Bionomics

PREVAIL Data Disclosure Webcast

March 9, 2023

Improving the Lives of Patients with Serious CNS Disorders

ASX: BNO | Nasdaq: BNOX

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Bionomics: Clinical Stage Company with Focused CNS Pipeline and Multiple Catalysts on the Horizon

Clinical stage ion channel focused company targeting Social Anxiety Disorder (SAD), Post-Traumatic Stress Disorder (PTSD) and cognitive dysfunction associated with Alzheimer's disease, schizophrenia and other CNS conditions through proprietary programs, partnerships and collaborations*

Program	Indication	Pre-Clinical / Phase 1 / Phase 2 / Phase 3	Status
Proprietary Programs:			
BNC210 α7 receptor NAM	Social Anxiety Disorder (SAD)	PREVAIL — Fast Track	Study completed Topline Data Annc. YE 2022
	Post-Traumatic Stress Disorder (PTSD)	ATTUNE — Fast Track	Study underway Topline Data: mid 2023
Collaboration Programs:			
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

*Pipeline of partnering candidates targeting potassium (Kv) and sodium (Nav) ion channels and partnership on legacy oncology program with Carina Biotech.

NAM = Negative Allosteric Modulator
PAM = Positive Allosteric Modulator

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BNC210: A Best-In-Class Development Candidate

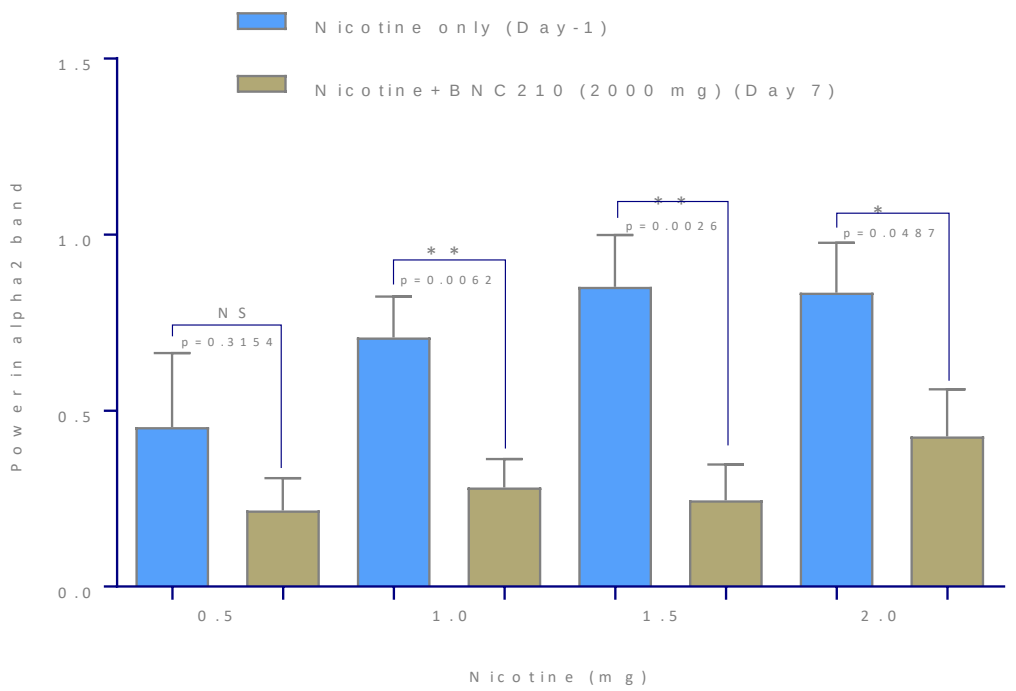
With a Profile Compatible as an Acute Non-Sedating Anxiolytic

- Novel negative allosteric modulator of α7 nAChR for treatment of anxiety and stressor-related disorders
- Extensive safety database from 13 clinical trials completed to date with exposure in over 500 subjects supporting a non-sedating, non-addicting anxiolytic profile
- Has achieved clinical Proof of Target Engagement (PTE), Proof of Mechanism (PoM) in panic model setting and Proof of Concept (PoC) in Generalized Anxiety Disorder (GAD)
- In development for underserved markets with >22 million patients in the US alone suffering from SAD and PTSD and no new FDA approved therapies in nearly two decades; peak annual sales for acute SAD of ~$1.7B and for chronic PTSD of ~$2.6B
- Strong proprietary protection with patent coverage through late 2030's

Proof of Target Engagement: BNC210 Modulates α7 Receptors in Healthy Volunteers

BNC210 reduces response of nicotinic receptors to stimulation

BNC210 Reduces Nicotine-induced EEG Responses



Activation of nicotinic receptors in the brain induces EEG response

↓

α7 receptors are the major nAChR populations targeted

↓

BNC210 daily oral dosing reduced nicotine-induced EEG in the α2 band

Reduction in EEG response serves to ***demonstrate BNC210's penetration of blood-brain barrier***

nAChR = Nicotinic Acetylcholine Receptor
EEG = Electroencephalography
* p-value less than 0.05
** p-value less than 0.01

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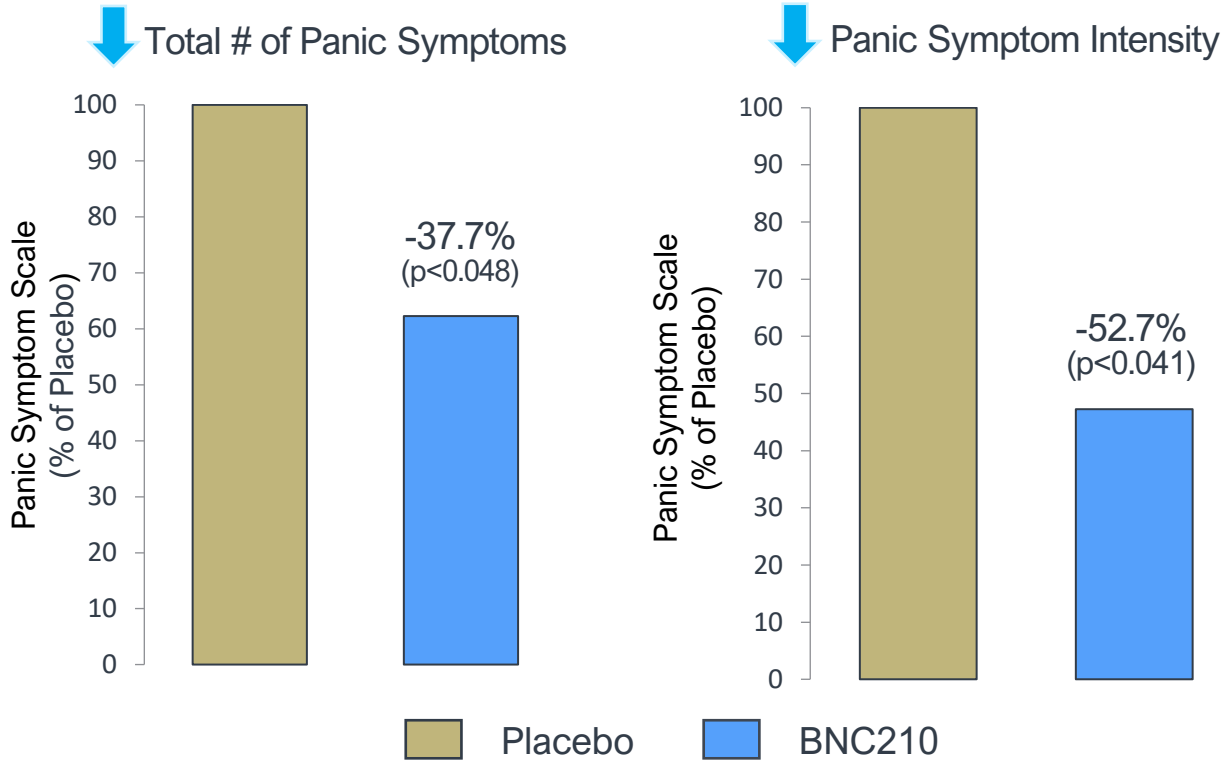
Proof of Mechanism: BNC210 Significantly Reduces Anxiety and Panic Symptoms

Phase 1b placebo-controlled study evaluating BNC210 in acute anxiety in 15 healthy volunteers who experienced a CCK-4-induced panic attack

- Subjects assessed after a single dose of BNC210 as they would be in an acute SAD trial setting
- Proof of Mechanism (PoM) in demonstrating anxiolytic activity

BNC210 demonstrated reduction in panic symptoms as measured with the Panic Symptom Scale



CCK-4 = Cholecystokinin Tetrapeptide (a peptide that induces anxiety and panic symptoms)

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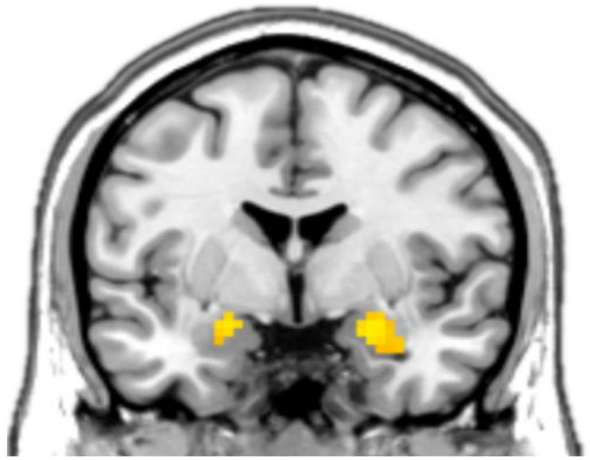
Proof of Concept: BNC210 Acute Administration Reduces Anxiety-Related Biomarkers in Generalized Anxiety Disorder Patients

Amygdala activation is an imaging surrogate for anxiety

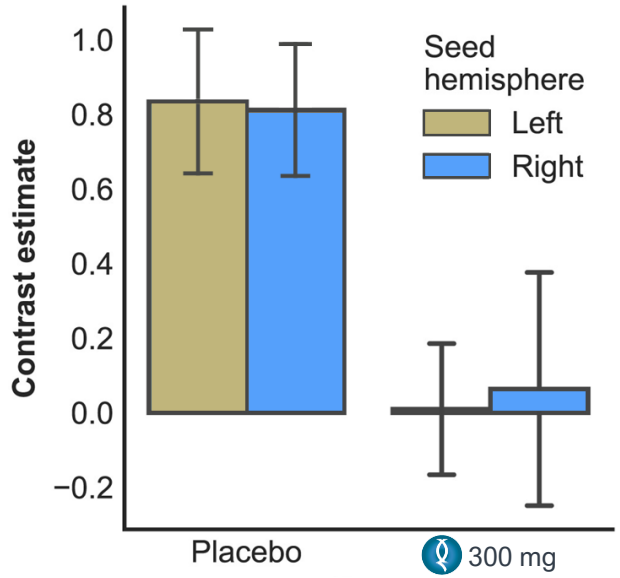
BNC210 reduced activation of L & R amygdala caused by viewing fearful faces (L: p=0.011; R: p=0.006)



300 mg

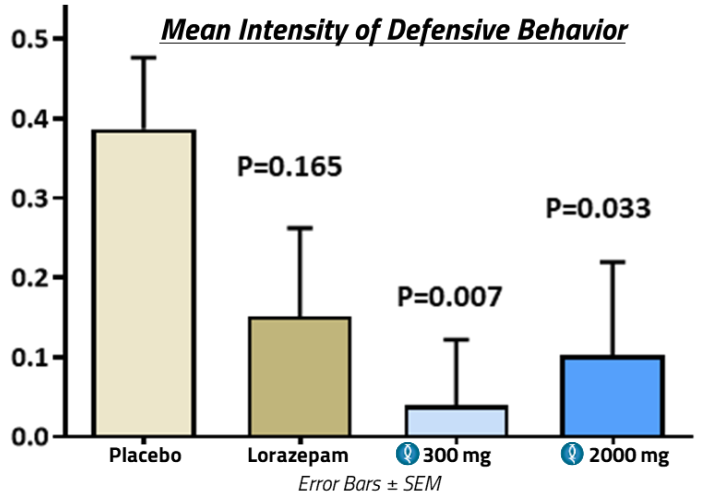
Connectivity between the amygdala and Anterior Cingulate Cortex (ACC) is very strong in high anxiety

BNC210 reduced connectivity between amygdala and ACC while viewing fearful faces (p=0.012)



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

BNC210 300 mg and 2000 mg reduced threat avoidance behavior of anxious subjects in the JORT behavioral task



= BNC210

Wise T. et al., Biological Psychiatry 2020 (https://doi.org/10.1016/j.biopsych.2019.12.013); Perkins A. et al., Translational Psychiatry 2021 (https://doi.org/10.1038/s41398-020-01141-5)

JORT = Joystick Operated Runway Task

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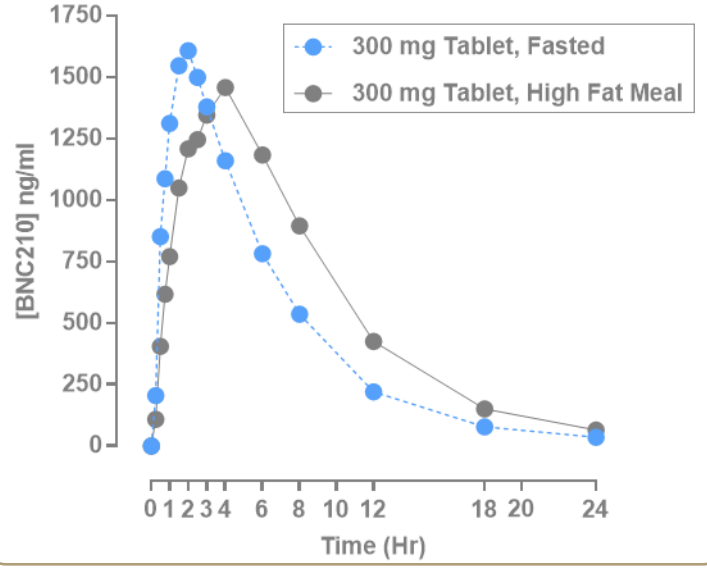
Fast-Acting Tablet Formulation Well-Suited for Treating Acute Anxiety Disorders

Desirable Solid-Dose PK Properties

1. No food effect
2. Rapid exposure
3. Dose-linear response

1 Novel tablet ***alleviates food effect***

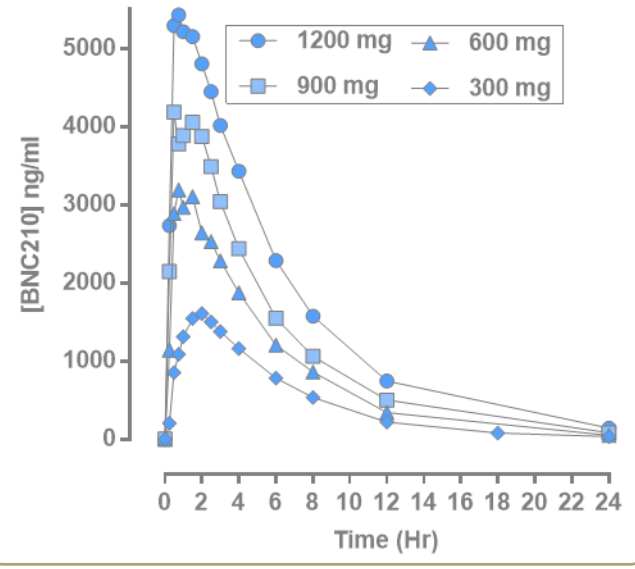


2

45 – 105 minutes

to reach maximum absorption concentrations across the dose range

3 Novel tablet has ***dose linear exposure***



✓ **IP coverage** extends to late 2030's with novel formulation

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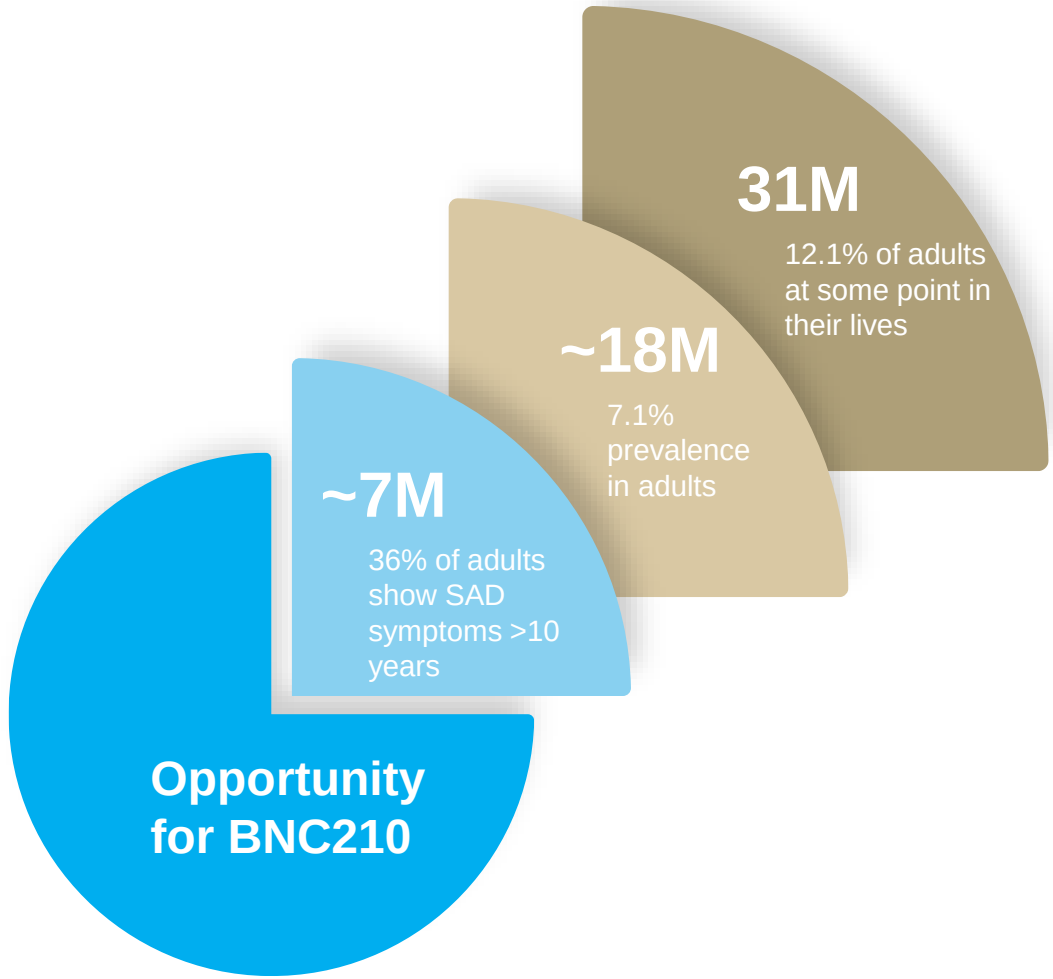
Social Anxiety Disorder Represents a Large Segment of the Anxiety Market

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

Social Anxiety Disorder (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

Amongst the largest mental health conditions with lifetime prevalence affecting >31M Americans. Triggers that exacerbate anxiety can occur at any time



Sources:
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

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A Phase 2, Randomized, Double-blind Study to Evaluate the Efficacy and Safety of BNC210 Compared to Placebo for the Acute Treatment of Social Anxiety Disorder

PREVAIL was a Well Powered Phase 2 Study to Enable Further Development

The selected design allowed for iterative learnings to enable late-stage development

Questions that PREVAIL was designed to answer:

1	Efficacy	Is BNC210 pharmacologically active and efficacious?
2	Primary Outcome	Can the activity be captured by SUDS? • if yes, what is the best analytical methodology?
3	Dose Response	Is there a dose response differentiating 225 mg and 675 mg?
4	Patient Population	Is subject selection optimal? If no, how can it be improved?
5	Safety	Does the safety and tolerability profile support further development? • If yes, is the profile compatible with a non-sedating anxiolytic?
6	Pharmacokinetics	Can the new BNC210 tablet formulation deliver a PK profile with rapid effect onset for acute treatment of social anxiety?
7	Overall Design	Can the selected study design support late-stage development? If yes, how can the overall design be improved?

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PREVAIL: A Study to Enable Iterative Late-Stage Development

PREVAIL Study

LIEBOWITZ SOCIAL ANXIETY SCALE

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

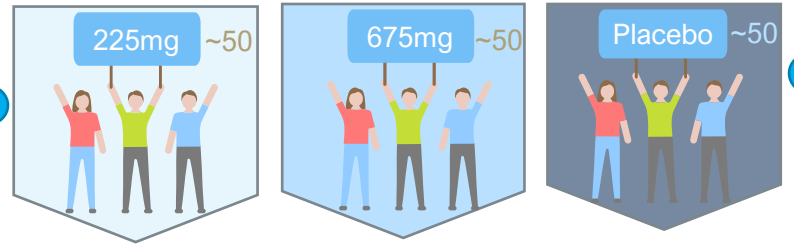
Phase 2 Study Design

15 US CENTERS
N~150

SCREENING

LSAS score ≥ 70

1:1:1 RANDOMIZATION
(DOUBLE-BLIND)



Participants I/E Criteria

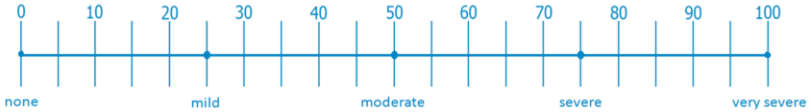
- Adults aged 18 to 65 years
- DSM-5 based diagnosis of SAD
- No psychotropic meds for 30 days prior to screening

Single Dose Administration

SINGLE ANXIETY CHALLENGE

PRIMARY EFFICACY MEASURE

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



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PREVAIL: Standardizing the Public Speaking Task for Potential Registrational Trials

Efficacy Schedule of Assessments

# Min Denotes amount of time spent in specific stage of study.
SUDS = Subjective Units Of Distress Scale
STAI = State-Trait Anxiety Inventory
SSPS-N = Self Statements During Public Speaking

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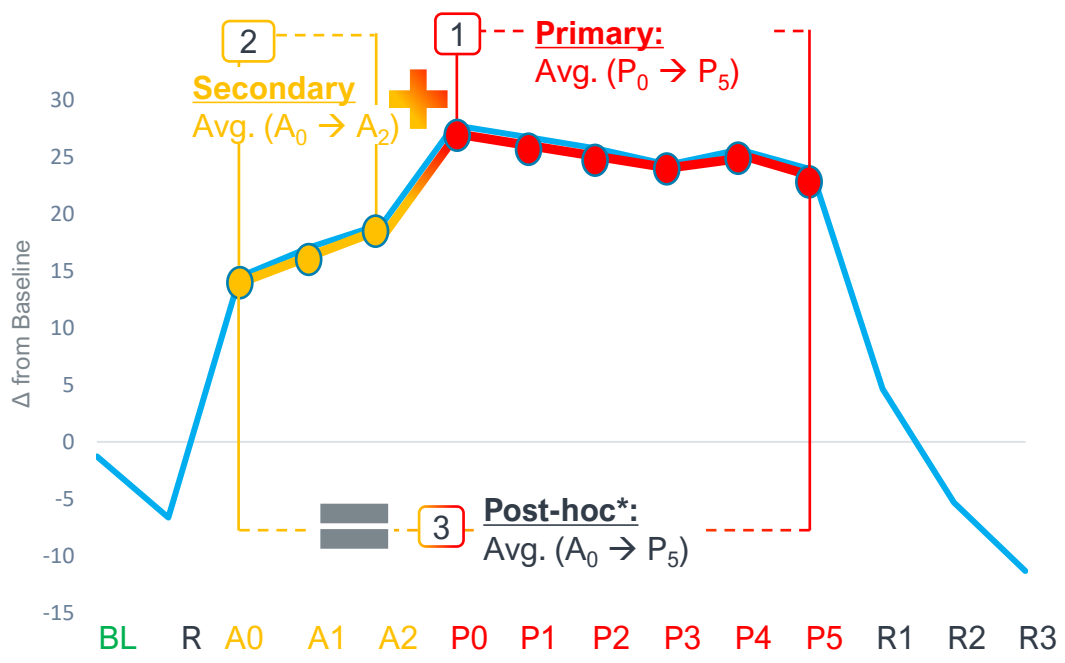
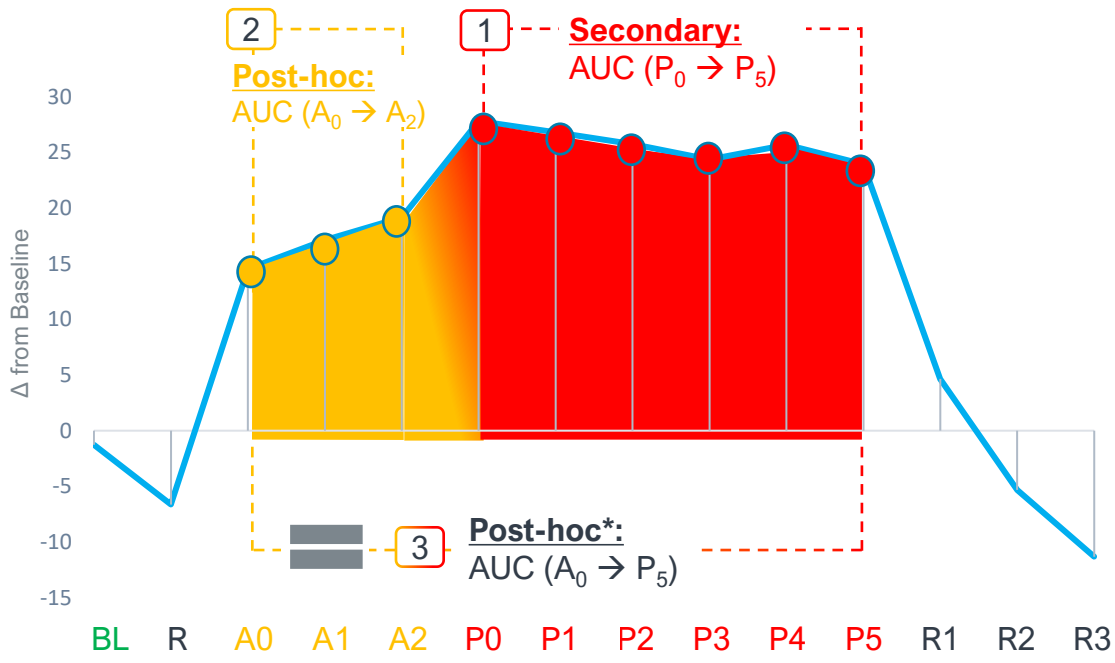
Primary Outcome Measure Analysis (SUDS) Should be Tailored Based on the Profile of BNC210

Efficacy Profile was Largely Unknown Prior to PREVAIL Readout

Average Change in SUDS



AUC of Change in SUDS



*Most clinically relevant endpoint combining 2 phases of increased anxiety
AUC = Area Under the Curve

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Subject Disposition and Baseline Demographics

Subject Disposition	BNC210 225 mg	BNC210 675 mg	BNC210 Overall	Placebo	Overall
Randomized/Safety/Full Analysis*/Study Completer Population	50	51	101	50	151
Per Protocol Population**	50	51	101	49	150
Baseline Characteristics					
Mean Age in Years (Min, Max)	35.5 (18,65)	37.7 (19,65)	36.6 (18,65)	34.5 (21,58)	35.9 (18,65)
Male/Female (%Female)	17/33 (66.0)	16/35 (68.6)	33/68 (67.3)	23/27 (54.0)	56/95 (62.9)

*Full Analysis Set (FAS): All randomized participants who receive any amount of the study intervention. Multiple prespecified and post-hoc subgroup analyses were conducted (presented in subsequent slides)
**Per Protocol (PP): FAS population who have no major protocol deviations. 1 participant was removed from the PP population prior to data lock for exclusion criterion #19 (previously participated in a study that involved a public speaking challenge)

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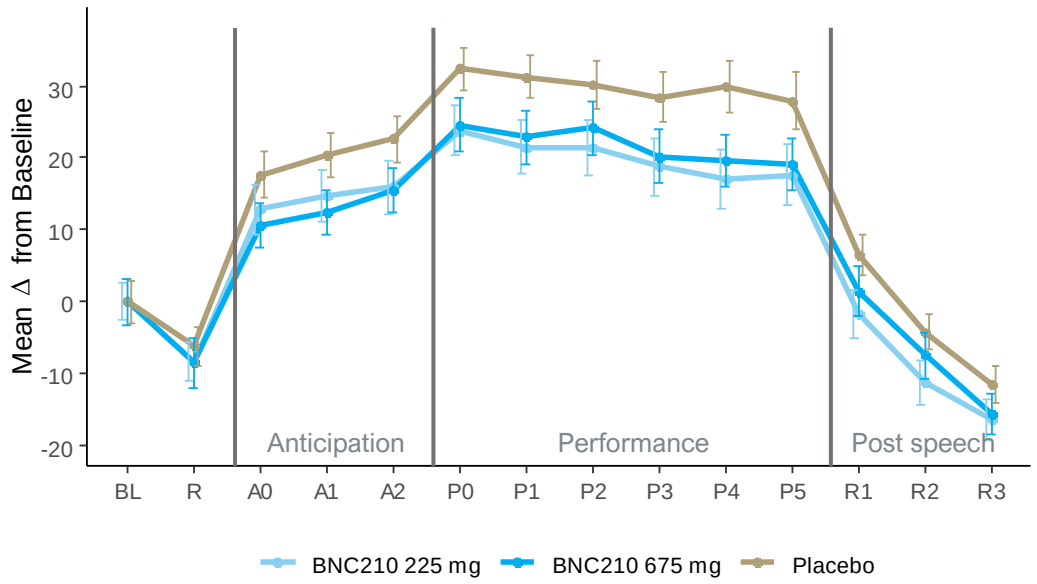
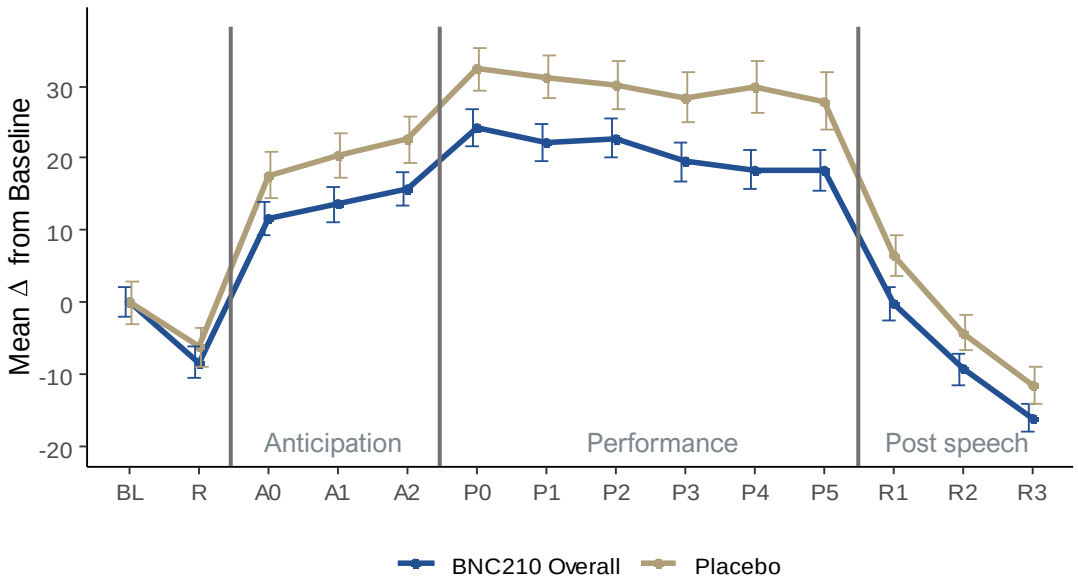
Proof of Pharmacology in SAD: Acute BNC210 Administration Demonstrates Activity Across the Phases of the Public Speaking Task

*BNC210 225 mg and 675 mg achieve similar separation from placebo**

Mean Change in SUDS Individual Arms



Mean Change in SUDS with Combined Arms



Dose response similarity 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
** Standard error represented

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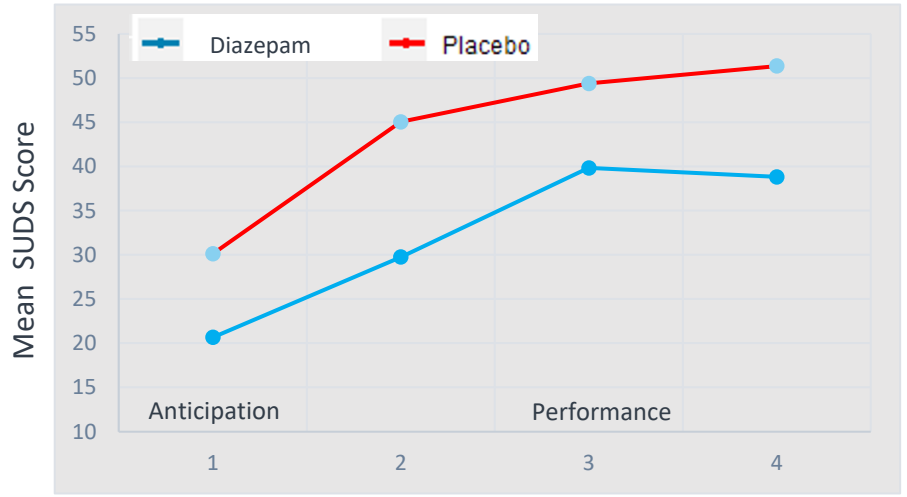
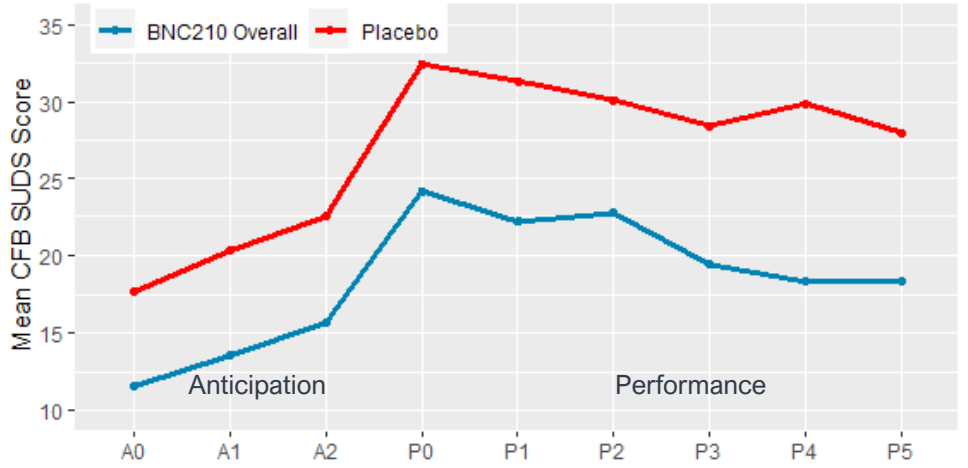
Clinical Meaningfulness: BNC210 Demonstrates Comparable Magnitude of Effect with Benzodiazepines

Mean Change in SUDS Diazepam 5 mg*



Mean Change from Baseline in SUDS BNC210 – Ph2



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

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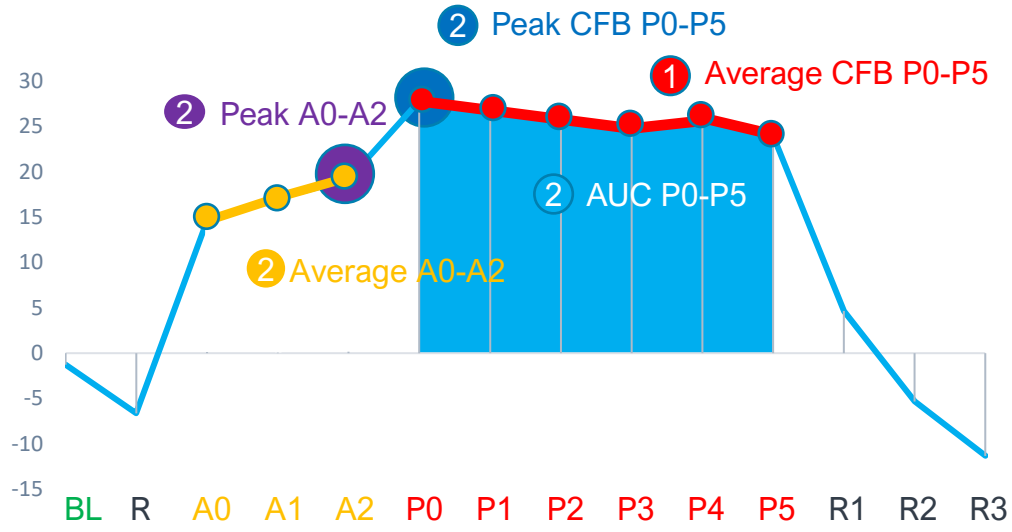
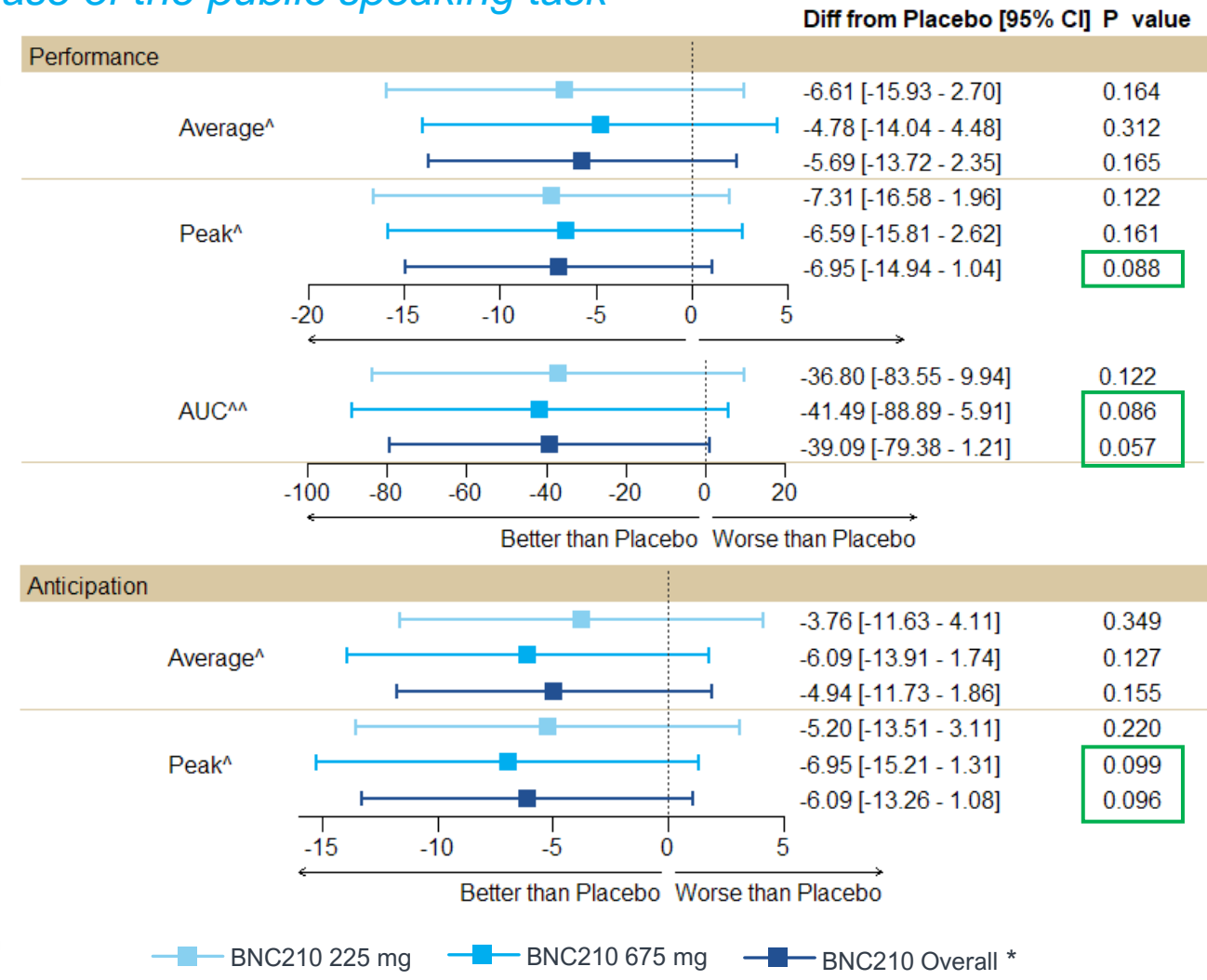
PREVAIL Did Not Meet the Primary Endpoint: Consistent Trends Were Observed

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

Prespecified endpoints in PREVAIL were based on individual public speaking task phases



Data available at the time of the press release



*Post-hoc analysis of mean SUDS values. No imputations applied.
^ Mixed model for repeated measures (MMRM); ^^ ANCOVA

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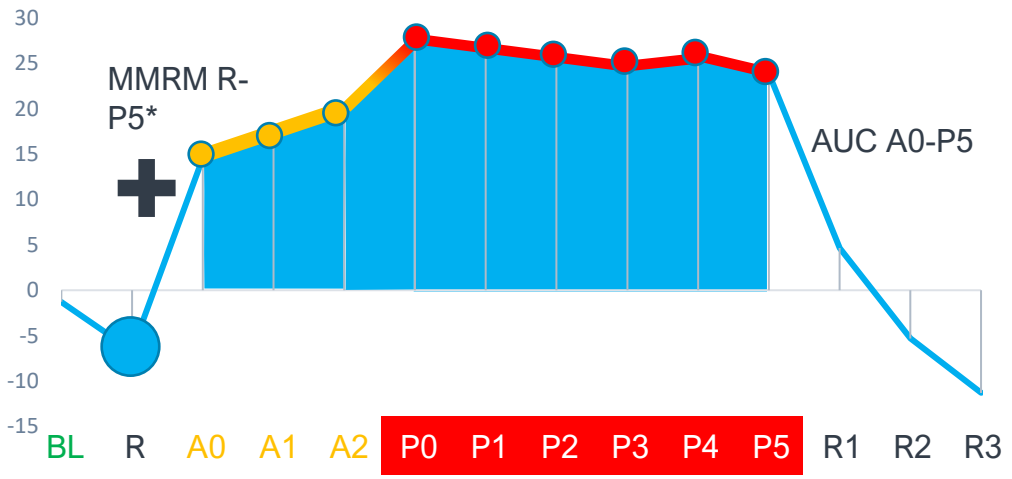
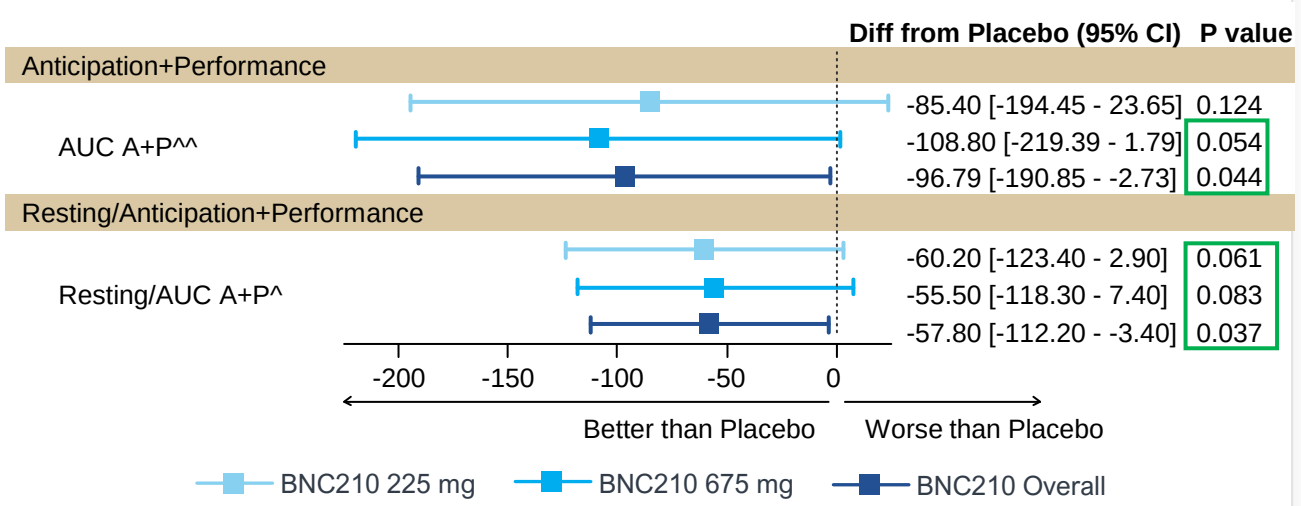
Statistical Significance is Achieved when Task Phases are Combined

Combining SUDS from all Task Phases is the Optimal Endpoint for Late-Stage Development in SAD

AUC of Change in SUDS for Anticipation and Speaking Phases



Results of Combined Speaking Task Phases



- Statistical significance was observed using the selected primary outcome (SUDS) in task stage analysis in the combined dose arm group (increased power)
- Analysis was based on the observation that BNC210 demonstrated pharmacological activity throughout the public speaking task

225 mg BNC210 was confirmed as the dose for late-stage development**

*Post-hoc analyses

**BNC210 225 mg matched estimated 300 mg Cmax concentrations seen in GAD trial

^ Mixed model for repeated measures (MMRM); ^^ ANCOVA

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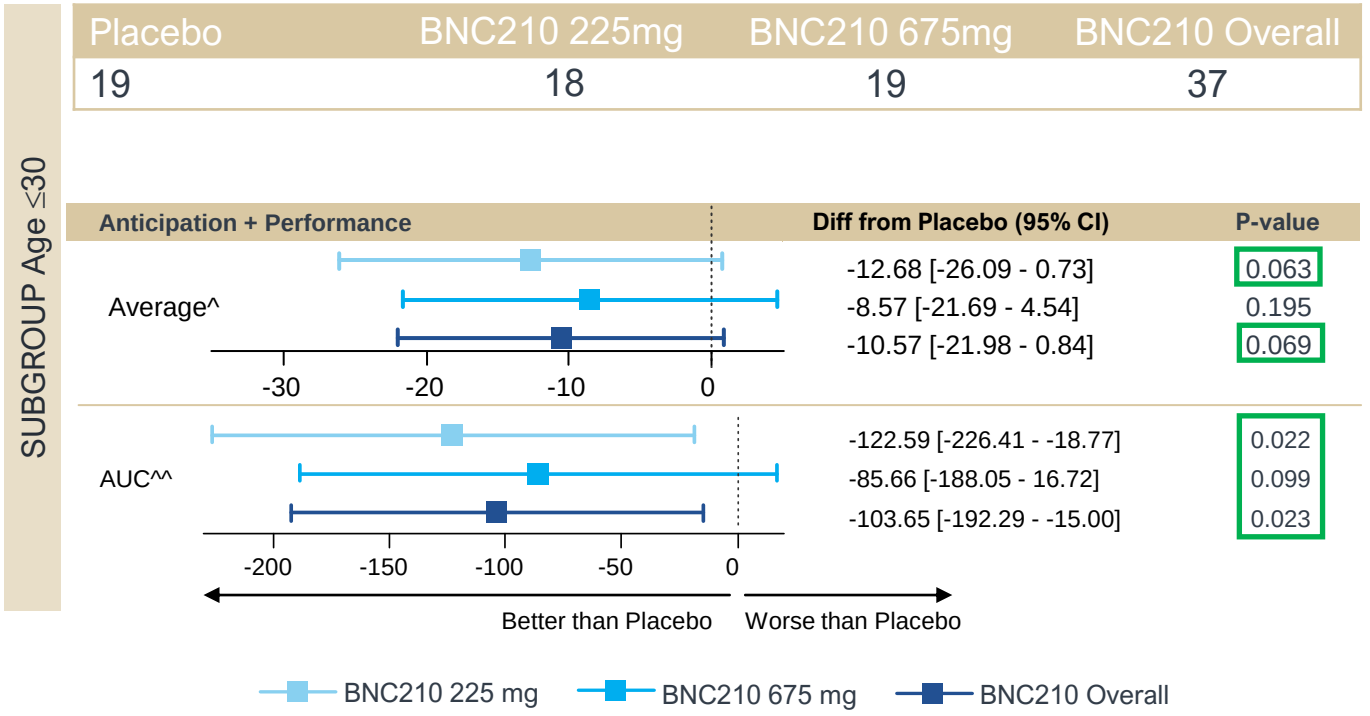
Subgroup Analyses* Uncovers a Patient Population for Late-stage Development

Subgroup analysis by age

Trends and Statistically Significant Effects for BNC210 in Younger Cohort on SUDS



*Post-hoc analyses

^ Mixed model for repeated measures (MMRM); ^^ ANCOVA

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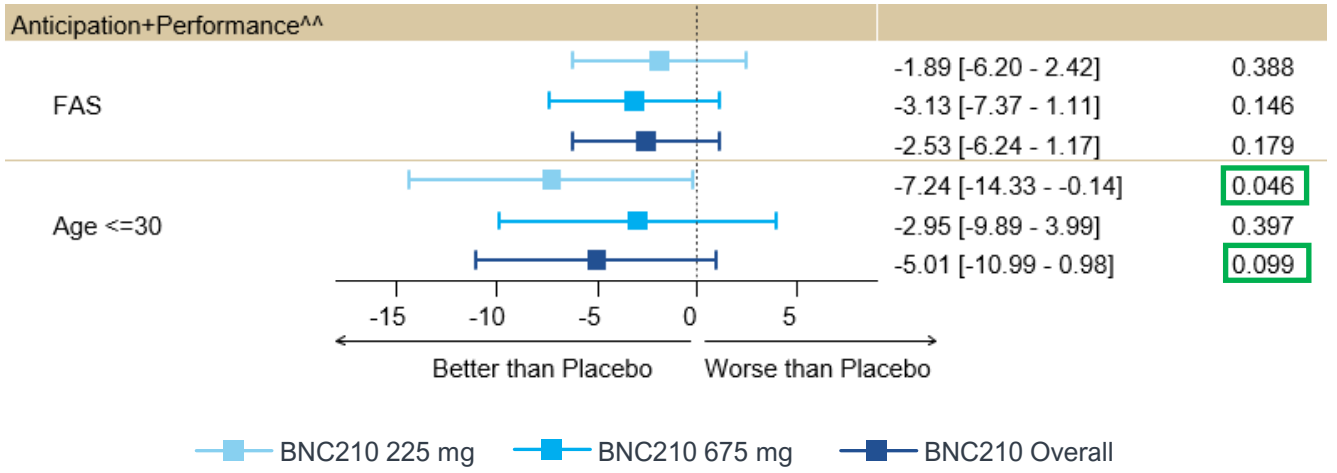
STAI-State Captures Trends in Prespecified and Post-hoc Analysis and Will be Considered as a Key Endpoint in Late-Stage Trials

Trends and Statistical Significance* for BNC210 in Younger Cohort on STAI



*Post-hoc analyses

^ Mixed model for repeated measures (MMRM); ^^ ANCOVA

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PREVAIL Conclusions are Expected to Enable Late-Stage Development in SAD

SUDS

- Consistent trends in prespecified analyses
- Significant effects observed in high anxiety phases of public speaking challenge
- Increased confidence in SUDS for primary endpoint – EoPh2 discussion

Dose Selection

- BNC210 225 mg and 675 mg achieve similar separation from placebo
- Combination of active arms increases confidence in data

Subgroup Analyses

- Subgroup analyses of age groups and also delivered statistically significant results favoring BNC210

STAI-State

- Convergence of STAI-state analysis confirmed SUDS observations
- Potential for secondary endpoint in future late-stage SAD trials

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Results – Safety & Tolerability

Adverse Event Summary: Highly Favorable Safety Profile

Number of Subjects	BNC210 225 mg	BNC210 675 mg	Placebo	Overall
With at Least 1 TEAE (%)	7 (14.0)	11 (21.6)	3 (6.0)	21 (13.9)
By Relationship to Study Drug				
Possibly/Probably/Definitely (%)	3/3/0 (6.0/6.0/0)	2/7/0 (3.9/13.7/0)	0/2/0 (0/4.9/0)	5/12/0 (3.3/7.9/0)
By Severity				
Mild/Moderate/Severe (%)	5/2/0 (10.0/4.0/0)	9/2/0 (17.6/3.9/0)	3/0/0 (6.0/0/0)	17/4/0 (11.3/2.6/0)
Serious Adverse Event	0	0	0	0
System Organ Class and Preferred Term	BNC210 225 mg	BNC210 675 mg	Placebo	Overall
Nervous System Disorders				
Somnolence (%)	2 (4.0)	6 (11.8)	2 (4.0)	10 (6.6)
Headache (%)	3 (6.0)	2 (3.9)	1 (2.0)	6 (4.0)
Dizziness (%)	1 (2.0)	3 (5.9)	0 (0)	4 (2.6)
Gastrointestinal disorders				
Abdominal pain upper (%)	0 (0)	2 (3.9)	0 (0)	2 (1.3)

- 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)

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

Questions that PREVAIL Addressed:

1	Efficacy	Is BNC210 is pharmacologically active and potentially efficacious
2	Primary Outcome	Analysis of SUDS by combination of phases of the public speaking task delivered stronger trends that reached significance in the combined dose arm
3	Dose Response	No dose separation was observed – BNC210 225 mg will be tested in late-stage trials
4	Patient Population	Focus on younger adults and potentially adolescents which make up most of the SAD population in the real word
5	Safety	Safety and tolerability profile is favorable and compatible with a non-sedating anxiolytic
6	Pharmacokinetics	The new BNC210 tablet formulation delivers a PK profile with rapid onset of effect for acute treatment of social anxiety
7	Overall Design	PREVAIL was completed in less than a year. The SAD Task performed as expected

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Next steps

2023 is a pivotal year for Bionomics

- Request and conduct FDA End-of-Phase 2 Meeting by Q3 2023 to discuss the registrational program design
- Initiate start-up activities for Ph3 study execution targeting First Patient In in late 2023-early 2024
- Kick-off financing and partnering discussions
- Initiate Bionomics' transformation into a late-clinical stage company with enhanced US focus
- Continue execution of PTSD program targeting a read-out in mid 2023
- Continue partnering discussions for Company's preclinical assets (KV3 and PanNav programs) and Merck Collaboration

Q&A Session

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