



Topline Results

Phase 2b PORTICO study

Efficacy of vafidemstat in
Borderline Personality Disorder

January 7, 2024

Pioneering personalized medicine
in **epigenetics**

ORYZON

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**Topline Results of
VAFIDEMSTAT's Phase 2b
PORTICO trial in
Borderline Personality
Disorder (BPD)**

- ❖ The primary endpoints improvement in *Borderline Personality Disorder Checklist (BPDCL)* and in aggression by CGI-S A/A did not reach statistical significance.
- ❖ Nominal statistically significant, and clinically meaningful, reduction was achieved in the secondary endpoint *Borderline Evaluation of Severity (BEST)*, an overall measure of BPD disease severity, across weeks 8-12 ($p = 0.042$).
- ❖ Nominal statistically significant, and clinically meaningful, reduction was also achieved in the secondary endpoint *State-Trait Anger Expression Inventory 2 (STAXI-2) Trait Anger*, a measure of agitation and aggression, across weeks 8-12 ($p=0.026$).
- ❖ Results across all efficacy endpoints consistently favored vafidemstat over placebo.
- ❖ Global Statistical Test (GST) confirms consistent trend across efficacy endpoints.
- ❖ Vafidemstat was safe and well tolerated, consistent with the overall safety profile to date.

Borderline personality disorder: A serious and prevalent disease with no approved drugs

Two main types of symptoms

**Unstable-extreme
interpersonal relationships**
+
Agitation and Aggression*



*Including self-directed aggression

+ 9 million affected in US+EU

- Frantic efforts to avoid real or imagined **abandonment**
- Pattern of **unstable and intense interpersonal relationships** alternating between extremes of idealization and devaluation
- **Identity disturbance**: markedly and persistently **unstable self-image** or sense of self
- **Affective instability** due to a marked reactivity of mood
- **Chronic feelings of emptiness**
- **Impulsivity** with **self-damage** (spending, sex, substance abuse, reckless driving, binge eating)
- Recurrent threats, or **suicidal / self-harming behavior**
- Inappropriate, **intense anger** or **difficulty controlling anger** (e.g., frequent displays of temper, recurrent fights)
- **Transient, stress-related paranoid ideation** or **severe dissociative symptoms**

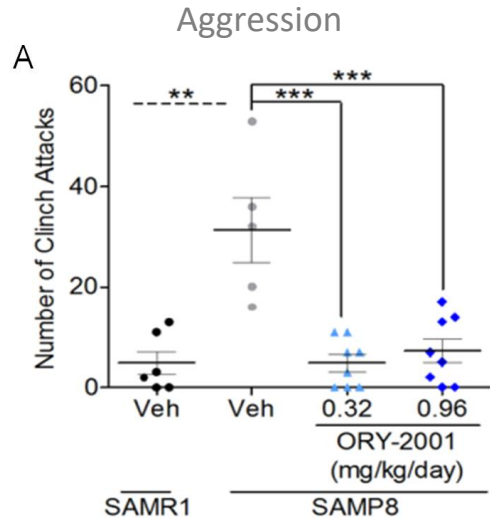
Borderline Personality Disorder (BPD). Multifactorial etiology

BPD etiology is multifactorial, but LSD1i effects are coherent with a potential therapeutic benefit.

- A growing body of data indicates that the glutamatergic system, particularly the *N*-methyl-D-aspartate (NMDA) subtype receptor, plays a major role in neuronal plasticity and other functions and may underlie the pathophysiology of multiple psychiatric disorders¹
- Prefrontal glutamatergic emotion regulation is disturbed in cluster B (BPD) and C personality disorders²
- **LSD1 inhibition rescues/restores NMDA deficiencies in different preclinical models**



Vafidemstat's unique MoA and pharmacology supports use in different mental diseases



Vafidemstat (aka ORY-2001) and other LSD1i induce expression of genes involved in neuronal plasticity, restoring neuronal morphology, branching and axonal navigation

Vafidemstat restores the response to stress by regulating genes involved in control of stress cues in the PFC-amygdala axis, as IEG, SRF, and others

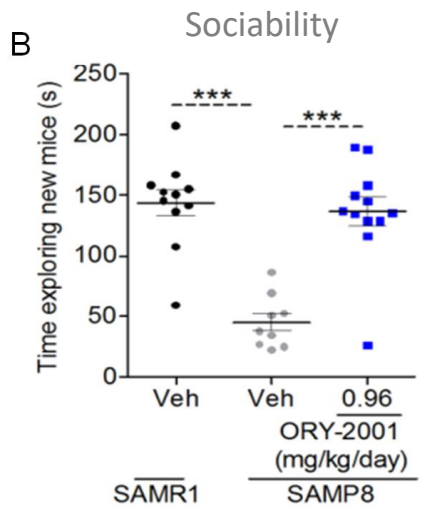
LSD1i is able to rescue glutamatergic NMDA-R hypofunction in prefrontal cortex in different ASD and SCZ models

Vafidemstat improves sociability

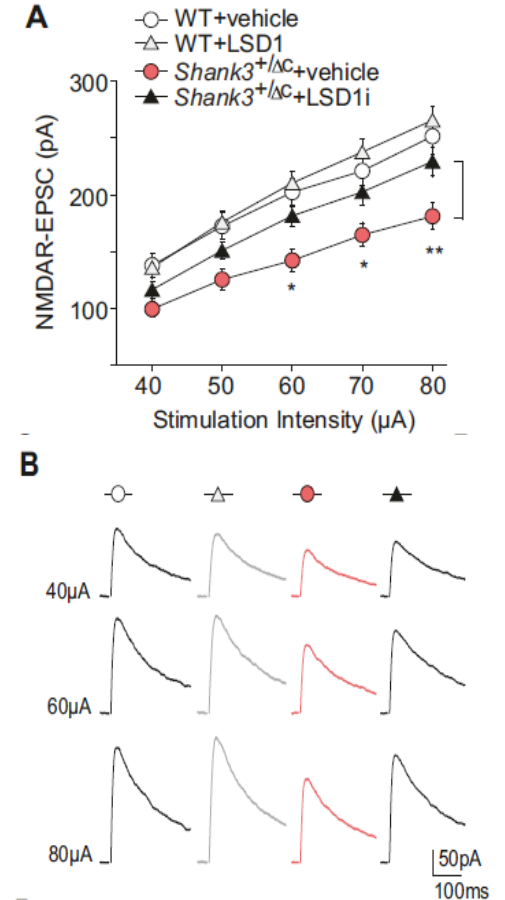
Vafidemstat reduces aggression

Vafidemstat improves memory

Borderline Personality Disorder, Schizophrenia, Autism, ADHD, others



NMDAR rescue



Maes et al, 2020 PLoS ONE
Rapanelli et al. 2022 Mol Psychiatry, *Shank3*-deficient mice

Vafidemstat is safe and well tolerated

A very robust safety package. +430 treated subjects

Brain Penetrant



An optimal
CSF : plasma
ratio of
0.9

Safe, No DDIs



Comparable SARs between
placebo and vafidemstat
arms in 6 Phase II trials:
1.0% vafidemstat vs 1.0%
placebo

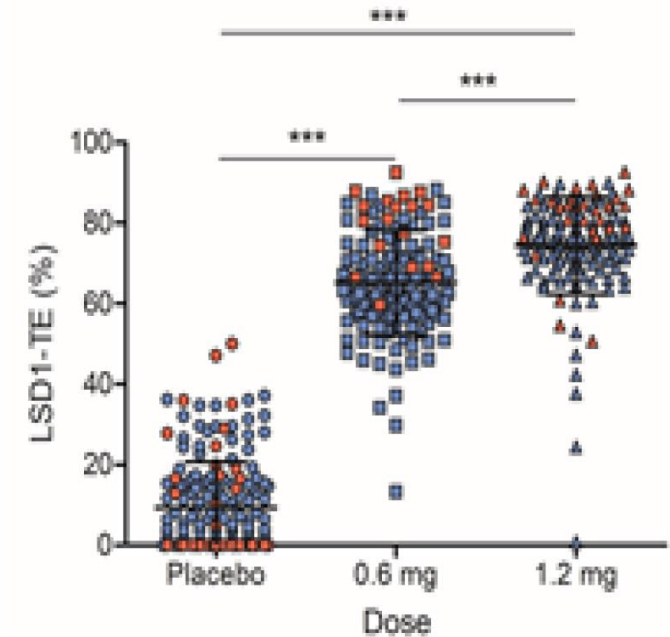
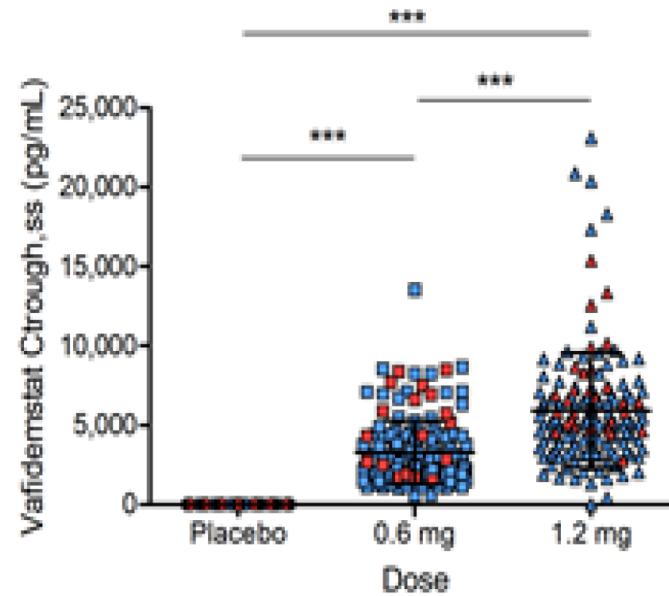
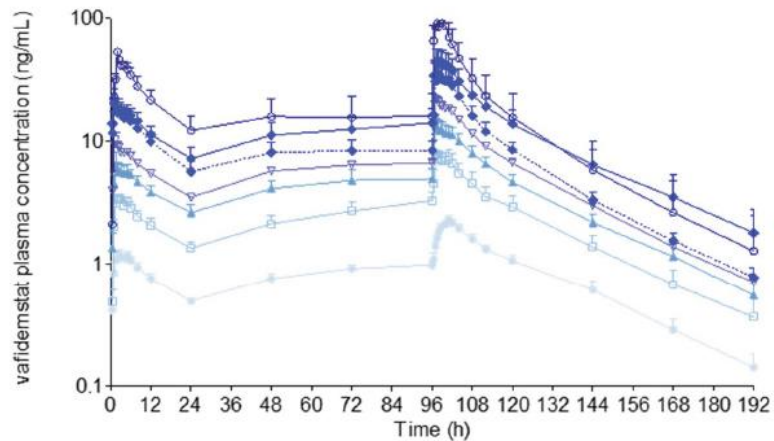
No side effects

- ❖ No weight gain
- ❖ No sedation /
somnolence
- ❖ No sexual dysfunction
- ❖ No extrapyramidal
signs



Vafidemstat: Excellent pharmacology & established RP2D in previous trials

Oral, once a day



PK data supports once daily dosing in both adult and elder subjects

Full LSD1 occupancy at 1.2 mg/day

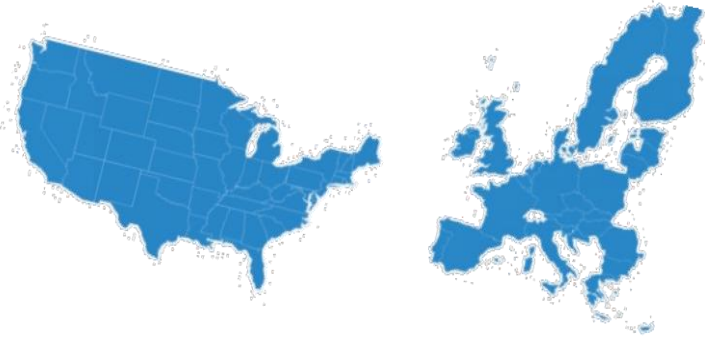
Multiple Shots on goal & main investment thesis in the short-mid term

Program	Study	Preclinical Phase	Phase I		Phase II		Status	Expected Milestone(s)
			Phase Ia	Phase Ib	Phase IIa	Phase IIb		
CNS: Vafidemstat (ORY-2001) - CNS optimized LSD1 inhibitor								
Borderline personality disorder Agitation/Aggression & Overall Improvement	PORTICO						Completed. Study has results	Top line data in January 2024 BioMks & Final Data 2Q2024 EoP2 FDA meeting in 2024
Schizophrenia Negative Symptoms & Cognition	EVOLUTION						Recruiting	Timeline updates 2024
Kabuki Syndrome	HOPE						IND in preparation	IND 2024
Oncology: Iadademstat (ORY-1001) - Selective LSD1 inhibitor								
AML 1L Unfit Patients Combination with azacitidine	ALICE						Completed. Study has results	Final positive results presented at ASH2022
AML 1L Unfit Patients Combination with azacitidine and venetoclax	IIS-X002						IND Approved Led by OSHU	FPI 1Q2024
AML R/R-Flt3mut+ Combination with gilteritinib	FRIDA						Recruiting	EHA-2024, ASH-2024
Neuroendocrine High Grade R/R Combination with paclitaxel	C-X001 NET Basket						Recruiting Collab. Study with FCCC	Study updates 2H24
ED-SCLC 1L Combination with ICI	CRADA-IIS						IND in preparation Led by MSKCC	IND 1Q2024
ED-SCLC 1L Combination with ICI	STELLAR						IND in preparation Company sponsored	IND 2024
Other Programs								
ORY-3001 (LSD1i) Sickle Cell Disease	--						IND enabling tox completed	
ORY-4001(HDAC6i) CMT, ALS	--						IND enabling tox ongoing	2023 PNS Annual Meeting June 2023

Borderline personality disorder: an unmet medical need & a vast commercial opportunity

A Prevalent & impairing disease

9 million in US & EU



Two main types of symptoms

Unstable-extreme interpersonal relationships

+

Aggression & self-aggression



No approved drugs yet

Patients in off-label anti-psychotics



Vafi improves these symptoms in:

- BPD patients
- in PC models

Vafidemstat
commercial
opportunity

- **BPD multi-symptom treatment** represents a substantial peak revenue opportunity of **+\$3.5B**
- **Aggression.** Positive results, only in BPD, would still represent a meaningful business opportunity with peak sales of **~\$1.4B**. Additional market opportunities, e.g. **Aggression in AD**, would increase this figure
- **Schizophrenia negative symptoms** treatment also represents a big commercial opportunity, where global net revenues could reach **~\$2.5B at peak**

PORTICO: Phase IIb randomized, placebo-controlled, double blinded trial in BPD

Key Inclusion criteria

Men and women **18-65 years of age**

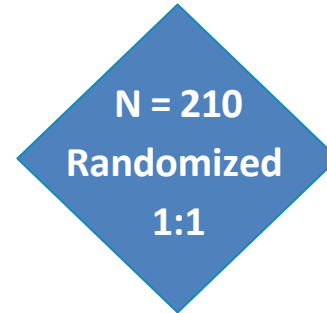
DSM-5 BPD diagnostic criteria, at least 3 months before the Screening visit.

Agitation-Aggression Psychiatric Inventory-Clinician Report (AAPI-CR) Agitation & Aggression (A/A) subscale score of ≥ 16 (severity x frequency) summed across the 4-items comprising the A/A subscale, and the sum of the A/A subscale severity scores ≥ 6

Stable regimen of background pharmacotherapy at Screening, Baseline and throughout the trial

Maintenance of pre-screening psychotherapy schedule throughout the trial

Willing and able to adhere to the protocol prohibitions, restrictions and requirements



Vafidemstat, 1.2mg
Once daily (5 ON, 2 PBO),
N = 106

Placebo
Once daily,
N = 104

14-week trial

Primary Endpoints

Improvement in Clinical Global Impression-Severity by **Agitation/Aggression (CGI-S A/A)** from baseline to weeks 8-12

Improvement in **Borderline Personality Disorder Checklist (BPDCL)** from baseline to weeks 8-12

Secondary Endpoints (efficacy)

To evaluate the change over time on the **CGI-S A/A**

To evaluate the change over time on the **BPDCL**

To evaluate the difference on the following measures, from baseline to weeks 8-12, as well as change over time, between the active treatment arm and the placebo arm:

- ❖ **Borderline Evaluation of Severity over Time (BEST)**
- ❖ **Beck Depression Inventory – II (BDI-II)**
- ❖ **State-Trait Anger Expression Inventory 2 (STAXI-2)**
- ❖ **State-Trait Anxiety Inventory (STAI)**

DEMOGRAPHICS

PORTICO enrolled a representative **real-world BPD population** allowing common comorbidities and concomitant medications that are typically exclusionary in other BPD trials, as well as allowed subjects to receive psychotherapy during the trial

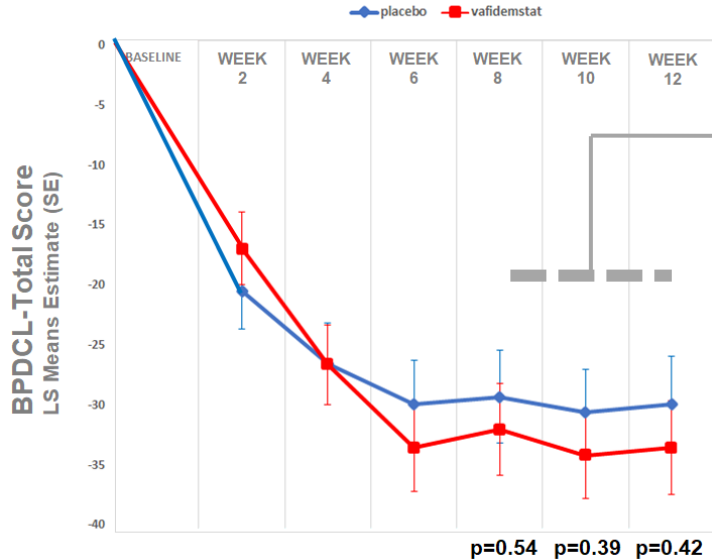
	Vafidemstat (n = 106)	Placebo (n = 104)
Psychotherapy at Baseline: No (n) / Yes (n)	84/22	82/22
Age (years, Mean (SD))	32.4 (10.68)	31.8 (10.89)
Female n (%)	78 (73.6)	79 (76.0%)
Male n (%)	28 (26.4%)	25 (24.0%)
Race, n (%) White	87 (82.1%)	86 (82.7%)
Black/African American	9 (8.5%)	7 (6.7%)
Other	10 (9.4%)	11 (10.6%)
Height Mean (SD)	167.4 (9.09)	168.4 (10.36)
Weight Mean (SD)	73.0 (15.91)	75.8 (16.05)
BMI Mean (SD)	26.0 (4.89)	26.6 (4.48)

BASELINE CHARACTERISTICS

There were no statistically significant group differences across endpoints at Baseline

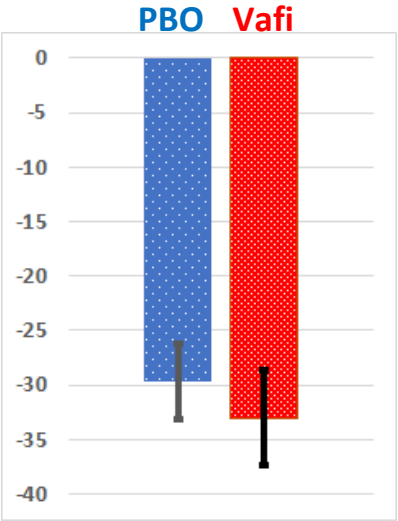
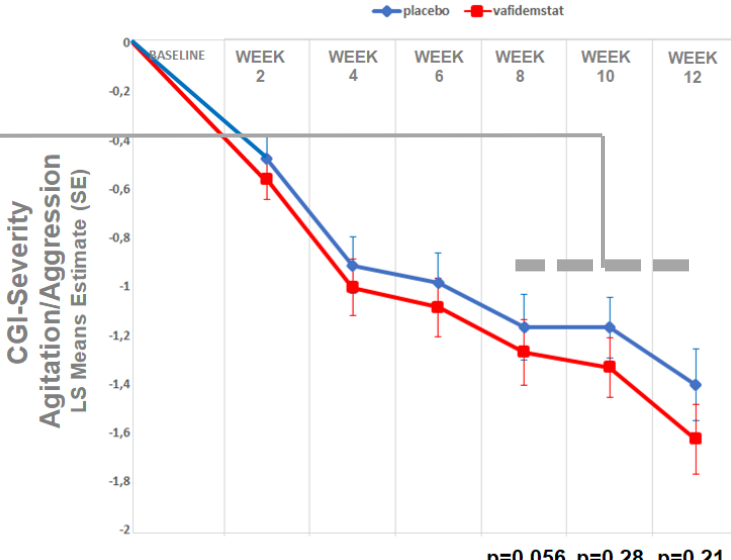
	Vafidemstat (n = 106)	Placebo (n = 104)
AAPI-CR Total	74.1 (22.51)	78.0 (22.30)
BPDCL Total	141.7 (36.96)	144.6 (34.08)
CGI-Severity A/A	4.8 (0.82)	4.7 (0.82)
BEST Total	39.9 (10.06)	39.6 (10.02)
STAXI-2 Trait Anger	27.5 (6.73)	27.0 (6.47)
STAXI-2 State Anger	23.5 (8.98)	23.3 (9.36)
Beck Depression Inventory-II	24.7 (14.58)	26.3 (13.67)
STAI State Anxiety	50.6 (11.69)	50.4 (11.32)
STAI Trait Anxiety	59.0 (11.23)	59.3 (10.51)

No Statistical Significance in the two Primary Endpoints: BPDCL and CGI-S A/A

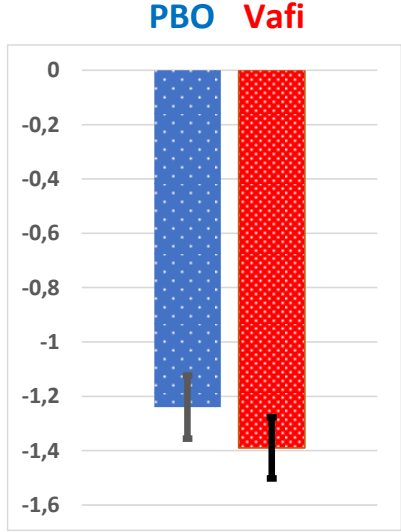


BPDCL-Total Score
Across weeks 8-12
LS Means Estimate (SE)

CGI-Severity A/A
Across weeks 8-12
LS Means Estimate (SE)

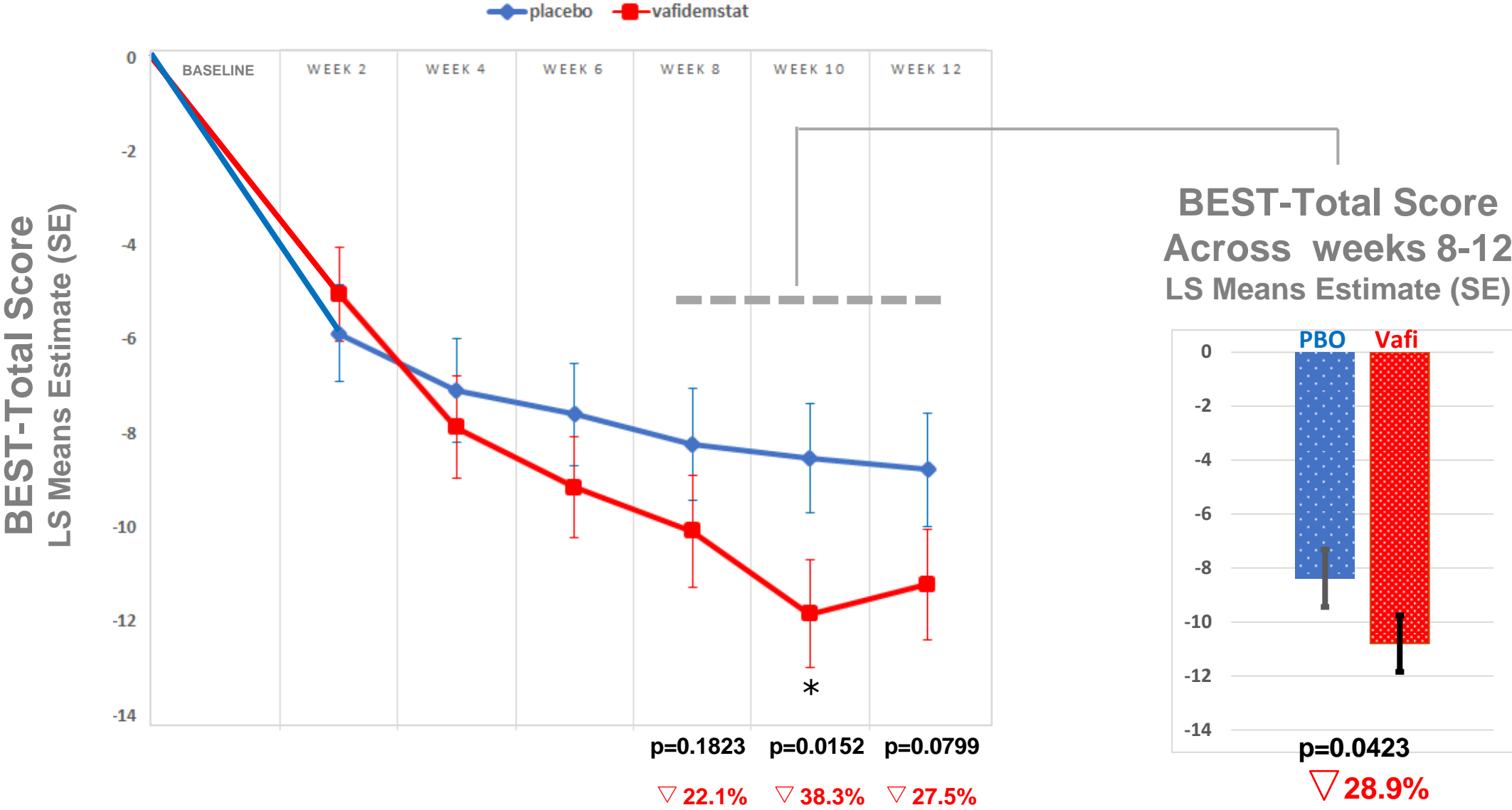


p=0.412

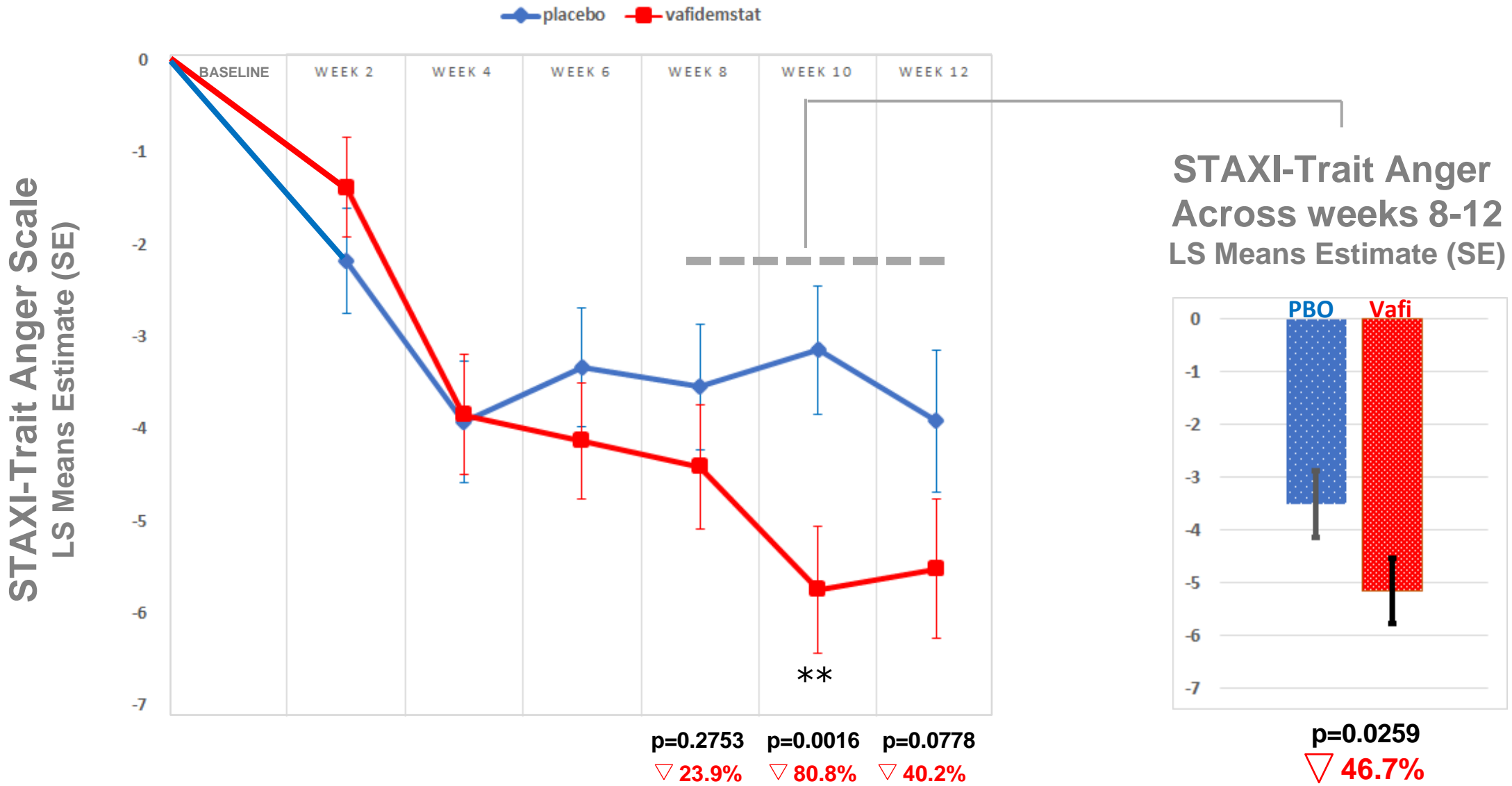


p=0.254

Nominal Statistical Significance in Secondary endpoint: Improvement in BEST across weeks 8-12

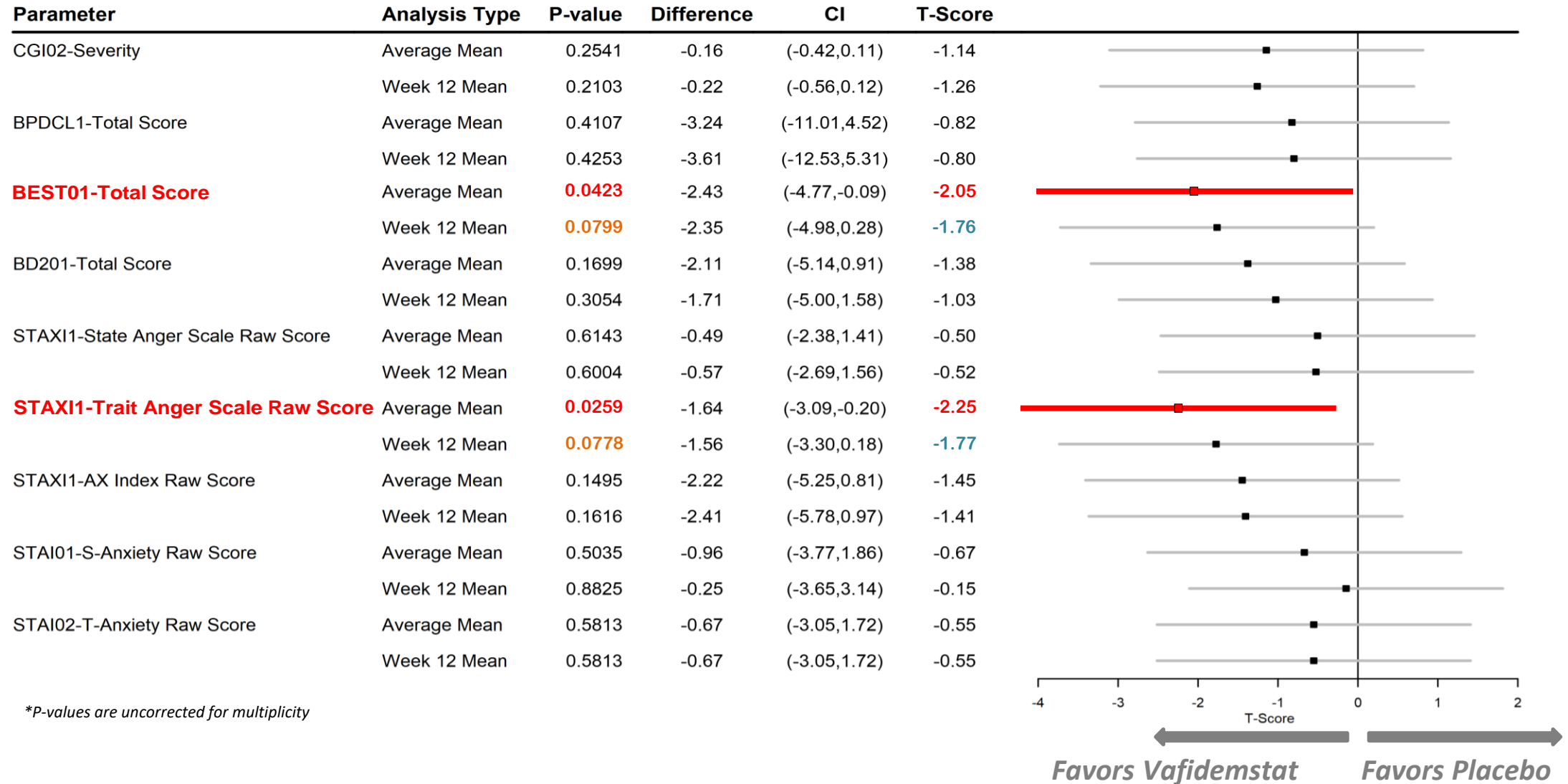


Nominal Statistical Significance in Secondary endpoint: Improvement in STAXI Trait Anger across weeks 8-12



PORTICO: All efficacy endpoints consistently favored vafidemstat over placebo

Full Analysis Set



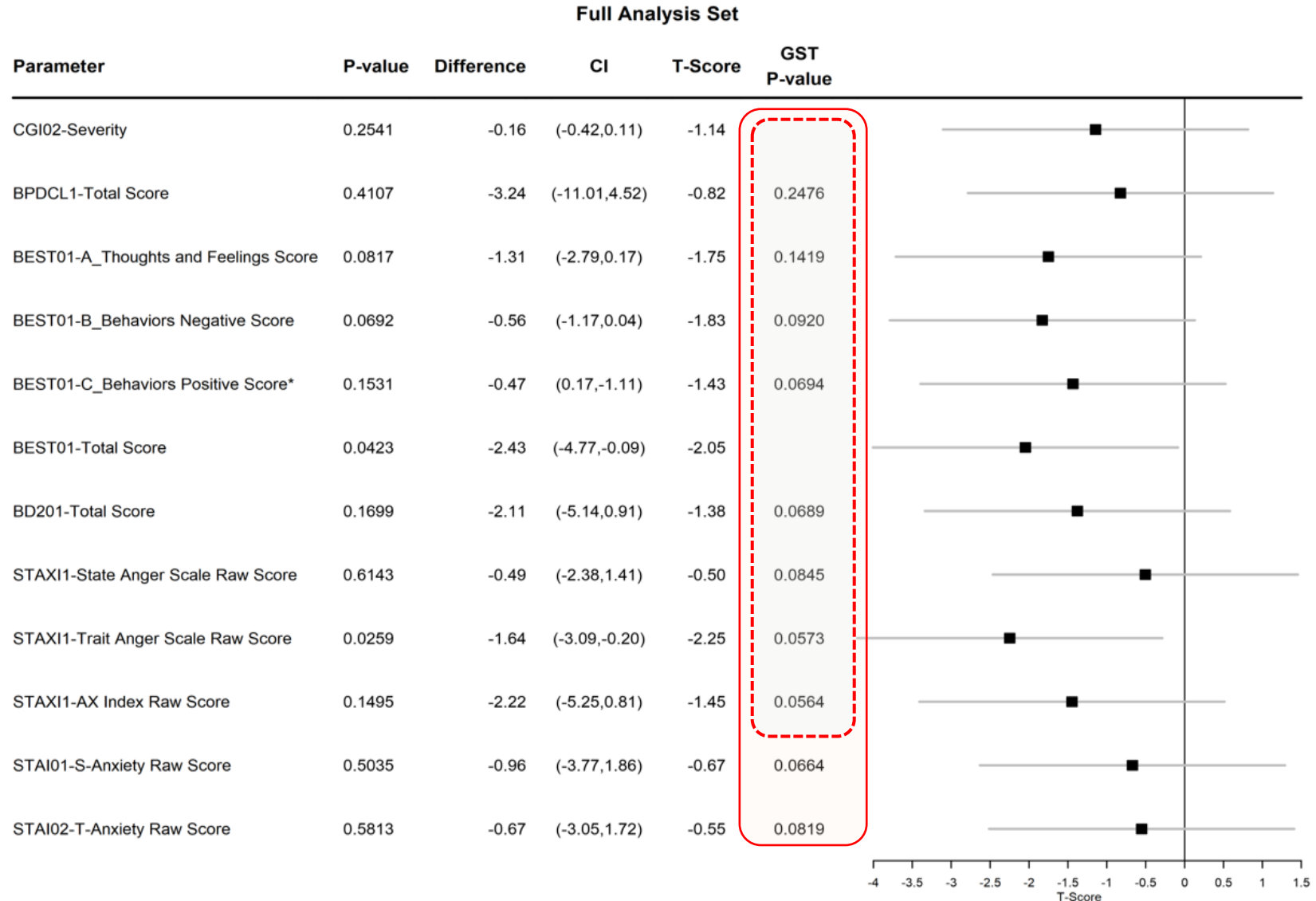
*P-values are uncorrected for multiplicity

Global statistical test (GST) consistent with a global treatment effect favoring vafidemstat

BPD is a multisymptomatic disease with psychiatric, behavioral, and functional outcomes.

GST is designed to address whether a treatment is efficacious across different aspects of a condition. GST efficiently summarizes a treatment's merit when the medical question is complex.

When a treatment improves all target outcomes, the GST often has a higher power than tests of single outcomes or other multiple-test procedures. As such, GST incorporates the impact of consistent directional change across multiple key target outcomes, even when individual outcomes may not show statistically significant improvement on their own.



GST p-value shows a strong trend. Particularly when considering specifically global improvement in the disease and in agitation/aggression

Topline Safety: vafidemstat was safe and well tolerated

- Treatment Emergent Adverse Events (TEAEs) were slightly lower for those receiving vafidemstat
- Treatment-Related TEAEs were similar between groups
- TEAEs leading to Study Discontinuation, Study Drug Withdrawal or Study Drug Interruption were low overall, 5 on vafidemstat and 3 on placebo
- TEAEs by Severity were consistent between groups, with slightly more Mild and Moderate TEAEs for those receiving placebo
- Severe TEAEs were low, 5 on vafidemstat and 4 on placebo
- The majority of TEAEs Recovered/Resolved by the end of the trial
- There were no deaths in PORTICO, and the only TEAE with sequelae was on placebo

	Placebo (N=104) n (%), e	Vafidemstat (N=106) n (%), e
Treatment Emergent AEs (TEAEs)	68 (65.4%), 214	61 (57.5%), 192
Treatment-Related TEAEs	33 (31.7%), 68	36 (34.0%), 91
<i>TEAEs Leading to Study Discontinuation</i>	1 (1.0%), 1	5 (4.7%), 8
<i>TEAEs Leading to Study Drug Withdrawal</i>	1 (1.0%), 1	5 (4.7%), 8
<i>TEAEs Leading to Study Drug Interruption</i>	3 (2.9%), 4	5 (4.7%), 7
TEAEs by Severity	68 (65.4%), 214	61 (57.5%), 192
<i>Mild</i>	60 (57.7%), 157	51 (48.1%), 128
<i>Moderate</i>	35 (33.7%), 52	29 (27.4%), 57
<i>Severe</i>	4 (3.8%), 5	5 (4.7%), 7
TEAEs by Outcome	68 (65.4%), 214	61 (57.5%), 192
<i>Recovered/Resolved</i>	66 (63.5%), 174	56 (52.8%), 165
<i>Not Recovered/Not Resolved</i>	17 (16.3%), 29	14 (13.2%), 18
<i>Recovering/Resolving</i>	9 (8.7%), 10	8 (7.5%), 9
<i>Recovered/Resolved With Sequelae</i>	1 (1.0%), 1	0 (0.0%), 0
<i>Death</i>	0 (0.0%), 0	0 (0.0%), 0
<i>Unknown</i>	0 (0.0%), 0	0 (0.0%), 0

PORTICO: Topline Safety – Treatment Emergent & Serious AEs

Treatment-Emergent Adverse Events by Preferred Term Occurring in $\geq 5\%$ of Subjects

	Placebo (N=104) n (%), e	Vafidemstat (N=106) n (%), e
TEAEs by Preferred Term	68 (65.4%), 214	61 (57.5%), 192
<i>Headache</i>	17 (16.3%), 18	13 (12.3%), 16
<i>Nasopharyngitis</i>	18 (17.3%), 22	9 (8.5%), 11
<i>Tension headache</i>	6 (5.8%), 17	5 (4.7%), 11
<i>Platelet count decreased</i>	1 (1.0%), 1	8 (7.5%), 8
<i>Nausea</i>	2 (1.9%), 2	6 (5.7%), 6
<i>Intentional self-injury</i>	6 (5.8%), 10	1 (0.9%), 2

Serious Adverse Events

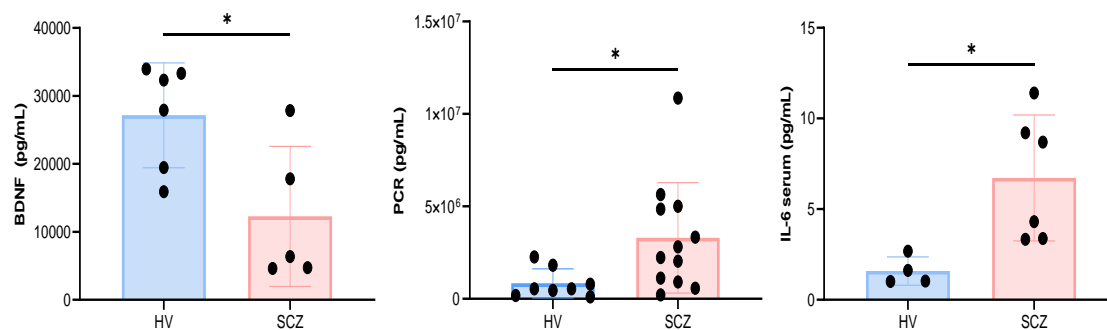
- ❖ There was 1 serious AE, a kidney infection, in a vafidemstat treated subject
 - Case was independently judged by the PI as ‘Unlikely Related’ to treatment.
 - Subject's dose was not changed, the condition ‘Recovered/Resolved’ within 7 days, and the subject completed the trial.

PORTICO will explore biomarker correlatives (as will also do EVOLUTION trial in SCZ)

Increasing evidence suggests that inflammatory responses have an important role in the pathophysiology of neurological disorders

- In **Schizophrenia**, changes have been identified in cytokine levels, correlating with behavioral symptoms severity and their potential clinical implication
- In **Borderline personality disorder**, patients have a lower level of BDNF and a higher level of tumor necrosis factor (TNF)- α and interleukin (IL)-6 in peripheral blood
- **PORTICO** measured several blood biomarkers (analyses ongoing)
- **Correlations with the different endpoints expected in 1Q 2024**

Basal levels in Schizophrenia patients (Evolution) and Healthy volunteers

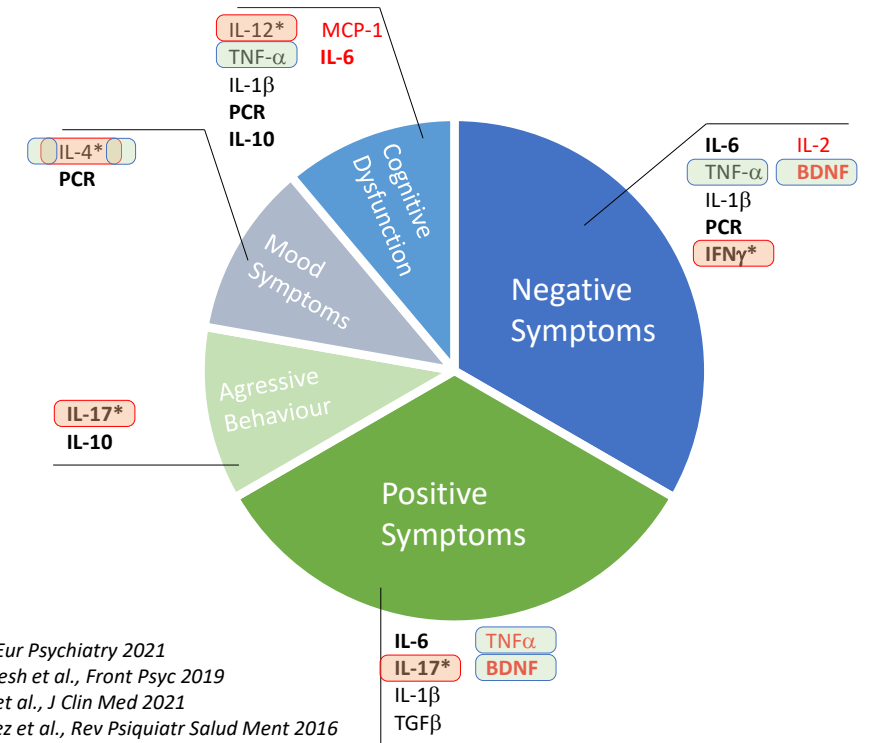


Cytokine alterations in Schizophrenia domains

(Positive correlation in black, negative in red)

Cytokines planned to be initially measured in PORTICO & EVOLUTION are in **bold**

- **IL-12*** **MCP-1**
- **TNF- α** **IL-6**
- **IL-1 β** **IL-10**
- **IL-4*** **PCR**
- **IL-6** **IL-2**
- **TNF- α** **BDNF**
- **IL-1 β** **PCR**
- **IFN γ ***
- **IL-17*** **IL-10**
- **IL-6** **TNF α**
- **IL-17*** **BDNF**
- **IL-1 β**
- **TGF β**



Cakici et al., Eur Psychiatry 2021
 Momtazmanesh et al., Front Psych 2019
 Dawidowski et al., J Clin Med 2021
 Garcia-Alvarez et al., Rev Psiquiatr Salud Ment 2016

DNA sequencing of the participants in the PORTICO study planned

PORTICO: Final Summary as of January 7th, 2023

- Primary endpoints not met.
- Two important pre-specified secondary endpoints reached statistical significance:
 - **Overall improvement in BPD disease severity**, measured by BEST across weeks 8-12 ($p=0.042$). Clinically meaningful reduction compared to placebo
 - **Improvement in Agitation/Aggression** measured by STAXI-2 across weeks 8-12 ($p=0.026$). Clinically meaningful reduction compared to placebo
- Reduction in overall BPD disease severity and agitation/aggression consistent with Phase IIa REIMAGINE trial results, albeit measured by different scales (BEST versus BPDCL; STAXI-2 versus CGI-S A/A).
- Results across ALL primary and secondary efficacy endpoints favored vafidemstat over placebo.
- Global Statistical Test (GST-p values) consistent with a global treatment effect favoring vafidemstat.
- Vafidemstat was safe and well tolerated.
- No deaths/suicides, and suicidal ideation was low (one case each in the PBO and vafi treated groups; 0.9% overall).
- This is the first time, to the best of our knowledge, that a large, randomized Phase II BPD trial had two statistically significant secondary endpoints reflecting improvements in agitation/aggression as well as in overall BPD disease severity.

PORTICO's efficacy and safety results pave the way to define further clinical development and Oryzon intends to request an end-of-Phase II meeting with the FDA to discuss plans for a registrational BPD Phase III trial.

An ongoing PoC in SCHIZOPHRENIA with vafidemstat

EVOLUTION: An adaptative randomized double blind, placebo-controlled Phase IIb trial with vafidemstat in schizophrenia patients

- **Strong rationale:** LSD1i restores phenotypes in various SCZ mice models
- **High Unmet Need:** No drugs approved yet for cognitive impairment or negative symptoms of SCZ
- Vafidemstat as add-on to SoC
- N=100
- **Cognition.** Treatment span to assess changes in CIAS: 6 months of treatment
- **Primary endpoints:** efficacy to address SCZ Negative and cognitive symptoms
- Actively recruiting patients in EU

A Prevalent & impairing disease
20 millio ww.
~5 million in US & EU



Market Value in 2021
US\$ ~8 billion



Three main types of symptoms
Positive or Negative
+
Cognitive Impairment



Highest Revenue Drug Category:
long-acting injectable (LAI)
antipsychotics

Single Best seller:
+ \$ 3.5 Billion



No approved drugs yet for
Negative symptoms (60%)
Cognitive Impairment (70%)



Vafi improves these symptoms in PC models

Moderate competition



Vafidemstat achieved nominal statistical significance in an exploratory endpoint of cognition using Brief Assessment of Cognition in Schizophrenia (BACS) ($p=0.05$) in the PORTICO study

A photograph of a modern glass skyscraper with the name 'ORYZON' and a globe logo on top. The building's glass facade reflects a sunset sky with orange and blue tones. The text 'Pioneering personalized medicine in epigenetics' is overlaid in the bottom left corner.

ORYZON

Pioneering
personalized medicine
in **epigenetics**