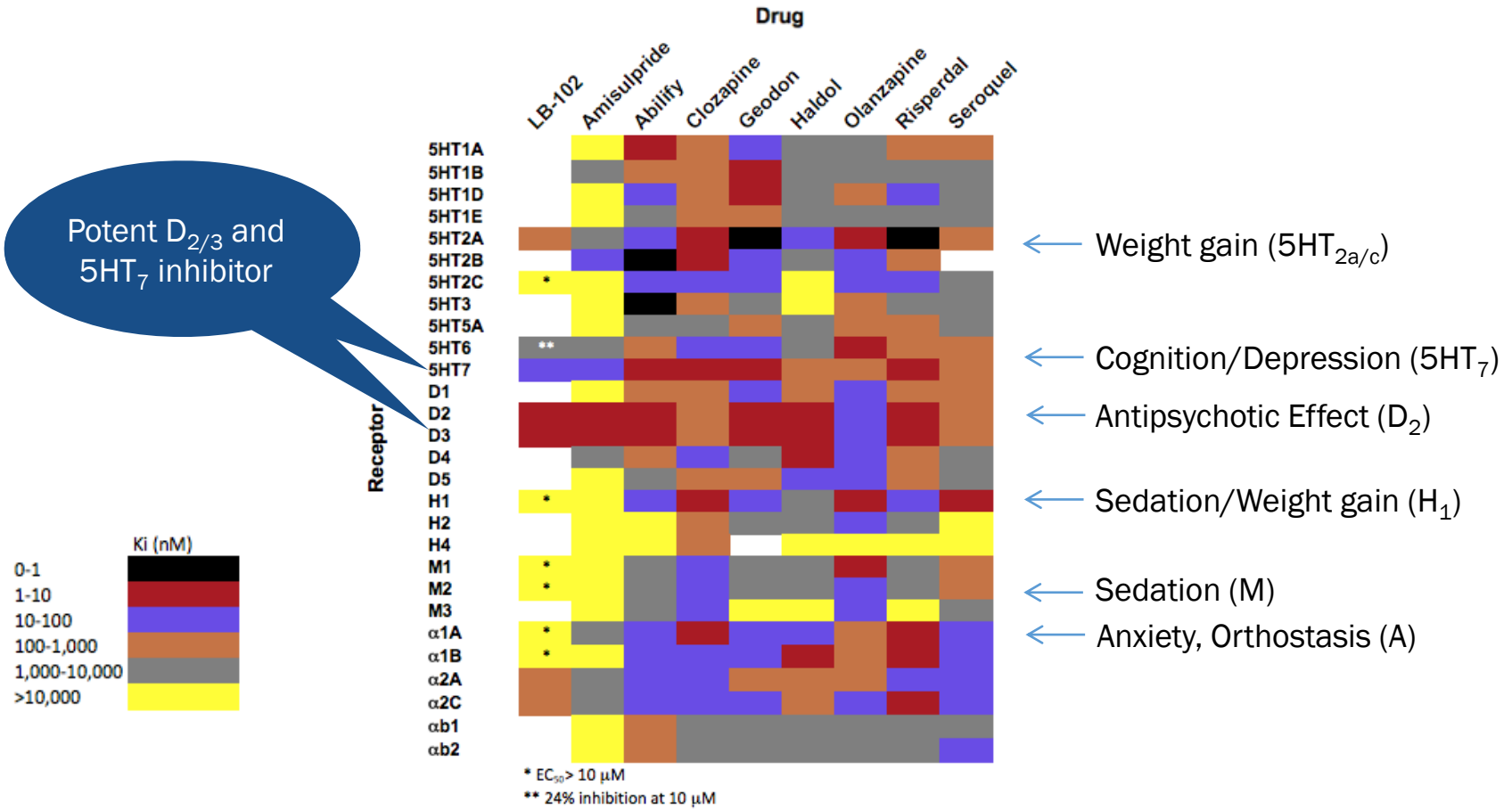
	Avg PANSS Δ from BL[1]
Caplyta	-14.1
Rexulti, 4 mg	-19.9
Vraylar, 3 mg	-22.4
Amisulpride	-28.9

- Minimal off-receptor binding (D_2, D_3, $5HT_7$) potentially leading to low incidence of AEs
- Potential use in patients with predominantly negative symptoms, depression, and Alzheimer's psychosis
  - Amisulpride one of two drugs to show statistically significant improvement in negative symptoms (SANS Δ 12 points vs. placebo)[2]
  - Equivalent to Prozac in clinical study of depression[3]
  - ATLAS study showed amisulpride effective in treating psychosis in elderly[4]
- Weakly metabolized, low risk of drug/drug interactions
- LB-102's low expected therapeutic doses (50 mg LB-102 = same dopamine RO as 400 mg amisulpride) could be amenable to LAI formulation

Notes: (1) Data from FDA Medical Reviews except amisulpride data from *Neuropsychopharmacology*, **2002**, *27*, 1071 and *Current Medical Research and Opinion*, **2002**, *18*, 355; (2) Danion et al, *Am J Psychiatry*, **1999**; (3) Smeraldi, *Journal of Effective Disorders*, **1998**, *48*, 47-56; (4) Howard et al., *Lancet Psychiatry*, **2018**

LB-102 AND AMISULPRIDE RECEPTOR SPECIFICITY

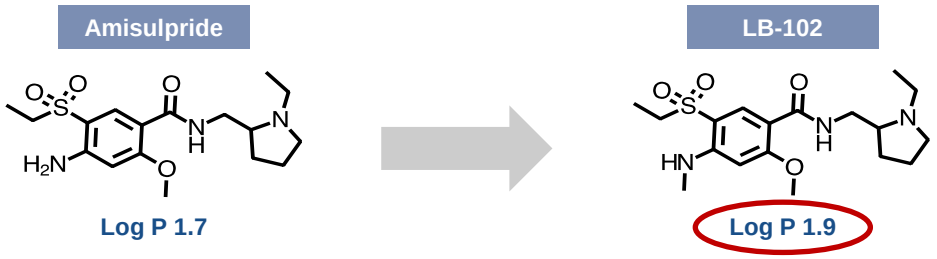
LB-102 is a selective D_2/D_3 /$5HT_7$ antagonist with minimal off-target activity



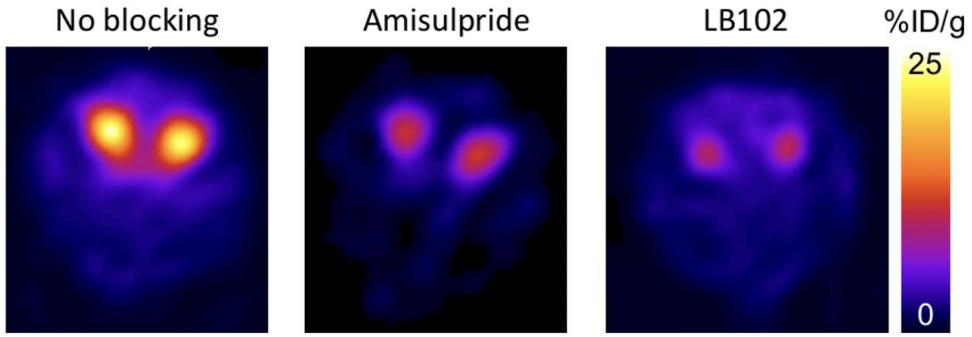
Notes: Ki data from: *The Neuroscientist*, **2000**, 6, 252-26245rf

LB-102: ENHANCING AMISULPRIDE'S PRODUCT PROFILE

- Of 30 psychiatric medications tested amisulpride was least able to passively diffuse across model BBB(1)
- Improving BBB permeability could improve efficacy/decrease adverse events
- Methylation has been shown to improve membrane permeability without changing receptor binding activity, for example desipramine to imipramine and nortriptyline to amitriptyline



- In a PET study, using ^{11}C raclopride, directly measuring dopamine RO in mice the same dose of LB-102 showed LB-102 bound $D_{2/3}$ receptors ~2X as strongly as amisulpride (K_is are similar)

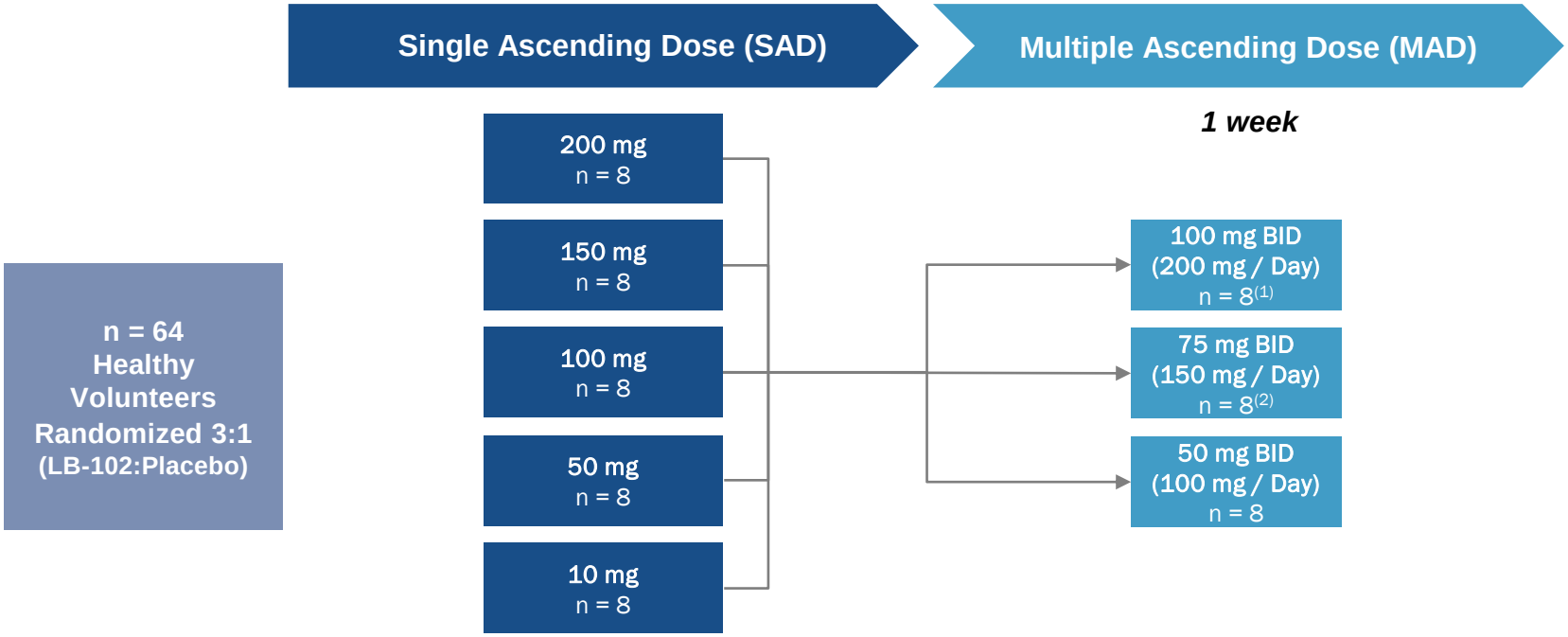


PET scans taken 140 min after dosing either 100 mg/kg amisulpride or LB-102

Notes: (1) Source: *The AAPS Journal*, **2014**, *16*, 1247-1258

LB-102 PHASE 1 CLINICAL TRIAL OVERVIEW

- **Dosing:** 5 single ascending dose (SAD) cohorts/3 multiple ascending dose (MAD, 1 week, BID dosing) cohorts
- **Endpoints:** Safety and pharmacokinetics
- **Single Site:** Medpace in Cincinnati, OH

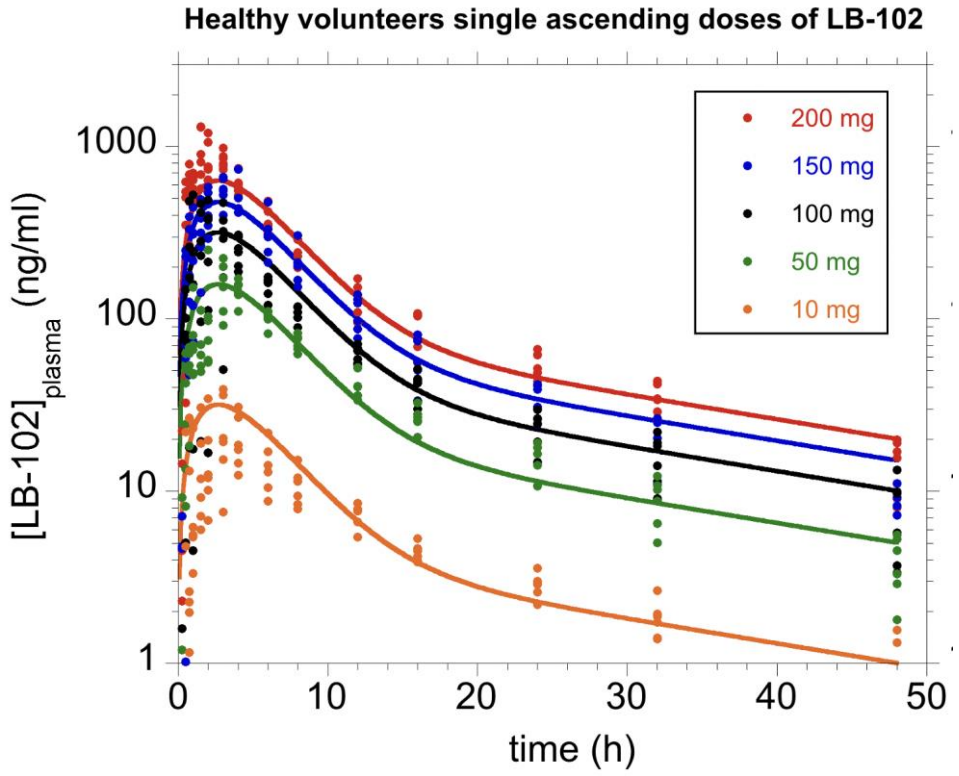


Notes: (1) Did not complete as pre-specified number of adverse events was reached; (2) n = 7 completed, one patient dropped out due to adverse events

LB-102 PHASE 1 PHARMACOKINETICS (SAD)

LB-102 exhibits favorable PK properties, with a half-life of 12+ hours and Tmax of 2-3 hours

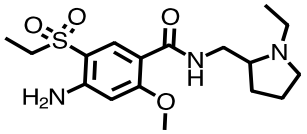
Dose LB-102 (mg)	Cmax (ng/mL)	AUCinf (h*ng/mL)	Tmax (h)	$T_{1/2}$(h)
10	24	253	3	13.7
50	176	1600	3	12.3
100	349	2823	2.8	14.7
150	596.5	4650	3.2	12.6
200	976	7001	2	12.8



PLASMA EXPOSURE OF LB-102 > AMISULPRIDE

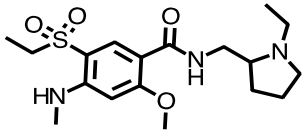
Rosenzweig[1] reported PK data on 18 healthy volunteers exposed to a single dose 50 mg amisulpride

Amisulpride



MW = 369.5
LogP = 1.7

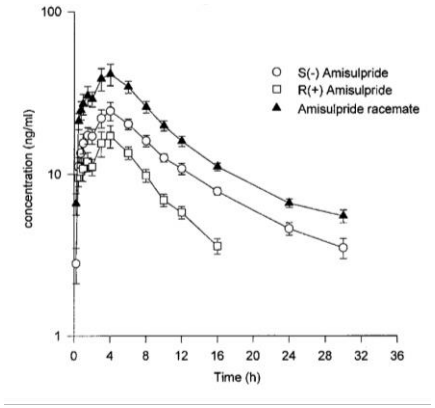
LB-102



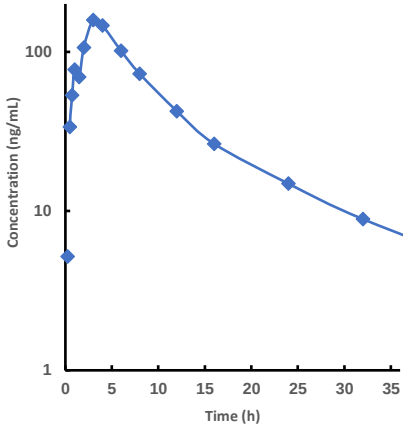
MW = 383.5
LogP = 1.9

Plasma Concentration of 50mg LB-102 vs. 50mg Amisulpride

50 mg Amisulpride



50 mg LB-102



Observed LB-102 plasma exposure is ~ 2.5x that of amisulpride[2]

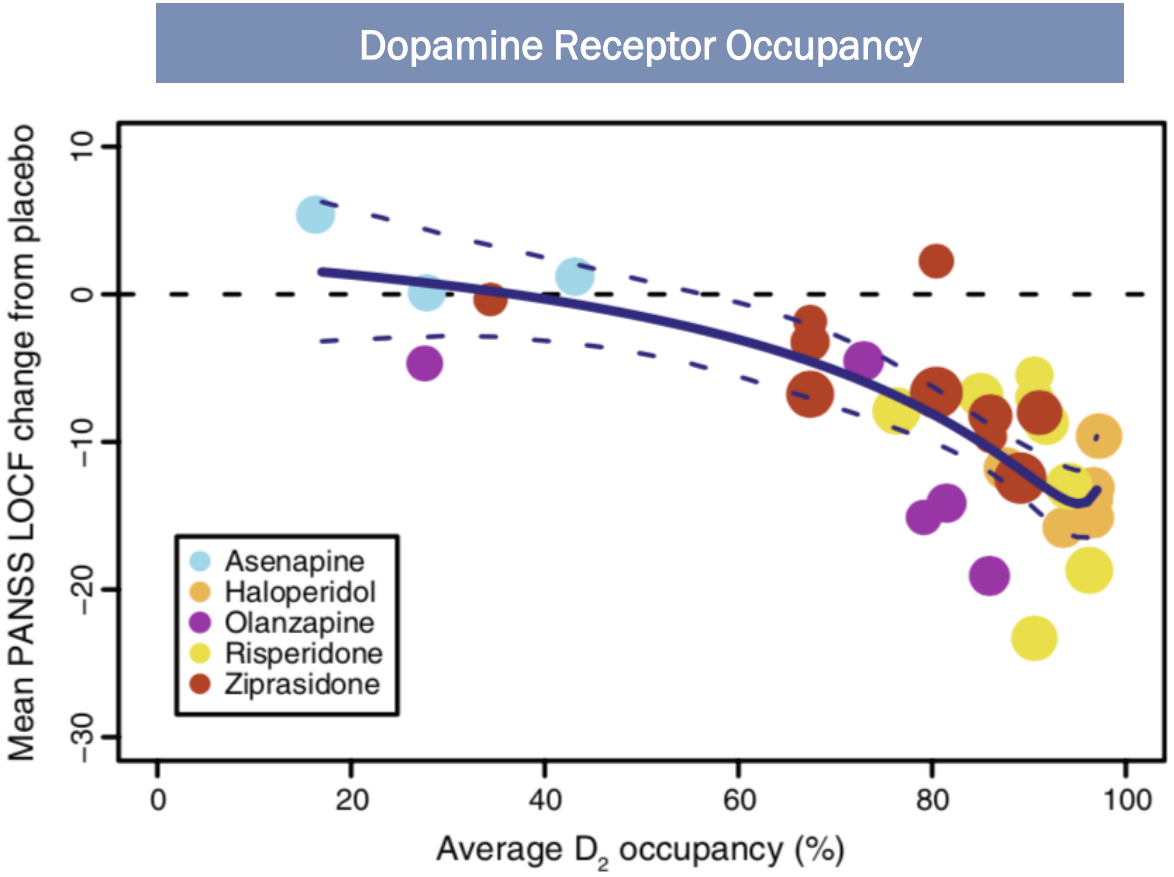
Notes: (1) Source: *Hum. Psychopharmacol. Clin. Exp.*, **2002**, *17*, 1-17; (2) Source: *Drugs*, **2001**, *61*, 2123-2150

LB-102 PHASE 1 ADVERSE EVENTS

		Single ascending dose					Multiple ascending dose		
Adverse event	**Placebo**	**10 mg**	**50 mg**	**100 mg**	**150 mg**	**200 mg**	**50 mg BID**	**75 mg BID**	**100 mg BID**
n	**16**	**8**	**8**	**8**	**8**	**8**	**8**	**8**	**8**
Elevated prolactin		2	3	1	1	1	2	2	1
Diarrhea			1						
Upper respiratory infection			1	1					
Abdominal pain	1	1		1					
Nausea						1		1	1
Urticaria				1					
Acute dystonia						1		1	2
QT prolongation						1			
Insomnia						1		1	
Gastroesophageal reflux						1			
Headache	1					1			
Oropharyngeal pain						1			
Heart palpitations						1			
Vomiting									1
Dry mouth									1
Somnolence								1	1
Dizziness								1	
Migraine								1	
Back pain	1							1	
Bug bite	1								

- Prolactin elevation (PRL), which was reversible and unassociated with clinical consequences, was observed at all doses, a consequence of dopamine receptor binding
- Dosing in 200 mg/d MAD cohort was stopped after 3 days due to two occurrences of EPS (acute dystonia)
  - EPS associated with excess $D_{2/3}$ RO, suggesting need to tamp down dose < 200 mg/d

DOPAMINE RO DIRECTLY LINKED TO IMPROVEMENTS IN SCZ PATIENTS

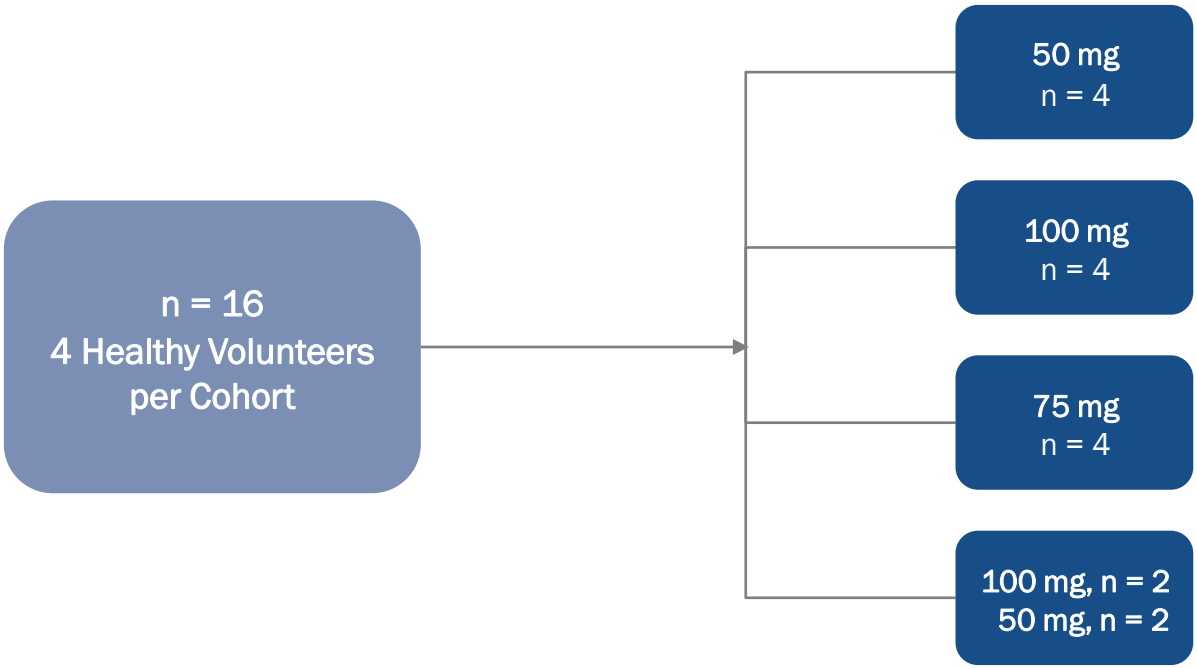


Dopamine RO a good predictor of PANSS improvement(1)

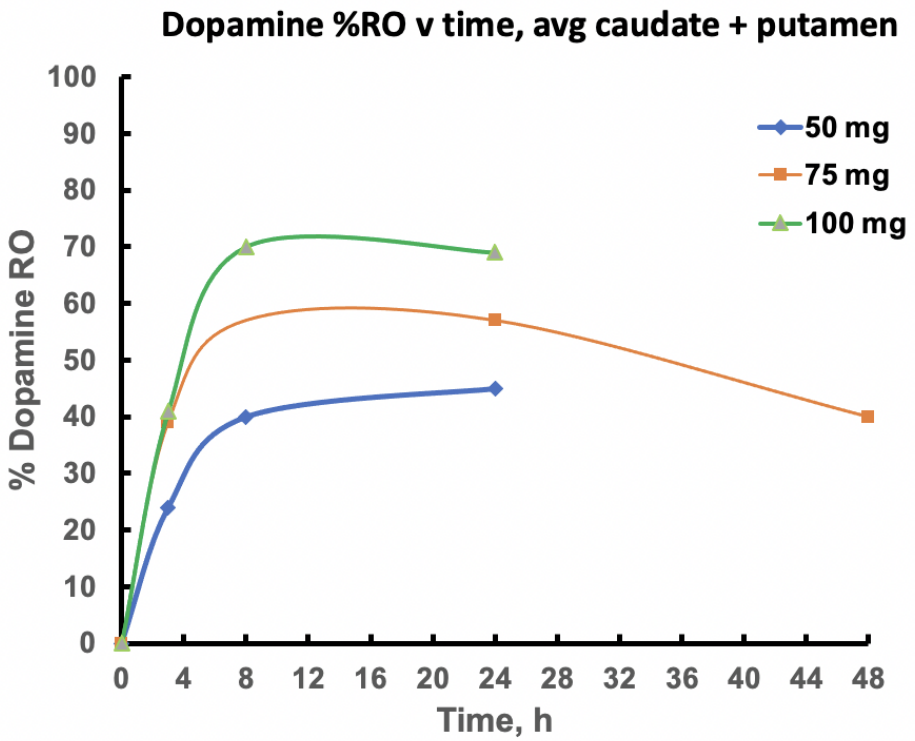
Notes: (1) Source: *The AAPS Journal*, **2011**, 13, 121-130

LB-102 PHASE 1b PET IMAGING STUDY (NCT04588129)

- **Dosing:** Adaptive design with 4 cohorts of 4 healthy volunteers each
  - Multiple PET scans per subject using ^{11}C raclopride as tracer
- **Study Objectives:** To confirm D_2/D_3 target engagement and inform Phase 2 dosing

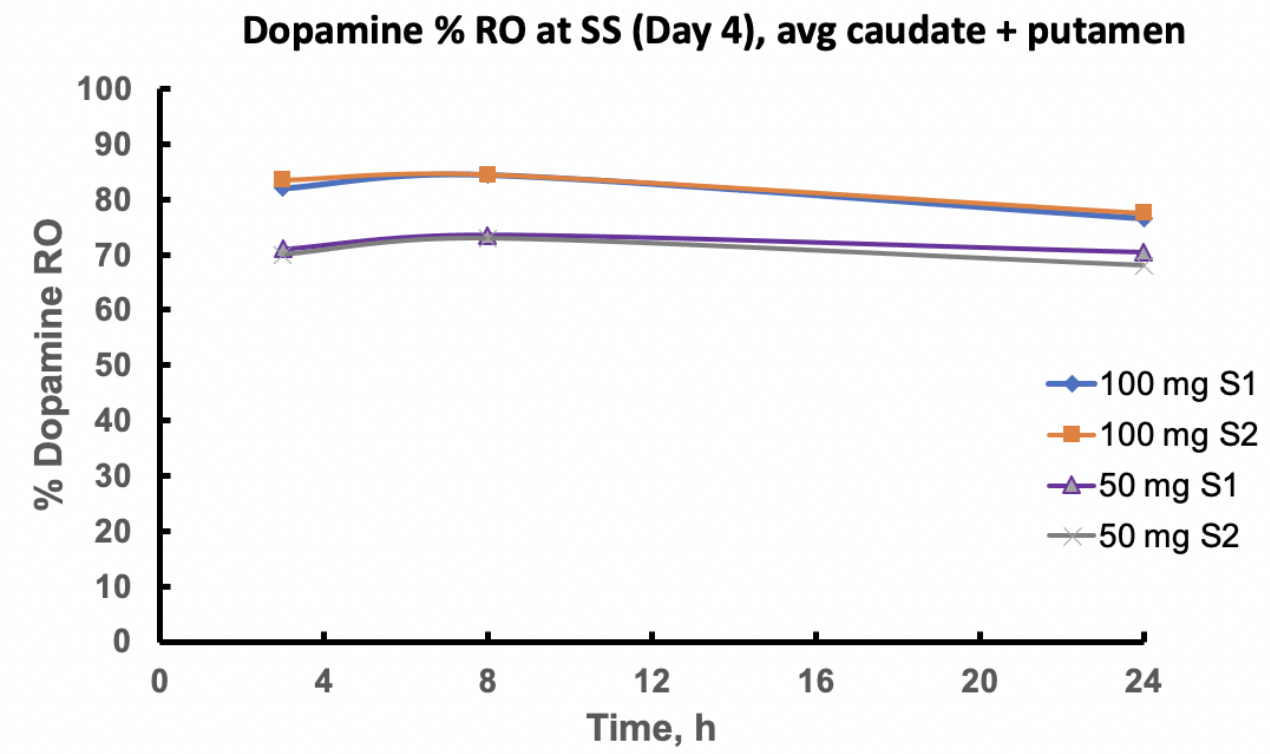


PHASE 1b - COHORTS 1 - 3, SINGLE DOSE



- Subjects in Cohorts 1 (100 mg) and 2 (50 mg) were scanned at 2.5, 7.5, and 23.5 hrs post-dose
- Subjects in Cohort 3 (75 mg) were scanned at 2.5, 23.5, and 47.5 hrs post-dose
- Desired dopamine RO between 60% and 75%
- Data suggests that LB-102 can be dosed once a day

PHASE 1b - COHORT 4, STEADY STATE, 100 MG (N=2); 50 MG (N=2)



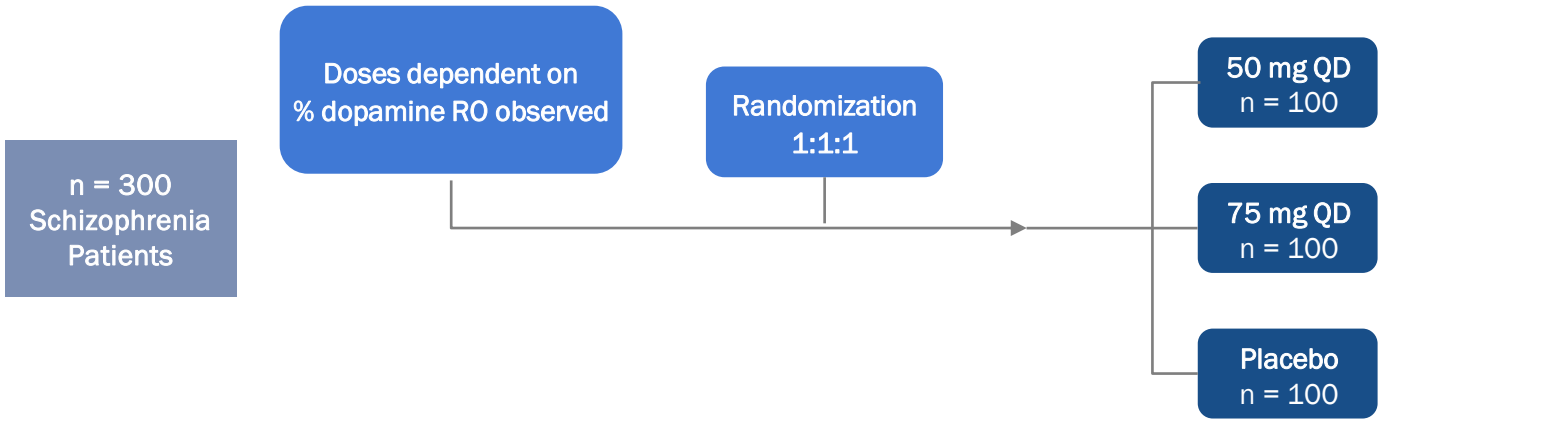
- Subjects scanned 2.5, 7.5, and 23.5 hrs after 4 days QD dosing
  - Dopamine RO observed at 50 mg was in the desired range for an effective schizophrenia drug
  - 50 mg LB-102 afforded same dopamine RO as 400+ mg amisulpride per day

PHASE 1b - KEY TAKEAWAYS

- No reported SAEs or EPS
- Dopamine receptor occupancy in desired range at 50 mg to 100 mg dose
- Confirms hypothesis from Phase 1 study
- Planned dosing for Phase 2 study: 50 mg and 75 mg, once per day
  - FDA guided LB-102 could be dosed up to 200 mg/d in SCZ patients
  - Therapeutic doses expected to be well within the margin of safety

LB-102 PHASE 2 CLINICAL PROGRAM

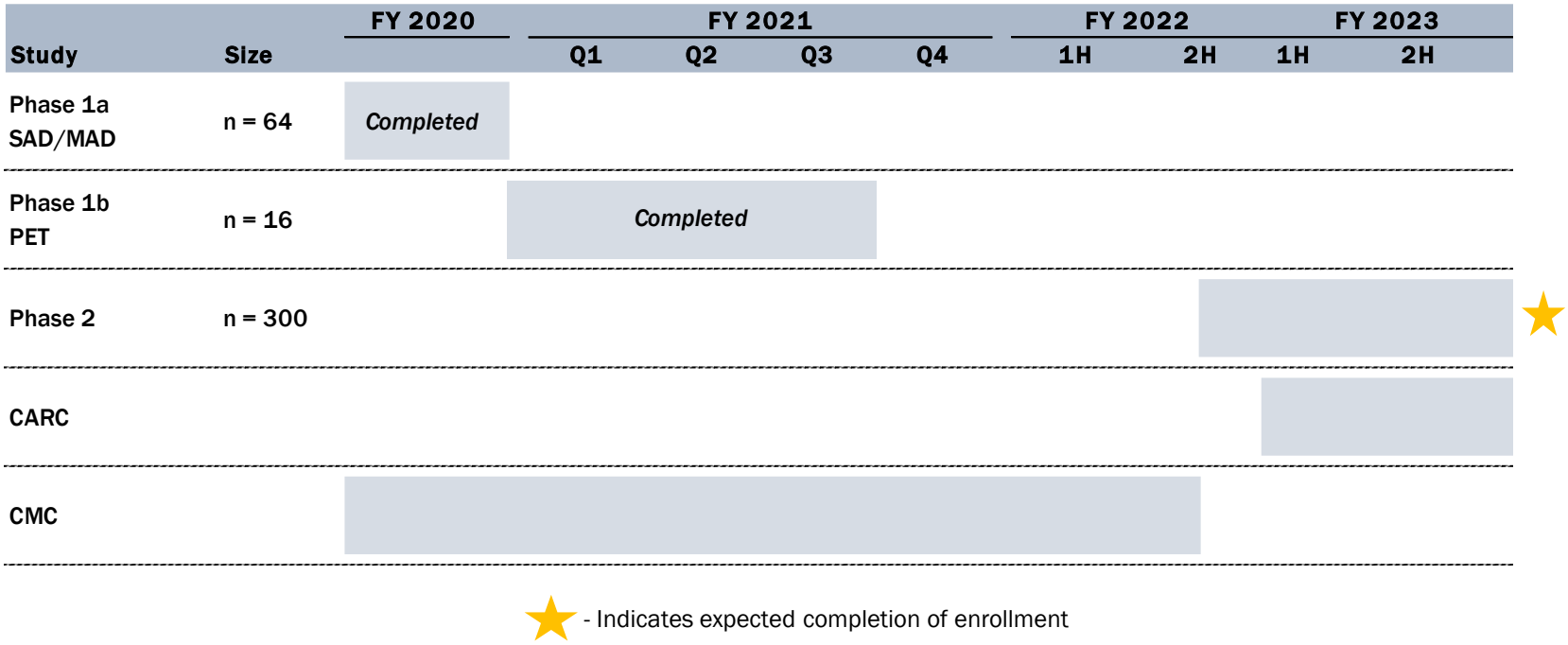
- **Trial Size:** Expecting to enroll ~300 SCZ patients at ~25 sites
- **Design:** 2 doses LB-102 versus placebo (4 weeks duration, in-patient, double-blind, placebo controlled)
- **Primary Endpoint:** Change in PANSS
- Development plan will follow well-established criteria for FDA approval of a schizophrenia drug (cf. Rexulti, Vraylar, Latuda)
  - LB-102 Phase 2 study designed to potentially be registrational study



Inclusion Criteria

- Adults, 18 to 50 years old, with acute schizophrenia diagnosis

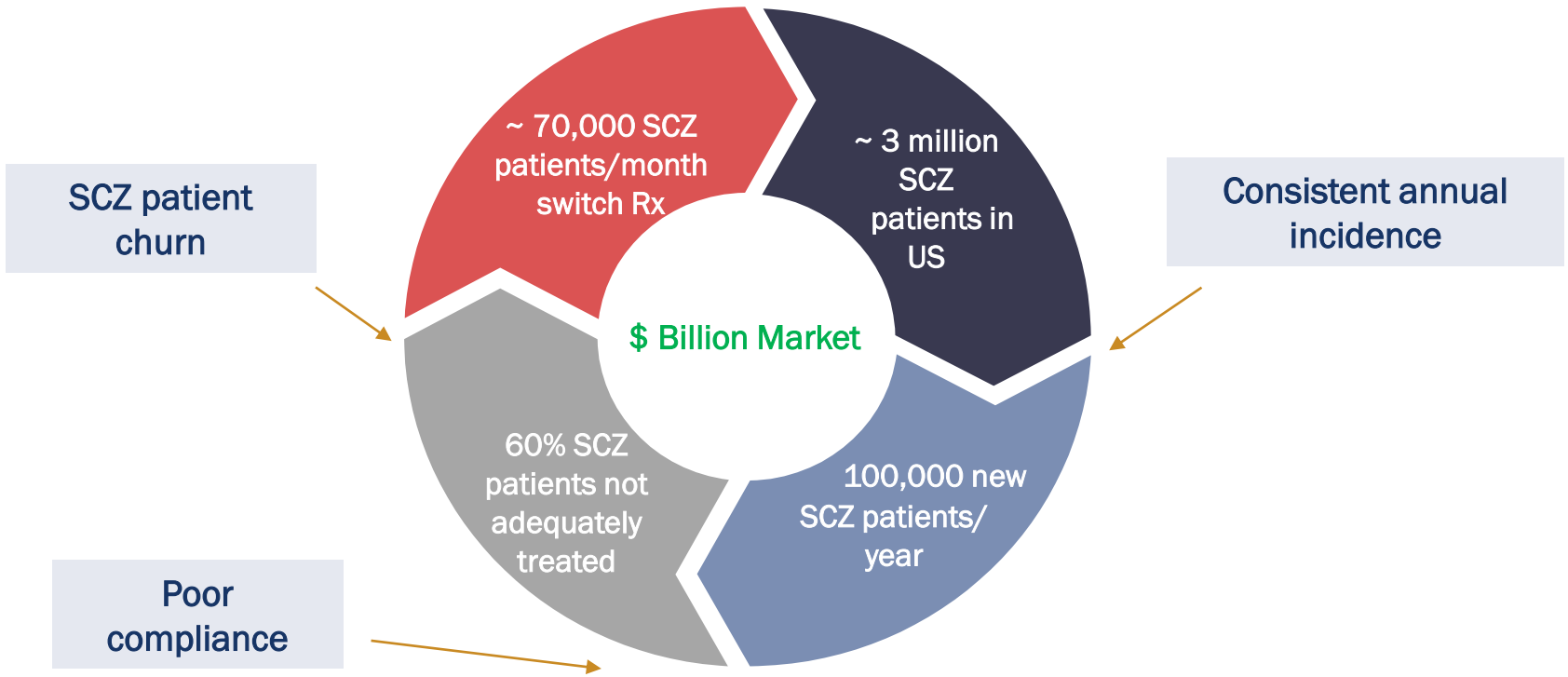
LB-102 CLINICAL DEVELOPMENT PROJECTED TIMELINE



- Phase 1 and 1b studies completed; End of Phase 1 meeting with FDA took place in 2021
- Start of Phase 2 study dependent on close of Series B financing
- CMC activities to support Phase 2 study to be completed in Q3 2022

LB-102 US MARKET OPPORTUNITY

- Expect LB-102 would be 3rd line SCZ treatment initially
- Amisulpride/LB-102 differentiated by robust efficacy for both positive and negative symptoms of the disease and a clean AE profile
  - Prescriptions in the Europe exceed 2.5 million/year despite a lack of sales/marketing support for 12 years
- Branded antipsychotic drugs generate ~$11 billion in sales annually in US



LB-102 combines de-risked efficacy/safety of amisulpride with IP of a NCE

Notes: (1) Source: IMS data including all dosage forms; (2) Source: *J. Clin. Psychiatry*, 77, 764-711

PIPELINE EXPANSION POTENTIAL

LB-102 has the potential for clinical impact in areas outside of schizophrenia, such as depression

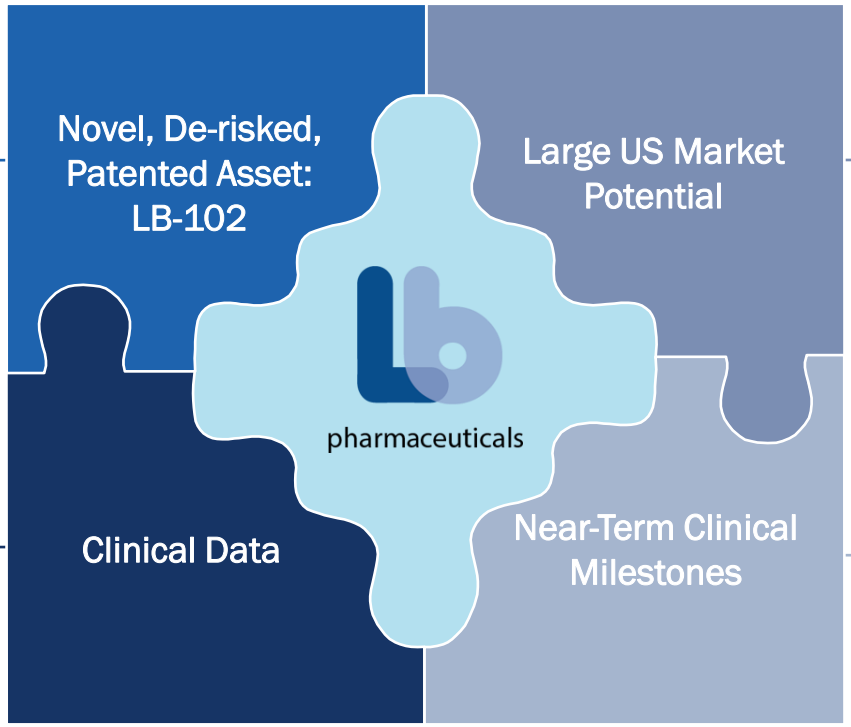
Product Indication	Discovery	Pre-Clinical	Phase 1	Phase 2	Phase 3
LB-102 (schizophrenia)					
LB-104 (depression)					
LB-102 (schizophrenia – negative symptoms)					
LB-102 (schizophrenia - LAI)					

LB PHARMACEUTICALS INVESTMENT HIGHLIGHTS

CNS-focused biotech building a pipeline of potential best-in-class therapies for the US market

Lead asset, **LB-102,** is a novel benzamide leveraging the demonstrated efficacy and safety of amisulpride for the treatment of schizophrenia

N = 80 Phase 1 studies showed LB-102 safe, well-tolerated, and bound $D_{2/3}$ at desired occupancy to treat SCZ



LB-102 has potential to exceed $1 billion in annual US sales (based on EU comparison)

Phase 2 study, planned for Q4 of 2022, could validate LB-102 as an important therapy for schizophrenia patients

pharmaceuticals

THANK YOU