Strongbridge Biopharma plc

January 2020

STRONGBRIDGE BIOPHARMA

Forward-looking statements

This document contains forward-looking statements relating to the Company's strategy, objectives, business development plans and financial position. All statements other than statements of historical facts included in this document, including, without limitation, statements regarding the Company's future financial position, strategy, anticipated investments, costs and results, status and results of clinical trials, anticipated timing of release of results from clinical trials, size of patient population potential advantages of a product or product candidate, anticipated timing of activities related to the regulatory approval process for a product candidate, the release of additional planned analyses of clinical trials, plans, outcomes of product development efforts, intellectual property portfolio and objectives of management for future operations, may be deemed to be forward-looking statements. You can identify forward-looking statements by words such as "anticipate," "believe," "could," "estimate," "expect," "intend," "may," "plan," "potential," "predict," "project," "should," "will," "would" or the negative of those terms, and similar expressions that convey uncertainty or future events or outcomes.

These forward-looking statements involve known and unknown risks, uncertainties, and other factors that may cause the Company's actual results, performance, or achievements or industry results to be materially different from those contemplated, projected, forecasted, estimated or budgeted, whether expressed or implied, by these forward-looking statements. Given these risks and uncertainties, investors should not place undue reliance on forward-looking statements as a prediction of actual results. A discussion of certain of these risks may be found in the filings the Company makes with the U.S. Securities and Exchange Commission. None of these forward-looking statements constitutes a guarantee of the future occurrence of such events or of actual results. These statements are based on data, assumptions, and estimates that the Company believes are reasonable.

The forward-looking statements contained in this document are made only as of the date hereof. Except as otherwise required by law, the Company expressly disclaims any obligation or undertaking to release publicly any updates of any forward-looking statements contained in this document to reflect any change in its actual results, assumptions, expectations or any change in events, factors, conditions, or circumstances on which any forward-looking statement contained in this document is based.

Strongbridge Biopharma is a revenue-generating rare disease company with three assets

KEVEYIS® dichlorphenamide 50 mg tablets	RECORLEV™ (levoketoconazole)	veldoreotide modified-release
Approved for the treatment of Primary Periodic Paralysis (PPP) 2019 revenue of ~$21.7M; 2020 revenue guidance of $26M - $27M; Product is contribution margin positive Provides established and leverageable rare disease commercial infrastructure	Phase 3 asset for the treatment of Cushing's syndrome (CS) Positive Phase 3 SONICS results published in *The Lancet Diabetes and Endocrinology* LOGICS Phase 3 trial top-line results anticipated in 2Q or 3Q 2020; NDA filing expected ~6 months following LOGICS top-line results	Next-generation somatostatin (SST) analog Immediate release formulation studied in Phase 2 in acromegaly patients Novel, patented, extended release formulation is under evaluation in nonclinical disease models potentially amenable to SST modulation

$78M in cash expected to fund operations through 3Q 2021*

*As of 12/31/19, preliminary unaudited financials

Seasoned management team

Extensive experience in rare disease development and commercialization	
John Johnson Executive Chairman	Johnson & Johnson · Lilly · ImClone Systems Incorporated · Pfizer
Richard Kollender Chief Operating Officer	Quaker Partners · Rapid micro biosystems · gsk GlaxoSmithKline
Robert Lutz Chief Financial Officer	Shire · medgenics · Goldman Sachs
Fred Cohen, MD Chief Medical Officer	Aptalis · Johnson & Johnson · Eurand · Lilly
Scott L. Wilhoit Chief Commercial Officer	NPS Pharma. · Johnson & Johnson · PTC · Marathon · Auxilium
Stephen Long Chief Legal Officer	ReedSmith · BARD · Warner Lambert
Brian Conner Chief Compliance Officer	Huron · Shire

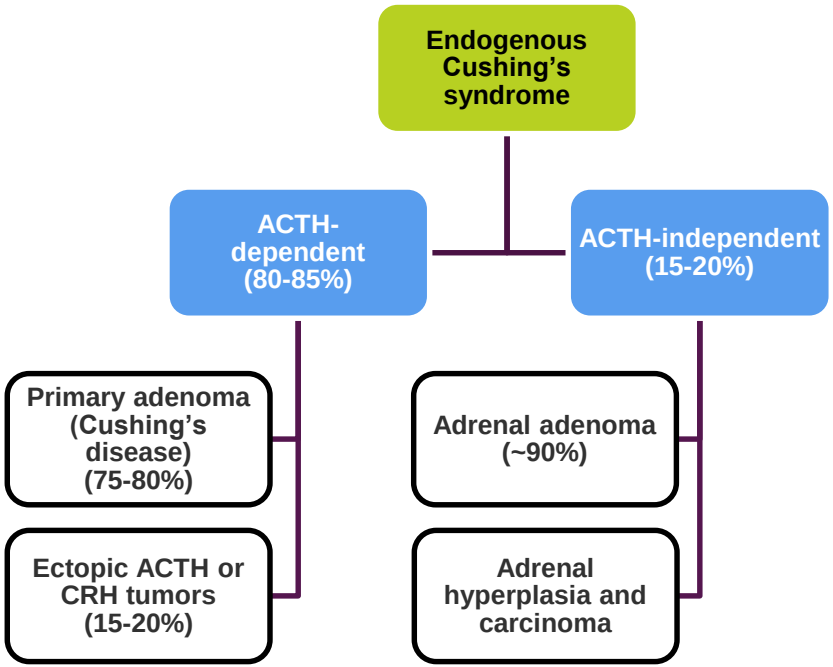
Recorlev

(levoketoconazole)

STRONGBRIDGE BIOPHARMA

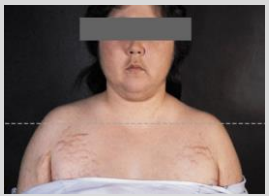
Endogenous Cushing's syndrome overview

Underlying cause is chronic exposure to excess serum cortisol due to any of several etiologies



Cushing's syndrome affects the whole body

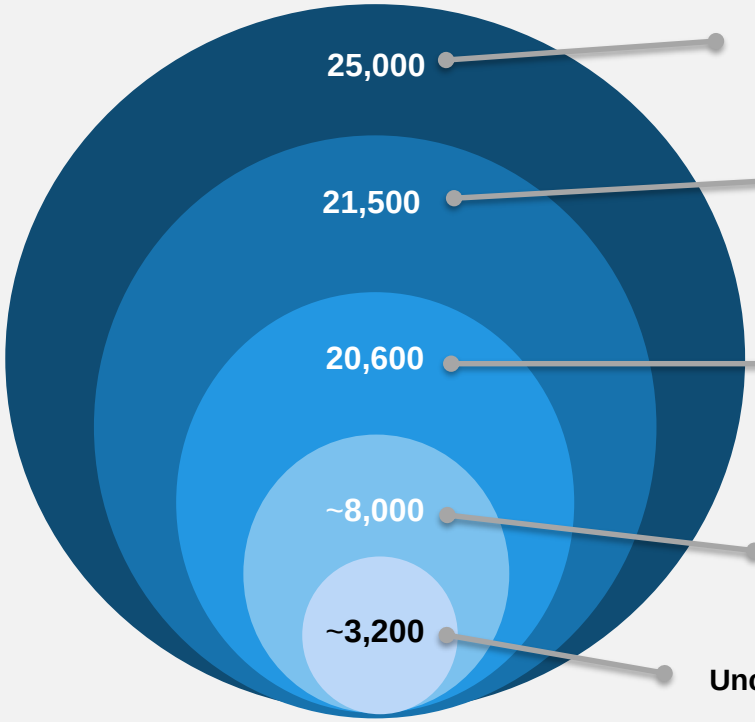
- Psychosis, impaired memory, sleep disturbance, depression, anxiety
- Heart attacks, stroke, high blood pressure, high cholesterol, vein clots
- Overweight/obesity, facial, neck and abdominal fat accumulation, diabetes
- Muscle and skin atrophy
- Osteoporosis



Cushing's disease patients have 2-5x higher incidence rates of comorbidities, 7x higher medical costs, 4x higher pharmacy costs*

Abbreviation: ACTH, adrenocorticotropic hormone. Source: Sharma TS, et al. *Clin Epidemiol*. 2015;7:281–293. *According to a retrospective analysis of claims from a large US commercial health plan (885 selected Cushing's disease cases and 2,655 matched controls without Cushing's disease) from 2007 to 2011.

Prevalence of endogenous Cushing's syndrome in US



Diagnosed patients

Non-malignant diagnosed patients

Adult non-malignant diagnosed patients
- >80% receive surgery as first-line treatment

Rx treated adult non-malignant patients

Uncontrolled Rx treated adult non-malignant patients

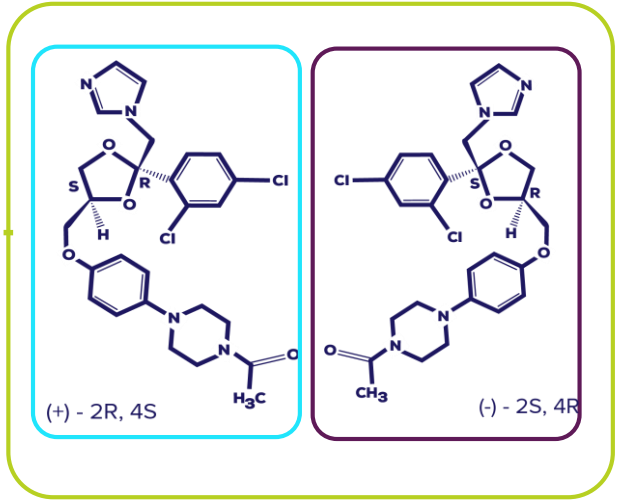
Source: Strongbridge Proprietary Market Research

Levoketoconazole is the relevant enantiomer of ketoconazole for cortisol synthesis inhibition in humans

DEXTROKETOCONAZOLE

- Right-handed enantiomer
- Estimated to contribute essentially no activity towards the inhibition of adrenal cortisol synthesis by ketoconazole

KETOCONAZOLE
Racemate with Two Enantiomers



LEVOKETOCONAZOLE

- Left-handed enantiomer
- Estimated to provide essentially all of the cortisol synthesis inhibition of ketoconazole in vivo

Auchus RJ, Wu JL, Peng HM "2S,4R-Ketoconazole is the Relevant Enantiomer of Ketoconazole for Cortisol Synthesis Inhibition: Steroidogenic P450s Inhibition Involves Multiple Mechanisms" Endocrine Society's Annual Meeting. University of Michigan, Chicago, IL. 18, March 2018. Poster presentation.

SONICS: A Phase 3, multi-center, open-label, single-arm study

Primary endpoint
Responder rate (normalized 24-hour mean urinary free cortisol at month 6 of maintenance without a dose increase during maintenance)

94 enrolled in dose titration → 77 entered maintenance → 61 completed maintenance → 46 completed extended evaluation

17 discontinued
6 adverse events
4 withdrew consent
3 insufficient efficacy
3 other reasons
1 physician decision

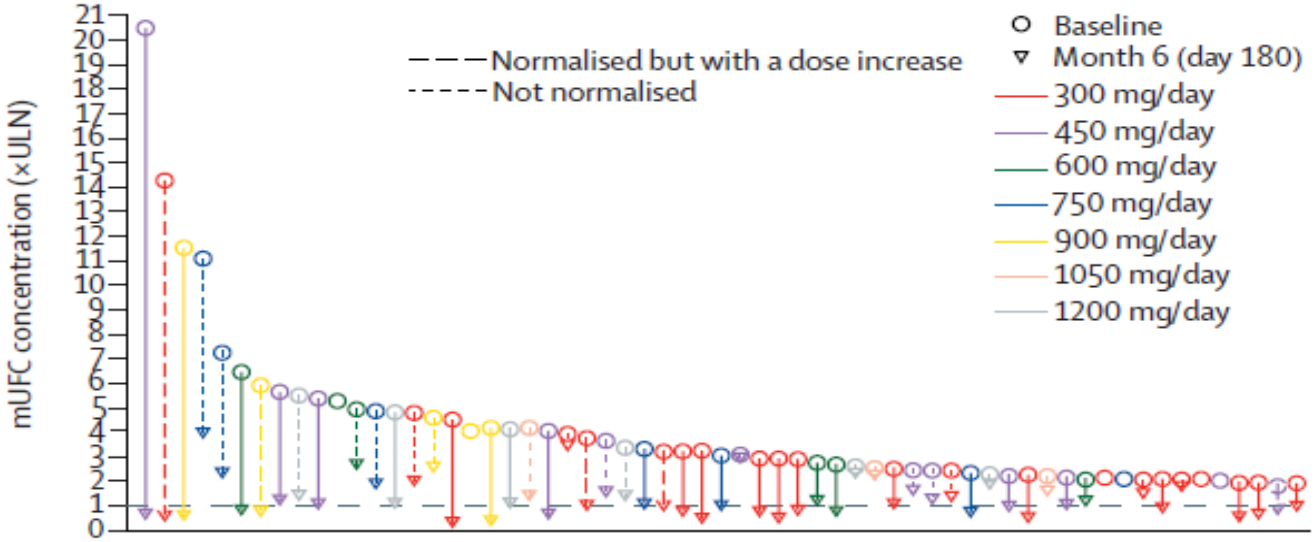
16 discontinued
6 adverse events
4 withdrew consent
4 insufficient efficacy
1 physician decision
1 other reasons

14 discontinued*
4 adverse events
3 insufficient efficacy
2 physician decision
2 withdrew consent
2 other reasons
1 death

*1 subject did not enter extended evaluation

SONICS achieved statistical significance on the primary endpoint

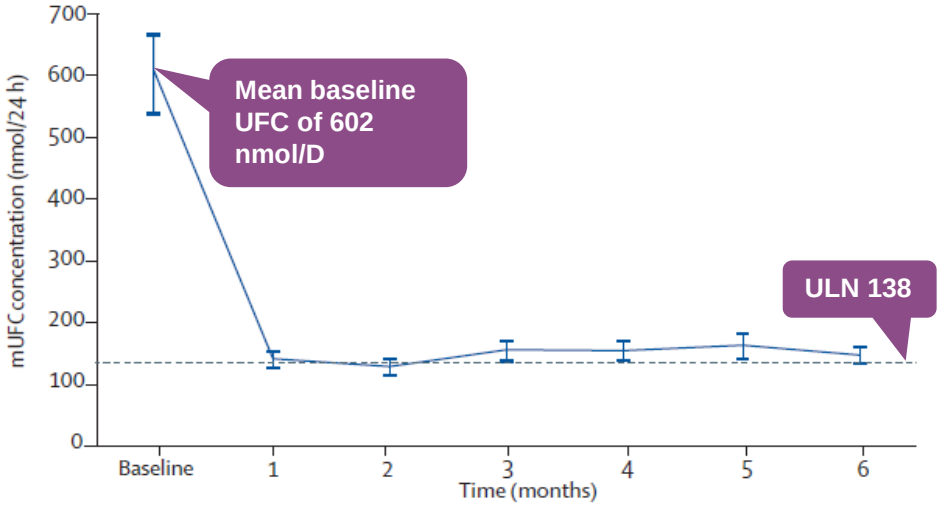
- Primary endpoint achieved statistical significance with 30% of patients (29/94) achieving mUFC normalization without dose increase (95% CI: 21%, 40%; p=.0154 vs null hypothesis), ITT analysis*



*Based on mixed-effects, repeated-measures model with underlying binomial distribution and logit link function, adjusted for baseline covariates.

Expanded mUFC “real world” analysis from SONICS further extends efficacy demonstration of RECORLEV

- Mean UFC remained at approximately the ULN from month 1 through month 6 of maintenance



Expanded mUFC “real world” analysis	
mUFC normalization at month 6 irrespective of dose increase	36% (34/94)
≥50% mUFC decrease or normalization at month 6 irrespective of dose increase	46% (43/94)
Maintenance phase completers with mUFC data and mUFC normalization at month 6 irrespective of dose increase‖	62% (34/55)
Maintenance phase completers with mUFC data and ≥50% mUFC decrease or normalization at month 6 irrespective of dose increase‖	78% (43/55)

‖Data based on 55 maintenance phase completers with both baseline and month 6 mUFC data available.

SONICS achieved statistical significance in key secondary endpoints and QoL at end of maintenance phase

- Five key cardiovascular (CV) secondary endpoints with favorable changes from baseline
  - Improvements in HbA1c and fasting blood glucose were more pronounced among patients with diabetes mellitus

Outcome Measure at End of Maintenance Phase	Baseline Mean, (n)	Mean Change From Baseline†, (n)	Adjusted* p-value of reductions from Baseline
Fasting Blood Glucose	5.8 mmol/L, (76)	-0.7, (50)	<0.0001
Hemoglobin A1c	6.0%, (77)	-0.4, (55)	<0.0001
Total cholesterol	5.6 mmol/L, (75)	-1.1, (53)	<0.0001
LDL-cholesterol	3.3 mmol/L, (75)	-1.0, (53)	<0.0001
Body Weight	82.1 kg, (77)	-5.1, (54)	<0.0001

  - HDL-C decreased by 0.2 mmol/L, an unfavorable change from baseline outweighed by the LDL-C improvement

- Mean scores in patient- and physician-reported outcomes of quality of life (QoL), hirsutism, acne, peripheral edema and depression all significantly improved at end of maintenance

*Hochberg adjustment applied to p-values to control type 1 error
†Reductions from baseline based on least squares mean changes from repeated measures model

Adverse events in SONICS

Combined dose titration and maintenance phases, ITT

Most Common Adverse Events	N=94
Nausea	32%
Headache	28%
Peripheral edema	19%
Hypertension	17%
Fatigue	16%
ALT increased*	15%
Diarrhea	15%

- In general, there were no unforeseen or unexpected safety issues in the study

Adverse Events of Special Interest	N=94
Liver-related (7%)	7%
QTc prolongation (5%)	5%
Adrenal insufficiency (3%)	3%

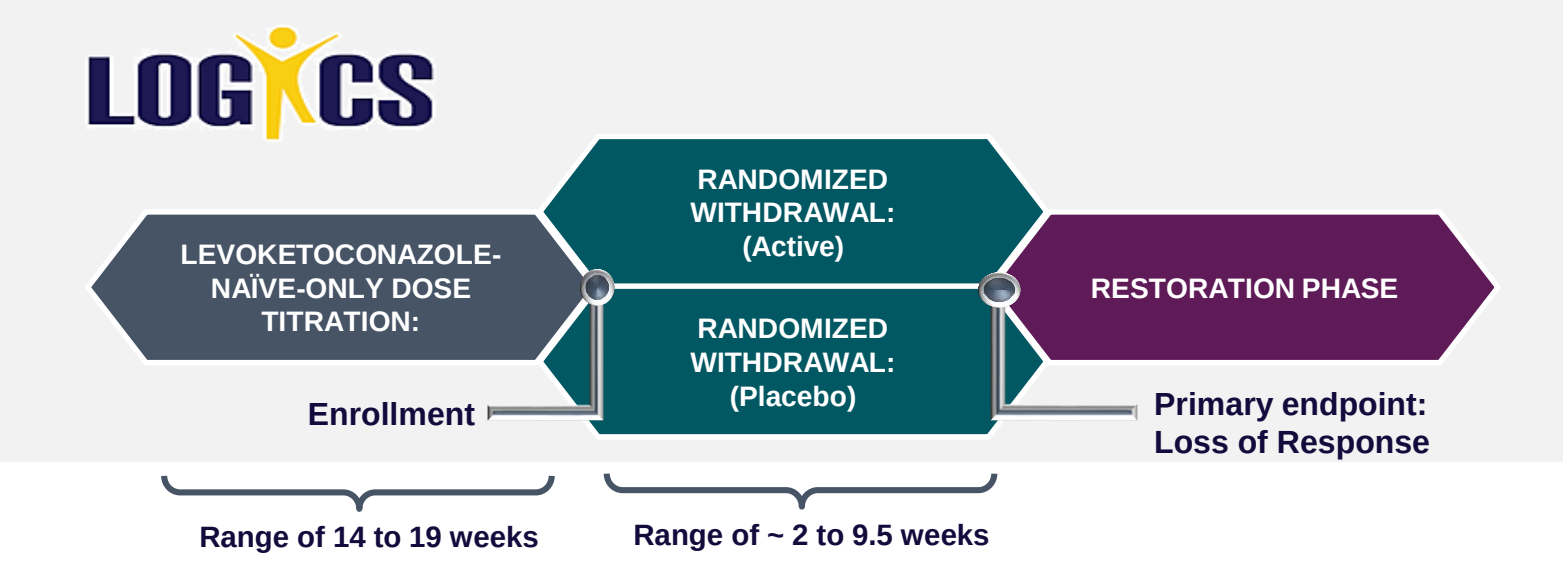
- No late onset of adverse events of special interest; all occurred in the maintenance phase of the study

*Includes all alanine aminotransferase (ALT) increases reported as an adverse event regardless of level or relationship to drug. A subset of these ALT increased events was also reported as adverse events of special interest.

Liver safety findings (full study)

- 3.2% of patients had an ALT elevation >5x ULN
- 10.6% of patients had an ALT elevation >3x ULN (includes those greater than 5x ULN)
  - All occurred on or before day-60 visit of maintenance
  - All were reversible upon discontinuation without clinical sequelae
- No transaminases >20 x ULN and no bilirubin values >1.5x ULN

LOGICS Phase 3 trial



Design: Double-blind, placebo-controlled, randomized-withdrawal study intended to assess the efficacy and safety of Recorlev

Primary endpoint - Comparison of the proportion of subjects with loss of therapeutic response upon withdrawing to placebo versus continuing treatment with Recorlev

Study rationale - Requested by FDA to provide placebo-controlled data

LOGICS Phase 3 trial enrollment & projection

- Top-line results anticipated in Q2 or Q3 2020
- Enrollment (as of January 9, 2020)
  - LOGICS is more than 70 percent enrolled*
  - We believe all additional patients required to complete enrollment are currently in the titration and maintenance phase
- Projection
  - An observed difference of at least 35% in the loss of response proportions between the active and placebo groups is projected to be associated with a statistical inference of efficacy
- NDA submission ~6 months following reporting of top-line results
  - Pursuing 505(b)(2) approval pathway for a new active substance

*Defined by the number of patients who have been randomized (i.e. enrolled) towards a target randomization of 46 to 54 patients

Recorlev potential benefits and differentiation indirectly compared to ketoconazole

	Recorlev	ketoconazole
Indication	Anticipated labeling for the treatment of CS	Indicated as a last line anti-fungal; FDA admonition of use in CS
Clinical data	Well characterized in two Phase 3 clinical trials	Not well-studied prospectively in CS
Liver safety	In SONICS, 3.2% of patients had an ALT elevation >5x ULN	In a registry study* of 47 keto-naïve patients, 13% had an ALT elevation > 5x ULN
Liver monitoring scheme	In SONICS, measured at least 1x every 2 weeks during dose titration; monthly for 6 months after therapeutic dose is established; every 3 months thereafter	FDA label indicates weekly liver monitoring
Patient & prescriber support	Fully leverage current CareConnection patient support program and planned specialty pharmacy distribution with expertise in Recorlev pharmacology and labeled monitoring scheme	Typically no specialty pharmacy or patient services available
Dosage & administration	SONICS/LOGICS studied doses from 150 mg once daily up to 600 mg twice daily; Median treatment duration in SONICS was 383 days	400-mg max dose, 200-mg strength, once daily; limited 6-month course

* Source: 1. Young et al. Eur J Endocrinol. 2018 Feb 22. pii: EJE-17-0886. doi: 10.1530/EJE-17-0886. [Epub ahead of print]

Ketoconazole labeled as last-line antifungal in U.S.
Includes warning against off label use in prostrate cancer and Cushing's syndrome

Indications	Last-line anti-fungal, not indicated for Cushing's syndrome	"NIZORAL® (ketoconazole) Tablets should be used only when other effective antifungal therapy is not available or tolerated...NIZORAL Tablets are indicated for the treatment of the following systemic fungal infections in patients who have failed or who are intolerant to other therapies…." [1]
Dosage and administration	Limited 6-month course, 400-mg max dose, 200-mg strength, once daily	"The recommended starting dose of NIZORAL Tablets is a single daily administration of 200 mg (one tablet). If clinical responsiveness is insufficient within the expected time, the dose of NIZORAL Tablets may be increased to 400 mg (two tablets) once daily…. The usual duration of therapy for systemic infection is 6 months." [1]
Boxed warnings	Hepatotoxicity; QT prolongation and drug interactions leading to QT prolongation	ALT Monitoring: "During the course of treatment, serum ALT should be monitored weekly for the duration of treatment. If ALT values increase to a level above the upper limit of normal or 30 percent above baseline, or if the patient develops symptoms, ketoconazole treatment should be interrupted." [1]
Adverse reactions to unapproved uses	FDA admonition of off-label use	**"Ketoconazole has been used in high doses for the treatment of advanced prostate cancer and for Cushing's syndrome when other treatment options have failed. The safety and effectiveness of ketoconazole have not been established in these settings and the use of ketoconazole for these indications is not approved by FDA."**[1]

1. Excerpted from NIZORAL U.S. Prescribing Information 2014

Cushing's syndrome represents a commercial opportunity where patients are in need of new treatment options

Market Potential

- **Estimated diagnosed and pharmacologic treated population**
  - ~25,000 CS diagnosed patients
  - ~8,000 patients Rx Treated
    - ~3,200 patients are treated and remain uncontrolled

Unmet Need

- **Unmet need centered around both efficacy and safety**
  - General lack of satisfaction with current treatment options
  - Hope for products with better efficacy, predictable treatment response and cortisol management
  - Need for safer options, in particular liver tolerability issue

Potential Competitive Profile

- **Sonics profile resonates with treating HCP's**
  - Product differentiation from well-characterized risk/benefit profile and substantial clinical evidence
  - Moderate – to – high interest in prescribing Recorlev
  - Top attributes align with HCP identified unmet needs

Pricing and Reimbursement

- **Payers generally positive towards Recorlev**
  - Established rare disease pricing corridor exists within Cushing's syndrome market
  - Payers generally had a positive view of the Recorlev profile
  - Assuming relative price parity with leading brand, payers expect to cover Recorlev within existing cost control frameworks

Source: Company-sponsored research

Pricing and reimbursement

- Pricing
  - Rare disease pricing corridor exists for CS
  - Current CS branded therapies are priced from $165k to $335k annually
    - Can reach up to $669k for higher dosing levels
  - Branded agents have fairly broad payer coverage
- Reimbursement
  - Largest insurance group for CS treated patients is commercial
  - Broad coverage for branded agents across insurance plans, typically on non-preferred or specialty tiers with prior authorization
  - CS is not an actively managed therapy area for payers today
  - Payers generally view Recorlev profile favorably

Source: Company-sponsored research

Existing commercial infrastructure

Company‘s existing commercial infrastructure anticipated to accelerate Recorlev’s time to peak penetration

Fully operational CareConnection patient services platform including specialty pharmacy and patient access managers; significant reimbursement experience

Established relationships with Cushing’s syndrome advocacy groups

6 field-based medical science liaisons focused on disease awareness and education with endocrinology KOLs

Keveyis

(dichlorphenamide)

The first and only FDA-approved therapy for primary periodic paralysis*

* FDA-approved treatment for hyperkalemic, hypokalemic, and related variants of primary periodic paralysis

STRONGBRIDGE BIOPHARMA

Primary periodic paralysis: a spectrum of rare, chronic, genetic, neuromuscular disorders

PPP	Symptoms/triggers	Impact of attacks	Frequency
Causes recurrent, progressive, and debilitating episodes of muscle weakness and temporary paralysis[2-4]	Symptoms: clumsiness, extreme fatigue, weakness, palpitations, pain Triggers: may include potassium, carbohydrates, rest after exercise, cold exposure, stress	Paralytic attacks are acute episodes that can be debilitating[4] Attacks may last from one hour to several days[1] As patients age, muscle weakness can become permanent[3]	**59%** have **weekly** attacks **28%** have **daily** attacks

Sources: 1. Charles G, Zheng C, Lehmann-Horn F, Jurkatt-Rott, Levitt J. Characterization of hyperkalemic periodic paralysis: a survey of genetically diagnosed individuals. *J Neurol*. 2013;260:2606-2613. 2. Cannon SC. Channelopathies of skeletal muscle excitability. *Compr Physiol.* 2015;5:761-790. 3. Cavel-Greant D, Lehmann-Horn F, Jurkat-Rott K. The impact of permanent muscle weakness on quality of life in periodic paralysis: a survey of 66 patients. *Acta Myol.* 2012;31:126-133. 4. Sansone V, Meola G, Links TP, Panzeri M, Rose MR. Treatment for periodic paralysis. *Cochrane Database Syst Rev.* 2008; Jan 23;(1):CD005045.

Keveyis approved for the treatment of PPP in the US

- The first and only FDA-approved therapy indicated for the treatment of primary hyperkalemic and hypokalemic periodic paralysis and related variants

- Dosing in an oral tablet formulation
  - Starting dose is 50 mg 1X or 2X daily
  - Can be titrated up to 100 mg 2X daily

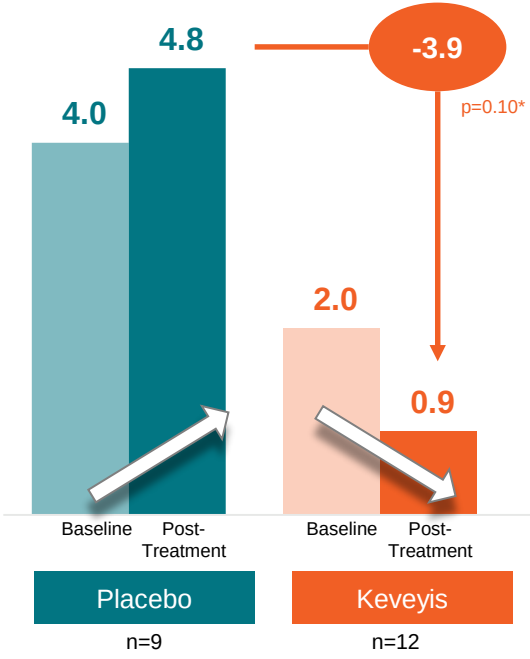
- ~4,000-5,000 diagnosed PPP patients in the United States *

* Based on Strongbridge analysis of medical claims database.
Identified patients were required to have medical activity of any type in the last 12-36 months.

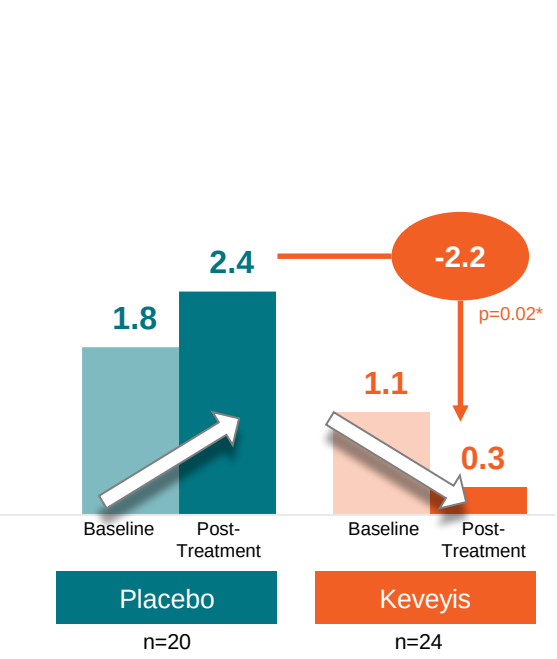
Treatment with Keveyis decreased weekly attack rates

Study 1: decreased weekly attack rates from baseline to week 9

Hyperkalemic



Hypokalemic



Study 2

Hyperkalemic

Mean decrease in attack rates relative to placebo

-2.3
Attacks per week

p=0.006

Mean weekly attack rate at baseline was 3.8 (n=31)

Study 1: Sansone VA, et al. Neurology 2016;86:1408-1416
Study 2: Tawil R, et al. Ann Nuerol. 2000; 47:46-53.

*Treatment effects (DCP-placebo) are computed as the median of the bootstrap distribution of the treatment group difference in median response

Our commitment to primary periodic paralysis

STRONGBRIDGE™ CareConnection

Suite of patient services

Personalized Support

Access Assistance

Education & Public Awareness

Community Connection

Uncovering Periodic Paralysis

Genetic Testing

Strategic priorities & revenue guidance

Continue to drive revenue growth and increase positive contribution margin

Pursue life cycle opportunities to extend exclusivity runway beyond 2022; update to be provided in 1H 2020

2019 revenue of ~$21.7 million
2020 full-year revenue guidance of $26 million to $27 million

IP & Financials

STRONGBRIDGE BIOPHARMA

Intellectual property and orphan exclusivity

	IP		Orphan exclusivity	
	US	EU	US	EU
Recorlev Global commercial rights owned by Strongbridge	2030 Method of use: reducing CRP levels and systemic inflammation 2026 Method of use: treating Cushing's syndrome	2026 Method of use: treating Cushing's syndrome	7 years	10 years
Veldoreotide Global commercial rights owned by Strongbridge	2037 Formulation	Filed patent application for novel formulation	7 years	10 years
Keveyis US commercial rights owned by Strongbridge	Exploring options	US rights only	Aug 2022	US rights only

Summary financial information*

- ~$78 million in cash; no debt
- ~54.2 million shares outstanding
- Cash runway through 3Q 2021
- 2019 estimated revenue of $21.7 million for Keveyis (29% growth from 2018)
- 2020 full-year Keveyis revenue guidance of $26 million to $27 million

* As of 12/31/2019; preliminary unaudited financials

Recent achievements & 2020 priorities

- Recent achievements
  - Achieved a positive contribution margin for Keveyis in Q3 2019
  - Expected to report Keveyis full-year 2019 revenue of approximately $21.7 million, exceeding $18 to $20 million guidance range
  - Phase 3 LOGICS study of Recorlev is more than 70% enrolled (as of January 9, 2020)
  - Extended cash runway two additional quarters; cash now expected to fund operations through 3Q 2021
- 2020 key priorities
  - Report top-line results for the Phase 3 LOGICS study of RECORLEV™ in endogenous Cushing's syndrome in 2Q or 3Q of 2020
  - Submit a NDA for Recorlev to the U.S. FDA approximately 6 months after reporting top-line LOGICS results
  - Provide clarity on life cycle opportunities underway for KEVEYIS in the first half of 2020
  - Continue search for a CEO

Strongbridge Biopharma plc

January 2020

STRONGBRIDGE BIOPHARMA