July 23, 2014

OUTPERFORM

Reason for report:

INITIATION

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ZAFGEN, INC.

Initiating at OP, Differentiated Beloranib to Drive Value in Orphan Obesity

• **Bottom Line:** We are initiating coverage on ZFGN with an Outperform rating and a $35 PT. Zafgen is developing its lead product beloranib in two rare forms of obesity: Prader-Willi Syndrome (PWS) and Craniopharyngioma-Associated Obesity (CAO), each of which present severe orphan unmet-medical needs with an estimated ~7,000 and ~3,000 patients in the US. With compelling beloranib efficacy already demonstrated in two Phase II studies on potentially registrational endpoints, we believe that ZFGN's focus on severe, biologically defined orphan obesity populations could offer a high likelihood of success with a streamlined development path and high margin business model.

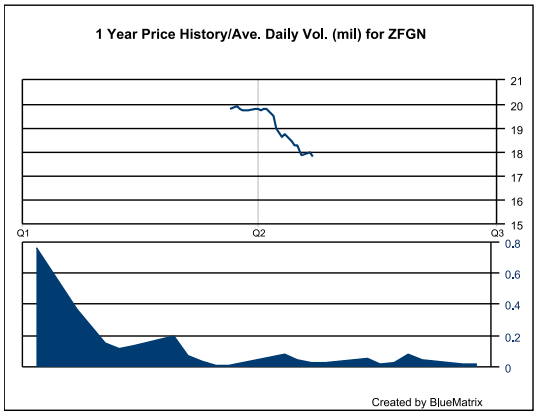
• **In two Phase II studies, Beloranib produced robust, statistically significant body fat/mass reductions while ameliorating hyperphagia (constant insatiable hunger)**, the latter of which is ranked by PWS patients as the largest unmet need for their disease. PWS patients are afflicted by a perpetual urge to eat and convert a disproportionate amount of their ingested calories into fat, and have an average lifespan of 32 years. Unlike other approved therapies for obesity such as Belviq and Qsymia, Beloranib's ability to precipitate weight loss was met with benefits on both hunger, fullness and various metabolic parameters, including 15-30% reductions in LDL-C and 12-15% increases in HDL-C. We assume a 70% probability of beloranib PWS approval in 2H17 and a mkt oppty of ~$700MM (~$500MM risk-adjusted) in US and EU in 2029.

• **Next up: 1Q15 beloranib data expected for ZFGN's Phase II CAO study which is already underway; Phase III PWS trial to begin in 2H14, with data expected 4Q15.** ZFGN's PWS pivotal trial program will be comprised of two clinical studies (one in the US and one in Europe), and will enroll up to 240 patients who will be evaluated for 12 months. Preliminary 6-month data from the US study could represent a key de-risking catalyst and is expected by YE15. Powering assumptions for the Beloranib pivotal study enable trial success even if the drug's effect size on hyperphagia is only ~50% as large as what was observed after 4 weeks in the Phase IIa, rendering us confident in our 70% probability-of-success assumption. A large ongoing Prader-Willi registry has identified almost 2,000 patients, and once approved we assume fairly rapid beloranib uptake. Pharmacoeconomics indicate our projected price of $150k US/ $90k EU could be conservative, in our view.

• **Longer term, Beloranib's potential in the broader severe obesity market could drive considerable upside to our valuation,** but currently comprises only ~$4/share of our $35 PT. Label expansion to include the estimated ~16MM severe obesity patients in the US is likely to require large trials and the generation of a robust safety database. In the meantime, we believe that establishing broader proof of concept in orphan sub-populations offers a less risky and more rapid development path, and down the road could position ZFGN as a very attractive partnership or takeout target.

Key Stats:	**(OTC Un:ZFGN)**
S&P 600 Health Care Index:	**1,304.31**
Price:	**$17.85**
Price Target:	$35.00
Methodology:	DCF
52 Week High:	$21.01
52 Week Low:	$17.50
Shares Outstanding (mil):	24.2
Market Capitalization (mil):	$432.0
Book Value/Share:	$0.00
Cash Per Share:	$5.22
Dividend (ann):	$0.00
Dividend Yield:	0.0%

General: Diluted shares outstanding; Cash per share 2Q14E



Dec Yr	1Q	2Q	3Q	4Q	FY Rev	1Q	2Q	3Q	4Q	FY EPS	P/E
2013E	--	--	--	--	0.0	--	--	--	--	($19.53)	NM
2014E	0.0	0.0	0.0	0.0	0.0	($0.28)A	($0.31)	($0.34)	($0.40)	($1.35)	NM
2015E	0.0	0.0	0.0	0.0	0.0	($0.44)	($0.47)	($0.49)	($0.52)	($1.92)	NM

Source: Company Information and Leerink Partners LLC Research

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Zafgen (ZFGN): Initiating at OP, Differentiated Beloranib to Drive Value in Orphan Obesity

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Zafgen, Inc. Investment Thesis

- **We Rate ZFGN Shares Outperform.** Zafgen (NASDAQ: ZFGN) is a biopharmaceutical company dedicated to the development of medicines to address the unmet need in obesity, with an initial focus on two orphan diseases that offer a potentially streamlined development path and high margin business model. We believe that ZFGN has an experienced management team with an outstanding track record executing in the field of drug discovery and commercialization. ZFGN's lead asset, beloranib, is a MetAP2 inhibitor that has generated compelling Phase II data in Prader-Willi Syndrome (PWS) and severe obesity on a number of clinically relevant endpoints, in our view, and is entering a PWS Phase III program beginning in 2H14. We project a 70% probability of PWS approval in 2017, and peak gross PWS sales of ~$700MM worldwide in 2029. Zafgen is also developing beloranib in craniopharyngioma-associated obesity (CPO), and data from a Phase IIa study is expected to be reported in 1Q15. We project 50% probability of CPO approval in 2018, and peak gross CAO sales of ~$440MM worldwide in 2029. The commercial opportunity presented by severe obesity holds the potential to be orders of magnitude larger than PWS and CAO, though ZFGN will likely need support from a larger partner to unlock its full potential. Thus, while severe obesity afflicts ~16MM Americans in the US, we solely model ~$140MM in peak beloranib sales in non PWS/CPO patients, though in a partnership/acquisition scenario (P&A), ZFGN is likely to receive considerably more value for beloranib in high prevalence indications. In the meantime, we believe that establishing broader proof of concept in orphan sub-populations offers a less risky and more rapid development path, and over the long term could position ZFGN as a very attractive partnership or takeout target. Likewise, a second generation MetAP2 inhibitor in preclinical development for general obesity, and a novel chemical class MetAP2 inhibitor in preclinical development for NASH/diabetes could provide significant upside to our price target as clinical catalysts are realized.

DCF Analysis Implies ~100% Upside to the Stock from Current Levels

- **We derive a ~$35 per share value for ZFGN using a 12% discount rate and a 2% terminal growth rate, representing a ~$860MM market capitalization.** Our price target assumes a 70% and 50% probability of beloranib approval in PWS and Craniopharyngioma, which leads to our peak risk-adjusted sales estimates of ~$490MM and ~$220MM in each indication. We only model ~$140MM in peak sales in severe obesity, which we believe holds the potential to be very conservative if/when ZFGN generates pivotal beloranib data in orphan indications.

Sum NPV FCF ($MM)		726
Net Cash 2Q14E		126
Implied ZFGN Mkt Cap ($MM)	**$**	**853**
ZFGN Per Share Value	**$**	**35.21**

Cost of Equity	12%
TG Rate	2%
Diluted Shares Oustanding	24.2

ZFGN DCF Analysis	2014E	2015E	2016E	2017E	2018E	2019E	2020E	2021E	2022E	2023E	2024E	2025E	2026E	2027E	2028E	2029E	2030E	2031E	TV
Cash Flow From Operations ($MM)	(25)	(39)	(48)	(61)	(26)	50	96	162	200	242	267	287	306	322	338	345	179	83	
Cash Flow From Investing ($MM)	(0)	(3)	(5)	(7)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	
Net Borrowing (Repayment) ($MM)	4	(4)	(4)	(4)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Free Cash Flow ($MM)	(21)	(46)	(57)	(72)	(36)	40	86	152	190	232	257	277	296	312	328	335	169	73	749
Discount Periods	-	0.75	1.75	2.75	3.75	4.75	5.75	6.75	7.75	8.75	9.75	10.75	11.75	12.75	13.75	14.75	15.75	16.75	
NPV FCF ($MM)	(15)	(42)	(47)	(52)	(24)	24	45	71	79	86	85	82	78	74	69	63	28	11	112

Source: Leerink Partners Research

Beloranib's Two Lead Indications Comprise a >$1B WW Opportunity Combined

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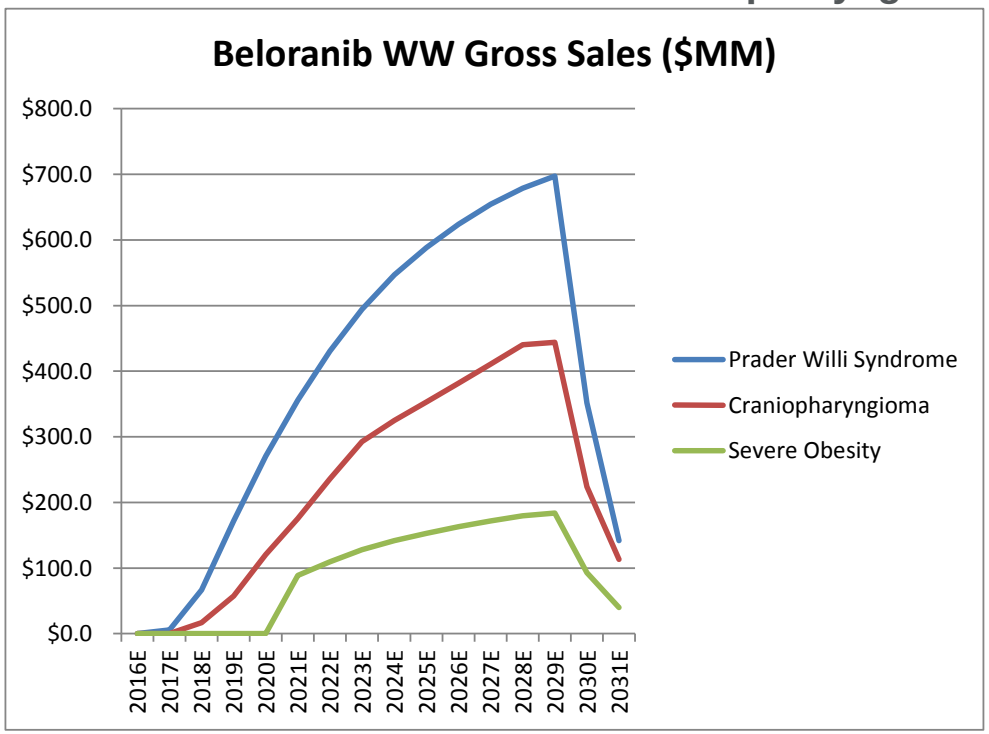
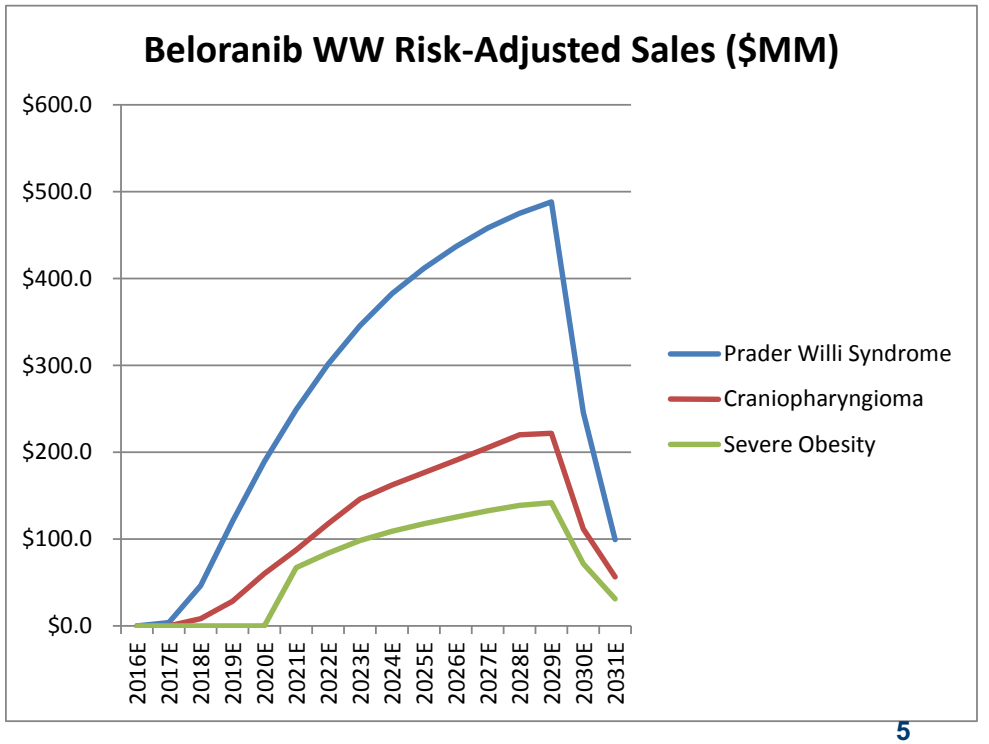
- **There are 7,500 and 12,000 PWS patients in the US/EU, ~50% of which are 13 years/old or older and are thus good candidates for beloranib therapy.** At 35% and 20% peak penetration in the US and Europe and a beloranib cost of $150,000/$90,000 respectively, we generate ~$490MM in peak risk-adjusted sales in PWS in 2029
- **Based on a literature prevalence of 1/50,000 individuals, we estimate that there are 6,260/14,850 Craniopharyngioma patients in the US and Europe, ~50% of which are estimated to be afflicted with hypothalamic function leading to hyperphagia.** At 40% and 30% peak beloranib penetration in this patient cohort and a price of $150,000/$90,000 in the US and Europe, we generate ~$220MM in peak risk-adjusted sales in 2029.
- **Thus, even without penetration into the severe obesity market, we believe that $1B in beloranib revenues is attainable in PWS/Craniopharyngioma alone**

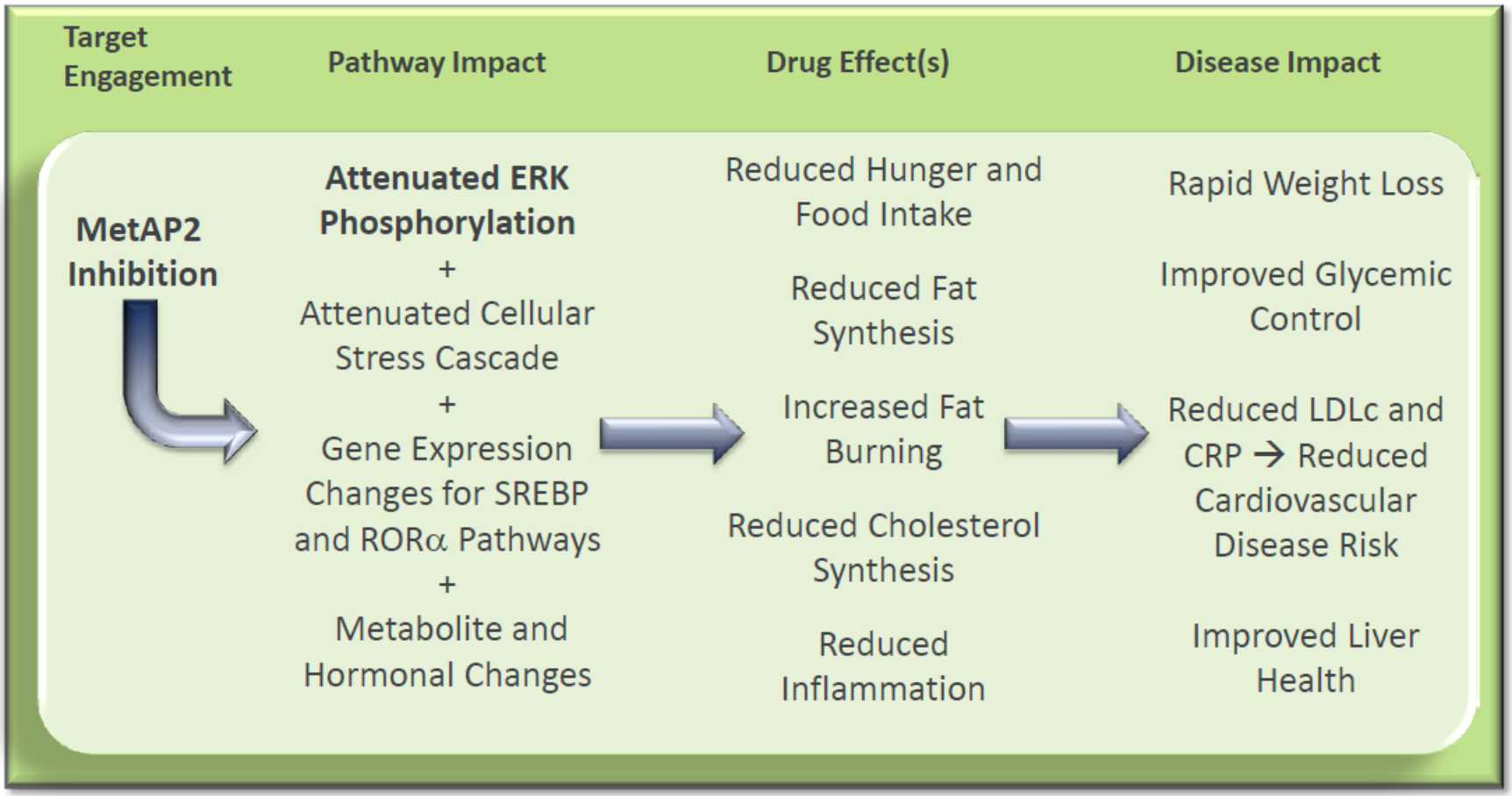




Source: Leerink Partners Research

Beloranib is a Met2AP Inhibitor With a Novel Mechanism of Action

- **Belornanib is a member of the Fumagillin-class methionine aminopeptidase 2 (MetAR2-inhibitor) that acts peripheral to the CNS on the liver and adipose tissue to rebalance lipid metabolism, body composition and reduce hunger.** A mechanism that is peripheral to the CNS renders Beloranib well-suited to help patients with both PWS and Craniopharyngioma, as each disease is more or less CNS mediated but due to either 1) underlying genetics or 2) brain plasticity and/or manipulated neural tissue, may not be well suited to respond to a CNS-oriented therapeutic.



Source: Company Slides

Phase IIb Data Shows Robust Benefits on Weight Loss and Hunger Reduction in Patients with Severe Obesity

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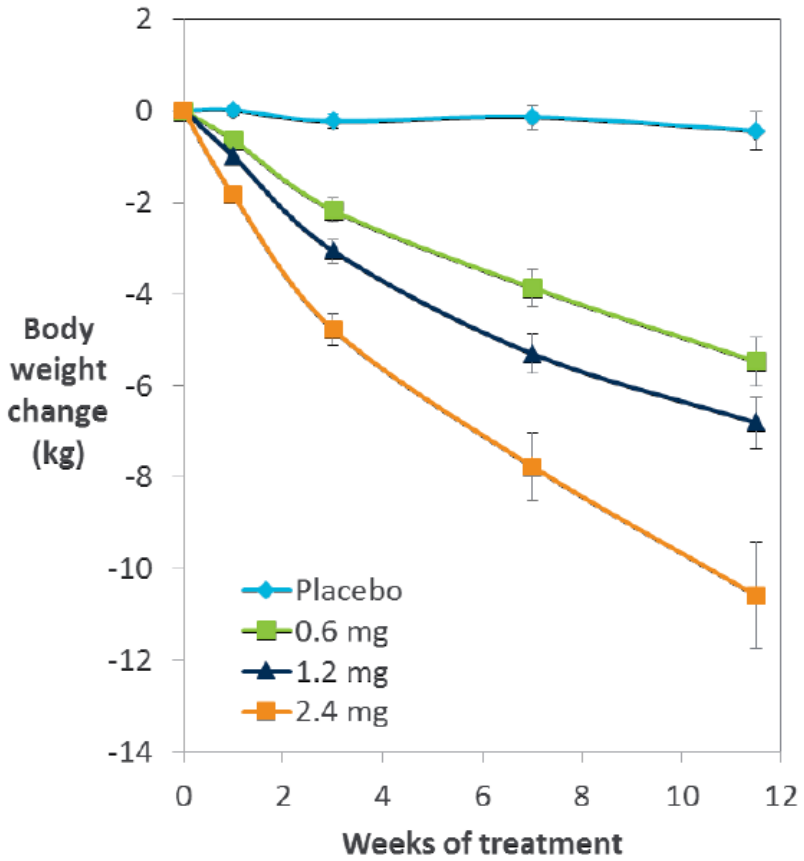
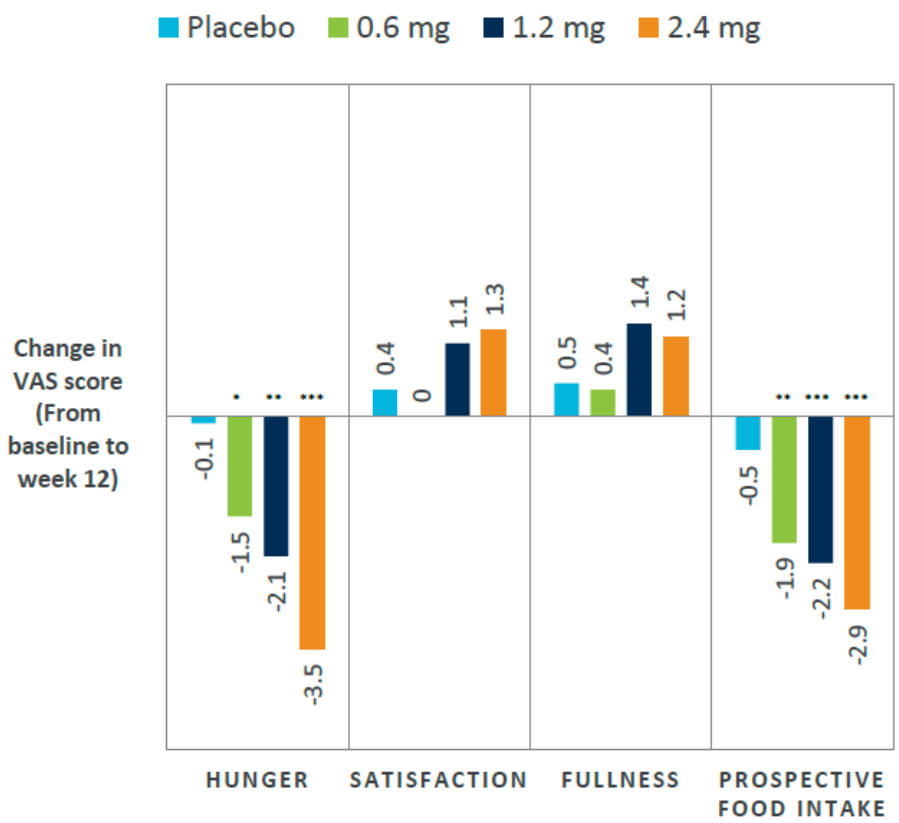
- **In patients afflicted by severe obesity, 2x/weekly subcutaneous Beloranib injections conferred robust, dose-dependent benefits on weight loss, hunger, satisfaction and fullness**
- ~50% of patients treated with the highest beloranib dose (2.4mg), but even the 1.2mg dose conferred 12-week weight loss benefits (~6.5% placebo-adjusted) that are numerically superior to approved obesity therapies as well as OREX's Contrave, which incurred a ~3% placebo-adjusted benefit at the same time-point





Source: Company Slides

A Phase IIa Study in 17 PWS Adult Patients Generated Proof-of-Concept; Sets the Stage for Phase III

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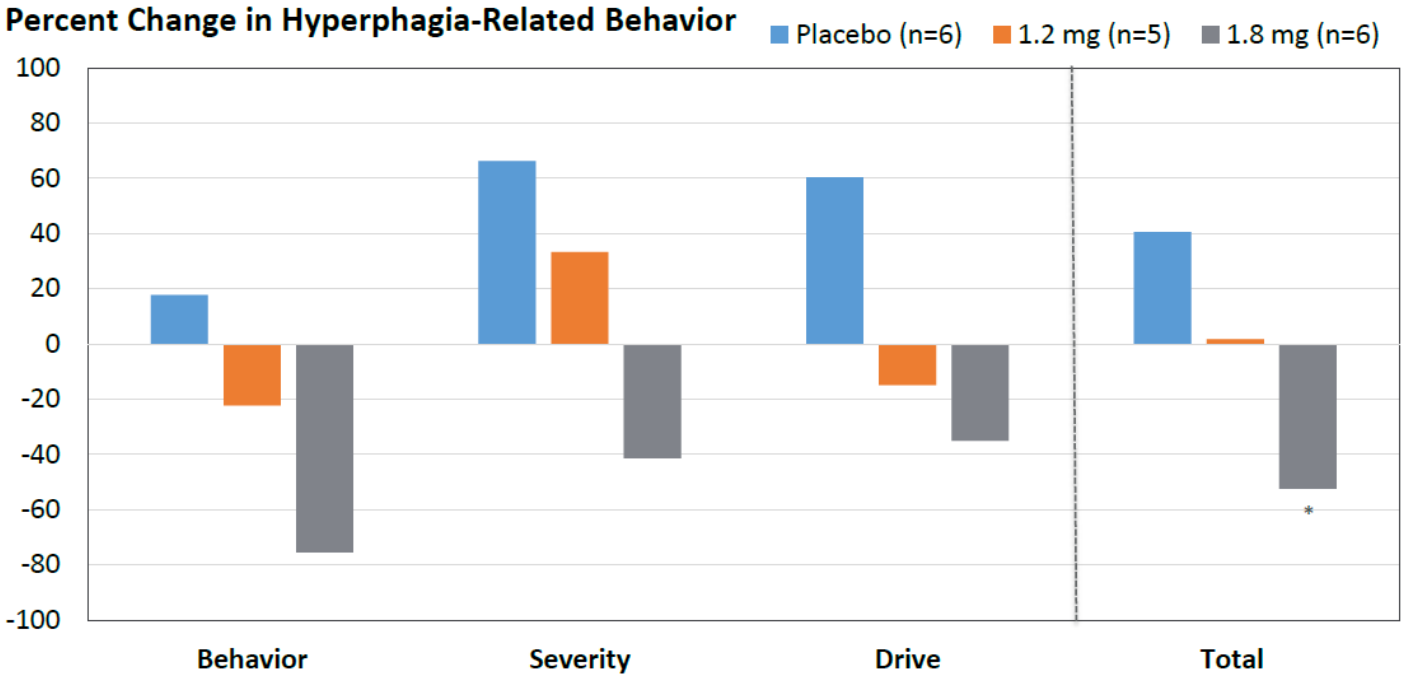
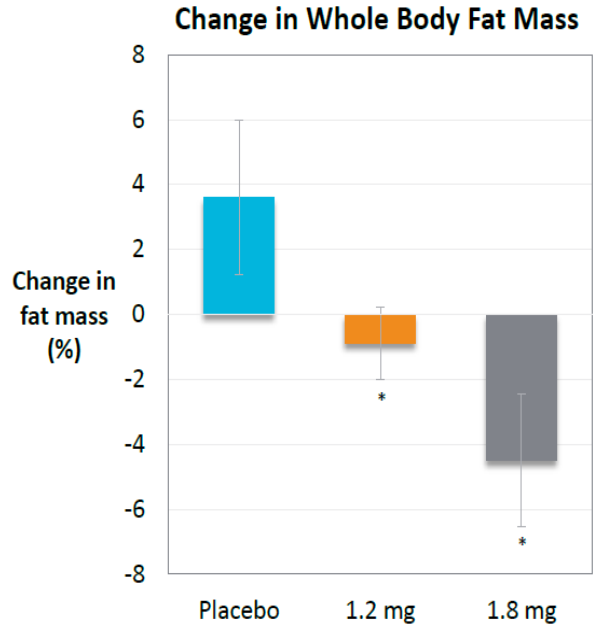
- **PWS is an orphan disease and is the most common known genetic cause of life threatening obesity.** PWS patients are afflicted by dysregulated metabolism and have an unrelenting physiological drive to eat (hyperphagia). The average PWS patient only survives to 32 years old.
- **After just 4 weeks of treatment, patients treated with the highest 1.8mg Beloranib dose demonstrated statistically significant improvements in hyperphagia-related behavior that were met with statistically significant reductions in whole body fat mass.**





*, p<0.05

Source: Company Slides

Weight Loss and Hunger Benefits Met with Beneficial Changes on Various Lipid Parameters and Markers of Metabolic Disease

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- **Beloranib works by directing MetAP2 binding to cellular stress mediators which reduces fat synthesis in the liver and fat storage throughout the body.**
- Shown below, at the two highest doses studied in the severe obesity trial, **beloranib precipitated reductions in triglycerides and LDL-C and led to robust increases in HDL-C, all of which were statistically significant.**

Consolidated results from ZAF-201 (for 1.2 mg and 2.4 mg dose groups)

Parameter	Change	Significance
Hunger	Decreased by 30-40%	p<0.05
Body fat content	Decreased by 8-9%	p<0.05
Waist circumference	Decreased by 4-10 cm	p<0.005
C-Reactive Protein	Decreased by 22-37%	p<0.0001
Systolic Blood Pressure	Decreased by 6-12 mmHg	p<0.05
Triglycerides	Decreased by 9-20%	p<0.05
LDLc	Decreased by 15-30%	p<0.05
HDLc	Increased by 12-15%	p<0.05

Source: Company Slides

Beloranib is the Only Obesity Therapy to Produce Robust Benefits on LDL-C, HDL-C and Hyperphagia or Hunger

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- **MEDACorp KOLs believe that Beloranib is the first anti-obesity agent that addresses two important abnormalities that are present in the obese patient**
  - **hunger that is inappropriate relative to the amount of energy stored as fat**
  - **dysregulation of fat metabolism, which causes more fat to be made and stored in an obese patient than in a lean person**

Shown below, in Phase IIb, beloranib conferred the most robust weight loss benefits, while also precipitating the only clinically significant effect on LDL-C and HDL-C, in our view.

Beloranib Compares Nicely to Other Obesity Drugs on Weight Loss and Appears Superior on LDL-C, HDL-C and Hyperphagia

Product	% Placebo-Adjusted Weight Loss	Impact on LDL-C/HDL-C*	Hyperphagia/Hunger Benefit?
Phentermine	3.8%-4.4%	none on label	No
Beloranib	**6.5%-10.5% at 1.2mg and 2.4mg at 12 weeks**	**LDL-C reduced 15-30%, HDL-C increased 12-15%**	**YES**
Xenical	2.0-5.0%	LDL-C reduced 9.0%, HDL-C reduced 3.7%	No
Qsymia	6.6% at target dose of 7.5mg/46 mg 8.6% at high dose of 15mg/92mg	LDL-C reduced 3%, HDL-C increased 3%	No
Belviq	3.0-3.3%	LDL-C reduced 1.3%, HDL-C increased 1.2%	No

**placebo-adjusted figures used*

Source: SEC Filings, Clinicaltrials.gov, Leerink Partners Research

Source: SEC Filings, Clinicaltrials.gov, FDA.gov

Beloranib Effects on Leptin, Adiponectin and Body Composition Also Observed in the Phase IIb

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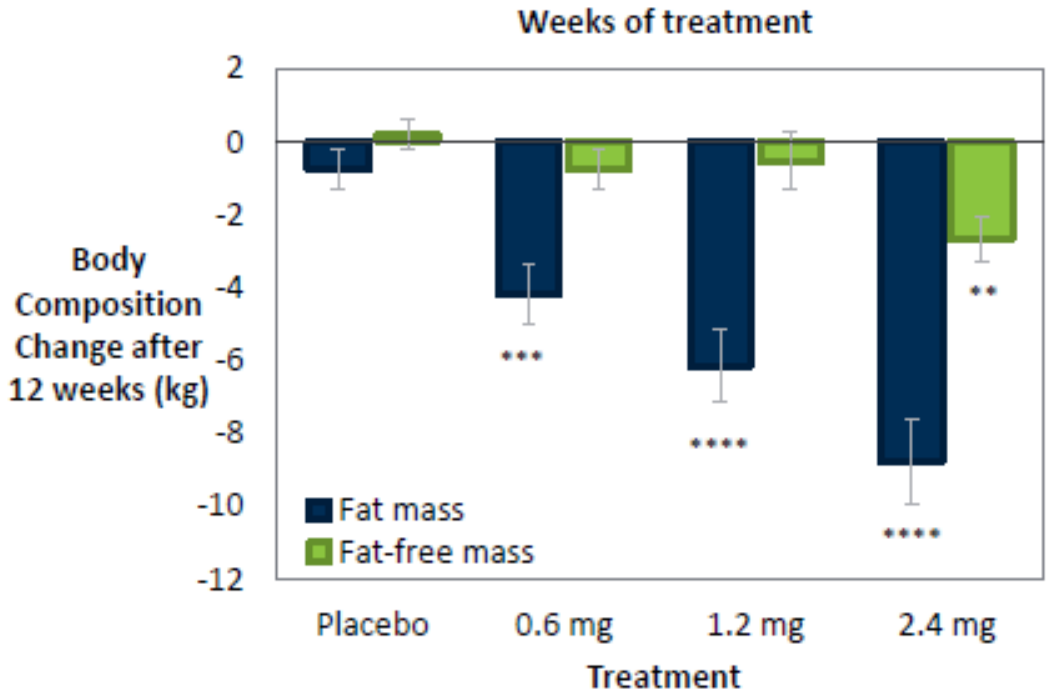
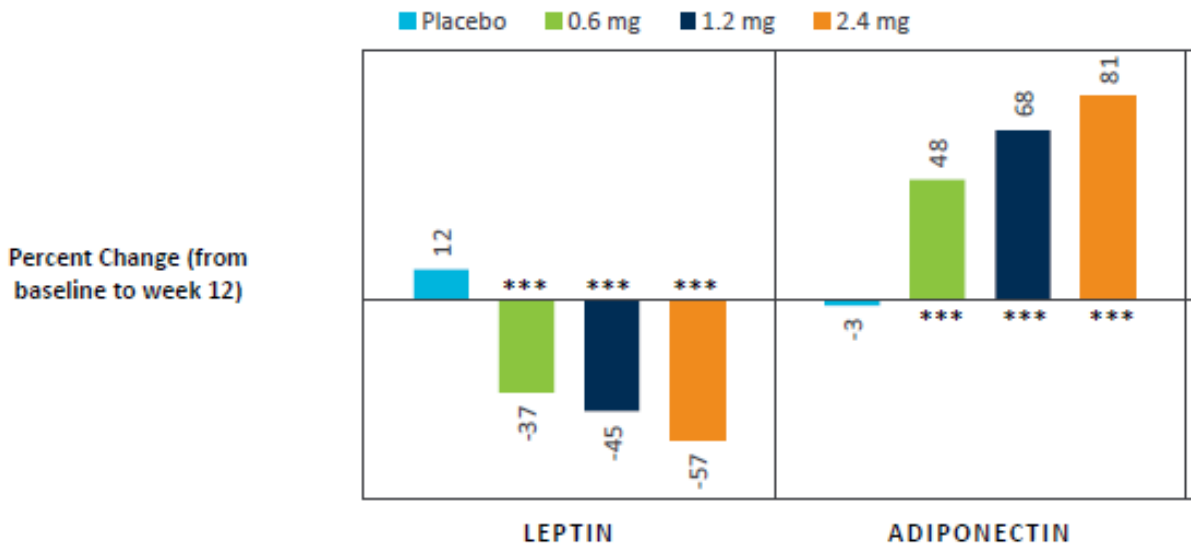
- **Beloranib also showed synchronizing benefits on leptin while increasing adiponectin**
- **Such benefits were also met with dose dependent, statistically significant, improvements in body composition at 12 weeks**





Source: Company Slides

Beloranib's Tolerability Profile in Severe Obesity Implies 1-2mg Best Dose, But Sleep Effects Could be Good for PWS

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- In the Phase IIb severe obesity trial (160 patients total), beloranib was administered 2x/weekly subcutaneously at doses of 0.6mg, 1.2mg and 2.4 mg
- Tolerability was limited at the 2.4mg dose, where ~49% of patients suffered from some insomnia and ~29% had any sleep disorder
- In addition, GI related issues afflicted more patients on drug, but were comparable to placebo at all doses except 2.4mg
  - Other obesity therapies such as Qsymia have shown similar sleep disturbances, while both Qsymia and Belviq-treated patients have experienced GI-adverse events
  - We believe that modest sleep induction delays during the first few weeks of treatment may be adequately addressed with coaching and sleeping pills.
  - While beloranib's effect on sleep could limit the high dose's utility in severe obesity, one of the primary complaints of PWS patients is fragmented sleep and hypersomnolesence, so belorabib may be reprogramming patients' sleep patterns back to normal, as with other disease aspects, which takes a little time.
- **Importantly, with 200 patients exposed to beloranib so far, there have been no serious adverse events deemed related to beloranib.** In the 12-week severe obesity trial there were no clinically significant laboratory values or ECG/vital sign changes in any treated subjects.

Beloranib's Tolerability Profile in Severe Obesity Phase IIb (cont'd)

Table 2. Most common (>10%) TEAEs and corresponding SOCs with greater incidence rate on any beloranib dose vs. placebo

System Organ Class/ Preferred Term*	Beloranib 0.6 mg (N=37) Subject Events	Beloranib 1.2 mg (N=37) Subject Events	Beloranib 2.4 mg (N=35) Subject Events	Placebo (N=38) Subject Events
Gastrointestinal disorders				
Diarrhoea	5 (13.5%) 7	5 (13.5%) 7	11 (31.4%) 16	6 (15.8%) 6
Nausea	8 (21.6%) 9	11 (29.7%) 15	16 (45.7%) 17	10 (26.3%) 11
Vomiting	3 (8.1%) 4	1 (2.7%) 1	8 (22.9%) 11	4 (10.5%) 5
Psychiatric disorders				
Abnormal dreams	10 (27.0%) 12	6 (16.2%) 6	6 (17.1) 6	3 (7.9%) 3
Depression	2 (5.4%) 2	4 (10.8%) 4	0 (0.0%) 0	0 (0.0%) 0
Insomnia	8 (21.6%) 11	11 (29.7%) 11	17 (48.6%) 17	8 (21.1%) 9
Sleep disorder	2 (5.4%) 2	7 (18.9%) 7	10 (28.6%) 10	6 (15.8%) 6
Nervous system disorders				
Dizziness	2 (5.4%) 2	2 (5.4%) 2	9 (25.7%) 11	2 (5.3%) 2
Headache	18 (48.6%) 30	12 (32.4%) 18	10 (28.6%) 19	15 (39.5%) 33
Skin and subcutaneous tissue disorders				
Pruritus	4 (10.8%) 7	0 (0.0%) 0	0 (0.0%) 0	1 (2.6%) 1
Vascular disorders				
Hot flush	4 (10.8%) 4	2 (5.4%) 2	8 (22.9%) 8	0 (0.0%) 0
General disorders and administration site conditions				
Injection site haematoma	14 (37.8%) 40	15 (40.5%) 32	17 (48.6%) 29	17 (44.7%) 40
Injection site pain	4 (10.8%) 5	0 (0.0%) 0	0 (0.0%) 0	2 (5.3%) 2
Injection site pruritis	4 (10.8%) 5	3 (8.1%) 3	5 (14.3%) 4	1 (2.6%) 1
Metabolism and nutrition disorders				
Decreased appetite	11 (29.7%) 13	12 (32.4%) 12	9 (25.7%) 9	7 (18.4%) 7
Other				
Cough	1 (2.7%) 1	2 (5.4%) 2	4 (11.4%) 4	0 (0.0%) 0
Dyspnoea	1 (2.7%) 1	2 (5.4%) 2	4 (11.4%) 4	0 (0.0%) 0

- While 57% of patients in the 2.4mg group did not complete the whole study, only 16% of patients in the 1.2mg group dropped out
- **Most importantly, in ZFGN's PWS Phase II study, patients were treated at doses up to 1.8mg, and outside of mild and transient injection site reactions (also observed in the placebo group), the drug appeared to be well tolerated with no serious AEs.**
- This supports our view that the sleep latency issues incurred by beloranib could actually be therapeutic for PWS patients

Source: Company Slides

Phase III PWS Trial to Begin 2H14, While a Phase II Craniopharyngioma Study is Underway

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- **ZFGN's beloranib Phase III program will include two pivotal trials: one in the US and one in Europe.**
- **In PWS, ZFGN plans to enroll a total of 240 patients of 12 years of age or older** and BMI>30kg/m2 (the minimum BMI to be obese). Doses of 1.8mg and 2.4mg will be compared to placebo for 6 months randomized treatment and 6 months open label (or randomized treatment)
- **Initial 6-month Beloranib PWS data from ZFGN's US trial is expected in 4Q15**

- **In Craniopharyngioma, ZFGN has already commenced its Phase IIa study which will recruit 14 patients with radiographically confirmed hypothalamic damage.** Patients will receive either 1.8mg of beloranib or placebo for 4 weeks.
- **Key endpoints are body weight, body composition and hunger,** which are also what ZFGN plans to examine in Phase III
- **Craniopharyngioma results are expected in 1Q15**

Source: Clinicaltrials.gov

ZFGN Management Team Well Suited to Create Value for Shareholders

Dr. Tom Hughes, CEO	Dr. Hughes has 25 years of pharma R&D experience. He joined ZFGN in 2008 as President/CEO and member of BOD. From 1987-2008, he held several positions at Novartis AG (and formerly Sandoz Pharmaceuticals) including VP and global head of CV and metabolic diseases therapeutic area at the Novartis Institutes for BioMedical Research in Cambridge, MA. He oversaw drug discovery and development of many projects targeting obesity, diabetes, and heart disease
Dr. Dennis Kim, CMO	Dr. Kim joined ZFGN September-2011 as CMO and taken leadership role in clinical development, regulatory strategy and trial design. He brings business development experience in fields of obesity, endocrinology, diabetes and metabolism. He is a board-certified endocrinologist and has >10 years of experience in biotech and medical technology industries. Previously, he held multiple senior-level positions at OREX. Prior to this, he was CMO at EnteroMedics, Inc. and Amylin Pharmaceuticals, Inc.
Dr. Jim Vath - Head of R&D	Dr. Vath joined ZFGN in 2006 with >20 years of experience in biotechnology/pharmaceutical industries. Previously, he held senior positions at Phylogix Inc. Praecis Pharmaceuticals, Millennium Pharmaceuticals and Genetics Institute. He has authored numerous peer-reviewed journal publications and book chapters. He earned his Ph.D. in chemistry from Massachusetts Institute of Technology and a B.S. in chemistry from Northeastern University.
Patricia Allen - CFO	Patricial Allen joined ZFGN in January 2013 with >20 years of financial leadership experience in biotechnology industry at both public and private companies. Prior to this she provided independent consulting services to biotechnology companies including interim CFO services, fundraising, deal structures, financial planning, organizational structure, investor relations and business development. She also previously served as VP Finance, Treasurer and Principal Financial Officer of ALNY, where she had significant interactions with the investment community and helped raise >$900M between 2004-2011 from IPO to follow-ons and other business development transactions with top-tier pharmaceutical companies, including Novartis, Roche and Takeda Pharmaceuticals.

Source: Company Website

2015 a Catalyst Rich Year for ZFGN Shares

Product	Event	Timing
Beloranib	Initiate US Phase III PWS Trial	2H14
Beloranib	Initiate Phase IIb Severe Obesity Trial	2H14
Beloranib	Phase IIa Craniopharyngioma Data	1Q15
ZGN-839	File NASH/Type II Diabetes IND	1H15
Beloranib	6 Mo. Phase III PWS Data	4Q15

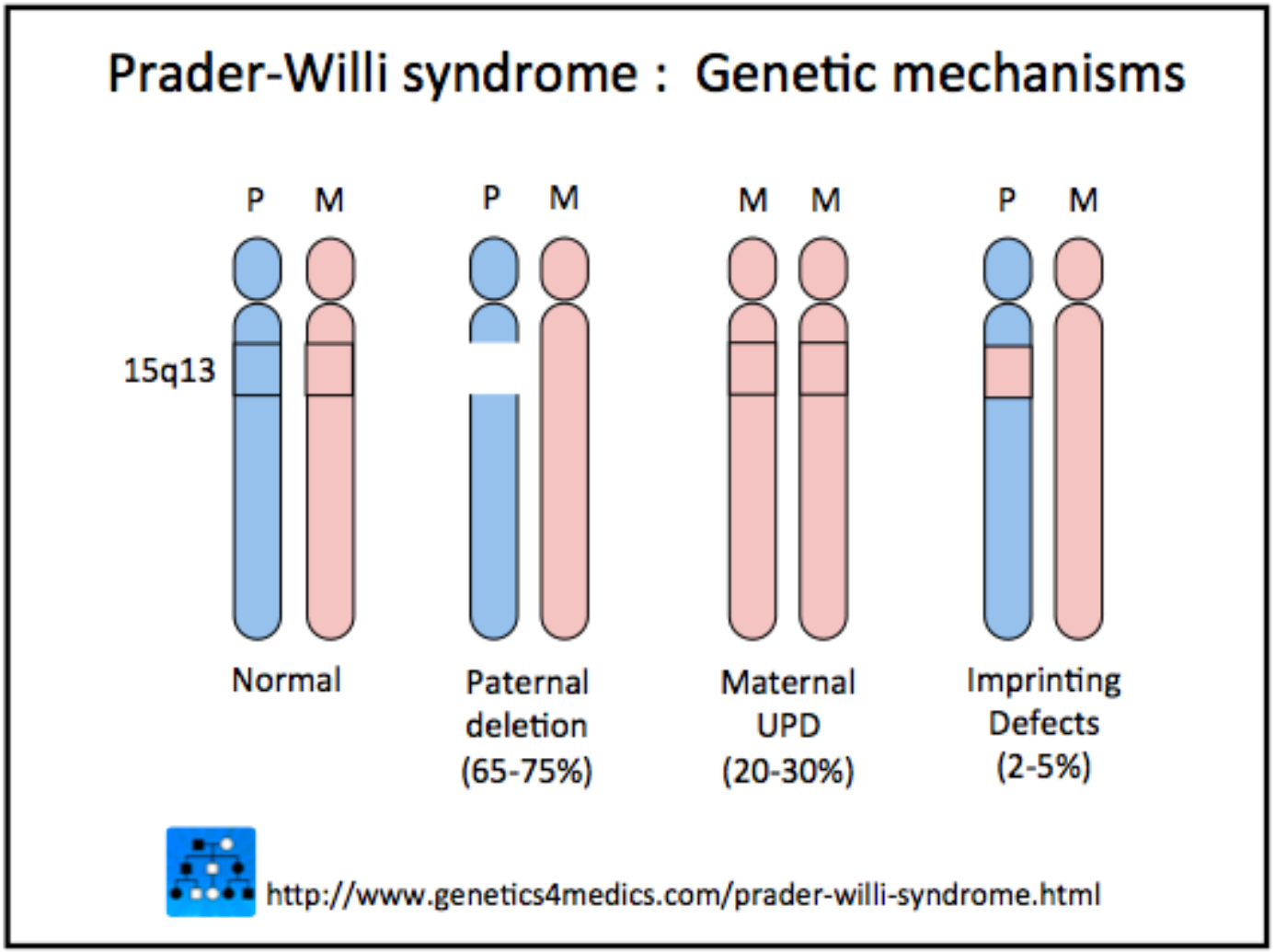
Source: Company Presentations and Leerink Partners Research

Prader-Willi Syndrome Background

- **Prader- Willi Syndrome (PWS) is an orphan indication that afflicts an estimated 7,500 patients in the US and 12,000 patients in the EU,** ~50% of which are greater than 12 years old and could be good candidates for beloranib treatment initially, while after the company completes its pediatric animal toxicology studies we believe it will be able to expand beloranib's label by completing an additional small pivotal study
- **PWS is characterized by uncontrollable hunger (hyperphagia) resulting from damage to or impaired functioning of the hypothalamus**. The physiological drive to eat in PWS is so powerful that patients will often go to great lengths to eat large quantities of food, even if it is spoiled, indigestible or unpalatable to others
- **Caregivers are often forced to place locks and alarms on refrigerators and pantries**
- Despite attempts to control the access to food, **the typical adult PWS patient is morbidly obese and has an estimated average life expectancy of 32 years of age**
- **Currently available therapies are unable to confer a meaningful benefit to PWS patients,** while existing surgical techniques such as bariatric surgery are contraindicated in PWS since PWS patients can overeat to a point whereby they can rupture their stomachs

Prader-Willi Syndrome is Caused by Simple Genetic Mechanisms

- **~70% of the time PWS is caused by a paternal deletion in chromosome 15, while in ~25% of cases it stems from maternal disomy.** Other mutations affect anywhere from 2-5% of patients
- **The simplicity of the biology underlying PWS, as well as the highly obvious manifestation of its symptoms, renders PWS an easy diagnosis for treating physicians**
- As the genetics underlying PWS are easily identified, **it is estimated that ~90% of PWS patients are diagnosed**

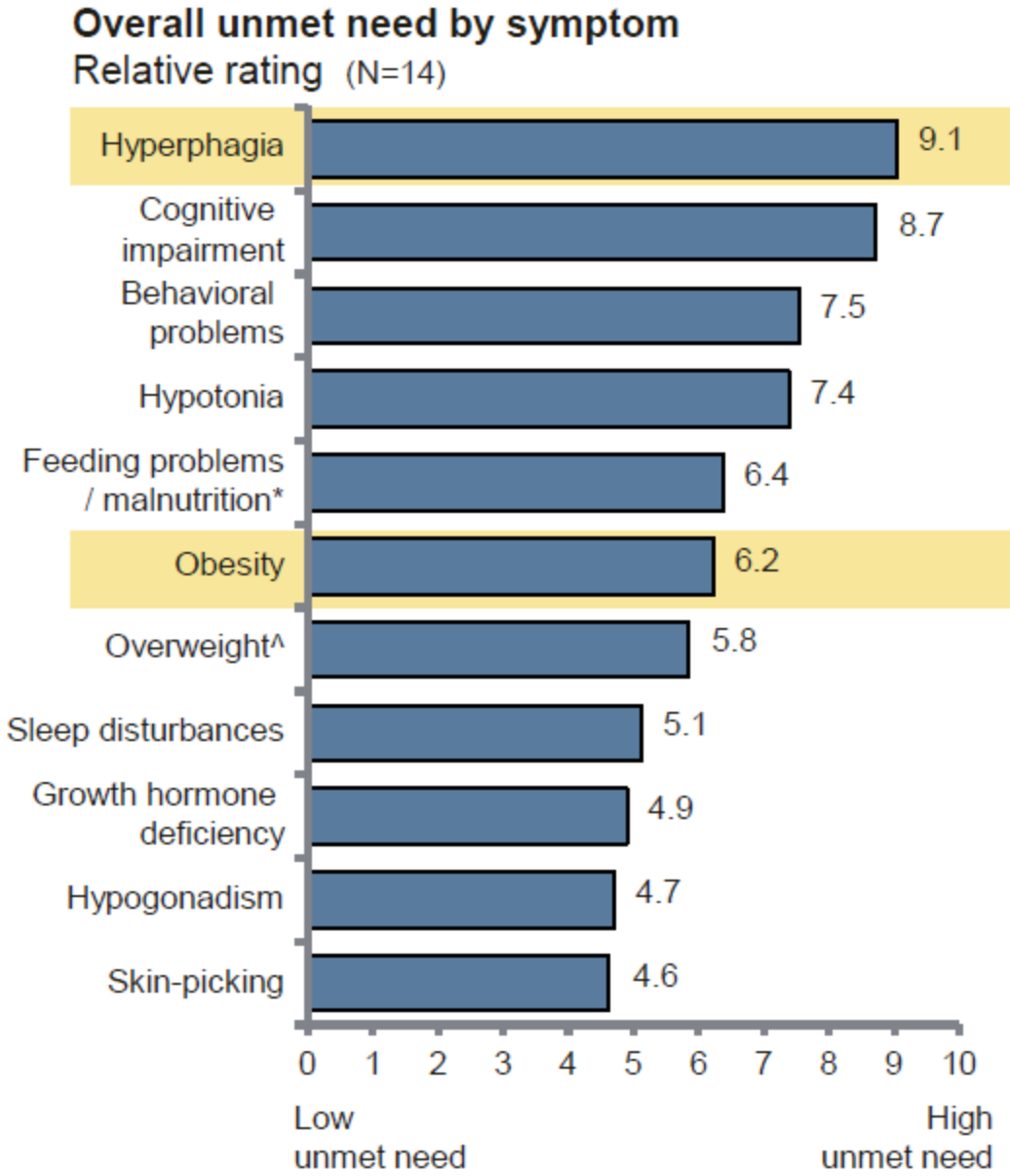


Source: Genetics for Medics

Hyperphagia, Malnutrition, and Obesity Ranked Among the Highest Unmet Needs in PWS

LEERINK

- Interestingly, while PWS complain most about their uncontrollable desire to eat, they also suffer from malnutrition since most are on a low calorie diet
  - The majority of PWS patients are on a low calorie diet due to their propensity to convert a disproportionate amount of their ingested calories into fat. As a result, it is difficult for PWS patients to eat a balanced diet that incorporates all of their health needs
  - **In the Phase IIa however, beloranib-treated PWS patients were able to lose body fat while ingesting 500 more calories per day**



Source: Company Slides

The Beloranib PWS Phase IIa Examined 3 Doses and Followed Treated Patients for 8 weeks

LEERINK

- **In addition to beloranib safety, ZFGN evaluated food consumption, weight loss, hyperphagia, and other clinically relevant parameters**

Trial Phase	Duration	Key Readouts
Placebo run-in (all patients)	2 weeks	• Pharmacokinetics • Safety and tolerability (incl. clinical chemistry) • Vital signs (incl. body weight) • Food consumption* • DEXA^ body composition • Pittsburgh Sleep Quality Index • Dykens PWS Hyperphagia Questionnaire • Hospital Anxiety and Depression Scale (HADS)
Randomized treatment (RT) Placebo 1.2 mg 1.8 mg	4 weeks	
Open label treatment (OLT) 1.8 mg+	4 weeks	

*Food allowances increased by 50% throughout the study to help ensure that treatment effects can be seen on food intake and body weight gain.

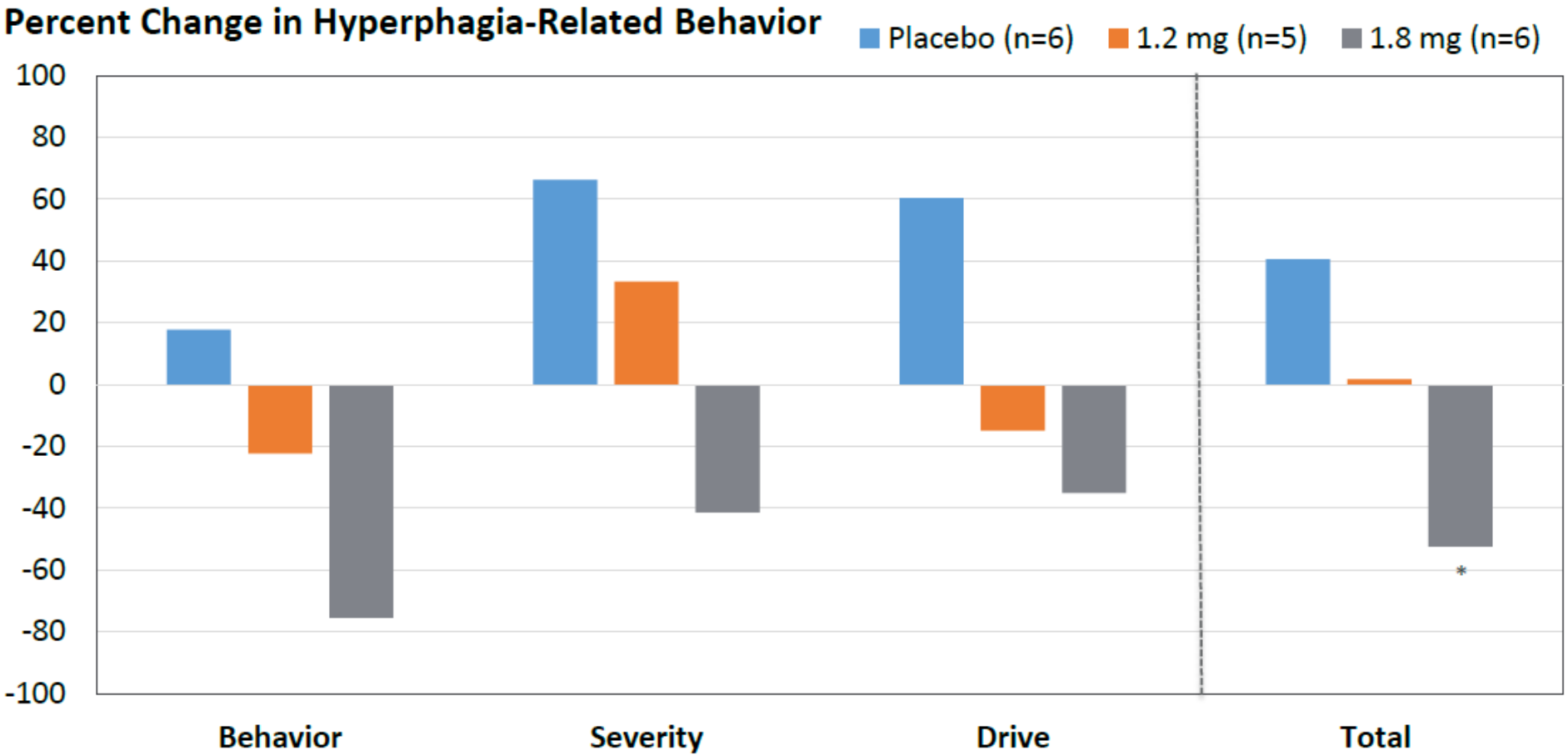
^DEXA – dual-energy X-ray absorptiometry

Source: Company Slides

Phase IIa Data Supports Beloranib's Ability to Control Hyperphagia-Related Behavior

LEERINK

- **Shown in the table below, patients treated with the highest dose of beloranib showed numerically improvements on hyperphagia behavior, severity and drive, which all together combined to demonstrate a statistically significant improvement. Such an effect has not been demonstrated by other obesity therapies.**
- While the sample size is relatively small compared to the 240 patient PWS Phase III program, we find it encouraging that the below analysis was able to achieve statistical significance in a multi-dose Phase IIa that only evaluated 17 patients

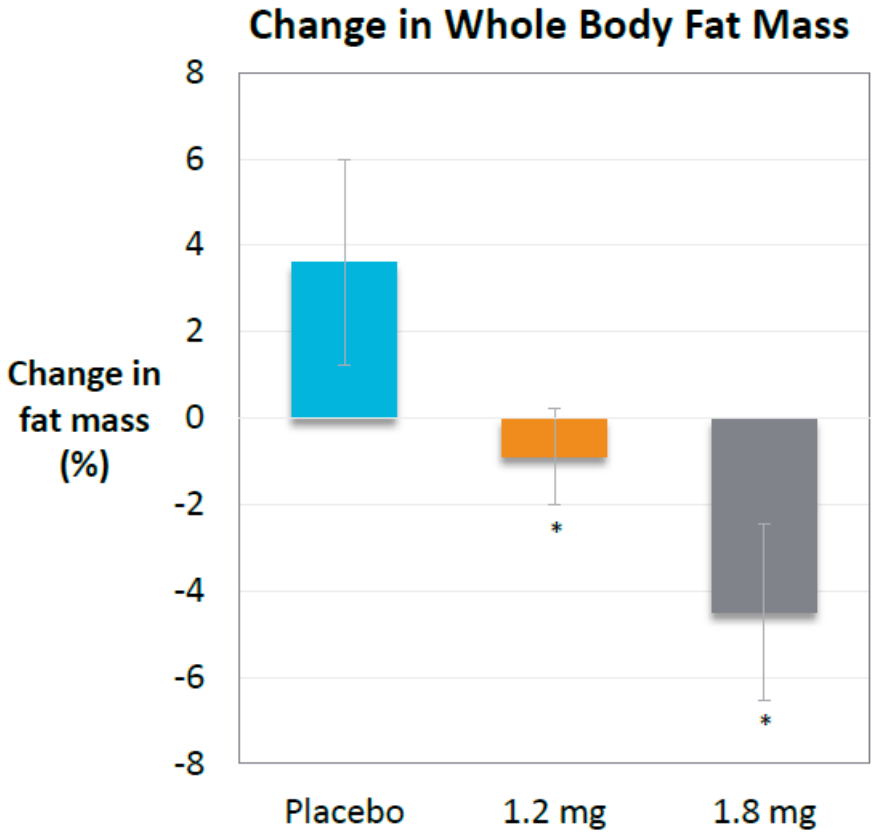


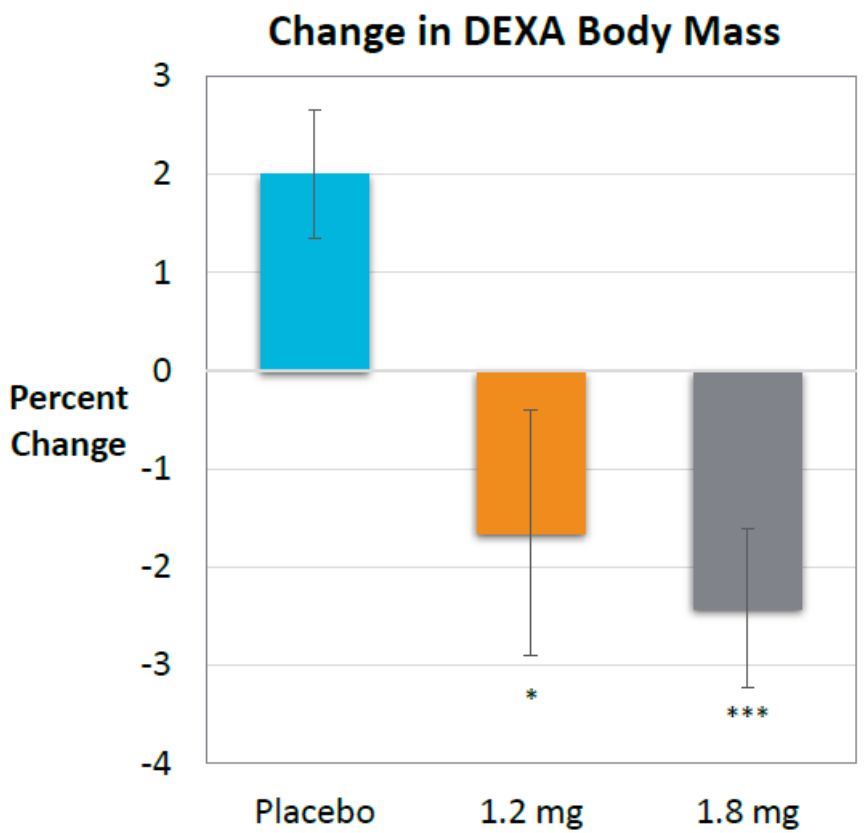
Source: Company Slides

Beloranib Also Conferred a Benefit on Fat Mass and Total Body Mass Reduction….

LEERINK

- ….despite the fact that treated patients ingested 500 more calories per day.
- Along with hyperhpagia, change in DEXA Body mass is expected to be a primary endpoint in the beloranib PWS Phase III





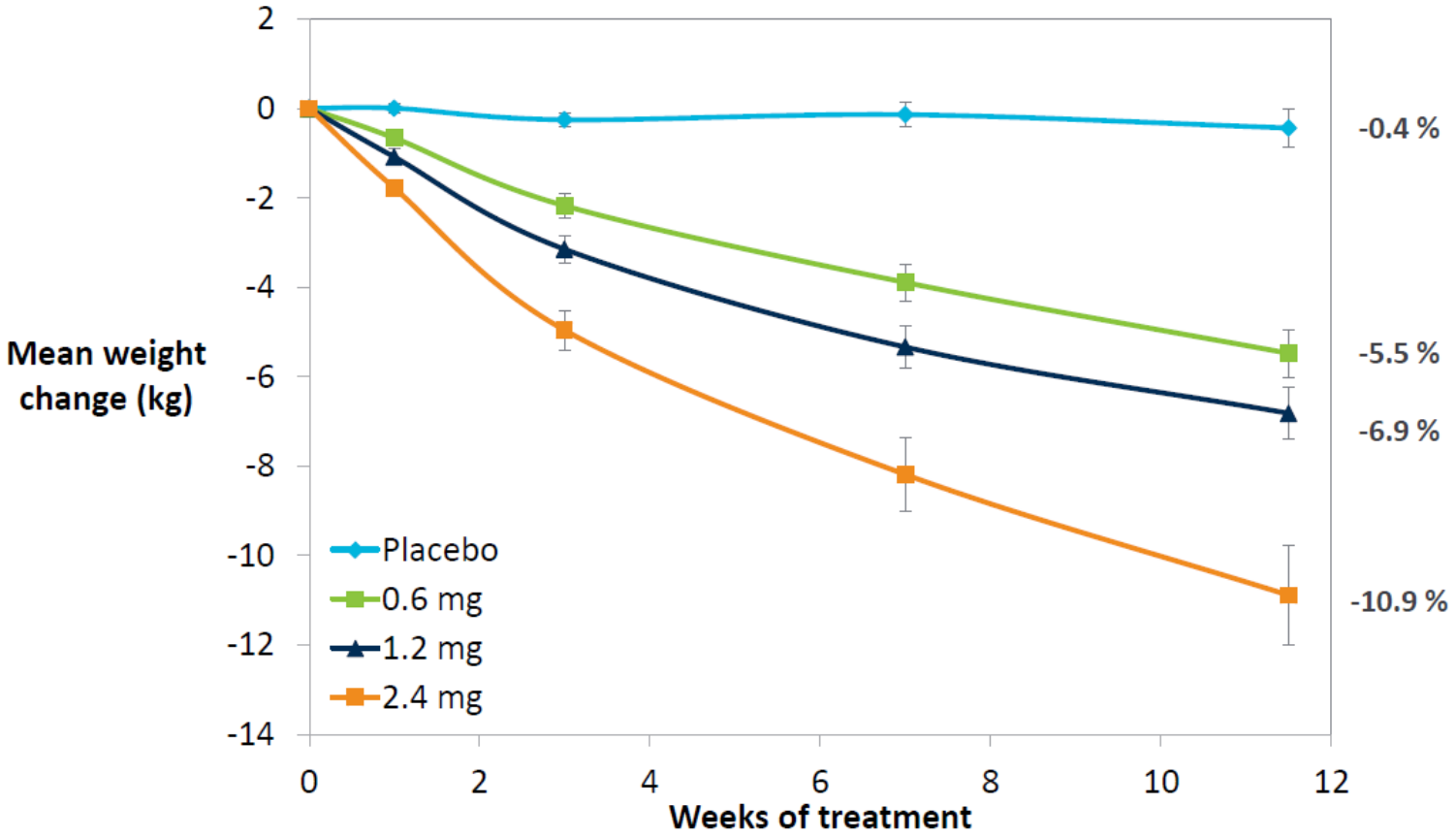
*, p<0.05; ***, p<0.005
Body composition and mass assessed by DEXA, dual-energy X-ray absorptiometry

Source: Company slides

Phase IIb data in Severe Obesity Suggests that Beloranib's Efficacy Compounds Over Time

LEERINK

- **While not in PWS patients, we find it highly encouraging that the separation between Beloranib and placebo widened over time in ZFGN's Phase IIb severe obesity study.**
  - At weeks 2, 6 and 12, the delta between 2.4 mg of Beloranib and placebo was ~2Kg, ~7Kg and 10.5Kg of weight change, respectively
- **This renders us confident that the Phase IIa benefits to PWS patients are real, and that the Phase III 6-month PWS trial has a high likelihood of success**



Source: Co. Slides

The PWS Phase III is Powered For a Smaller Effect Size Than Observed in the Successful Phase IIa Trial

LEERINK

- **ZFGN's beloranib PWS Phase III is powered at 90% with a two sided test to see a 6% change in body fat content versus placebo at 6-months, while an 8% change vs. placebo was observed at 4 weeks in the Phase IIa trial**
- **In addition, the Phase III is powered for a 20% benefit on the hyperphagia-related behaviors scale, while a 50% benefit over placebo was observed at 4 weeks in the Phase IIa trial**
- The Phase II PWS trial was performed in a controlled treatment facility where some hyperphagia-related behaviors that are measured on the scale (such as going through the trash for food) were more easily limited
  - Because patients in the Phase III will mostly be living at home (a less controlled environment), this could render it easier for beloranib to demonstrate its robust benefits on patient behavior

LEERINK

PWS Pharmacoeconomics Supportive of Premium Beloranib Pricing

- **Shown below, PWS patients are exceptionally difficult to manage and are costly to the healthcare system,** and require an average of $100K-$300k per year
- **This renders us confident that our beloranib US/EU price assumptions of $150,000 and $90,000 could be conservative**

Costs accrued by PWS patients as a result of hyperphagia and obesity

	Treatment	Description	Annual cost per patient	Source of funding
Current treatments	GH treatment* & other endocrine therapies	Cost of growth hormone treatment	~$10K-$100K	Insurance
Environmental management	Assisted living	Cost of 24/7 residential home	~$75K-$120K	State funding / Medicaid / Out-of-pocket
Potential complications of hyperphagia and obesity**	Sleep apnea	Cost of management and device for breathing	~$2-3K	Insurance
	Hip fracture	Cost of hospitalization	~$7K-$20K	Insurance
	Behavioral management	Cost of medication	>$1K-$3K	Insurance
	Stroke	Cost of hospitalization	~$10K-$20K	Insurance
	Type 2 diabetes	Cost of medication	~$2K	Insurance
	Hypertension	Cost of medication or hospitalization	~$1K-18K	Insurance
	Hypercholesterolemia	Cost of medication	>$1K	Insurance

TOTAL: $100K-$300K

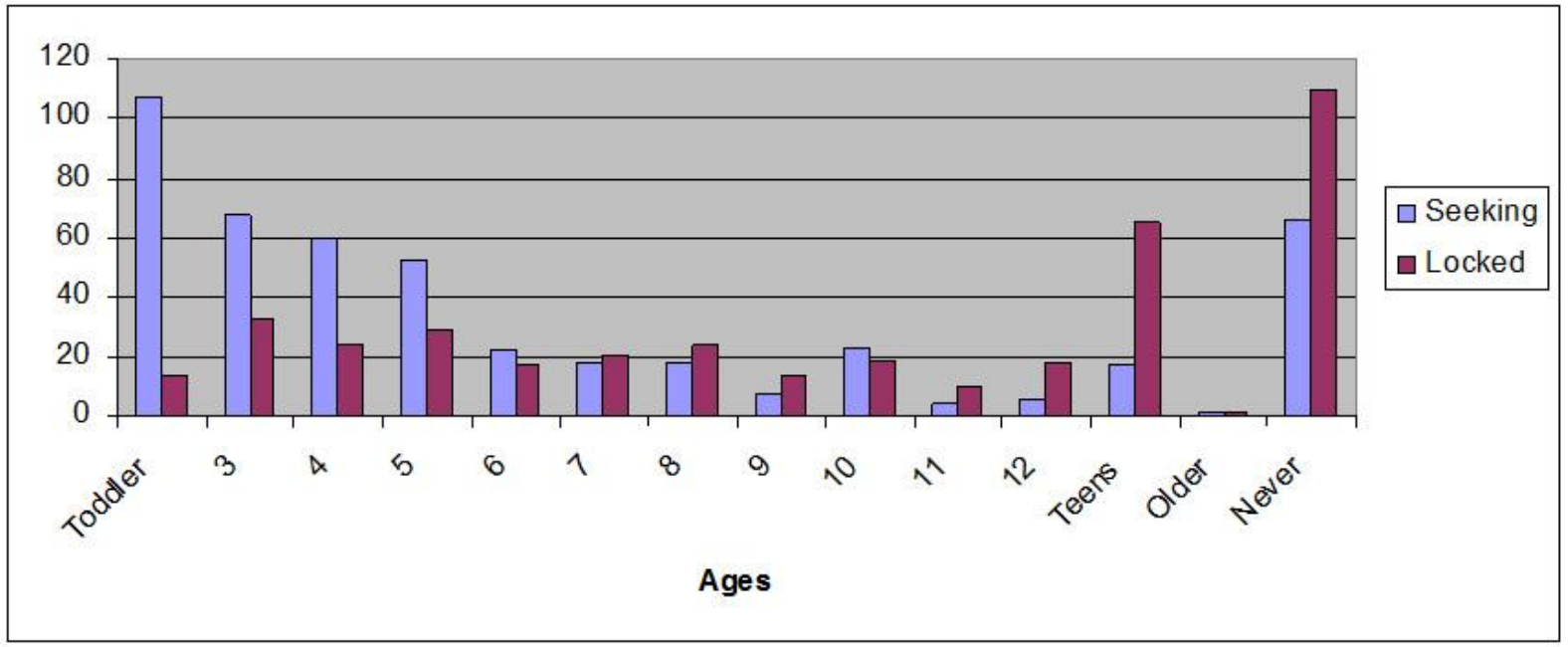
Source: Co. Presentations

The Prader-Willi Patient Community is Motivated and Highly Engaged in Supporting New Therapies

LEERINK

- In March 2013, representatives from the Prader-Willi Society of America (PWSA) visited the White House, mobilized to support the advancement of new therapies
- The PWSA offers support for families after initial diagnosis of PWS and frequently runs informational webinars online for patients and their families
- **Shown below, as of December 2010, the PWSA had identified 1,964 patients in its registry, despite the fact that no cure or disease modifying treatments are yet available.** Seeking/locked refer to the number of patients who are very frequently seeking food and the number of patients for whom food is locked-up.
- **The fact that almost 2K PWS are identified could render our US beloranib launch ramp estimates of 39, 350 and 902 patients on drug from approval in 2017 to 2019 conservative**

US PWS Patients by Age and Behavior– Identified by Prader-Willi Society



Source: Prader Willi Society of America

Beloranib Revenue Model in PWS – Key Assumptions

- **We assume a $150,000 price in the US and a $90,000 price in Europe**
- **We assume that beloranib is first approved in PWS patients above the age of 12 but that its label is expanded to include patients below the age of 12 approximately 1 year after initial approval**
- **We assume peak penetrations of 35% in the US and 20% in Europe in 2029, when ZFGN's "polymorphs composition of matter" patent expires**
  - The beloranib composition of matter expires in 2019, while orphan drug exclusivity in the US and Europe should also provide protection until 2024 and 2027, respectively
  - ZFGN also has a beloranib method of treatment in obesity patent that expires in 2031, which we assume is circumvented by a competitor

Source: Leerink Partners Research and Company Slides

Beloranib Revenue Model in PWS

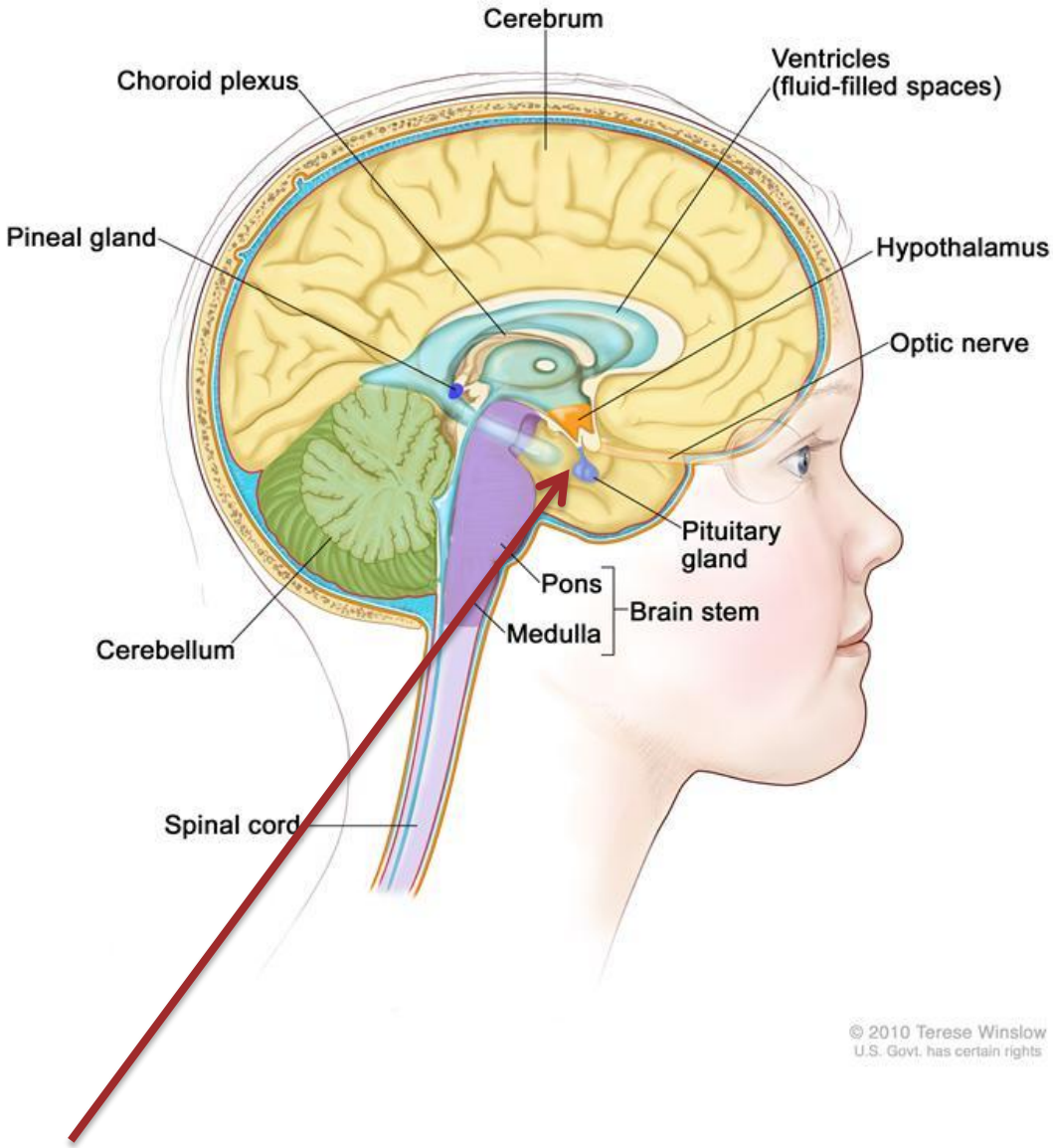
Prader Willi Syndrome Revenue Model	2014E	2015E	2016E	2017E	2018E	2019E	2020E	2021E	2022E	2023E	2024E	2025E	2026E	2027E	2028E	2029E	2030E	2031E
PWS Patients in the US	7,500	7,568	7,636	7,704	7,774	7,844	7,914	7,985	8,057	8,130	8,203	8,277	8,351	8,426	8,502	8,579	8,656	8,734
% >12 years old	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%
US PWS Patients >12 yr/old	3,750	3,784	3,818	3,852	3,887	3,922	3,957	3,993	4,029	4,065	4,102	4,138	4,176	4,213	4,251	4,289	4,328	4,367
% treated with Beloranib	0.0%	0.0%	0.0%	1.0%	8.0%	15.0%	21.0%	25.0%	28.0%	30.0%	32.0%	33.0%	34.0%	35.0%	35.0%	35.0%	17.5%	7.0%
PWS Patients on Beloranib	-	-	-	39	311	588	831	998	1,128	1,219	1,312	1,366	1,420	1,475	1,488	1,501	757	306
Annual Cost of Therapy	$150,000	$150,000	$150,000	$150,000	$150,000	$150,000	$150,000	$150,000	$150,000	$150,000	$150,000	$150,000	$150,000	$150,000	$150,000	$150,000	$150,000	$150,000
Gross Revenues ($MM)	$0.0	$0.0	$0.0	$5.8	$46.6	$88.2	$124.6	$149.7	$169.2	$182.9	$196.9	$204.9	$213.0	$221.2	$223.2	$225.2	$113.6	$45.9
%<12 years old	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%
US PWS Patients <12 yr/old	3,750	3,784	3,818	3,852	3,887	3,922	3,957	3,993	4,029	4,065	4,102	4,138	4,176	4,213	4,251	4,289	4,328	4,367
% treated with Beloranib	0.0%	0.0%	0.0%	0.0%	1.0%	8.0%	15.0%	21.0%	25.0%	28.0%	30.0%	32.0%	33.0%	34.0%	35.0%	35.0%	17.5%	7.0%
PWS Patients on Beloranib	-	-	-	-	39	314	594	838	1,007	1,138	1,230	1,324	1,378	1,433	1,488	1,501	757	306
Annual Cost of Therapy	$150,000	$150,000	$150,000	$150,000	$150,000	$150,000	$150,000	$150,000	$150,000	$150,000	$150,000	$150,000	$150,000	$150,000	$150,000	$150,000	$150,000	$150,000
Gross Revenues ($MM)	$0.0	$0.0	$0.0	$0.0	$5.8	$47.1	$89.0	$125.8	$151.1	$170.7	$184.6	$198.6	$206.7	$214.9	$223.2	$225.2	$113.6	$45.9
Approval Probability	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%
US P(w) Beloranib PWS Revenues	**$0.0**	**$0.0**	**$0.0**	**$4.0**	**$36.7**	**$94.7**	**$149.6**	**$192.8**	**$224.2**	**$247.6**	**$267.0**	**$282.4**	**$293.8**	**$305.2**	**$312.5**	**$315.3**	**$159.1**	**$64.2**
PWS Patients in the EU	12,000	12,108	12,217	12,327	12,438	12,550	12,663	12,777	12,892	13,008	13,125	13,243	13,362	13,482	13,604	13,726	13,850	13,974
% >12 years old	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%
EU PWS Patients >12 yr/old	6,000	6,054	6,108	6,163	6,219	6,275	6,331	6,388	6,446	6,504	6,562	6,621	6,681	6,741	6,802	6,863	6,925	6,987
% treated with Beloranib	0.0%	0.0%	0.0%	0.0%	2.5%	4.0%	6.0%	8.0%	11.0%	13.0%	15.0%	16.0%	17.0%	18.0%	19.0%	20.0%	10.0%	4.0%
PWS Patients on Beloranib	-	-	-	-	155	251	380	511	709	846	984	1,059	1,136	1,213	1,292	1,373	692	279
Annual Cost of Therapy	$90,000	$90,000	$90,000	$90,000	$90,000	$90,000	$90,000	$90,000	$90,000	$90,000	$90,000	$90,000	$90,000	$90,000	$90,000	$90,000	$90,000	$90,000
Gross Revenues	$0.0	$0.0	$0.0	$0.0	$14.0	$22.6	$34.2	$46.0	$63.8	$76.1	$88.6	$95.3	$102.2	$109.2	$116.3	$123.5	$62.3	$25.2
%<12 years old	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%
US PWS Patients <12 yr/old	6,000	6,054	6,108	6,163	6,219	6,275	6,331	6,388	6,446	6,504	6,562	6,621	6,681	6,741	6,802	6,863	6,925	6,987
% treated with Beloranib	0.0%	0.0%	0.0%	0.0%	0.0%	2.5%	4.0%	6.0%	8.0%	11.0%	13.0%	15.0%	17.0%	18.0%	19.0%	20.0%	10.0%	4.0%
PWS Patients on Beloranib	-	-	-	-	-	157	253	383	516	715	853	993	1,136	1,213	1,292	1,373	692	279
Annual Cost of Therapy	$90,000	$90,000	$90,000	$90,000	$90,000	$90,000	$90,000	$90,000	$90,000	$90,000	$90,000	$90,000	$90,000	$90,000	$90,000	$90,000	$90,000	$90,000
Gross Revenues ($MM)	$0.0	$0.0	$0.0	$0.0	$0.0	$14.1	$22.8	$34.5	$46.4	$64.4	$76.8	$89.4	$102.2	$109.2	$116.3	$123.5	$62.3	$25.2
Approval Probability	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%
EU P(w) Beloranib PWS Revenues	**$0.0**	**$0.0**	**$0.0**	**$0.0**	**$9.8**	**$25.7**	**$39.9**	**$56.3**	**$77.2**	**$98.3**	**$115.8**	**$129.3**	**$143.1**	**$152.9**	**$162.8**	**$172.9**	**$87.3**	**$35.2**
WW Beloranib Gross Sales	$0.0	$0.0	$0.0	$5.8	$66.5	$172.0	$270.7	$356.0	$430.5	$494.1	$546.8	$588.2	$624.1	$654.5	$679.0	$697.5	$351.9	$142.0
WW Beloranib P(w) Sales	**$0.0**	**$0.0**	**$0.0**	**$4.0**	**$46.5**	**$120.4**	**$189.5**	**$249.2**	**$301.4**	**$345.9**	**$382.8**	**$411.8**	**$436.9**	**$458.1**	**$475.3**	**$488.2**	**$246.3**	**$99.4**

Assumptions	
Beloranib US Cost	$150,000
Beloranib EU Cost	$90,000
Probability of Approval	70%

Source: Company Presentations and Leerink Partners Research

Craniopharyngioma Background

- **A craniopharyngioma is a benign tumor that develops near the pituitary gland (a small endocrine gland at the base of the brain**
- **Cranopharyngioma tumors most commonly manifest in children between 5-10 years old, though onset can sometimes occur during adulthood**
- **Shown below, as the pituitary gland is right below the hypothalamus, surgery to remove a craniopharyngioma can incur hypothalmic damage, which subsequently can dysregulate various bodily cycles including hunger, sleep/wake or temperature**



Pituitary gland borders hypothalamus

Source: Genetics for Medics

Based on its CNS-Independent MoA, Beloranib Well Suited to Confer a Benefit to Craniopharyngioma Patients, We Believe

LEERINK

- Craniopharyngoima patients have disrupted hypothalamic function, and therefore the degree to which their hunger drive could be affected by a CNS-mediated treatment (especially in a uniform fashion between patients) is unclear
- Beloranib acts on the liver and adipose tissue to rebalance lipid metabolism, body composition and reduce hunger.
- **Inhibition of MetAP2 is a requirement for fatty acid metabolism, and Beloranib acts through the MetAP2 inhibition pathway to suppress the buildup of new fatty acids by the liver.**
  - This is believed to help convert stored fatty acids into useful energy, by re-establishing balance to the way the body packages and metabolizes fat and glucose
  - MetAP2 inhibitors reduce the production of new fatty acid molecules by the liver and help convert stored fats into useful energy while reducing hunger
  - **MEDACorp KOLs expect beloranib's mechanism-of-action to translate nicely into craniopharyngioma patients**

Source: SEC Filings

Craniopharyngioma Phase IIa Underway, With Data Expected in 1Q15

LEERINK

- ZFGN's Craniopharyngioma Phase IIa study has begun and is expected to recruit 14 patients with radiographically-confirmed hypothalamic damage

- Patients with receive 1.8mg of beloranib or placebo for 4 weeks in a double-blind fashion

- Key efficacy endpoints include change in body weight, change in body compositon and hunger, all of which have been shown to respond to beloranib-therapy in previous studies. The craniopharyngioma Phase III is expected to focus on the same parameters.

- The trial will be conducted at 4 centers in the US and Australia, with data expected in 1Q15

We Model ~$220MM in Risk-Adjusted Beloranib Craniopharyngioma Revenues, Based on a 50% Probability of Approval

LEERINK

- **Like in PWS, we assume a $150,000 US cost and a $90,000 EU annual cost of therapy,** which we believe could be conservative
- **We project peak US/EU penetration of 40% and 30% in the 50% of craniopharyngioma patients with hypothalamic dysfunction in 2029**

Craniopharyngioma Revenue Model	2014E	2015E	2016E	2017E	2018E	2019E	2020E	2021E	2022E	2023E	2024E	2025E	2026E	2027E	2028E	2029E	2030E	2031E
Craniopharyngioma Patients in the US	6,260	6,316	6,373	6,431	6,488	6,547	6,606	6,665	6,725	6,786	6,847	6,908	6,971	7,033	7,097	7,160	7,225	7,290
% with post-treatment hypothalamic dysfunction	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%
beloranib craniopharyngioma candidates	3,130	3,158	3,187	3,215	3,244	3,273	3,303	3,333	3,363	3,393	3,423	3,454	3,485	3,517	3,548	3,580	3,612	3,645
% treated with Beloranib	0.0%	0.0%	0.0%	0.0%	2.0%	6.0%	13.0%	18.0%	24.0%	29.0%	32.0%	34.0%	36.0%	38.0%	40.0%	40.0%	20.0%	10.0%
Patients on Beloranib	-	-	-	-	65	196	429	600	807	984	1,095	1,174	1,255	1,336	1,419	1,432	722	364
Annual Cost of Therapy	$150,000	$150,000	$150,000	$150,000	$150,000	$150,000	$150,000	$150,000	$150,000	$150,000	$150,000	$150,000	$150,000	$150,000	$150,000	$150,000	$150,000	$150,000
Gross Revenues ($MM)	$0.0	$0.0	$0.0	$0.0	$9.7	$29.5	$64.4	$90.0	$121.1	$147.6	$164.3	$176.2	$188.2	$200.4	$212.9	$214.8	$108.4	$54.7
Approval Probability	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%
US P(w) Beloranib Cranio Revenues	**$0.0**	**$0.0**	**$0.0**	**$0.0**	**$4.9**	**$14.7**	**$32.2**	**$45.0**	**$60.5**	**$73.8**	**$82.2**	**$88.1**	**$94.1**	**$100.2**	**$106.4**	**$107.4**	**$54.2**	**$27.3**
Craniopharyngioma Patients in the EU	14,850	14,984	15,119	15,255	15,392	15,530	15,670	15,811	15,953	16,097	16,242	16,388	16,536	16,684	16,835	16,986	17,139	17,293
% with post-treatment hypothalamic dysfunction	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%
beloranib craniopharyngioma candidates	7,425	7,492	7,559	7,627	7,696	7,765	7,835	7,906	7,977	8,049	8,121	8,194	8,268	8,342	8,417	8,493	8,569	8,647
% treated with Beloranib	0.0%	0.0%	0.0%	0.0%	1.0%	4.0%	8.0%	12.0%	16.0%	20.0%	22.0%	24.0%	26.0%	28.0%	30.0%	30.0%	15.0%	7.5%
Patients on Beloranib	-	-	-	-	77	311	627	949	1,276	1,610	1,787	1,967	2,150	2,336	2,525	2,548	1,285	648
Annual Cost of Therapy	90,000	90,000	90,000	90,000	90,000	90,000	90,000	90,000	90,000	90,000	90,000	90,000	90,000	90,000	90,000	90,000	90,000	90,000
Gross Revenues ($MM)	$0.0	$0.0	$0.0	$0.0	$6.9	$28.0	$56.4	$85.4	$114.9	$144.9	$160.8	$177.0	$193.5	$210.2	$227.3	$229.3	$115.7	$58.4
Approval Probability	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%
EU P(w) Beloranib Cranio Revenues	**$0.0**	**$0.0**	**$0.0**	**$0.0**	**$3.5**	**$14.0**	**$28.2**	**$42.7**	**$57.4**	**$72.4**	**$80.4**	**$88.5**	**$96.7**	**$105.1**	**$113.6**	**$114.7**	**$57.8**	**$29.2**
WW Gross Beloranib Craniopharyngioma Revenues	$0.0	$0.0	$0.0	$0.0	$16.7	$57.4	$120.8	$175.4	$235.9	$292.5	$325.1	$353.2	$381.7	$410.7	$440.2	$444.1	$224.1	$113.0
WW P(w) Beloranib Craniopharyngioma Revenues	**$0.0**	**$0.0**	**$0.0**	**$0.0**	**$8.3**	**$28.7**	**$60.4**	**$87.7**	**$118.0**	**$146.2**	**$162.6**	**$176.6**	**$190.8**	**$205.3**	**$220.1**	**$222.1**	**$112.0**	**$56.5**

Assumptions	
Beloranib US Cost	$150,000
Beloranib EU Cost	$90,000
Probability of Approval	50%

Source: Company Presentations and Leerink Partners Research

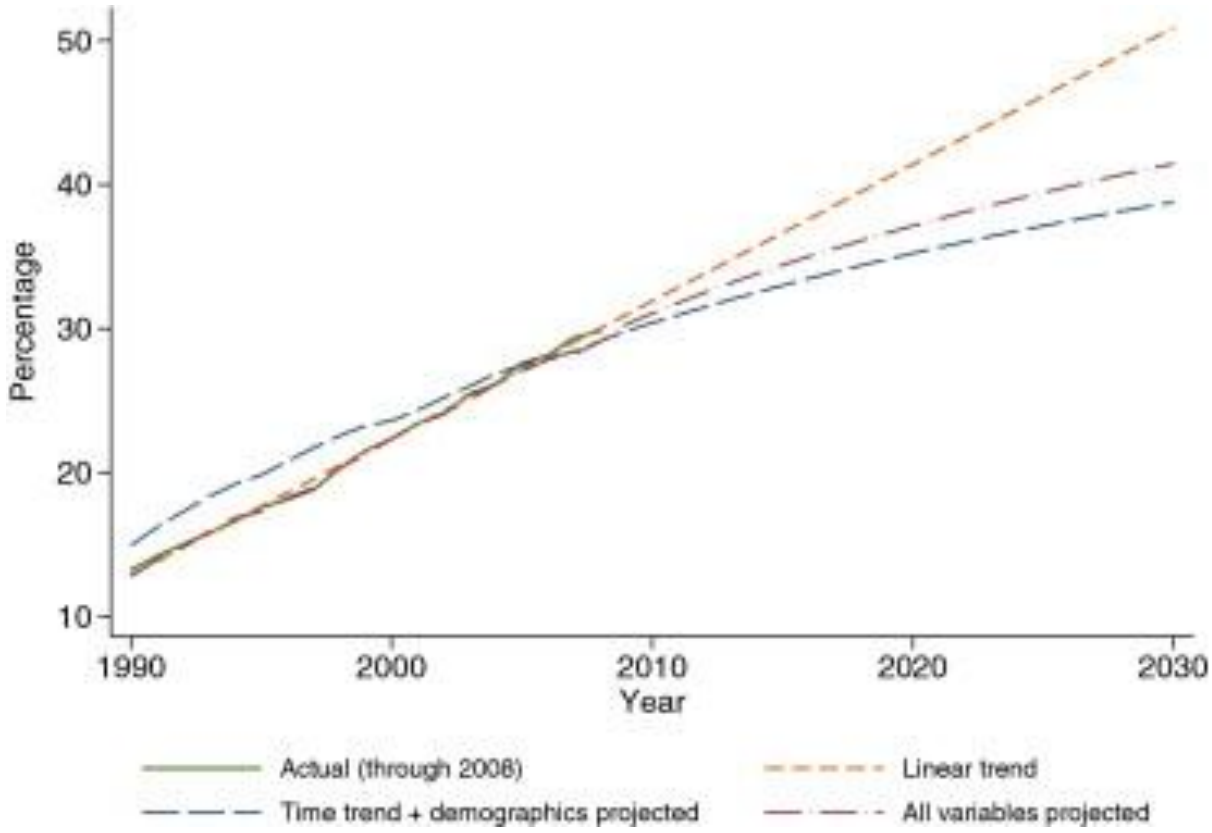
Source: Leerink Partners Research, NIH.gov

Severe Obesity Could Unlock a Much Larger Market Opportunity for Beloranib

LEERINK

- **With ~16MM patients in the US currently, severe obesity holds the potential to present a commercial opportunity that is orders of magnitude larger than PWS and CAO**
- **However, while ZFGN is running an additional severe obesity study in 2H14, we believe that the company will only pursue this indication commercially if it is able to secure a large resource-rich partner.** It's possible that ZFGN will advance a second-generation, improved MetAP2-inhibitor into pivotal severe obesity studies
- Thus, in the meantime, we model ~$140MM in peak severe obesity sales, which could be conservative

Journal of Preventative Medicine - Prevalence and Predicted Prevalence of Americans with a BMI Over 30: ~50% of Americans Expected to be Obese by 2030



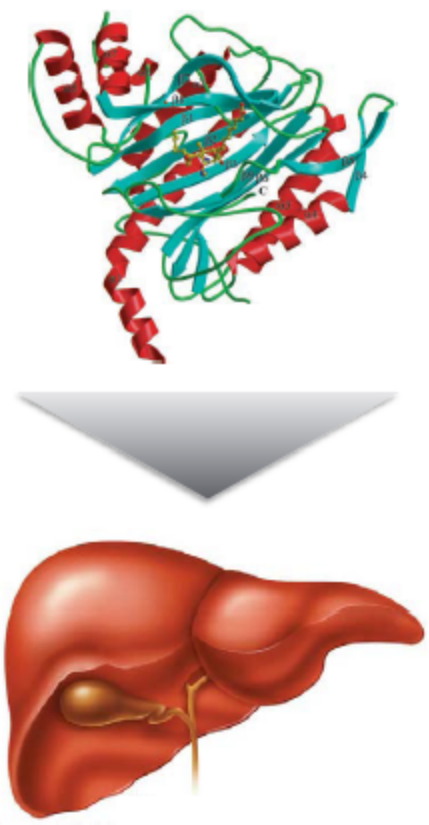
The article also predicted that the severe obese population is estimated to grow to 10% of the US adult population by 2030

Source: American Journal of Preventative Medicine

ZGN-839 Oral NASH Product

- **ZFGN plans to file an IND for its oral NASH/Type 2 Diabetes product in 1H15**
- **Both Type-2 Diabetes and NASH could present blockbuster opportunities that are upside to our current valuation**

ZGN-839 Program Background



- **Novel chemical class - potent MetAP2 inhibition**
- **ZGN-839 treatment in mice**
  - Target and biomarker activity
  - Effective in NASH model
  - Gene expression profile and animal model efficacy favorable for NASH, fibrosis, and type 2 diabetes
  - ~9% weight loss vs. vehicle after 16 days of treatment
  - Lowers glucose and cholesterol
  - Promising early safety profile
- **ZGN-839 in preparation for IND submission – no significant flags at present**
- **ZGN-839 claimed in multiple pending patent applications**

Source: Company Slides

ZFGN Intellectual Property

- ZFGN owns two issued U.S. patents relating to Beloranib polymorph compositions of matter that will expire in 2031, as well as two issued U.S. patents to methods of treating obesity that will expire in 2029.
- Zafgen has pending patent applications in Europe on Beloranib polymorph composition of matter and methods of treating obesity that we expect to expire, once issued, in 2031.
- As of June 5, 2014, ZFGN owns four issued U.S. patents, seven pending U.S. patent applications and foreign counterpart applications, and one Patent Cooperation Treaty application that will allow ZFGN to seek corresponding protection worldwide, all of which relate to Beloranib.
- In addition, ZFGN owns seven pending U.S. patent applications with pending foreign counterpart applications and five PCT patent applications, all of which relate to ZFNG's MetAP2 inhibitor program.

Drug	Patent	Expiration
Beloranib	**General composition of matter**	**2019**
Beloranib	**Polymorph compositions of matter**	**2031 (issued US, pending EU)**
Beloranib	**Method of treating Obesity**	**2029**

Source: SEC Filings

Financial Model Assumptions

- We project R&D expenses of $20MM, $35MM and $42MM for 2014-2016 as ZFGN advances beloranib through pivotal trials for PWS, craniopharyngioma and into a Phase IIb for severe obesity

- For 2014, 2015 and 2016, we model SG&A of $6MM, $9MM and $14MM, and expect this to increase to $27MM and $38MM once ZFGN launches beloranib after approval in 2H17

- After its IPO in 2Q14, we estimate that the company will have ~$122MM in cash at YE14, which we project to be sufficient to fund operations into 2016

- We model the first beloranib revenues in 2017, and project profitability in 2019 when the company earns ~$1/share in EPS

Source: Leerink Partners Research

Valuation and Risks to Valuation

- **We derive a $35 Price Target for ZFGN shares based on a 12% discount rate and a 2% terminal growth rate.** Our base case assumption assumes $850MM in peak-risk adjusted 2029 sales based on a 70%/50% probabilities of beloranib approval in PWS and Craniopharyngioma-Associated Obesity.

- **Risks to our valuation include disappointing clinical data, regulatory setbacks, and commercial shortfalls.** Because ZFGN has only one late stage product, the occurrence of any of these could impact the stock significantly.

Source: Leerink Partners Research

Acknowledgements

- **Acknowledgement:**
- Felix Danso Ampomah, Leerink Partners Equity Research intern, contributed to this report. His contribution is greatly appreciated.

ZFGN P&L ($MM) GAAP	2013	1Q14	2Q14E	3Q14E	4Q14E	2014E	1Q15E	2Q15E	3Q15E	4Q15E	2015E	2016E	2017E	2018E	2019E
Beloranib PWS	-	-	-	-	-	-	-	-	-	-	-	-	4.0	46.5	120.4
Beloranib Craniopharyngioma	-	-	-	-	-	-	-	-	-	-	-	-	-	8.3	28.7
Beloranib Severe Obesity	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Revenue (p/w)	-	-	-	-	-	-	-	-	-	-	-	-	**4.0**	**54.9**	**149.1**
COGS	-	-	-	-	-	-	-	-	-	-	-	-	0.4	5.5	14.9
R&D	9.6	3.3	3.7	6.0	7.0	20.0	8.0	8.5	9.0	9.5	35.0	42.0	50.4	55.4	52.2
SG&A	4.2	1.2	1.4	1.4	1.8	5.8	2.0	2.2	2.4	2.5	9.1	13.7	27.3	38.4	52.2
Operating Expenses	13.8	4.5	5.1	7.4	8.8	25.8	10.0	10.7	11.4	12.0	44.1	55.7	78.1	99.3	119.3
Operating Income	(13.8)	(4.5)	(5.1)	(7.4)	(8.8)	(25.8)	(10.0)	(10.7)	(11.4)	(12.0)	(44.1)	(55.7)	(74.1)	(44.5)	29.8
Interest Income (Expense)	-	(0.0)	(0.1)	(0.2)	(0.2)	(0.6)	(0.2)	(0.2)	(0.2)	(0.2)	(0.8)	(0.4)	(0.3)	-	-
FX Gains/Losses	(0.2)	0.1	-	-	-	0.1	-	-	-	-	-	-	-	-	-
Total Other Income (expense)	(0.2)	0.1	(0.1)	(0.2)	(0.2)	(0.6)	-	-	-	-	-	(0.4)	(0.3)	-	-
EBT	(14.0)	(4.5)	(5.2)	(7.6)	(9.0)	(26.4)	(10.0)	(10.7)	(11.4)	(12.0)	(44.1)	(56.0)	(74.4)	(44.5)	29.8
Tax	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Net Income (Loss)	**(14.2)**	**(4.5)**	**(5.2)**	**(7.6)**	**(9.0)**	**(26.4)**	**(10.0)**	**(10.7)**	**(11.4)**	**(12.0)**	**(44.1)**	**(56.0)**	**(74.4)**	**(44.5)**	**29.8**
Diluted EPS	**$ (19.53)**	**$ (0.28)**	**$ (0.31)**	**$ (0.34)**	**$ (0.40)**	**$ (1.35)**	**$ (0.44)**	**$ (0.47)**	**$ (0.49)**	**$ (0.52)**	**$ (1.92)**	**$ (2.15)**	**$ (2.75)**	**$ (1.59)**	**$ 1.03**
Basic Shares Outstanding	0.7	15.8	16.8	22.7	22.8	19.5	22.9	23.0	23.1	23.2	23.1	26.1	27.1	28.1	29.1
Diluted Shares Oustanding	0.7	15.8	16.8	22.7	22.8	19.5	22.9	23.0	23.1	23.2	23.1	26.1	27.1	28.1	29.1

Source: SEC Filings and Leerink Partners Research

ZFGN BS & CFS ($MM) GAAP	2013	1Q14	2Q14E	3Q14E	4Q14E	2014E	1Q15E	2Q15E	3Q15E	4Q15E	2015E	2016E	2017E	2018E	2019E
Net Cash	**35.5**	**31.1**	**126.4**	**118.7**	**109.8**	**109.8**	**99.7**	**89.6**	**78.7**	**67.0**	**67.0**	**114.5**	**43.8**	**11.4**	**51.7**
Cash & Equivalents	35.5	38.5	133.7	131.0	122.2	122.2	111.7	100.6	88.7	76.0	76.0	119.2	47.5	11.4	51.7
Debt	-	7.4	7.4	12.4	12.4	12.4	12.0	11.0	9.9	8.9	8.9	4.7	3.7	-	
Change in Cash	**25.6**	**3.0**	**95.3**	**(2.7)**	**(8.9)**	**86.7**	**(10.4)**	**(11.1)**	**(12.0)**	**(12.7)**	**(46.2)**	**43.3**	**(71.7)**	**(36.1)**	**40.3**
Operating Cash Flow	**(15.0)**	**(4.0)**	**(4.9)**	**(7.2)**	**(8.5)**	**(24.7)**	**(9.4)**	**(10.1)**	**(9.9)**	**(9.7)**	**(39.1)**	**(47.6)**	**(61.0)**	**(26.1)**	**50.3**
Net Income (Loss)	(14.0)	(4.5)	(5.2)	(7.6)	(9.0)	(26.4)	(10.0)	(10.7)	(11.4)	(12.0)	(44.1)	(56.0)	(74.4)	(44.5)	29.8
SOE	0.4	0.2	0.3	0.4	0.5	1.5	0.6	0.6	0.7	0.7	2.6	4.5	7.8	9.4	10.4
D&A	0.0	0.0	-	-	-	0.0	-	-	0.8	1.6	2.4	4.0	5.6	9.0	10.0
Other	(1.4)	0.3	-	-	-	0.3	-	-	-	-	-	-	-	-	-
Investing Cash Flow	**(0.0)**	**(0.0)**	**-**	**-**	**-**	**(0.0)**	**-**	**-**	**(1.0)**	**(2.0)**	**(3.0)**	**(5.0)**	**(7.0)**	**(10.0)**	**(10.0)**
CapEx	(0.0)	(0.0)	-	-	-	(0.0)	-	-	(1.0)	(2.0)	(3.0)	(5.0)	(7.0)	(10.0)	(10.0)
Other	-	-	-	-	-	-	-	-	-	-	-	-			
Financing Cash flow	**40.6**	**7.0**	**100.2**	**4.5**	**(0.3)**	**111.3**	**(1.0)**	**(1.0)**	**(1.0)**	**(1.0)**	**(4.2)**	**95.8**	**(3.7)**	**-**	**-**
Equity Issuance (Buyback)	40.8	0.4	100.2	-	-	100.6	-	-	-	-	-	100.0	-	-	-
Debt Issuance (Retirement)	-	7.4	-	4.5	(0.3)	11.5	(1.0)	(1.0)	(1.0)	(1.0)	(4.2)	(4.2)	(3.7)	-	-
Other	(0.2)	(0.8)	-	-	-	(0.8)	-	-	-	-	-	-	-	-	-

Source: SEC Filings and Leerink Partners Research

ZFGN DCF Analysis	2014E	2015E	2016E	2017E	2018E	2019E	2020E	2021E	2022E	2023E	2024E	2025E	2026E	2027E	2028E	2029E	2030E	2031E	TV
Cash Flow From Operations ($MM)	(25)	(39)	(48)	(61)	(26)	50	96	162	200	242	267	287	306	322	338	345	179	83	
Cash Flow From Investing ($MM)	(0)	(3)	(5)	(7)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	
Net Borrowing (Repayment) ($MM)	4	(4)	(4)	(4)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Free Cash Flow ($MM)	(21)	(46)	(57)	(72)	(36)	40	86	152	190	232	257	277	296	312	328	335	169	73	749
Discount Periods	-	0.75	1.75	2.75	3.75	4.75	5.75	6.75	7.75	8.75	9.75	10.75	11.75	12.75	13.75	14.75	15.75	16.75	
NPV FCF ($MM)	(15)	(42)	(47)	(52)	(24)	24	45	71	79	86	85	82	78	74	69	63	28	11	112

Sum NPV FCF ($MM)	726
Net Cash 2Q14E	126
Implied ZFGN Mkt Cap ($MM)	**$ 853**
ZFGN Per Share Value	**$ 35.21**

Cost of Equity	12%
TG Rate	2%
Diluted Shares Oustanding	24.2

Source: Leerink Partners Research

Prader Willi Syndrome Revenue Model	2014E	2015E	2016E	2017E	2018E	2019E	2020E	2021E	2022E	2023E	2024E	2025E	2026E	2027E	2028E	2029E	2030E	2031E
PWS Patients in the US	7,500	7,568	7,636	7,704	7,774	7,844	7,914	7,985	8,057	8,130	8,203	8,277	8,351	8,426	8,502	8,579	8,656	8,734
% >12 years old	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%
US PWS Patients >12 yr/old	3,750	3,784	3,818	3,852	3,887	3,922	3,957	3,993	4,029	4,065	4,102	4,138	4,176	4,213	4,251	4,289	4,328	4,367
% treated with Beloranib	0.0%	0.0%	0.0%	1.0%	8.0%	15.0%	21.0%	25.0%	28.0%	30.0%	32.0%	33.0%	34.0%	35.0%	35.0%	35.0%	17.5%	7.0%
PWS Patients on Beloranib	-	-	-	39	311	588	831	998	1,128	1,219	1,312	1,366	1,420	1,475	1,488	1,501	757	306
Annual Cost of Therapy	$150,000	$150,000	$150,000	$150,000	$150,000	$150,000	$150,000	$150,000	$150,000	$150,000	$150,000	$150,000	$150,000	$150,000	$150,000	$150,000	$150,000	$150,000
Gross Revenues ($MM)	$0.0	$0.0	$0.0	$5.8	$46.6	$88.2	$124.6	$149.7	$169.2	$182.9	$196.9	$204.9	$213.0	$221.2	$223.2	$225.2	$113.6	$45.9
%<12 years old	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%
US PWS Patients <12 yr/old	3,750	3,784	3,818	3,852	3,887	3,922	3,957	3,993	4,029	4,065	4,102	4,138	4,176	4,213	4,251	4,289	4,328	4,367
% treated with Beloranib	0.0%	0.0%	0.0%	0.0%	1.0%	8.0%	15.0%	21.0%	25.0%	28.0%	30.0%	32.0%	33.0%	34.0%	35.0%	35.0%	17.5%	7.0%
PWS Patients on Beloranib	-	-	-	-	39	314	594	838	1,007	1,138	1,230	1,324	1,378	1,433	1,488	1,501	757	306
Annual Cost of Therapy	$150,000	$150,000	$150,000	$150,000	$150,000	$150,000	$150,000	$150,000	$150,000	$150,000	$150,000	$150,000	$150,000	$150,000	$150,000	$150,000	$150,000	$150,000
Gross Revenues ($MM)	$0.0	$0.0	$0.0	$0.0	$5.8	$47.1	$89.0	$125.8	$151.1	$170.7	$184.6	$198.6	$206.7	$214.9	$223.2	$225.2	$113.6	$45.9
Approval Probability	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%
US P(w) Beloranib PWS Revenues	**$0.0**	**$0.0**	**$0.0**	**$4.0**	**$36.7**	**$94.7**	**$149.6**	**$192.8**	**$224.2**	**$247.6**	**$267.0**	**$282.4**	**$293.8**	**$305.2**	**$312.5**	**$315.3**	**$159.1**	**$64.2**
PWS Patients in the EU	12,000	12,108	12,217	12,327	12,438	12,550	12,663	12,777	12,892	13,008	13,125	13,243	13,362	13,482	13,604	13,726	13,850	13,974
% >12 years old	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%
EU PWS Patients >12 yr/old	6,000	6,054	6,108	6,163	6,219	6,275	6,331	6,388	6,446	6,504	6,562	6,621	6,681	6,741	6,802	6,863	6,925	6,987
% treated with Beloranib	0.0%	0.0%	0.0%	0.0%	2.5%	4.0%	6.0%	8.0%	11.0%	13.0%	15.0%	16.0%	17.0%	18.0%	19.0%	20.0%	10.0%	4.0%
PWS Patients on Beloranib	-	-	-	-	155	251	380	511	709	846	984	1,059	1,136	1,213	1,292	1,373	692	279
Annual Cost of Therapy	$90,000	$90,000	$90,000	$90,000	$90,000	$90,000	$90,000	$90,000	$90,000	$90,000	$90,000	$90,000	$90,000	$90,000	$90,000	$90,000	$90,000	$90,000
Gross Revenues	$0.0	$0.0	$0.0	$0.0	$14.0	$22.6	$34.2	$46.0	$63.8	$76.1	$88.6	$95.3	$102.2	$109.2	$116.3	$123.5	$62.3	$25.2
%<12 years old	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%
US PWS Patients <12 yr/old	6,000	6,054	6,108	6,163	6,219	6,275	6,331	6,388	6,446	6,504	6,562	6,621	6,681	6,741	6,802	6,863	6,925	6,987
% treated with Beloranib	0.0%	0.0%	0.0%	0.0%	0.0%	2.5%	4.0%	6.0%	8.0%	11.0%	13.0%	15.0%	17.0%	18.0%	19.0%	20.0%	10.0%	4.0%
PWS Patients on Beloranib	-	-	-	-	-	157	253	383	516	715	853	993	1,136	1,213	1,292	1,373	692	279
Annual Cost of Therapy	$90,000	$90,000	$90,000	$90,000	$90,000	$90,000	$90,000	$90,000	$90,000	$90,000	$90,000	$90,000	$90,000	$90,000	$90,000	$90,000	$90,000	$90,000
Gross Revenues ($MM)	$0.0	$0.0	$0.0	$0.0	$0.0	$14.1	$22.8	$34.5	$46.4	$64.4	$76.8	$89.4	$102.2	$109.2	$116.3	$123.5	$62.3	$25.2
Approval Probability	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%
EU P(w) Beloranib PWS Revenues	**$0.0**	**$0.0**	**$0.0**	**$0.0**	**$9.8**	**$25.7**	**$39.9**	**$56.3**	**$77.2**	**$98.3**	**$115.8**	**$129.3**	**$143.1**	**$152.9**	**$162.8**	**$172.9**	**$87.3**	**$35.2**
WW Beloranib Gross Sales	$0.0	$0.0	$0.0	$5.8	$66.5	$172.0	$270.7	$356.0	$430.5	$494.1	$546.8	$588.2	$624.1	$654.5	$679.0	$697.5	$351.9	$142.0
WW Beloranib P(w) Sales	**$0.0**	**$0.0**	**$0.0**	**$4.0**	**$46.5**	**$120.4**	**$189.5**	**$249.2**	**$301.4**	**$345.9**	**$382.8**	**$411.8**	**$436.9**	**$458.1**	**$475.3**	**$488.2**	**$246.3**	**$99.4**

Assumptions	
Beloranib US Cost	$150,000
Beloranib EU Cost	$90,000
Probability of Approval	70%

Source: Company Presentations and Leerink Partners Research

Craniopharyngioma Revenue Model	2014E	2015E	2016E	2017E	2018E	2019E	2020E	2021E	2022E	2023E	2024E	2025E	2026E	2027E	2028E	2029E	2030E	2031E
Craniopharyngioma Patients in the US	6,260	6,316	6,373	6,431	6,488	6,547	6,606	6,665	6,725	6,786	6,847	6,908	6,971	7,033	7,097	7,160	7,225	7,290
% with post-treatment hypothalamic dysfunction	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%
beloranib craniopharyngioma candidates	3,130	3,158	3,187	3,215	3,244	3,273	3,303	3,333	3,363	3,393	3,423	3,454	3,485	3,517	3,548	3,580	3,612	3,645
% treated with Beloranib	0.0%	0.0%	0.0%	0.0%	2.0%	6.0%	13.0%	18.0%	24.0%	29.0%	32.0%	34.0%	36.0%	38.0%	40.0%	40.0%	20.0%	10.0%
Patients on Beloranib	-	-	-	-	65	196	429	600	807	984	1,095	1,174	1,255	1,336	1,419	1,432	722	364
Annual Cost of Therapy	$150,000	$150,000	$150,000	$150,000	$150,000	$150,000	$150,000	$150,000	$150,000	$150,000	$150,000	$150,000	$150,000	$150,000	$150,000	$150,000	$150,000	$150,000
Gross Revenues ($MM)	$0.0	$0.0	$0.0	$0.0	$9.7	$29.5	$64.4	$90.0	$121.1	$147.6	$164.3	$176.2	$188.2	$200.4	$212.9	$214.8	$108.4	$54.7
Approval Probability	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%
US P(w) Beloranib Cranio Revenues	**$0.0**	**$0.0**	**$0.0**	**$0.0**	**$4.9**	**$14.7**	**$32.2**	**$45.0**	**$60.5**	**$73.8**	**$82.2**	**$88.1**	**$94.1**	**$100.2**	**$106.4**	**$107.4**	**$54.2**	**$27.3**
Craniopharyngioma Patients in the EU	14,850	14,984	15,119	15,255	15,392	15,530	15,670	15,811	15,953	16,097	16,242	16,388	16,536	16,684	16,835	16,986	17,139	17,293
% with post-treatment hypothalamic dysfunction	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%
beloranib craniopharyngioma candidates	7,425	7,492	7,559	7,627	7,696	7,765	7,835	7,906	7,977	8,049	8,121	8,194	8,268	8,342	8,417	8,493	8,569	8,647
% treated with Beloranib	0.0%	0.0%	0.0%	0.0%	1.0%	4.0%	8.0%	12.0%	16.0%	20.0%	22.0%	24.0%	26.0%	28.0%	30.0%	30.0%	15.0%	7.5%
Patients on Beloranib	-	-	-	-	77	311	627	949	1,276	1,610	1,787	1,967	2,150	2,336	2,525	2,548	1,285	648
Annual Cost of Therapy	90,000	90,000	90,000	90,000	90,000	90,000	90,000	90,000	90,000	90,000	90,000	90,000	90,000	90,000	90,000	90,000	90,000	90,000
Gross Revenues ($MM)	$0.0	$0.0	$0.0	$0.0	$6.9	$28.0	$56.4	$85.4	$114.9	$144.9	$160.8	$177.0	$193.5	$210.2	$227.3	$229.3	$115.7	$58.4
Approval Probability	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%
EU P(w) Beloranib Cranio Revenues	**$0.0**	**$0.0**	**$0.0**	**$0.0**	**$3.5**	**$14.0**	**$28.2**	**$42.7**	**$57.4**	**$72.4**	**$80.4**	**$88.5**	**$96.7**	**$105.1**	**$113.6**	**$114.7**	**$57.8**	**$29.2**
WW Gross Beloranib Craniopharyngioma Revenues	$0.0	$0.0	$0.0	$0.0	$16.7	$57.4	$120.8	$175.4	$235.9	$292.5	$325.1	$353.2	$381.7	$410.7	$440.2	$444.1	$224.1	$113.0
WW P(w) Beloranib Craniopharyngioma Revenues	**$0.0**	**$0.0**	**$0.0**	**$0.0**	**$8.3**	**$28.7**	**$60.4**	**$87.7**	**$118.0**	**$146.2**	**$162.6**	**$176.6**	**$190.8**	**$205.3**	**$220.1**	**$222.1**	**$112.0**	**$56.5**

Assumptions	
Beloranib US Cost	$150,000
Beloranib EU Cost	$90,000
Probability of Approval	50%

Source: Company Presentations and Leerink Partners Research

Product	Event	Timing
Beloranib	Initiate US Phase III PWS Trial	2H14
Beloranib	Initiate Phase IIb Severe Obesity Trial	2H14
Beloranib	Phase IIa Craniopharyngioma Data	1Q15
ZGN-839	File NASH/Type II Diabetes IND	1H15
Beloranib	6 Mo. Phase III PWS Data	4Q15

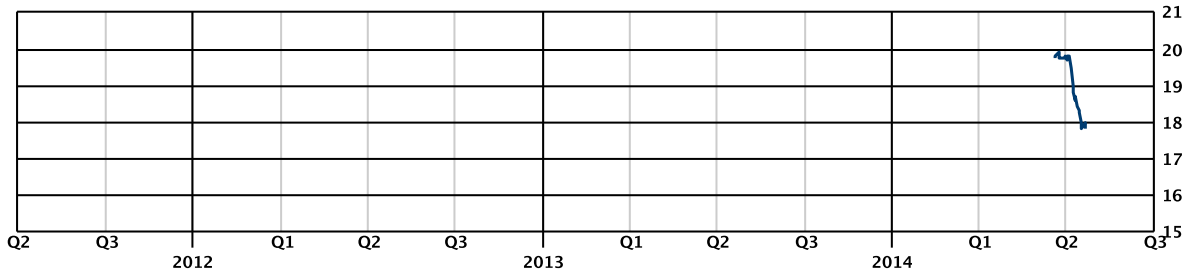
Source: Company Presentations and Leerink Partners Research

Disclosures Appendix

Analyst Certification

I, Joseph P. Schwartz, certify that the views expressed in this report accurately reflect my views and that no part of my compensation was, is, or will be directly related to the specific recommendation or views contained in this report.

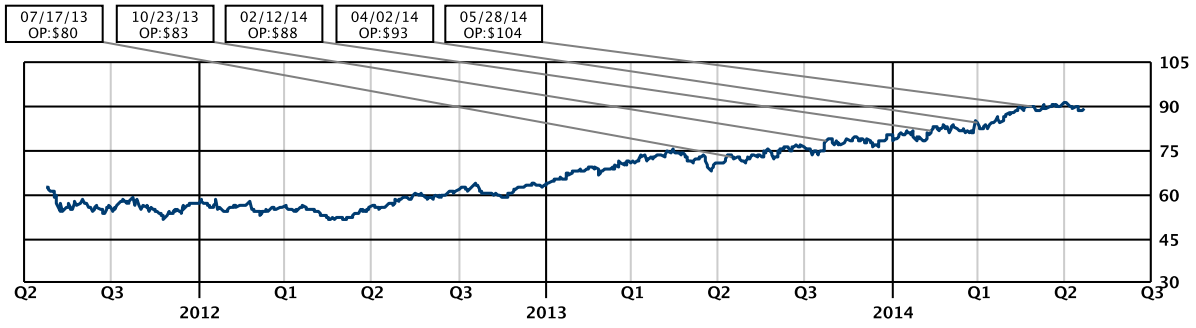
Rating and Price Target History for: Zafgen, Inc. (ZFGN) as of 07-22-2014



OP=Outperform MP=Market Perform UP=Underperform D=Drop Coverage I=Initiate SC=Suspend Coverage

Created by BlueMatrix

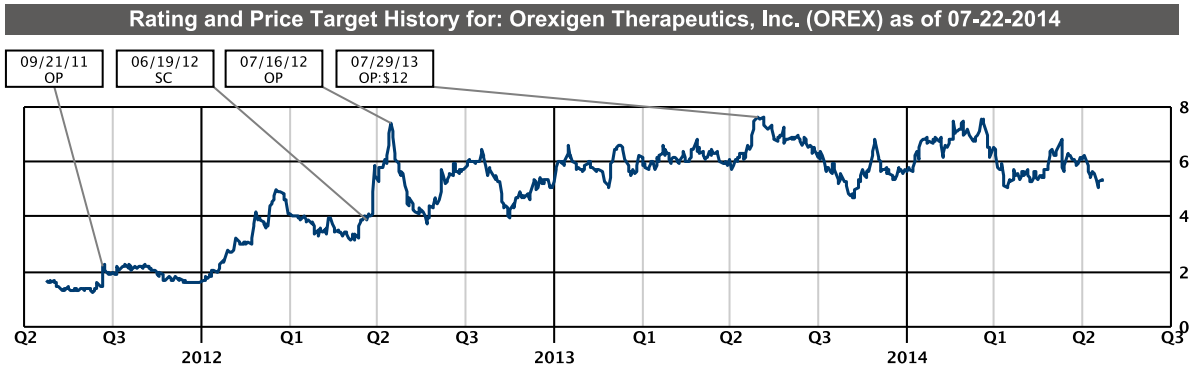
Rating and Price Target History for: Novartis AG (NVS) as of 07-22-2014



Leerink Swann initiated coverage of NVS with an Outperform rating on November 9, 2010. On June 11, 2013, Leerink Swann began a transition to specific price targets for the stocks under its coverage, replacing valuation ranges.

OP=Outperform MP=Market Perform UP=Underperform D=Drop Coverage I=Initiate SC=Suspend Coverage

Created by BlueMatrix



Rating and Price Target History for: Orexigen Therapeutics, Inc. (OREX) as of 07-22-2014

Leerink Swann placed a Market Perform rating on OREX on February 1, 2011. On June 11, 2013, Leerink Swann began a transition to specific price targets for the stocks under its coverage, replacing valuation ranges.

OP=Outperform MP=Market Perform UP=Underperform D=Drop Coverage I=Initiate SC=Suspend Coverage

Created by BlueMatrix

Distribution of Ratings/Investment Banking Services (IB) as of 06/30/14				
			IB Serv./Past 12 Mos.	
Rating	Count	Percent	Count	Percent
BUY [OP]	138	69.00	50	36.20
HOLD [MP]	62	31.00	2	3.20
SELL [UP]	0	0.00	0	0.00

Explanation of Ratings

Outperform (Buy): We expect this stock to outperform its benchmark over the next 12 months.

Market Perform (Hold/Neutral): We expect this stock to perform in line with its benchmark over the next 12 months.

Underperform (Sell): We expect this stock to underperform its benchmark over the next 12 months.The degree of outperformance or underperformance required to warrant an Outperform or an Underperform rating should be commensurate with the risk profile of the company.

For the purposes of these definitions the relevant benchmark will be the S&P 600® Health Care Index for issuers with a market capitalization of less than $2 billion and the S&P 500® Health Care Index for issuers with a market capitalization over $2 billion.

Important Disclosures

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In the past 12 months, the Firm has received compensation for providing investment banking services to Zafgen, Inc. and Orexigen Therapeutics, Inc. .

Leerink Partners LLC makes a market in Zafgen, Inc., Amylin Pharmaceuticals, Inc., Arena Pharmaceuticals, Inc., Orexigen Therapeutics, Inc. and VIVUS, Inc.

Leerink Partners LLC is willing to sell to, or buy from, clients the common stock of Novartis AG on a principal basis.

Leerink Partners LLC has acted as the manager for a public offering of Zafgen, Inc. in the past 12 months.

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