Bionomics Corporate Presentation

May 2023

Developing treatments for patients with underserved CNS disorders

Safe Harbor Statement

Factors Affecting Future Performance

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Targeting Common Neuropsychiatric Disorders of High Unmet Need

BNC210: Phase 3-Ready α7 Nicotinic Receptor Negative Allosteric Modulator Leads Pipeline

- Non-sedating anxiolytic profile and rapid onset of action: **potential first & best-in-class** for the acute treatment of Social Anxiety Disorder
- If approved, could be the first acute, as-needed treatment for Social Anxiety Disorder with a non-sedating, non-habit-forming profile

Near Term Clinical and Regulatory Milestones Anticipated

- **Q3'23:** Topline data from placebo-controlled Phase 2b ATTUNE study of BNC210 in PTSD
- **2H'23:** FDA End of Phase 2 meeting to discuss registrational program for BNC210 in Social Anxiety Disorder
- **Q4'23 / Q1'24:** Potential for first patient dosed in Phase 3 study of BNC210 in Social Anxiety Disorder

Partnerships and Collaborations Support Early-Stage Programs

- **Merck partnership** for Phase 1 candidates targeting cognitive deficits in Alzheimer's and other CNS disorders
- Memorandum of understanding with EmpathBio for feasibility assessment of EMP-01 (MDMA derivative) & BNC210 for PTSD treatment
- Other partnering opportunities include preclinical assets targeting potassium (Kv) and sodium (Nav) ion channels

CNS = central nervous system; FDA = US Food and Drug Administration; MDMA =3,4-Methylenedioxymethamphetamine; MOU = Memorandum of Understanding; NAM = negative allosteric modulator; PTSD = post-traumatic stress disorder.

Multi-Asset CNS Pipeline Led by Social Anxiety Disorder Program Entering Phase 3

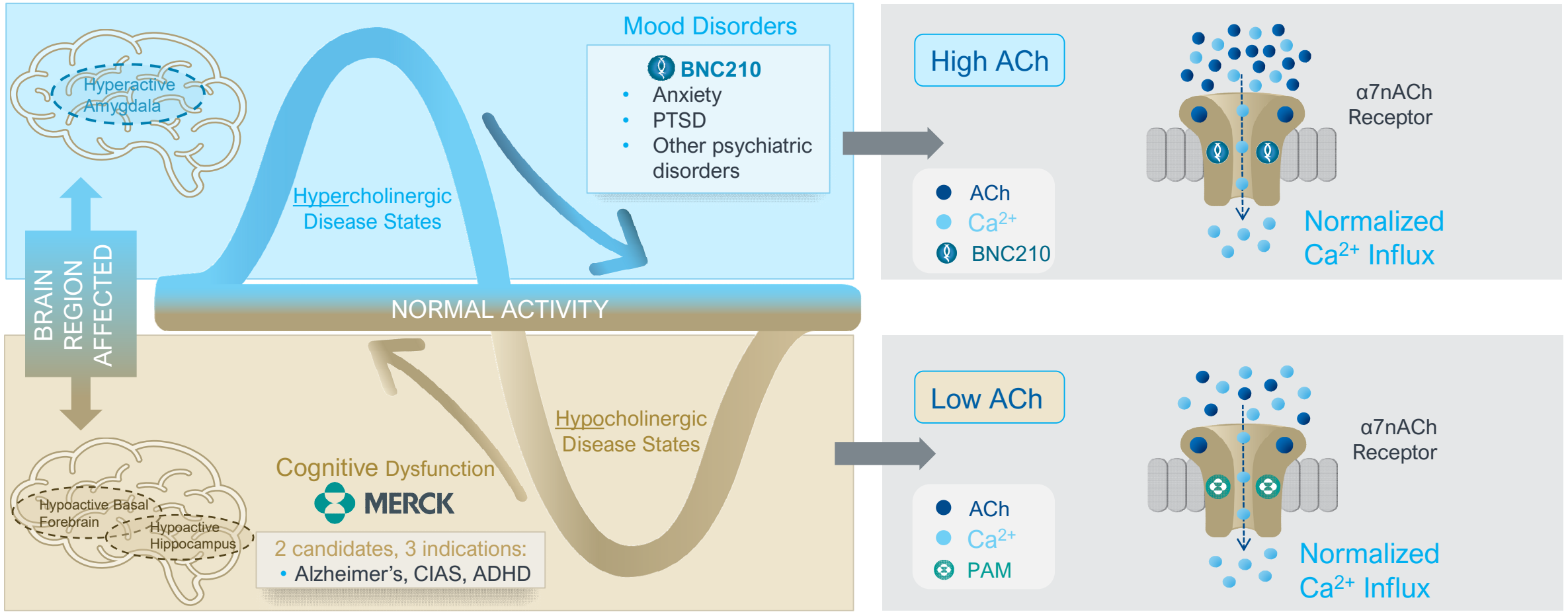
FDA Fast Track Designations for Social Anxiety Disorder and PTSD

Program	Indication	Pre-Clinical / Phase 1 / Phase 2 / Phase 3	Status
BNC210 α7 receptor NAM	Social Anxiety Disorder (SAD)		PREVAIL Completed EoP2 Mtg: 2H'23
	Post-Traumatic Stress Disorder (PTSD)		ATTUNE Enrollment Completed - Topline: Q3'23
	CNS Indication(s)		To be disclosed
EmpathBio BNC210	+MDMA derivative EMP-01 (PTSD)	MOU to explore combination treatment regimen	Feasibility assessment
MERCK Collaboration α7 receptor PAM	2 candidates for Cognitive Deficit in Alzheimer's		Phase 1 safety & biomarker studies ongoing
Nav1.7/1.8 Inhibitors Series Lead	Chronic Pain		Partnering Asset
Kv3.1/3.2 Activators Series Lead	Cognitive Impairment		Partnering Asset

NAM = Negative Allosteric Modulator; PAM = Positive Allosteric Modulator.

FDA Fast Track designation

Bionomics Clinical Assets Restore Neurotransmitter Balance Through Allosteric Modulation of the α7 Nicotinic Acetylcholine (nACh) Receptor



ACh = Acetylcholine; ADHD = Attention Deficit Hyperactivity Disorder; Cholinergic = System associated with memory, selective attention, and emotional processing cognitive functions; CIAS = Cognitive Impairment Associated with Schizophrenia; PTSD = Post-Traumatic Stress Disorder.

BNC210: A Ph3-Ready Best- and First-in-Class α-7 Nicotinic Receptor Small molecule NAM in Development for the Treatment of Neuropsychiatric Disorders

Unique and differentiated MoA

Rapid (~60min) and durable (half-life 6-8hrs) anti-anxiety relief

Clinically meaningful reduction of anxiety in GAD & SAD – similar to benzodiazepines

Non-sedating, non-habit forming, not cognition impairing*

Fully developed internally, solid tablet formulation, strong IP protection

*Profile based on a safety database of ~500 subjects.

BNC210 in Social Anxiety Disorder

Bionomics

Social Anxiety Disorder: A Significant Unmet Need

Need for broad acting therapy with fast onset of action and improved safety profile compared to SoC

SAD, or Social Phobia, is a significant and persistent fear of social and performance-related situations.

Includes anxiety from everyday social situations; a reoccurring episodic disorder that affects work, relationships, daily activities, and other aspects of life.

Amongst the largest mental health conditions with lifetime prevalence affecting >31M Americans. Triggers exacerbating anxiety can occur at any time.[7]

	BNC210's Potential Advantages*			
	BNC210	**Benzodiazepines†** *Off-label use*	**Beta blockers‡** *Off-label use*	**SSRIs / SNRIs§**
Fast Acting Anxiolytic	✓	✓	X	X
No Sedation	✓	X	✓	✓
No Withdrawal Syndrome	✓	X[1] ⚠	✓	X[2,3]
No Cognitive Impairment	✓	X[4]	✓	✓
No Suicidal Ideation/ Suicide Risk	✓	X[5]	✓	X[6]

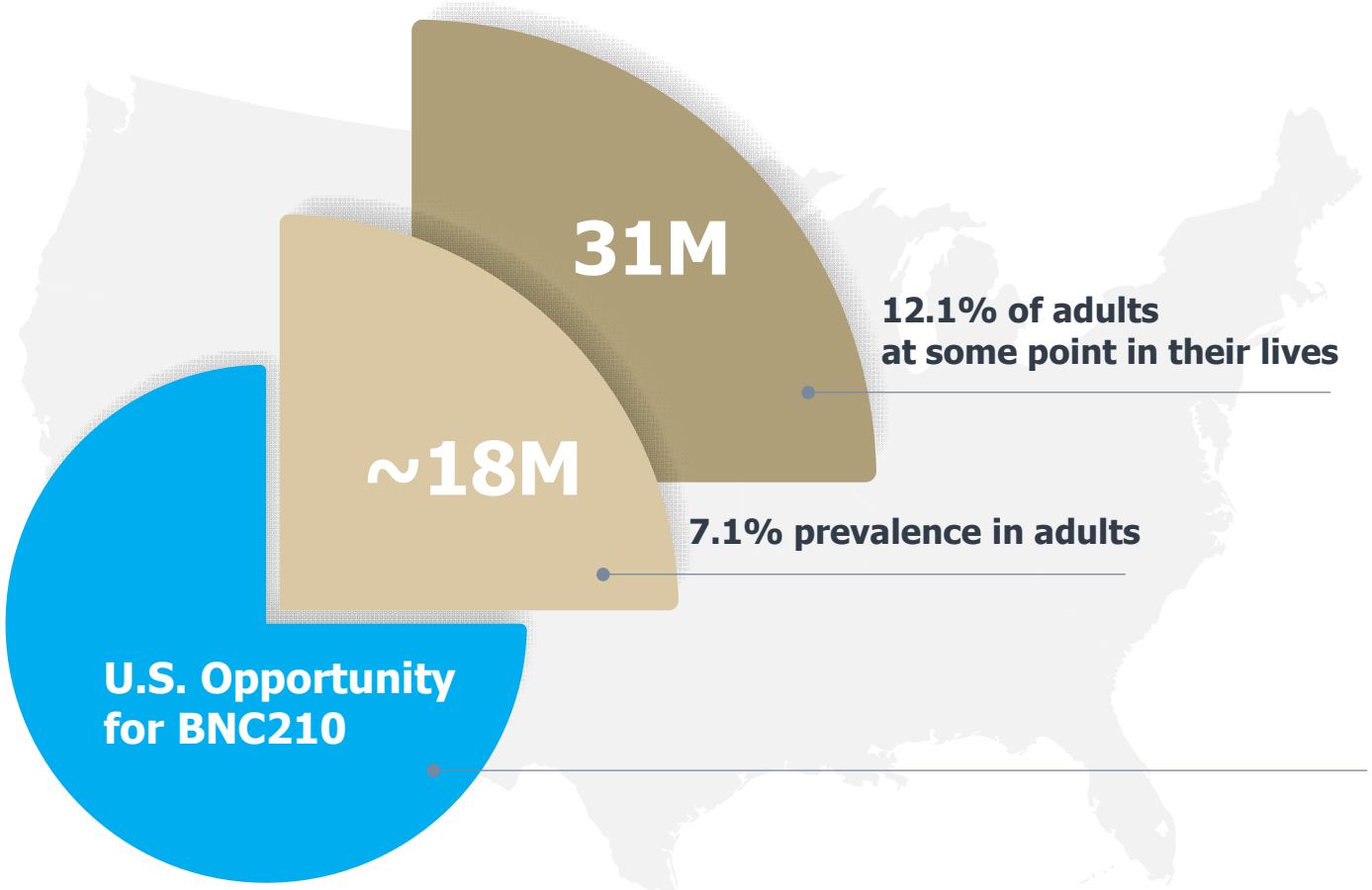
⚠ FDA black box warning.

1. Soyka M. *N Engl J Med*. 2017. 2. Fava GA, et al. *Psychother Psychosom*. 2015. 3. Fava GA, et al. *Psychother Psychosom*. 2018. 4. Liu L, et al. *Front Psychiatry*. 2020. 5. Dodds TJ. *Prim Care Companion CNS Disord*. 2017. 6. Barbui C, et al. *CMAJ*. 2009. 7. Bluestar market research 2022.

*Potential benefits based on analysis of data from separate studies and not on results that might have been obtained from head-to-head studies. †Includes Valium and certain other benzodiazepines. ‡Beta blockers address only the sequalae, e.g., physical symptoms such as blushing, increased heart rate, stammering of SAD but do NOT treat the underlying anxiety. §Includes Prozac and certain other SSRIs (Selective Serotonin Reuptake Inhibitors) / SNRIs (Serotonin-Norepinephrine Reuptake Inhibitors).

Targeting a Large Segment of the Anxiety Market

No FDA-approved fast-acting medications for as-needed treatment



BNC210 has blockbuster potential in US annual peak sales in SAD*

Unmet medical need to large patient population
Potential to be the first approved as-needed treatment
Ability to potentially achieve large market share

US Census Bureau. https://www.census.gov/library/stories/2021/08/united-states-adult-population-grew-faster-than-nations-total-population-from-2010-to-2020.html.
NIMH. "Social Anxiety Disorder" data from 2017 National Comorbidity Survey (NCS). https://www.nimh.nih.gov/health/statistics/social-anxiety-disorder.shtml.
Anxiety and Depression Association of America (ADAA). "Social Anxiety Disorder - Understand the Facts" https://adaa.org/understanding-anxiety/social-anxiety-disorder.
*Based on 3rd party (Bluestar BioAdvisors) independent market analysis.

PREVAIL Study Supports Advancement to Late-Stage Development

LIEBOWITZ SOCIAL ANXIETY SCALE

>95: Very severe social phobia
80–95: Severe social phobia
65–80: Marked social phobia
55–65: Moderate social phobia

Participants I/E Criteria

- Adults aged 18 to 65 years
- DSM-5 based diagnosis of SAD
- No psychotropic meds for 30 days prior to screening

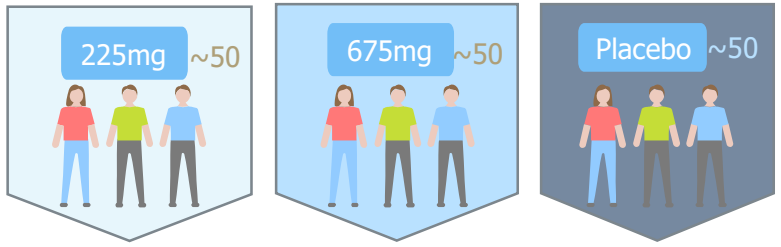
Phase 2 Study Design

SCREENING

LSAS score ≥ 70

15 US CENTERS
Target N~150

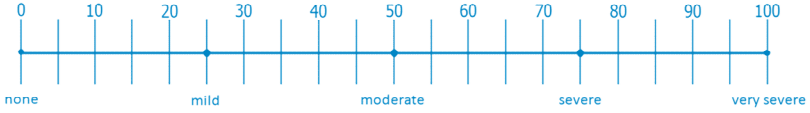
1:1:1 RANDOMIZATION
(DOUBLE-BLIND)



Single Dose Administration

PRIMARY EFFICACY MEASURE

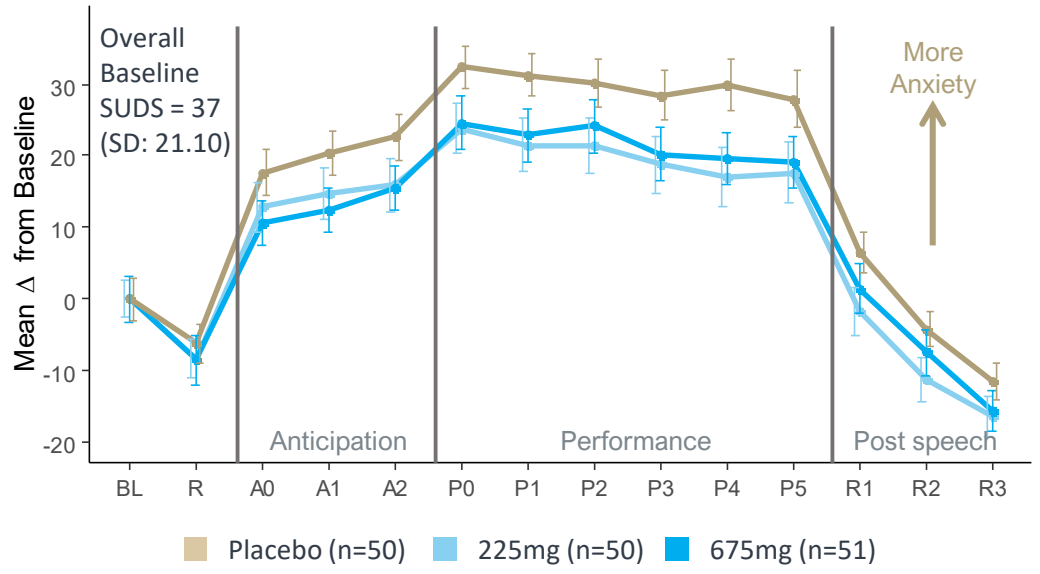
SUBJECTIVE UNITS OF DISTRESS SCALE (SUDS): Visual Analogue Scale (VAS) that measures the self-reported intensity of anxiety and/or distress.



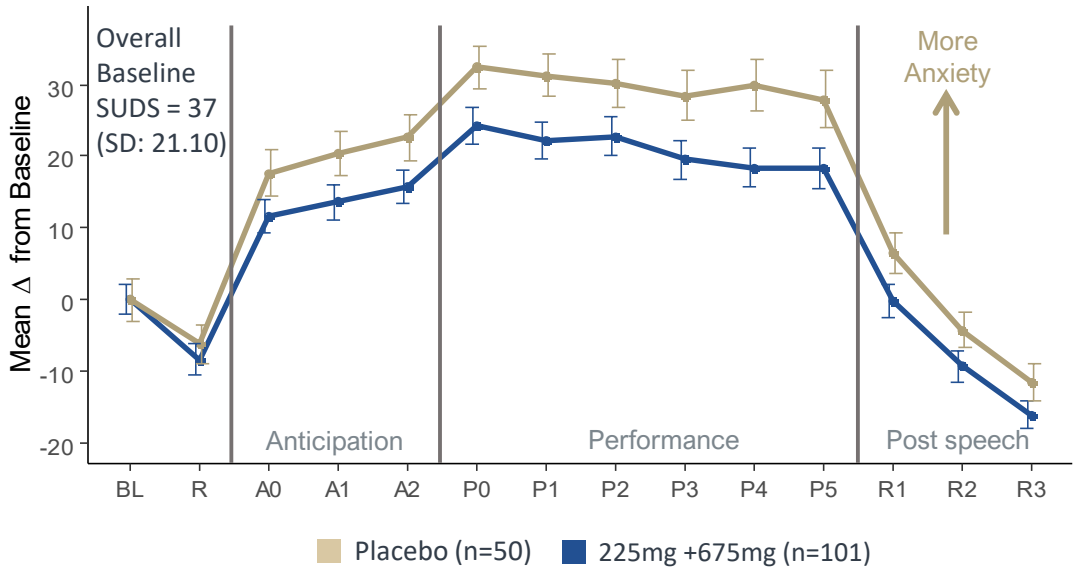
Acute BNC210 Administration Reduces Anxiety During Public Speaking Task

BNC210 225 mg and 675 mg arms achieved similar separation from placebo*,†

Mean Change in SUDS Individual Arms



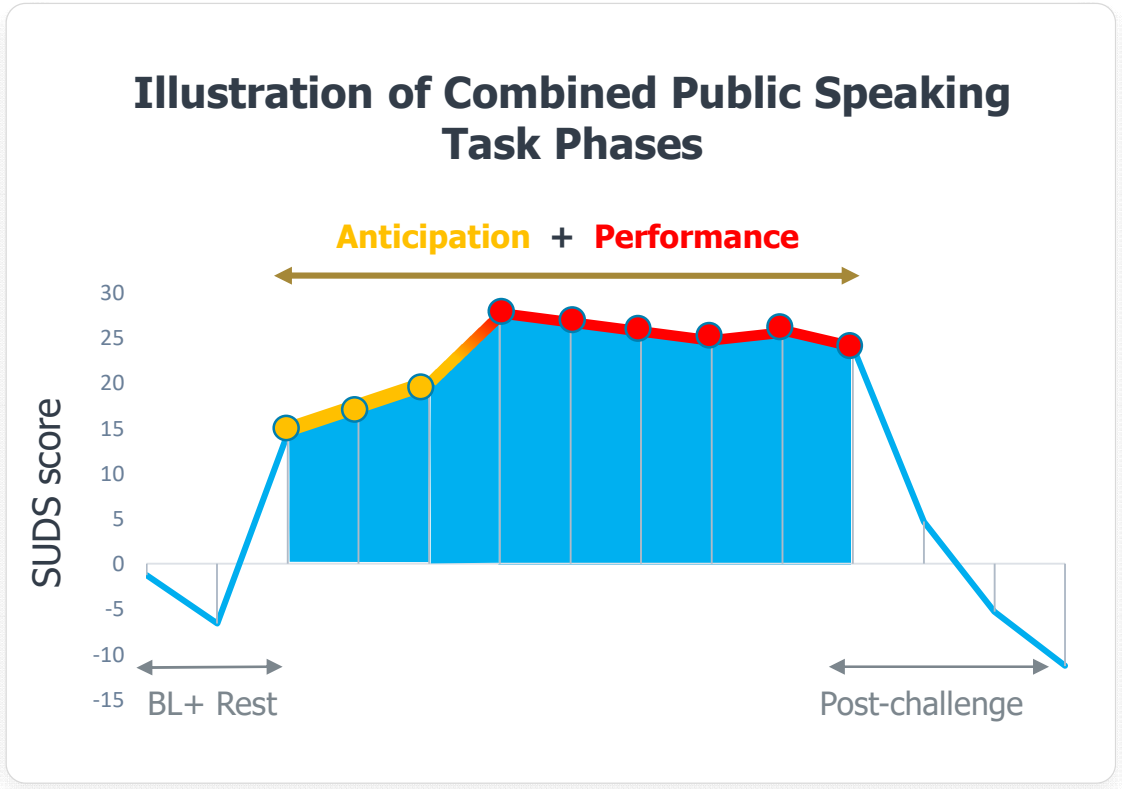
Mean Change in SUDS with Combined Arms

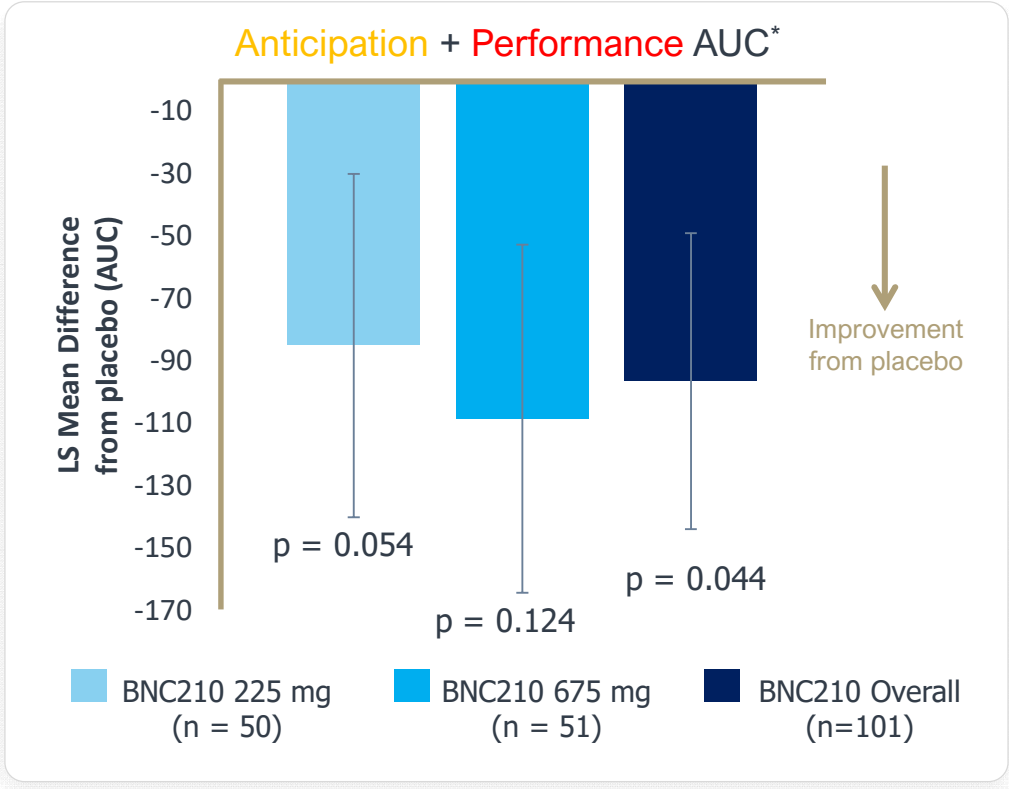


Similar reduction of anxiety allows for combination of active arms (225 mg and 675 mg) for further analysis

*Post-hoc analysis of mean SUDS values. No models or imputations applied. †Baseline demographics of the population: Mean age: 39.5 years (min 18, max 65); Male/Female 56/95 (62.9% Females).

BNC210 Significantly Reduced Anxiety As Measured By SUDS During the Public Speaking Task



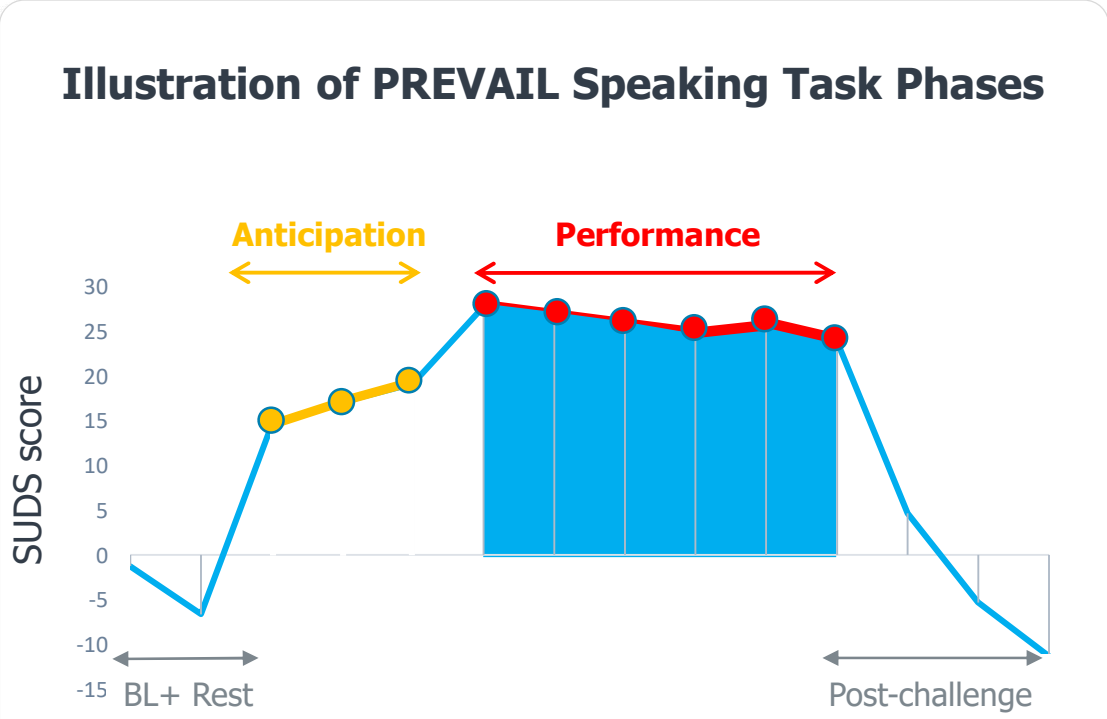


Statistical significance was observed in the combined task phases, using the selected primary outcome (SUDS) in the combined dose arm group (increased power)

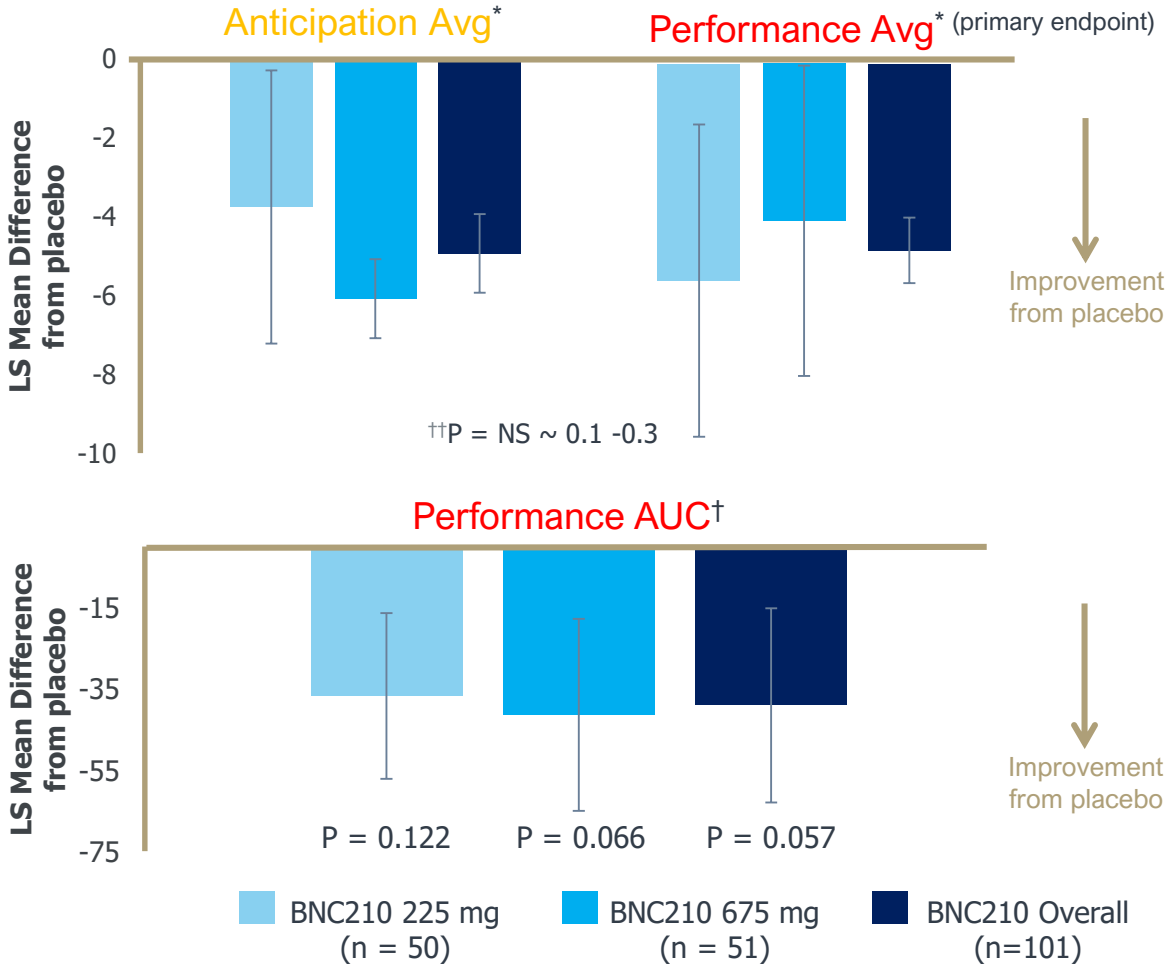
*Analysis of covariance (ANCOVA).

Consistent Efficacy Trends Were Also Seen in Parts of the Public Speaking Task

Average change from baseline in the performance phase of the public speaking task



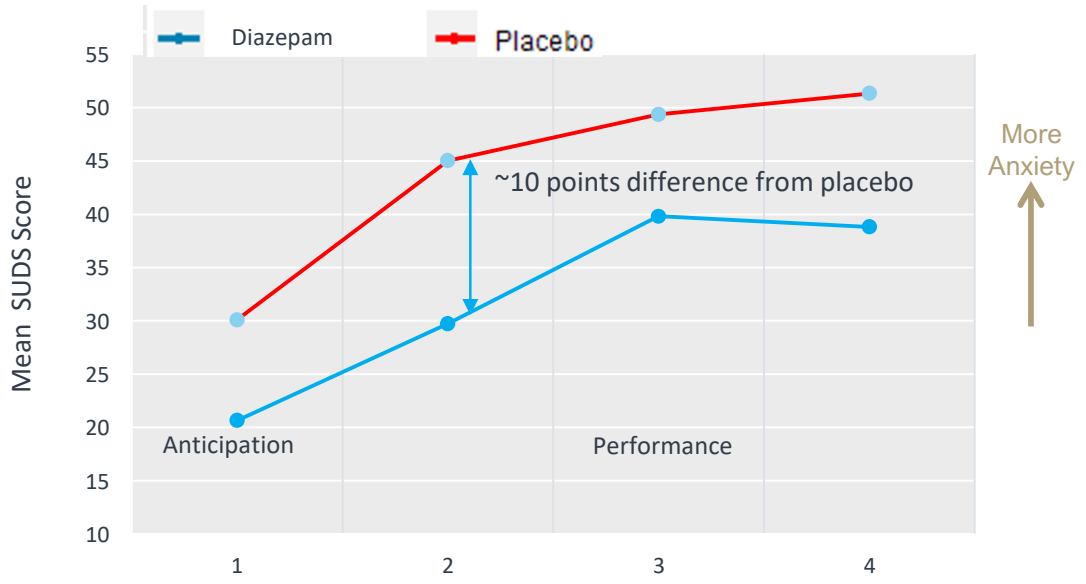
Prespecified endpoints based on individual public speaking task phases



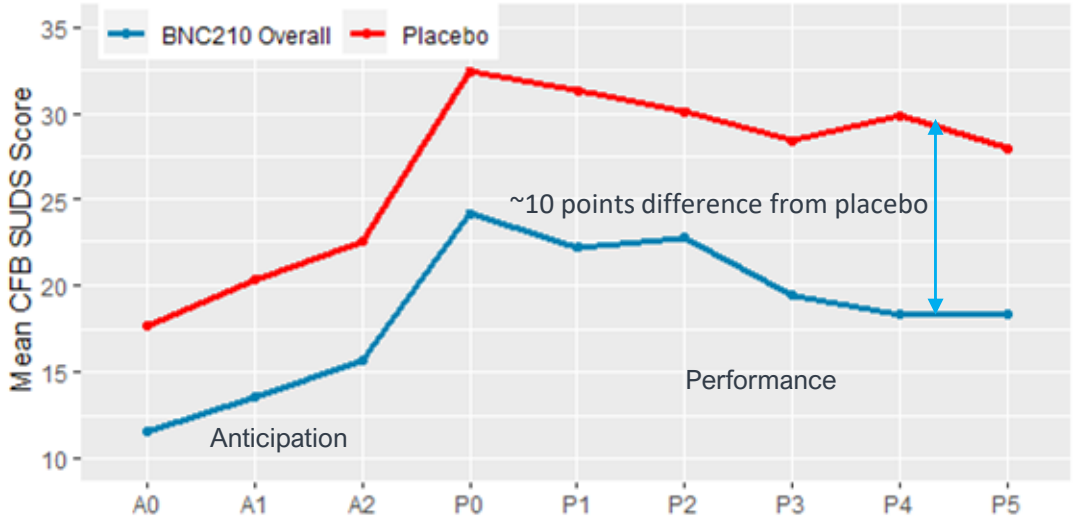
*Mixed model for repeated measures (MMRM). †Analysis of covariance (ANCOVA). †† P values including pre-specified primary endpoint – the Performance Avg - did not reach significance and ranged approximately between 0.1 and 0.3

Clinical Meaningfulness: BNC210 Demonstrated Reduction in Anxiety Comparable in Magnitude to Benzodiazepines

Mean Change in SUDS Diazepam 5 mg*



Mean Change from Baseline in SUDS BNC210: Ph2 PREVAIL Study



*Adapted from Helmus et al. *Experimental and Clinical Psychopharmacology.* 2005.

BNC210 Showed a Highly Favorable Safety Profile

- No serious nor severe adverse events reported
- The majority of adverse events were reported as mild (17 out of 21)
- The 4 moderate adverse events were:
  - Dizziness and headache (225 mg BNC210)
  - Headache and somnolence (675 mg BNC210)

Number of Subjects	Placebo	BNC210 225 mg	BNC210 675 mg	Overall
With at Least 1 TEAE (%)	3 (6.0)	7 (14.0)	11 (21.6)	21 (13.9)
By Relationship to Study Drug				
Possibly/Probably/Definitely (%)	0/2/0 (0/4.9/0)	3/3/0 (6.0/6.0/0)	2/7/0 (3.9/13.7/0)	5/12/0 (3.3/7.9/0)
By Severity				
Mild/Moderate/Severe (%)	3/0/0 (6.0/0/0)	5/2/0 (10.0/4.0/0)	9/2/0 (17.6/3.9/0)	17/4/0 (11.3/2.6/0)
Serious Adverse Event	0	0	0	0

System Organ Class & Preferred Term	Placebo	BNC210 225 mg	BNC210 675 mg	Overall
Nervous System Disorders				
Somnolence (%)	2 (4.0)	2 (4.0)	6 (11.8)	10 (6.6)
Headache (%)	1 (2.0)	3 (6.0)	2 (3.9)	6 (4.0)
Dizziness (%)	0 (0)	1 (2.0)	3 (5.9)	4 (2.6)
Gastrointestinal disorders				
Abdominal pain upper (%)	0 (0)	0 (0)	2 (3.9)	2 (1.3)

TEAE = Treatment-Emergent Adverse Events.

PREVAIL is Expected to Enable Late-Stage Development of BNC210 in SAD

Options for SUDS-based late-stage endpoints were identified and will be discussed with FDA

BNC210 Efficacy & Safety

- BNC210 **reduced anxiety** as measured by SUDS* during the public speaking task in the combined dose arm
- Safety and tolerability profile is favorable and compatible with a non-sedating anxiolytic

Study Design & Dose Identification

- **225 mg** is the top dose to be tested in late-stage trials
- PREVAIL was completed in less than a year
- The Public Speaking Task performed as expected

Next Steps

- **FDA End-of-Phase 2 Meeting anticipated in 2H'23**
- Start-up activities initiated for Phase 3 study
- Potential for First Patient Dosed expected in Q4'23 / Q1'24

*Post-hoc analysis of mean SUDS; no manipulation applied.

BNC210 in Post-Traumatic Stress Disorder

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PTSD: A Chronic Psychiatric Disorder with Significant Unmet Need

Only 20-30% of PTSD patients achieve clinical remission on SoC SSRI therapy[1]

PTSD is a debilitating disorder that leads to social, occupational and interpersonal dysfunction. It involves flashbacks, intrusive thoughts and nightmares

PTSD causes changes in cognition, mood, arousal and reactivity, and can ultimately affect work, relationships, and ability to perform daily activities

PTSD results from exposure to actual or threatened death, serious injury or sexual violence

	BNC210's Advantages*			
	BNC210	SSRIs / SNRIs	Ketamine *Experimental*	MDMA† *Experimental*
No Withdrawal Syndrome	✓	X[2,3]	✓	X[4]
No neurotoxicity or other toxicity	✓	✓	X[5,6]	X[7]
No Cognitive or Memory Impairment	✓	✓	X[8]	X[9]
No Suicidal Ideation/ Suicide Risk	✓	X	✓	X[10]

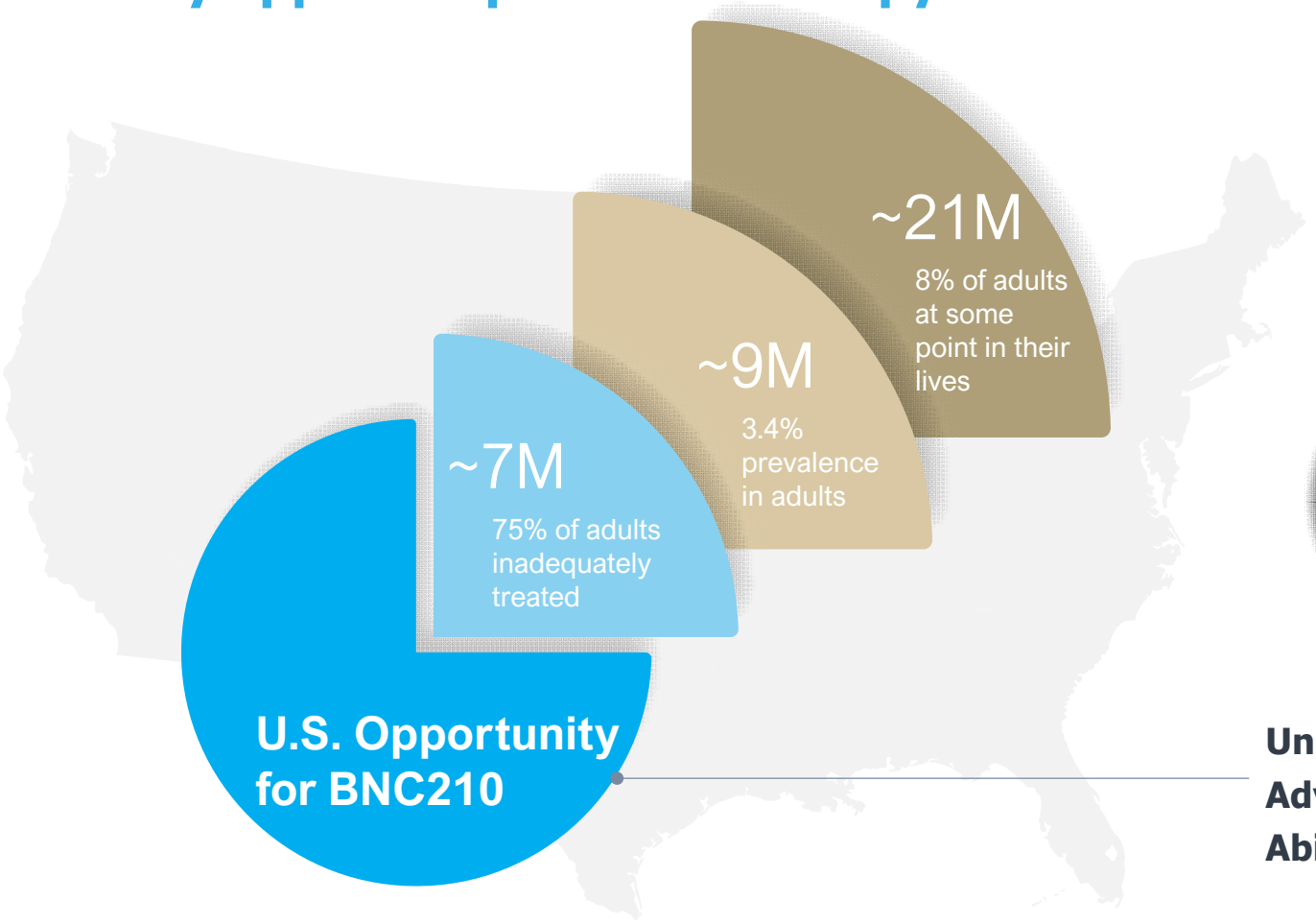
1. Lee DJ, et al. *Depress Anxiety*. 2016. 2. Fava GA, et al. *Psychother Psychosom*. 2015. 3. Fava GA, et al. *Psychother Psychosom*. 2018. 4. Barbui C, et al. *CMAJ*. 2009. 5. Kurdi MS, et al. *Anesth Essays Res*. 2014. 6. Dong C, et al. *Toxicol Lett*. 2013. 7. Sarkar S, et al. *Curr Pharm Biotechnol*. 2010. 8. Ward J, et al. *J Clin Exp Neuropsychol*. 2006. 9. Morgan CJ, et al. *Addiction*. 2012. 10. Wagner D, et al. *Addiction*. 2013. 10. Kim J, et al. *Suicide Life Threat Behav*. 2011.

*Potential benefits based on analysis of data from separate studies and not on results that might have been obtained from head-to-head studies.

† MDMA does not work as a monotherapy. MDMA has been explored in combination with CBT. BNC210 + MDMA combination therapy may reduce number of CBT sessions required during MDMA treatment.

PTSD Represents a Significant Unmet Need and Market Opportunity

No newly approved pharmacotherapy in almost two decades



BNC210 could achieve blockbuster status in US annual peak sales in PTSD*

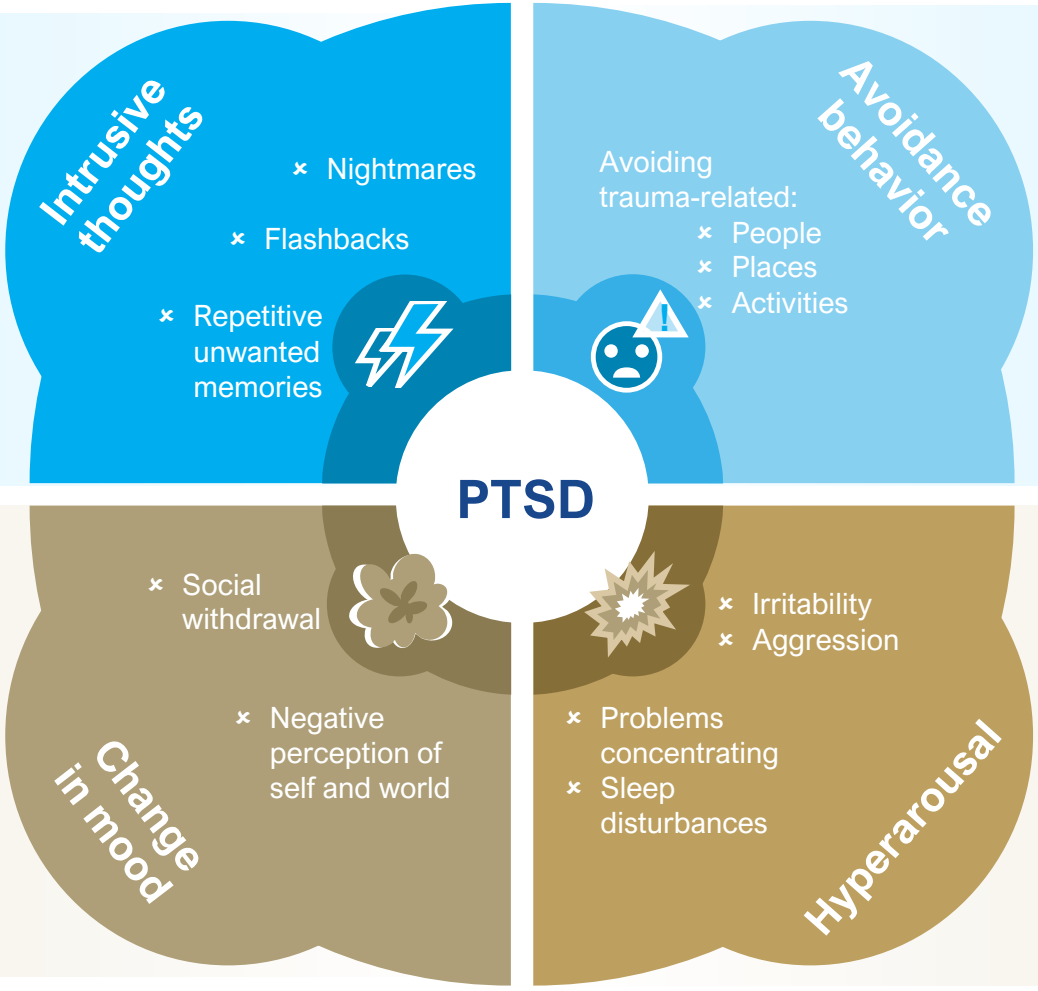
Unmet medical need to large patient population
Advancement in care
Ability to potentially achieve large market share

Kilpatrick, D., et al., Journal of Traumatic Stress, 2013.
Mayo LM, et al. Biol Psychiatry. 2020.
US Census Bureau. https://www.census.gov/library/stories/2021/08/united-states-adult-population-grew-faster-than-nations-total-population-from-2010-to-2020.html
*Based on 3rd party (Bluestar BioAdvisors) independent market analysis.

BNC210: Strong Rationale Support Broad Potential Against PTSD Symptoms

Preclinical studies, Phase 1 CCK-4 trial and Phase 2 trials in GAD and SAD support BNC210's utility in PTSD

Enhanced conditioned fear extinction in rodents and emotional recovery in humans following panic attack*



↓ Threat avoidance behavior in humans (GAD Phase 2) and rodent models†

↓ Number/intensity panic symptoms in humans*

Antidepressant effects in rodent model of depression

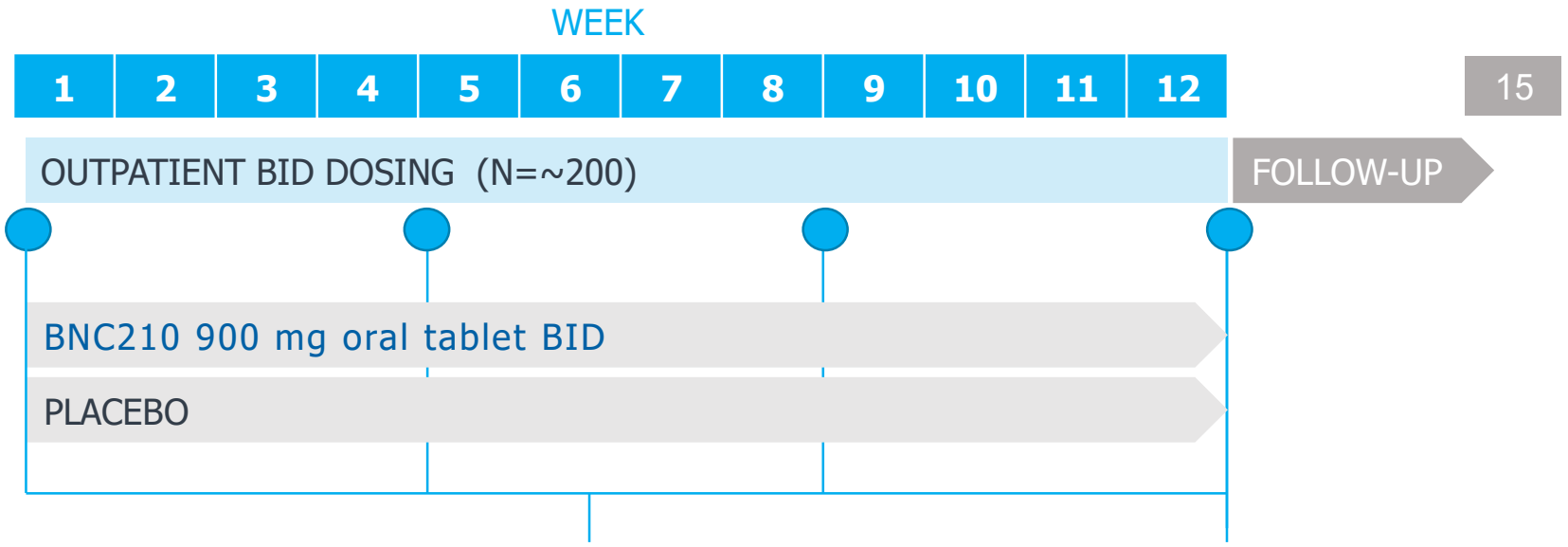
↓ Anxious behavior in rodents and humans†,‡

↓ Amygdala hyperactivity in humans†

GAD: General anxiety disorder; SAD: Social anxiety disorder
*Seen in Phase 1 CCK-4 trial. †Seen in Phase 2 GAD trial. ‡Seen in Phase 2 SAD trial.

Enrollment Complete in Phase 2b Double-Blind Randomized Placebo-Controlled BNC210 Monotherapy PTSD Trial

ATTUNE Study



SECONDARY ENDPOINTS

Change from baseline to Week 12 compared to placebo in:
CAPS-5 Response and Remission
PTSD-checklist, Anxiety (HAM-A), Depression (MADRS), CGI, Sleep (ISI) and Disability (SDS)
Safety & tolerability endpoints

PRIMARY ENDPOINT

CAPS-5 Total Symptom Severity Scores in change from Baseline to Week 12 compared to placebo

Phase 2b

Single potential registrational-supporting trial for monotherapy treatment in PTSD

KEY INCLUSION CRITERIA

Female and male (18 – 75 years)
Current PTSD diagnosis
CAPS-5 ≥ 30 (Screening & Baseline)
(& ≤ 25% decrease Screening to Baseline)

34 Sites (US and UK)

Fast Track designation from FDA

Topline data expected Q3 2023

BID = Twice daily dosing; CAPS-5 = Clinician-Administered PTSD Scale for the Diagnostic and Statistical Manual of Mental Disorders, 5th Edition (DSM-5).

BNC210: Future Development Strategy Highlights

Seek approval in an acute indication: Acute SAD

Potential for rapid approval in acute setting

Seek approval in first chronic indication: PTSD

Building robust safety database for BNC210 as a potential chronic treatment[1]

Leveraging robust efficacy & safety record across BNC210 programs*

Evaluate other indications for BNC210

Evaluate other acute and chronic anxiety and stressor-related disorders

Co-Morbid Anxiety
- Chronic Social Anxiety Disorder
- Generalized Anxiety Disorder
- Panic Disorder
- Bipolar Disorder
- Major Depressive Disorder

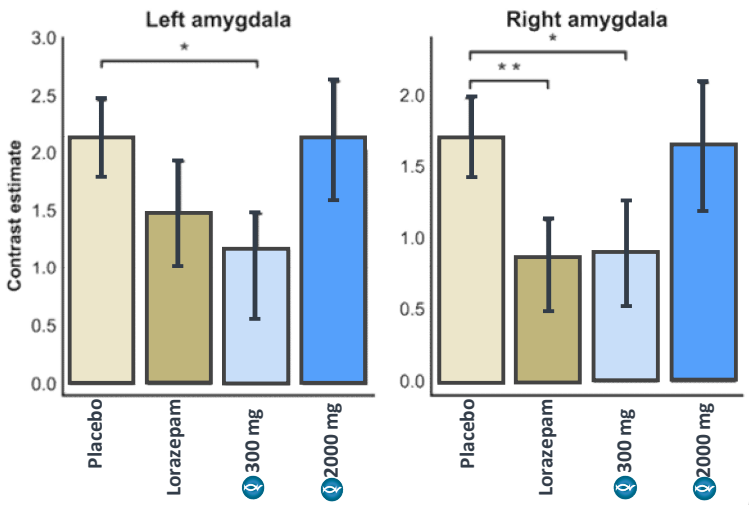
Neurodegenerative Disease
- Anxiety & Agitation

*Clinical data observed in ~400 subjects to date in 12 clinical trials, excluding ongoing ATTUNE and PREVAIL studies.

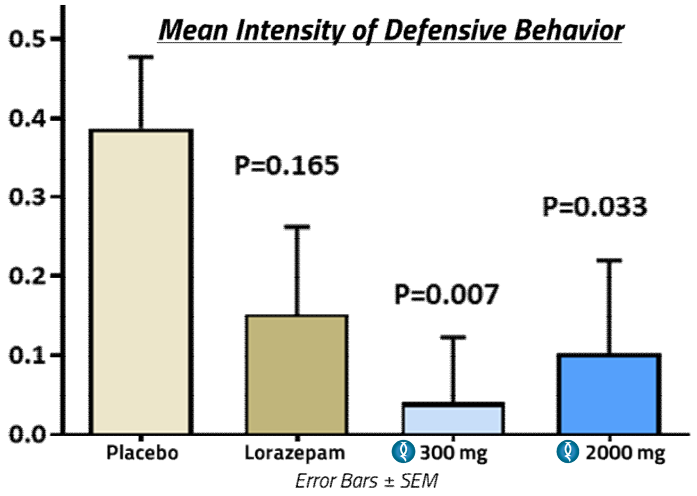
BNC210 Acute Administration Reduces Anxiety-Related Measures in a Phase 2a Study in Generalized Anxiety Disorder

BNC210 reduced activation of L & R amygdala caused by viewing fearful faces (L: p=0.011; R: p=0.006)

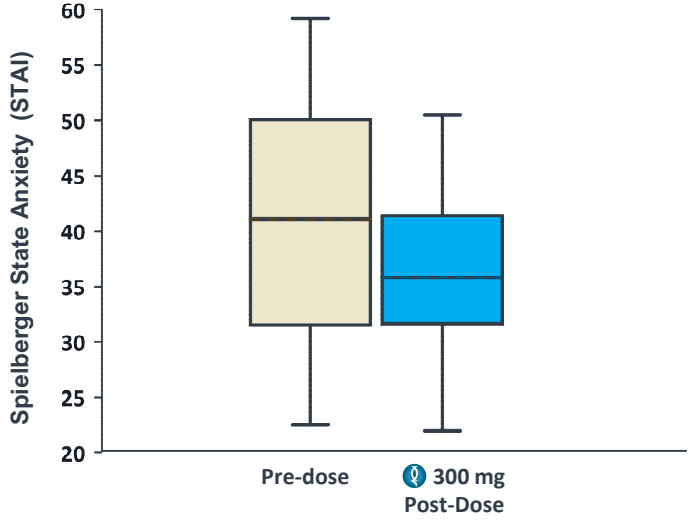
Amygdala activation is an imaging surrogate for anxiety



BNC210 300 mg and 2000 mg reduced threat avoidance behaviour of anxious subjects in the JORT behavioural task



BNC210 300 mg significantly reduced self-reported state anxiety - STAI (p=0.003)



Comparisons favor BNC210 vs Lorazepam, a common benzodiazepine

= *BNC210*

JORT = Joystick Operated Runway Task.

Wise T, et al., *Biological Psychiatry.* 2020. Perkins A, et al., *Translational Psychiatry.* 2021.

CNS-focused Collaborations

MDMA Derivative in combination with BNC210 for PTSD

Cognitive Impairment in Alzheimer's and other CNS disorders

Bionomics

Merck & Co Strategic Collaboration: Positive Allosteric Modulators (PAMs) of α7 Nicotinic Acetylcholine Receptor for Treatment of Cognitive Deficits

α7 Receptor PAMs correct hypocholinergic states in cognitive dysfunction and impairment

MSD* Collaboration Overview

2014 agreement to develop α7 receptor PAMs targeting cognitive dysfunction associated with Alzheimer's disease, schizophrenia, and other CNS conditions

Merck funds all research and clinical development, and WW commercialization of any resulting products

Payments received: US$20M upfront and US$10M for Phase 1 milestone

Eligible to receive up to US$465M in additional milestone payments plus royalties

Development Updates

Two α7 receptor PAM candidates in early-stage Phase 1 safety and biomarker studies for cognitive impairment

1st compound has completed Phase 1 safety clinical trials in healthy subjects and biomarker studies ongoing

In 2020, a second molecule with an improved potency profile in non-human primate models was advanced into Phase 1 clinical trials

PAM = Positive allosteric modulator.
*MSD is a tradename of Merck & Co., Inc., Kenilworth NJ USA.
Wang et al. *J Pharmacol Exp Ther.* 2020.

Leadership, Financial Information & Investment Highlights

Powered by an Experienced and Dynamic Management Team

Spyros Papapetropoulos, MD, PhD

President & CEO

ACADIA Pharmaceuticals · Allergan · Biogen · Cavion · Pfizer · SwanBio Therapeutics · teva · vigil Neuro

Connor Bernstein

Finance and Corporate Strategy

Apeiron Investment Group · Circumvent Pharma · Houlihan Lokey · Guggenheim Securities · Link Immunotherapeutics · PWP Perella Weinberg Partners · Piper Sandler · RBC Capital Markets

Atul Mahableshwarkar

Clinical Development

Emalex Biosciences · Revance · gsk · Takeda · janssen

Julie Kerner

Business Operations

Avrobio · Aliada Therapeutics · Biogen · Fulcrum Therapeutics · Wave Life Sciences · DRG Part of Clarivate

Liz Doolin

Clinical Development

ag · British Biotech

New World Bio Limited

Adrian Hinton

Interim Aus. CFO

Deloitte. · APAG

Stock, Financial, and IP Snapshot

Lean operations with modest burn

A$30.7M (US$20.7M) of net cash[1]

US-focused corporate strategy

ASX : BNO

Nasdaq : BNOX

Leading Significant Investors

APEIRON INVESTMENT GROUP

BVF PARTNERS L.P.

PRESIGHT CAPITAL

MERCK

CNS patents filed in the US and abroad

USA: 5 granted, 4 pending

Worldwide: 4 granted, 5 pending

BNC210 IP coverage extends into late 2030s

BNC210 freedom to operate opinion

1. Figures as of December 31, 2022.

Targeting Common Neuropsychiatric Disorders of High Unmet Need

BNC210: Phase 3-Ready α7 Nicotinic Receptor Negative Allosteric Modulator Leads Pipeline

- Non-sedating anxiolytic profile and rapid onset of action: **potential first & best-in-class** for the acute treatment of Social Anxiety Disorder
- If approved, could be the first acute, as-needed treatment for Social Anxiety Disorder with a non-sedating, non-habit-forming profile

Near Term Clinical and Regulatory Milestones Anticipated

- **Q3'23:** Topline data from placebo-controlled Phase 2b ATTUNE study of BNC210 in PTSD
- **2H'23:** FDA End of Phase 2 meeting to discuss registrational program for BNC210 in Social Anxiety Disorder
- **Q4'23 / Q1'24:** Potential for first patient dosed in Phase 3 study of BNC210 in Social Anxiety Disorder

Partnerships and Collaborations Support Early-Stage Programs

- **Merck partnership** for Phase 1 candidates targeting cognitive deficits in Alzheimer's and other CNS disorders
- Memorandum of understanding with EmpathBio for feasibility assessment of EMP-01 (MDMA derivative) & BNC210 for PTSD treatment
- Other partnering opportunities include preclinical assets targeting potassium (Kv) and sodium (Nav) ion channels

CNS = central nervous system; FDA = US Food and Drug Administration; MDMA =3,4-Methylenedioxymethamphetamine; MOU = Memorandum of Understanding; NAM = negative allosteric modulator; PTSD = post-traumatic stress disorder.