pharmaceuticals

CORPORATE PRESENTATION

JANUARY 2019

Making Smart Chemical Changes to Create Improved Novel Therapeutics

FORWARD-LOOKING STATEMENTS

This presentation does not purport to be all-inclusive or comprehensive. Any information communicated regarding LB Pharmaceuticals ("the Company"), whether oral or written, is qualified in its entirety, for purposes of any investment in the Company, by the information set forth in the Company's confidential private placement memorandum, including, but not limited to, the risk factors described therein. This presentation does not constitute an offer to sell securities to, or buy securities from, anyone.

The Company has made statements throughout this presentation which constitute forward-looking statements. These statements involve known and unknown risks, uncertainties and other factors that may cause its actual results, levels of activity, performance or achievements to be materially different from any results, levels of activity, performance or achievements expressed or implied by any such forward-looking statements. In some cases you can identify forward-looking statements by terminology such as "may," "will," "should," "could," "expect," "hopes," "intends," "plans," "anticipates," "believes," "estimates," "predicts," "likely," "potential," or "continue" or the negative of these terms and similar words. Although management believe that the expectations reflected in these forward-looking statements are reasonable, management cannot guarantee future results, levels of activity, performance or achievements. Furthermore, management undertakes no obligation to update any forward-looking statements for any reason unless required to do so by law.

LB PHARMACEUTICALS INVESTMENT HIGHLIGHTS

- 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 for the treatment of schizophrenia has potential, to yield in excess of $1 billion in annual sales based on current ex-US market data*

- Companies in the psychiatric space with comparable (later stage) profiles comparable (but later stage) have generated public market capitalizations of between $300 million and $500 million upon successful Phase 2 clinical trials

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

    - Rivopharm SA, the world's largest supplier of amisulpride, is LB's largest investor to date and manufacturing advisor

- We expect to complete our IND-enabling studies for LB-102 in Q3 2019 and to initiate Phase 1 clinical study in Q4 2019

* Based on a 2% market share of 60 million antipsychotic Rx per year in US (IMS, US data, 2013 - Q2 2015) at an average sales price of $2,000 per month

MANAGEMENT TEAM

Zachary Prensky, Chief Executive Officer & Co-Founder

- Experienced biotechnology and pharmaceutical investor
- Managed family office from 1997-2015
- Has 18+ year history of strategic consulting in the biotech industry (Datascope, Caliper, Emisphere, Aldeyra, and others)

Andrew Vaino, Ph.D., Chief Science Officer

- Former VP of R&D at Retrophin, Inc.
- Invented and brought drug to treat PKAN (RE-024) from idea to dosing in humans in under 2 years

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

- Chief Executive Officer and Co-Founder, LB Pharmaceuticals, Inc.

Isaac Blech

- Biotechnology investor and entrepreneur
- Co-Founder, Celgene Corporation, Genetic Systems Corporation, Icos Corporation, Nacuity Pharmaceuticals, Inc., Nova Pharmaceuticals Corporation, etc., combined value > $100 billion

Piero Poli

- Investor, LB Pharmaceuticals, Inc.
- Chief Executive Officer and Owner, Rivopharm SA, a Swiss company that has developed over 25 molecules and registered generic products throughout Europe, including amisulpride

Edmund Sullivan

- Managing Partner, Remsen Investors, LP; Angel Investor in LB Pharmaceuticals, Inc.
- Formerly at Citigroup and Cowen & Company

Vincent Grattan, R.Ph

- Co-Founder and senior consultant, LB Pharmaceuticals, Inc.
- 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 experience in psychopharmacology

SCIENTIFIC ADVISORY BOARD

John M. Kane, M.D., Chairman

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

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

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

Christoph Correll, M.D.

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

Stefan Leucht, M.D.

- Department of Psychiatry and Psychotherapy, Technische Universitat Munchen, Munich, Germany

Ira Glick, M.D.

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

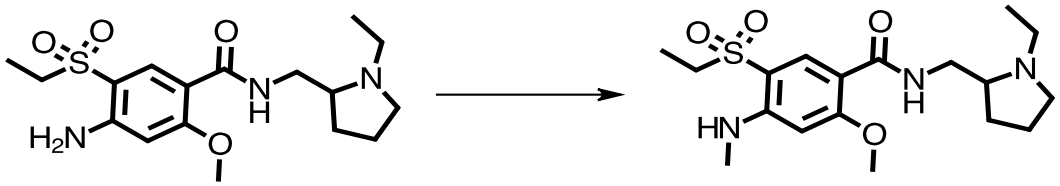
Herbert Meltzer, M.D.

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

LB PHARMACEUTICALS COMPANY OVERVIEW

Making Smart Chemical Changes to Create Improved Novel Therapeutics

- Lead drug, LB-102, is a methylated version of amisulpride (used in Europe for decades) that treats the multi-billion dollar disease schizophrenia

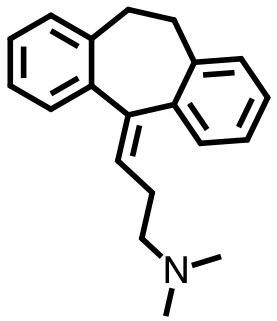


Amisulpride (1983) LB-102 (2016)

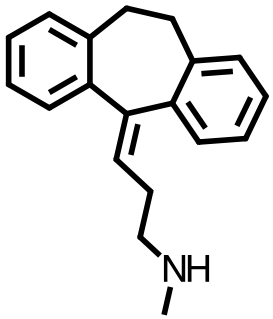
  - Novel chemical structure – biological/pharmacological properties which have been shown to be as good as or better than original
  - Preliminary *in vivo* and *in vitro* data suggest that the effective dose of LB-102 may be lower than that of amisulpride, which could lead to improved safety and tolerability
  - Amisulpride and the entire benzamide class of antipsychotics have never been commercially available in the US despite enjoying significant market share throughout Europe
  - US composition of matter patent covering LB-102 granted in January 2019 (Patent No: 10,167,256). PCT application filed in November 2017 currently being prosecuted

- We have identified and are currently evaluating a number of successful CNS therapies that have never been commercialized in the US and believe this development strategy can yield significant value for shareholders as assets are moved through development

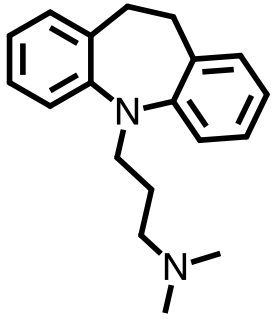
EXAMPLES OF METHYLATION



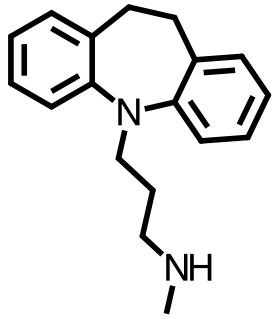
Amitriptyline (1961)



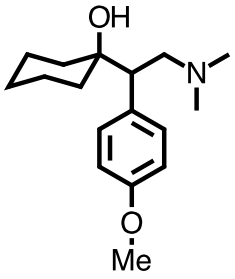
Nortriptyline (1964)



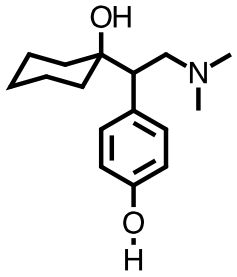
Imipramine (1957)



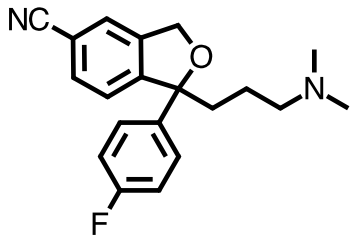
Desipramine (1964)



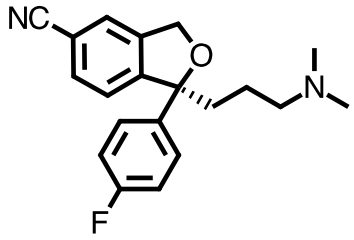
Efffexor (1993)



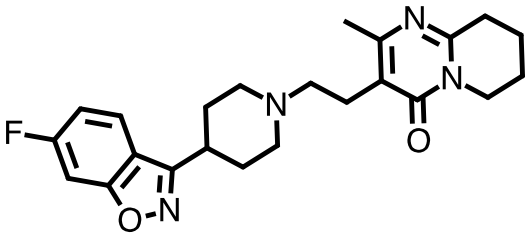
Pristiq (2008)



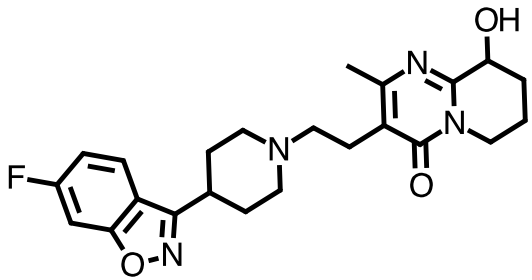
Celexa (1998)



Lexapro (2002)



Risperdal (1993)



Invega (2006)

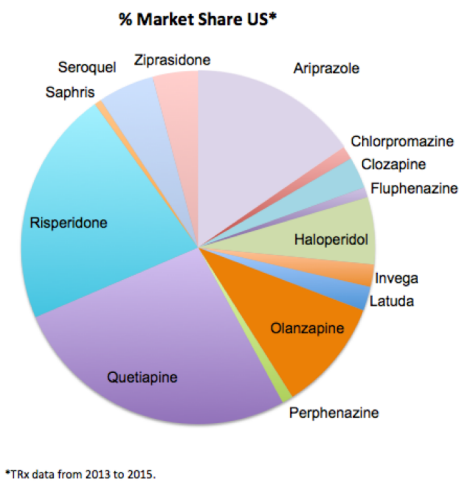
SCHIZOPHRENIA

- Schizophrenia (SCZ) is a debilitating disease affecting 3 million Americans[1]
  - Characterized by disorganized thought, social withdrawal, and cognitive deficits
- SCZ patients have profoundly diminished qualities of life
  - On average, SCZ patients life expectancy is reduced by 12-15 years[2]
  - SCZ in top 25 causes of disability worldwide[3]
- The economic burden of SCZ in the US has been estimated at $155 billion per year ($38 billion in direct costs)[4]
- SCZ thought to be caused by abnormal dopamine $D_{2/3}$ activity
  - All approved SCZ drugs act at $D_{2/3}$ receptors
  - First line treatment typically risperidone, quetiapine, or olanzapine
- Up to 60% of SCZ patients do not experience adequate resolution[5]
  - Lack of efficacy and tolerability prime causes of discontinuation
  - If approved, LB-102 could become 2nd or 3rd line treatment for SCZ

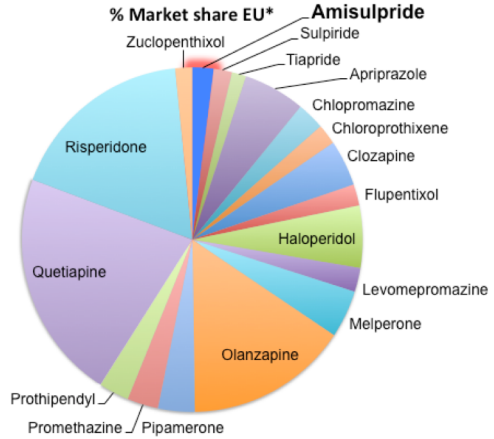
1 https://www.nimh.nih.gov/health/statistics/prevalence/schizophrenia.shtml
2 *Am. J. Psychiatry*, **2013**, *170*, 324–333
3 *Neuropsychiatr. Dis. Treat.*, **2016**, *12*, 357-373
4 *J. Clin. Psychiatry*, **2016**, *77*, 764-771
5 American Psychiatric Association Schizophrenia Treatment Guidelines February 2004

SCHIZOPHRENIA LANDSCAPE

- US market share[1] by product similar to that of the EU[2]



*TRx data from 2013 to 2015.



*Includes data from: Austria, Estonia, Finland, Germany, Latvia, Lithuania, Netherlands, Norway, Sweden, UK

- Amisulpride maintains an estimated 2% market share of antipsychotics for all indications in the EU (~ 2 million scripts per year[2]; steady usage over past 5 years)
  - Closely related sulpiride (another benzamide not available in the US) also has a 2% market share
- 60 million Rx per year in US for antipsychotics[1]

A 2% market share in the US translates to annual sales in excess of $1 billion[3]

1 IMS, US data, 2013 – Q2 2015
2 IMS, EU data, Q2 2015
3 Based on a 2% market share of 60 million antipsychotic Rx per year in US (IMS, US data, 2013 - Q2 2015) at an average sales price of $2,000 per month

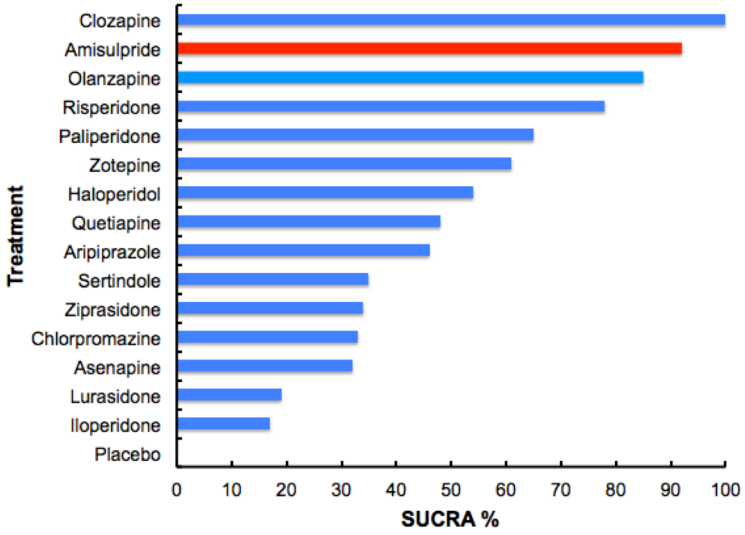
AMISULPRIDE BACKGROUND

- Amisulpride is a schizophrenia drug marketed in Europe since 1986
  - Patented and developed by Synthélabo, a small French company 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 a July 2000 press release, Sanofi stated that it would not pursue development of Solian (amisulpride) in the US
    - FDA informed Sanofi that new US trials with active comparator would be required for marketing approval
    - Based on this FDA feedback and remaining patent life, Sanofi made the business decision not to pursue US approval
- 30 years of clinical use demonstrates an excellent safety/efficacy profile
- European prescriptions steady at 2 million per year*

* IMS, EU data Q2 2015

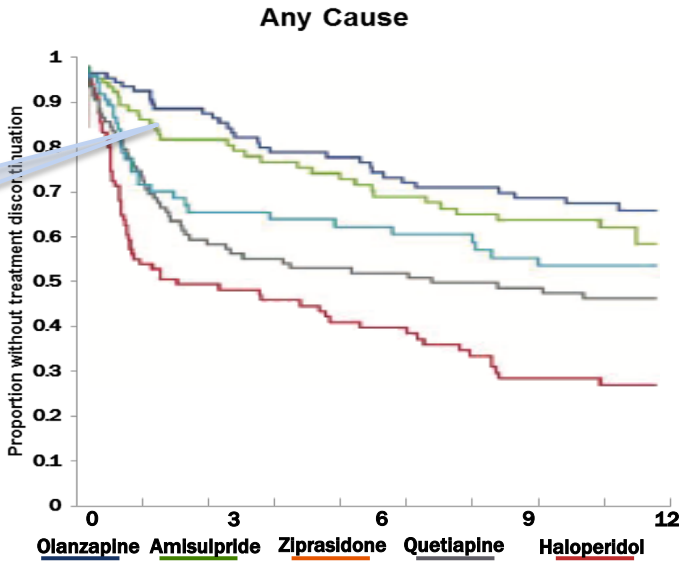
AMISULPRIDE COMPARATIVE EFFICACY

n = 43,000 meta-analysis of 15 SCZ drugs*



Amisulpride is one of the most effective antipsychotics in the world

EUFEST study, n = 498 clinical trial of 5 SCZ drugs**



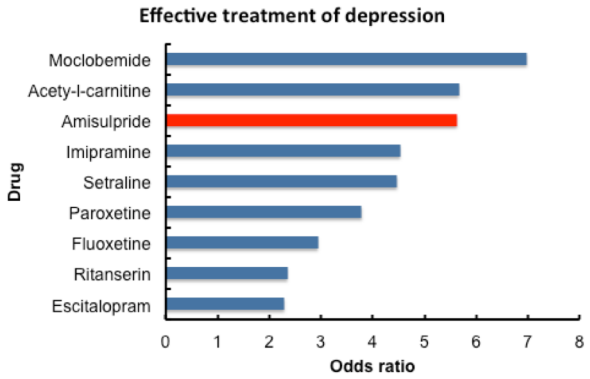
Amisulpride has one of the lowest discontinuation rates of any antipsychotic

*Leucht *et al.*, *Lancet*, **2013**, *382*, 951-962.
Kahn *et al.*, *Lancet*, **2008, *371*, 1085-1097.

SUCRA = Surface Under the Cumulative Ranking, a measure that compares efficacy of drug to an intervention that is always the best

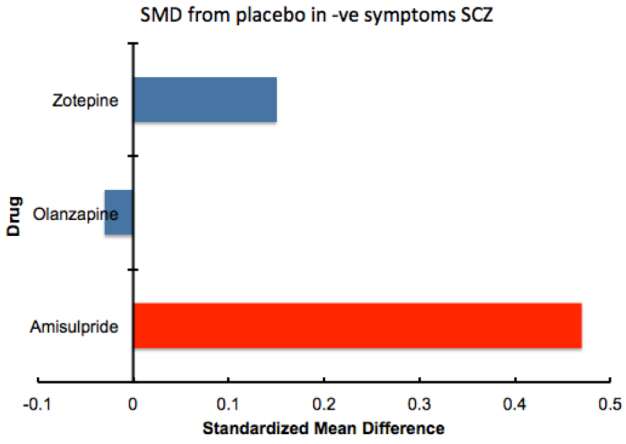
AMISULPRIDE NEGATIVE SYMPTOMS AND DEPRESSION

Amisulpride's ability to inhibit 5-HT_7 provides anti-depressant properties…



Kriston *et al.*, *Depression and Anxiety*, **2014**, *31*, 621-630

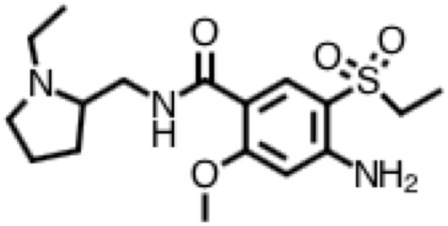
And renders it effective in treating negative symptoms of SCZ



Krause *et al.*, *European Archives of Psychiatry and Clinical Neuroscience, in press*

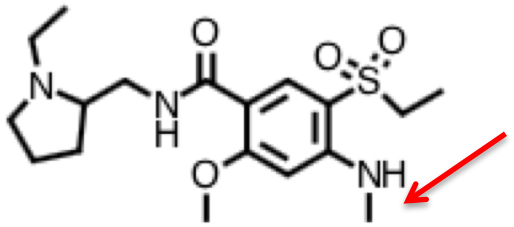
LB-102: A NOVEL BENZAMIDE

Amisulpride



MW = 369.5
cLogP = 3.94

LB-102



MW = 383.5
cLogP = 4.41

- LB-102 designed to improve delivery to the brain while minimally affecting receptor binding
- US patent and PCT patent application (filed November 2017) cover composition of matter
- *In vitro* data suggests that LB-102 has greater membrane permeability than amisulpride
- LB-102 shows equivalent, and in some cases better, efficacy in animal models of schizophrenia compared to amisulpride
- LB-102 shows comparable selectivity profile to amisulpride with no discernible differences at key receptors (D_2, D_3, $5HT_2$, $5HT_7$, etc.)
- LB-102 rat 14-day toxicology profile is consistent with amisulpride. Dog studies in progress

WHY METHYLATE AMISULPRIDE?

- Comparable efficacy to risperidone and olanzapine (best-in-class antipsychotics) at treating symptoms of SCZ[1]

- Less sedation than nearly all other antipsychotics.[1] In a recent retrospective cohort study, amisulpride was found to have lower risk of self-harm after SCZ diagnosis than olanzapine or risperidone[2]

- In ESCAPE study[3] 78% of SCZ pts switching to amisulpride from risperidone and 56% switching from olanzapine had > 50% improvement in PANSS at 8 weeks

- In recent meta-analysis[4] amisulpride was the only antipsychotic (of 34, including olanzapine and risperidone) that outperformed placebo in treatment of negative symptoms (indicated to treat negative symptoms in the UK)

- In recently published ATLAS study[5] in late onset schizophrenia, amisulpride was found to be well tolerated and highly effective in a population of elderly patients (mean age 80 years)

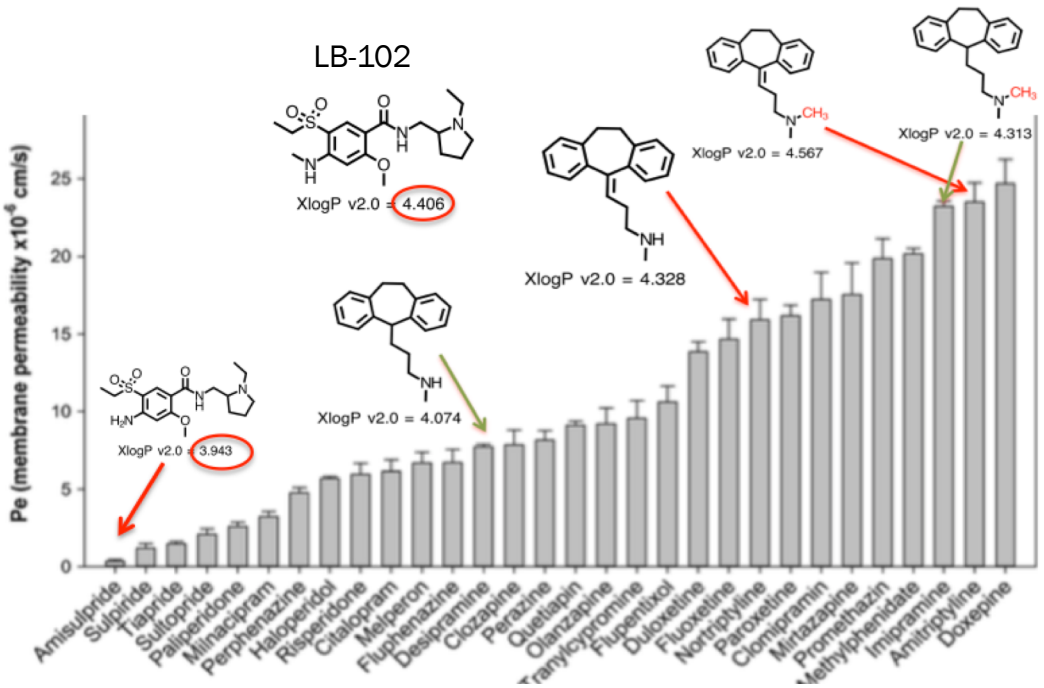
- Despite a strong record of efficacy and safety and clear differentiation from other anti-psychotics, amisulpride is unavailable to schizophrenia patients in the United States

Based on data generated to date, we believe LB-102 offers all of the advantages of amisulpride with the addition of 20 years of intellectual protection in the US

1 Leucht *et al. Lancet*, **2013**, *382*, 951-962
2 Ma *et al. Acta. Psychiatr. Scand.*, **2018**, 1-10
3 Liang and Yu, *Neuropsychiatric Disease and Treatment*, **2017**, *13*, 1163-1173
4 Krause *et al.*, *European Archives of Psychiatry and Clinical Neuroscience*, **2018,** *https://doi.org/10.1007/s00406-018-0869-3*
5 Howard *et al. Lancet Psychiatry*, **2018,** *5,* 553-563

LB-102 DESIGNED TO IMPROVE BBB PERMEABILITY

- Of 30 psychiatric medications tested amisulpride was least able to passively diffuse across Blood Brain Barrier (BBB)*

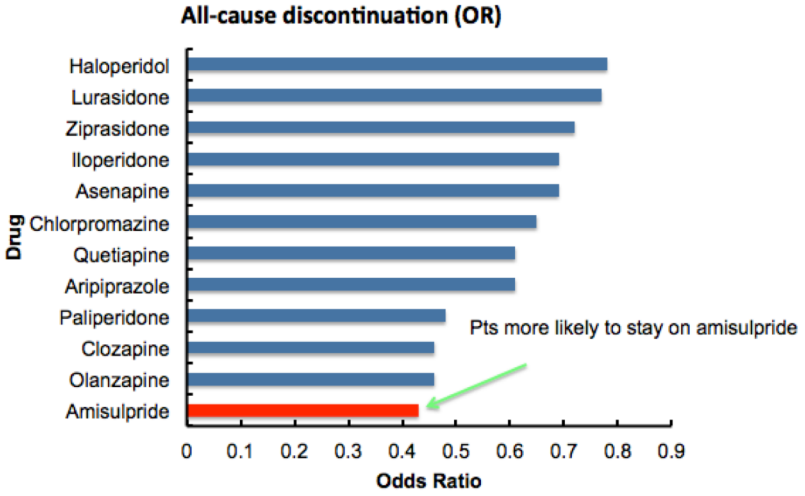


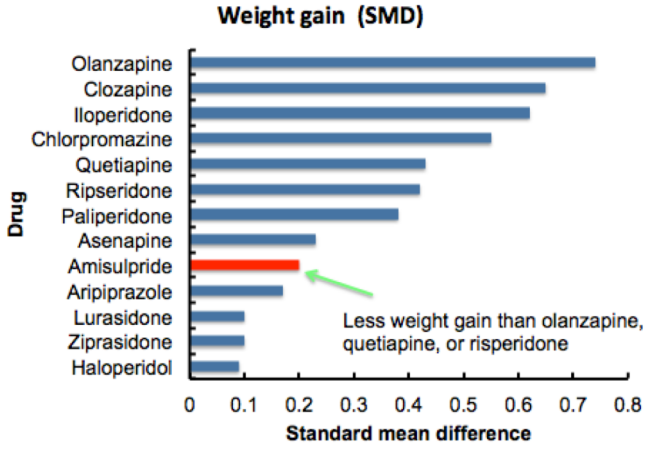
- High doses of amisulpride may be responsible for some of its clinically relevant side effects
- Addition of a single methyl group (e.g. amisulpride to LB-102) to an amine can have a profound impact on BBB permeability
  - Two examples shown above are desipramine to imipramine and nortriptyline to amitriptyline

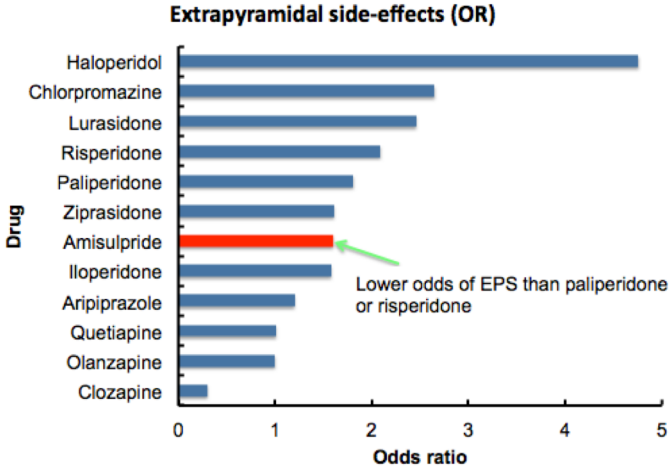
The AAPS Journal*, **2014, *16*, 1247-1258

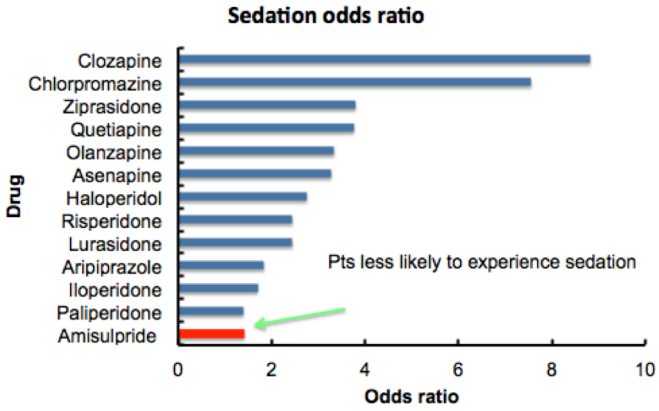
AMISULPRIDE COMPARATIVE SAFETY

Data from 43,000 patient meta-analysis*









*Leucht *et al. Lancet,* **2013**, *382*, 951-962

AMISULPRIDE SAFETY

QT PROLONGATION

- All antipsychotics, amisulpride included, have the potential to alter the QT interval
  - Pharmacovigilance data from UK from 2013 to 2017 covering 16,000 patients exposure years showed 18 CV SAEs and 9 examples of QT alteration (also 1 incidence of Parkinsonianism, 1 of EPS, and 1 of galactorrhea)
  - In an *in vitro* assay LB-102 was found to have no affinity for the hERG receptor, a marker of cardiac depolarization

Preliminary in vivo and in vitro data on LB-102 suggests that the effective dose may be lower than amisulpride

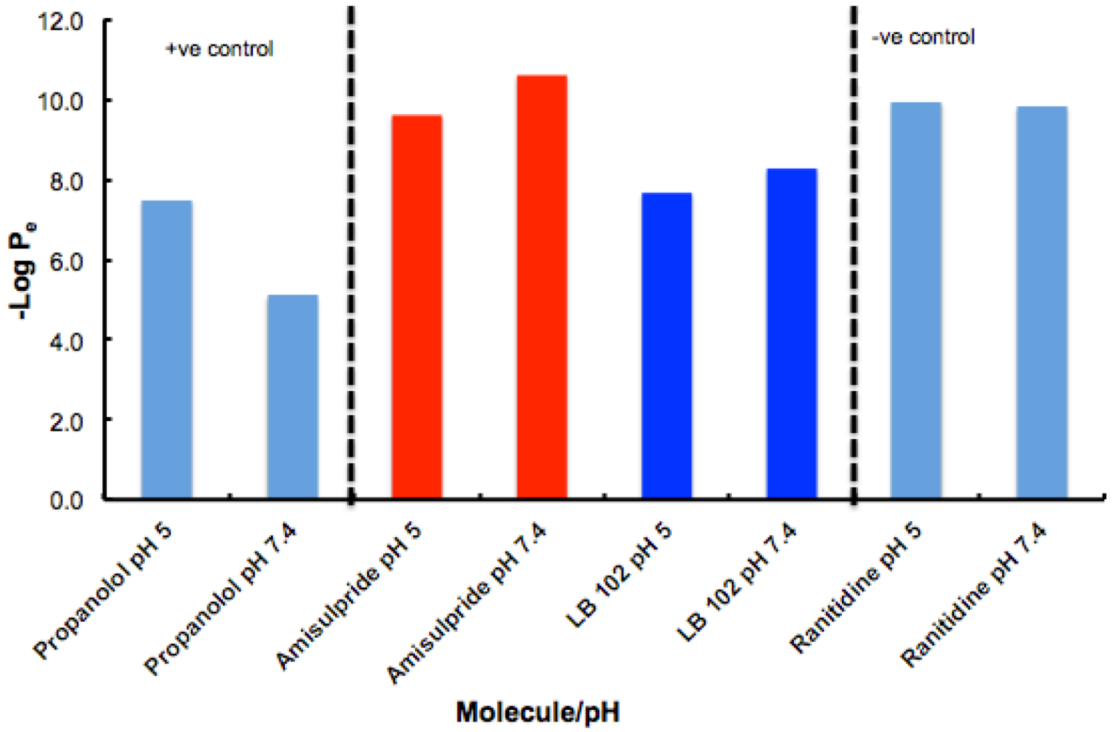
Examples of QTc prolongation associated with select antipsychotics[a,b]

Antipsychotic	Approximate QTc interval prolongation in milliseconds[c]
Aripiprazole	-1 to -4
Clozapine	10
Haloperidol	7 to 15
Mesoridazine	39 to 53
Olanzapine	2 to 6.5
Paliperidone	2 to 4
Quetiapine	6 to 15
Risperidone	3.5 to 10
Sertindole	30
Thioridazine	33 to 41
Ziprasidone	16 to 21
Amisulpride	3.1

a. Washington et al, *Current Psychiatry*, Oct 2012, Vol 11:36-39
b. List is not comprehensive. Other antipsychotics may be associated with QTc prolongation
c. QTc prolongation interval may depend on the route of administration

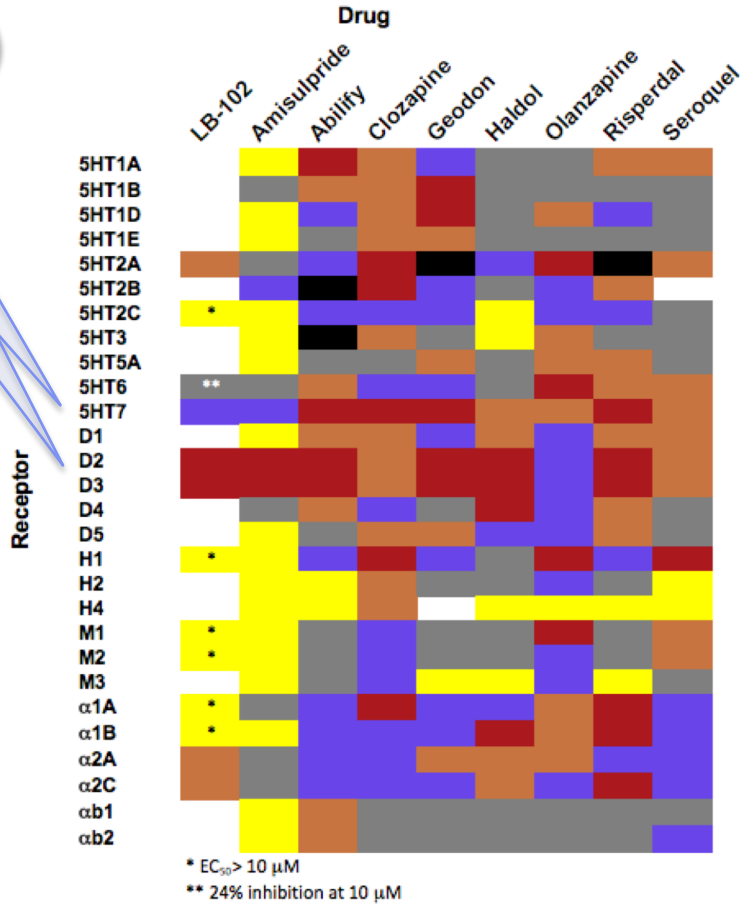
LB-102 *IN VITRO* MEMBRANE PERMEABILITY DATA

In a PAMPA assay LB-102 was ~200X more permeable than amisulpride



LB-102 AND AMISULPRIDE RECEPTOR SPECIFICITY

Potent $D_{2/3}$ and $5HT_7$ inhibitor



Ki (nM)

0-1
1-10
10-100
100-1,000
1,000-10,000
>10,000

← Weight gain ($5HT_{2a/c}$)

← Cognition/Depression ($5HT_7$)

← Antipsychotic Effect (D_2)

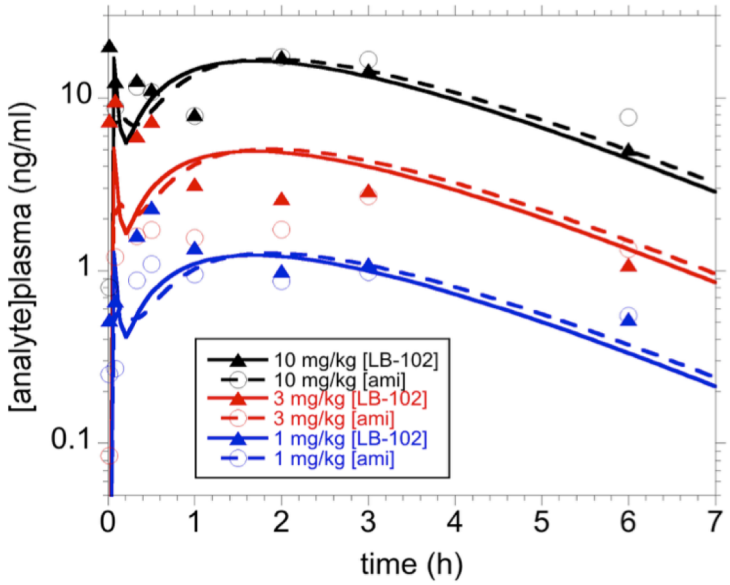
← Sedation/Weight gain (H_1)

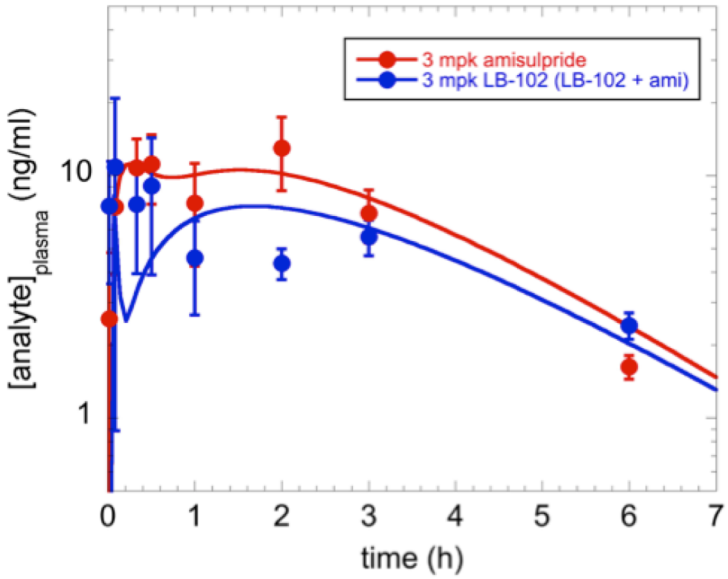
← Sedation (M)

← Anxiety, Orthostasis (A)

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

LB-102 PHARMACOKINETICS EQUIVALENT TO AMISULPRIDE

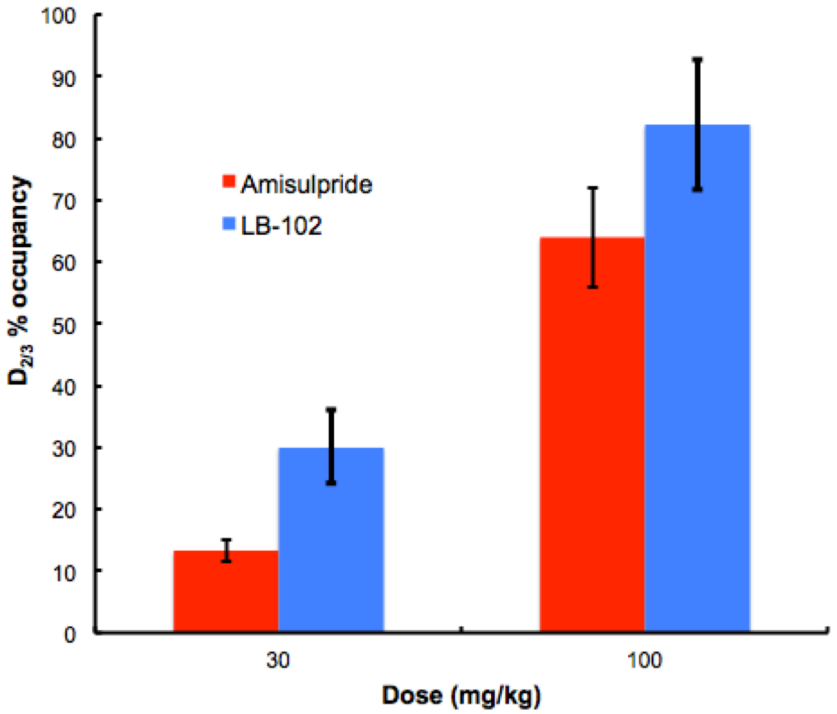




- Total benzamide (LB-102 + amisulpride) plasma exposure of orally dosed LB-102 is similar to amisulpride and is linearly dose dependent in rats and in mice
- Note, LB-102 is ~50% demethylated to amisulpride in rodents
  - Demethylation likely CYP-driven and expected to be lower in humans

LB-102 RAT BRAIN $D_{2/3}$ RECEPTOR OCCUPANCY (RO)

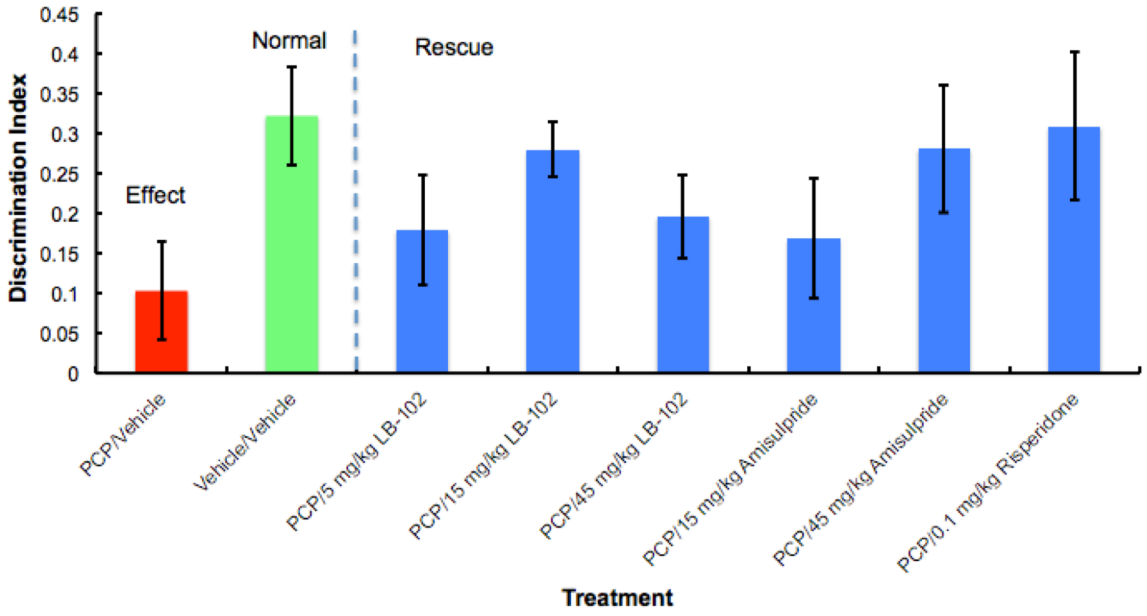
Dopamine % Receptor Occupancy in rat brains (n = 3/group) 12h after PO doses of LB-102 or amisulpride



- Initial *in vivo* data suggests greater dopamine RO in rat brains for LB-102
- In humans, dopamine RO is highly correlated to improvements in PANSS

NOVEL OBJECT RECOGNITION (NOR) STUDY

- NOR is a widely published and validated animal model of cognitive impairment in SCZ



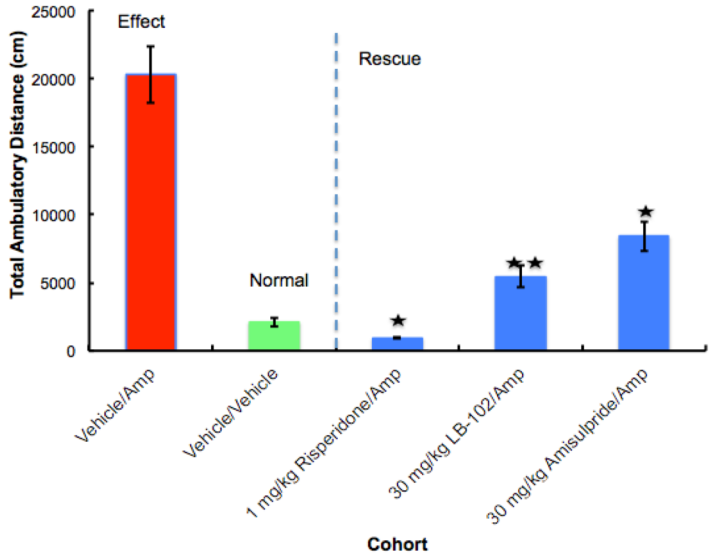
Discrimination index ((time spent exploring novel - time spent exploring familiar)/total exploration time) ± SEM (n = 10/group)

- Study results show LB-102 restored cognitive function to PCP impaired rats in a manner comparable to amisulpride

Study results presented as part of poster: "Pre-clinical evaluation of two novel benzamides, LB-102 and 103, for the treatment of schizophrenia", ECNP (*European Neuropsychopharmacology*, **2017**, *27 (S4)*, S922-S923)

LOCOMOTOR ACTIVITY (LMA) STUDY

- LMA is a widely published and validated animal model of hyperactivity in SCZ



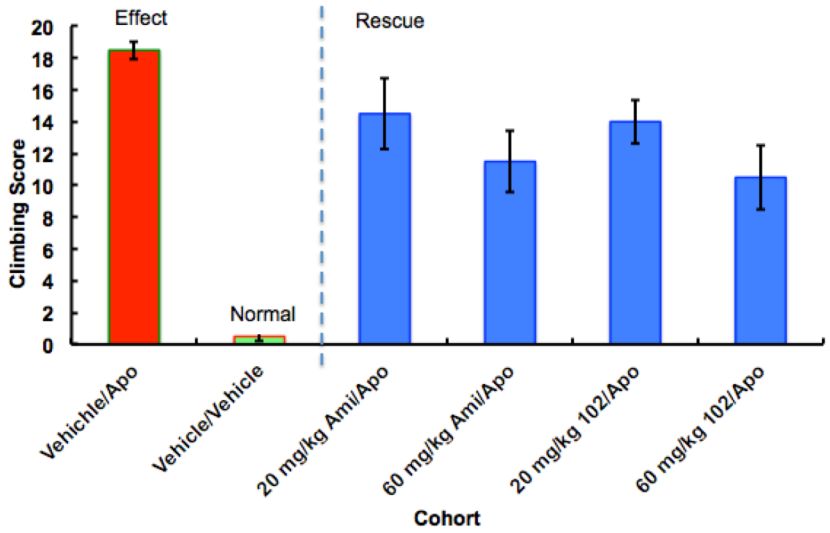
Total ambulatory distance data from an amphetamine induced LMA rat study (n=10/group) measured 6 hours post-dose amphetamine over the course of an hour. * $p < 0.01$ v control, ** $p < 0.05$ v amisulpride

- Study results show LB-102 was statistically superior to amisulpride in restoring normal motion to amphetamine impaired rats at 30mg/kg ($p < 0.05$)

Study results presented as part of poster: "Pre-clinical evaluation of two novel benzamides, LB-102 and 103, for the treatment of schizophrenia", ECNP (*European Neuropsychopharmacology*, **2017**, *27 (S4)*, S922-S923)

MOUSE APOMORPHINE INDUCED CLIMBING (AIC) STUDY

- AIC is a widely published and validated animal model of stereotypy in SCZ



Climbing Score± SEM (n = 10/group).

- Study results show LB-102 restored movement to apomorphine impaired rats in a manner comparable to amisulpride

Study results presented as part of poster: "Pre-clinical evaluation of two novel benzamides, LB-102 and 103, for the treatment of schizophrenia", ECNP (*European Neuropsychopharmacology*, **2017**, *27 (S4)*, S922-S923)

IN-VIVO TOXICOLOGY CONSISTENT WITH AMISULPRIDE

RESULTS OF LB-102 NON-GLP 4 & 14 DAY TOXICOLOGY STUDIES (MPI RESEARCH)

- Initial 4 day study included groups of 6 rats (3F/3M) treated with 200, 600, 1200, and 2400 mg/kg/d LB-102
  - Rats dosed at 200 and 600 mg/kg/d survived for duration of experiment
- Final results of a 14 day dose range finding study in rats produced a maximum tolerated dose of 200mg/kg/d, consistent with amisulpride
  - In excess of 7x the doses that were effective in LMA and NOR rat models of schizophrenia
- 14 day dose range finding study in dogs in progress, results expected in February 2019
- In a bar balance test, an animal model of EPS, LB-102 was indistinguishable from amisulpride

LB-102 ANIMAL STUDY CONCLUSIONS

- LB-102 has PK profile indistinguishable from amisulpride
- LB-102 has equivalent/superior dopamine receptor occupancy
- LB-102 displayed efficacy in three rodent models examined (2 in rats, 1 in mice)
    - Cognitive function
    - Hyperactivity
    - Stereotypy
- LB-102 efficacy in animal models comparable/superior to amisulpride, one of the most effective antipsychotics
- MTD in two week rat toxicology study showed LB-102 to be equivalent to amisulpride

CLINICAL PROOF OF CONCEPT: PHASE 1/2

- **Based on FDA guidance at pre-IND meeting, we believe P1 could be conducted with ~ 35 healthy volunteers**
  - Single and multiple ascending doses, based on amisulpride's known safety and PK profile
  - PK/PD/Safety endpoint
  - 200 mg/kg/d in rats equivalent to ~3x typical human amisulpride dose (800 mg/d)
- **Phase 2 dose-finding study,** acute schizophrenia patients
  - PANSS at 4 weeks primary endpoint, and dopamine receptor occupancy secondary endpoints
  - Number of patients to be determined based on resources

LB-102 SUMMARY

- LB-102 is a novel antipsychotic closely related to amisulpride; US composition of matter patent granted in January 2019; PCT patent application filed in November 2017 currently being prosecuted (affording IP to 2037+)
- In every measure of SCZ to date, LB-102 has been shown to be as good as or better than amisulpride
- With similar TRx to amisulpride in Europe, we believe annual sales could exceed $1 billion
- IND enabling package expected to be complete in Q3 2019 and first in human clinical study expected to start before the end of 2019
- Potential to expand label for use as an augmentation to treat depression-related disorders*

* Based on IMS data, amisulpride is indicated for depression-related disorders in Italy, Brazil, Latvia and Slovakia

pharmaceuticals

THANK YOU