Bionomics – Corporate Presentation

January 2024

Developing treatments for patients with underserved CNS disorders

Safe Harbor Statement

Factors Affecting Future Performance

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Bionomics is an Advanced Clinical Stage CNS-focused Biotech Company with Multiple Value-Creating Milestones

Leading expertise in ion channel targeting, advancing a pipeline of best-in class allosteric modulators

BNC210	**Ph3-ready α7 NAM with unique non-sedating, non-habit-forming psychoactive profile suitable for acute and chronic dosing in multiple CNS indications**
PTSD and Social Anxiety Disorder	• No new treatment for decades • Significant socioeconomic impact • Blockbuster potential
Alzheimer's Disease and Schizophrenia	Clinical Stage partnership with Merck on a7 PAM valued ~500M in regulatory and clinical milestones

2024-2026
Milestone Rich Development Plan

Q1-Q2 2024

Initiation of SAD Ph3

Q2-Q3 2024

FDA PTSD breakthrough designation decision

FDA PTSD Meeting

Q4 2024

Initiation of late-stage PTSD study

2025-2026

SAD Ph3 readout

Potential Merck Ph2 milestone

PTSD late-stage trial Readout

EoP2 = end of Phase 2; FDA = U.S. Food and Drug Administration; NAM = Negative Allosteric Modulator; PAM = Positive Allosteric Modulator, PTSD = post-traumatic stress disorder; SAD = social anxiety disorder.

Management Team with Proven Track Record and Significant Expertise

Innovative thinking, nimble mindset, successful NDAs, drug launches, capital raises and strategic deals

Spyros Papapetropoulos, MD, PhD

President & CEO

Allergan · Biogen · Cavion · Pfizer · University of Miami · SwanBio Therapeutics · teva · vigil Neuro · ACADIA Pharmaceuticals · Massachusetts General Hospital

Tim Cunningham, CPA, MBA

CFO

Danforth Advisors · IBM · Organogenesis · pwc · KPMG

Mark A Smith, MD

Acting Chief Medical Officer

teva · Shire · DuPont

Julie Kerner, PhD

SVP, Business Operations and Early Commercialization

AVROBIO · ALIADA Therapeutics · WAVE Life Sciences · Biogen · DRG Part of Clarivate · Fulcrum Therapeutics

Liz Doolin, M.Sc.

SVP, Clinical Development

ag · British Biotech · New World Bio Limited

Matthew Brennan, MBA

VP, Business Development

IPSEN Innovation for patient care · fog pharma · vigil Neuro · Warp Drive Bio · SANOFI · FLATIRON

Bionomics Focused CNS Pipeline Targets Major Unmet Needs

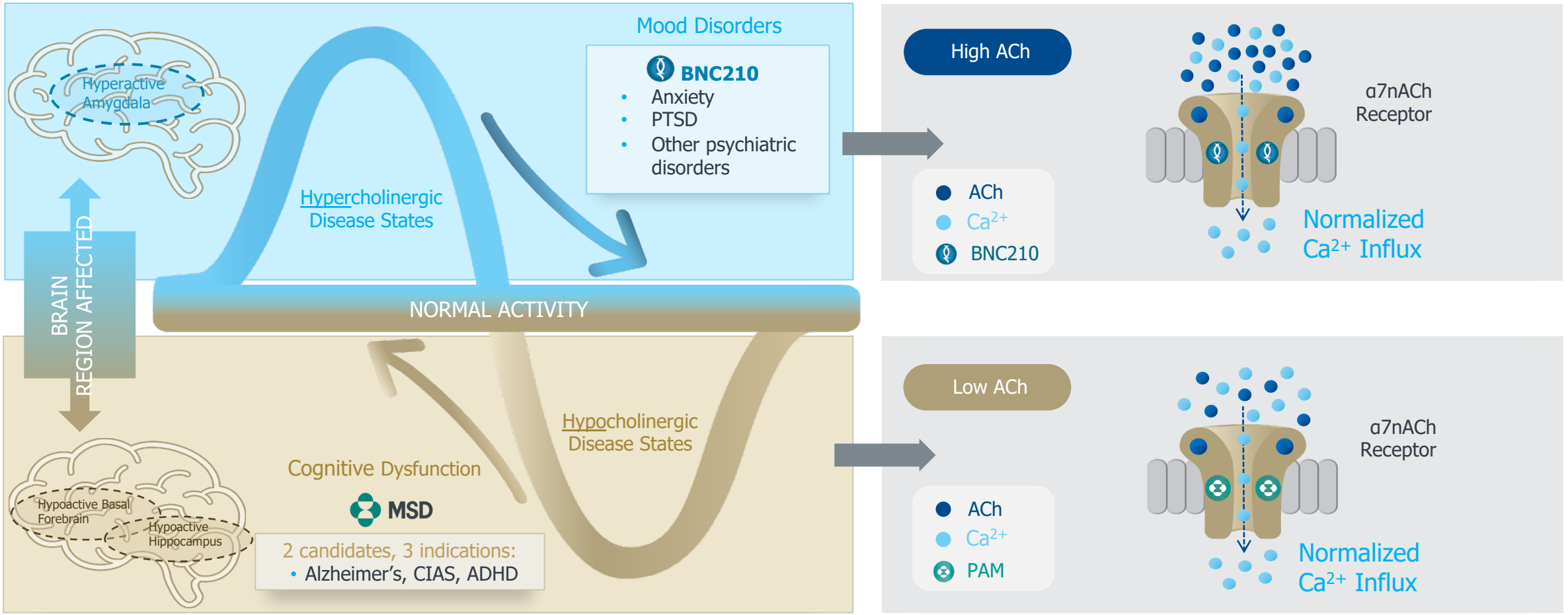
FDA Fast Track Designations for PTSD and Social Anxiety Disorder programs entering Phase 3

Program	Indication	Pre-Clinical / Phase 1 / Phase 2 / Phase 3	Status
BNC210 α7 receptor NAM	Post-Traumatic Stress Disorder (PTSD)	Phase 2 / Phase 3	✓ Phase 2 completed • FDA meeting H2 2024
BNC210 α7 receptor NAM	Social Anxiety Disorder (SAD)	Phase 2 / Phase 3	✓ Phase 2 completed ✓ EoP2 completed
BNC210 α7 receptor NAM	CNS Indication(s)	Pre-Clinical	To be disclosed
MK-4334 α7 receptor PAM	Cognitive Deficit in Alzheimer's and Schizophrenia	Phase 1 (MSD)	Phase 1 safety & biomarker studies ongoing
Nav1.7/1.8 Inhibitors Series Lead	Chronic Pain	Pre-Clinical	Partnering Asset
Kv3.1/3.2 Activators Series Lead	Cognitive Impairment	Pre-Clinical	Partnering Asset

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

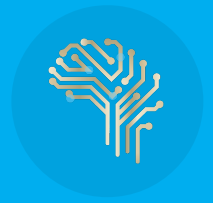
FDA Fast Track designation

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: Best- and First-in-Class α7 Nicotinic Receptor Small Molecule NAM in Development for the Treatment of Neuropsychiatric Disorders



Unique and differentiated MoA with high confidence in rationale and probabilities of success

Rapid and durable anxiety relief with acute administration
(~60 min onset, half-life 4-5 hrs)
Chronic administration for PTSD and other indications

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

Clinically Meaningful Effects

Reduction of PTSD symptom severity - treatment effects higher than SSRIs

Reduction of anxiety in Panic Attacks, GAD & SAD - benzodiazepine-like without the side effects

*Profile based on a safety database of ~600 subjects.
GAD = General Anxiety Disorder; MOA = Mechanism of Action; NAM = Negative Allosteric Modulator; SAD: Social Anxiety Disorder; PTSD = Post-Traumatic Stress Disorder; SSRIs = Serotonin Selective Reuptake Inhibitors.

BNC210 in Post-Traumatic Stress Disorder

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PTSD: A Chronic Psychiatric Disorder with Significant Unmet Need and No New Pharmacotherapies for Decades

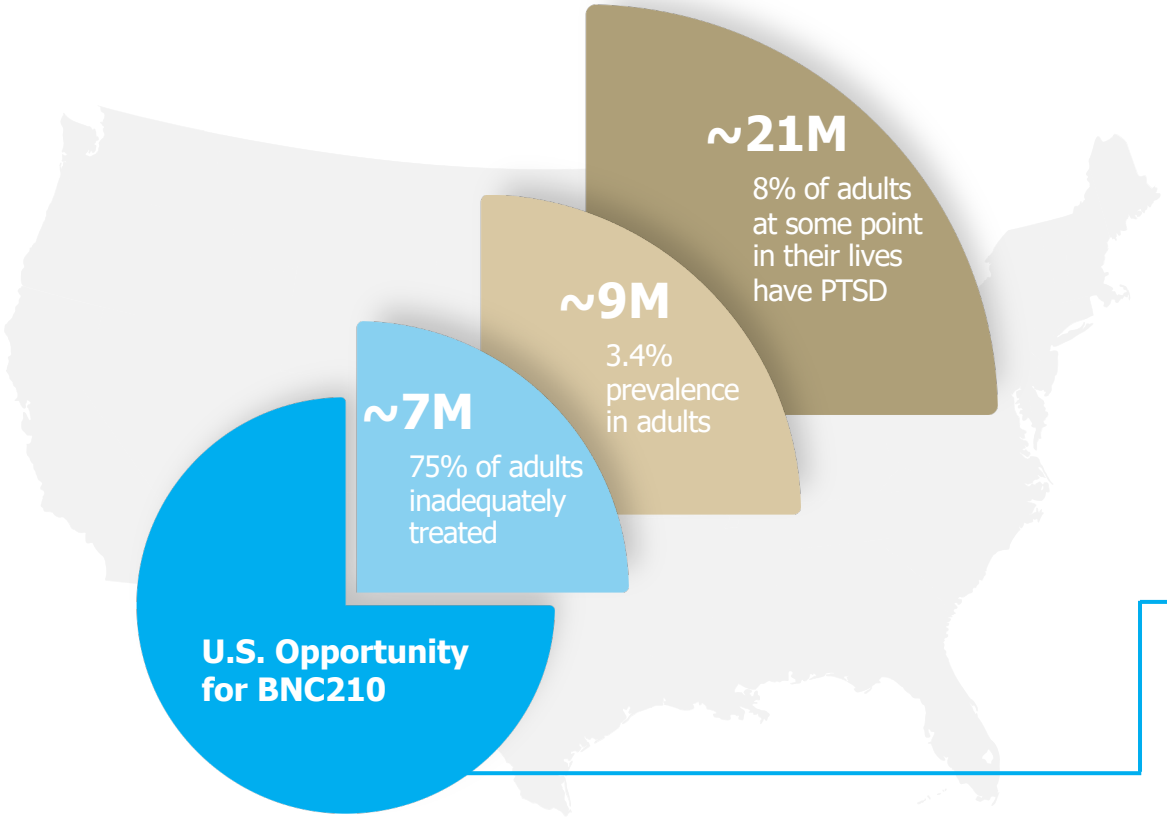
Only 20-30% of PTSD patients achieve clinical remission on SoC SSRI therapy[1]

PTSD is a debilitating disorder that leads to social, occupational and interpersonal dysfunction

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

>80% patients are in the general population rather than the military population

Associated with significant socioeconomic burden



BNC210 has the potential to be the first novel therapy for PTSD in decades

Large underserved population

No current investigational pharmacotherapies with positive datasets other than psychedelics

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

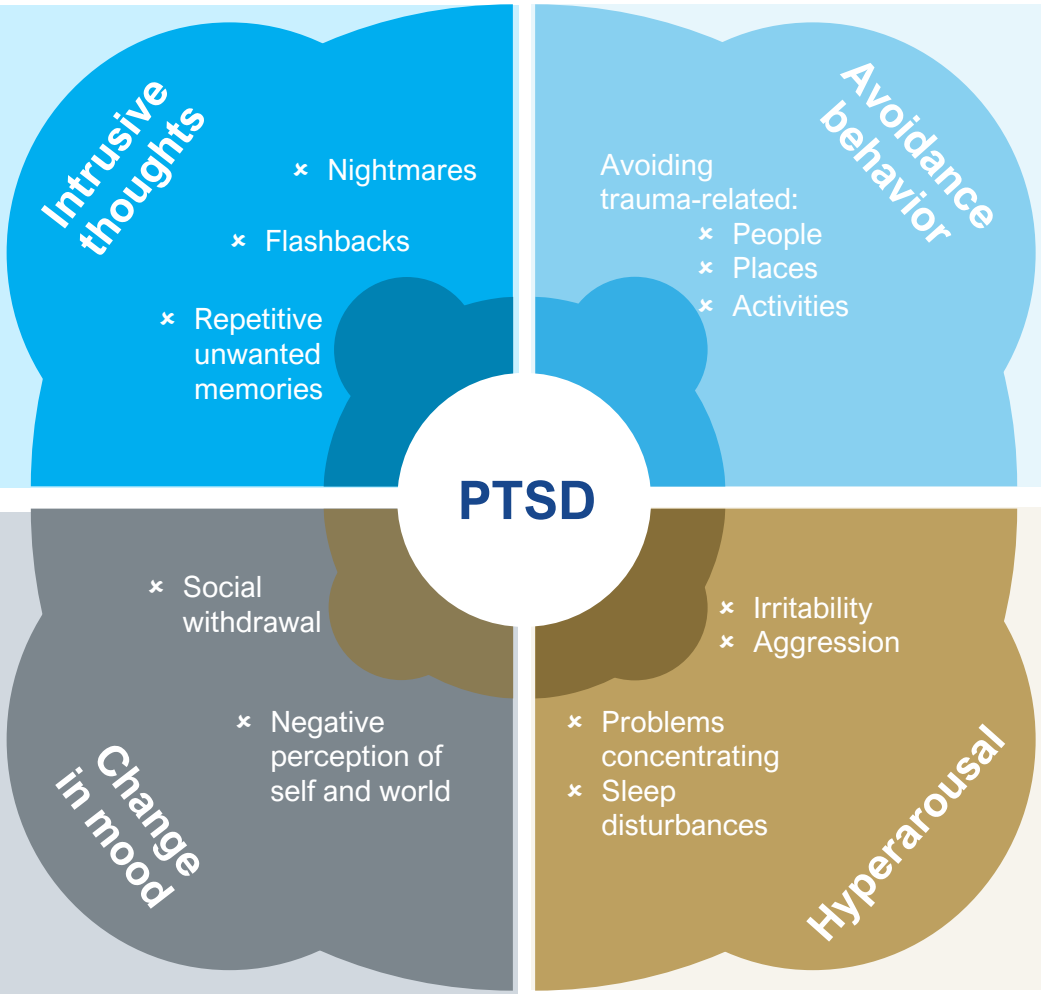
Davis, L. L. et al., Journal of Clinical Psychiatry, 2022. Kessler, R. C et al., Archives of General Psychiatry, 2005. Kilpatrick, D., et al., Journal of Traumatic Stress, 2013. Mayo LM, et al. Biol Psychiatry. 2020. United Nations Department of Economic and Social Affairs. 1994, Retrieved from https://population.un.org/wpp/Publications/Files/WPP2019_Highlights.pdf. 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

All studies to date support BNC210's effectiveness in PTSD

Enhanced emotional recovery in humans following panic attack*

Antidepressant effects in rodent model of depression



↓ Threat avoidance behavior in humans and rodent models†

↓ Frequency/intensity of panic symptoms in humans*

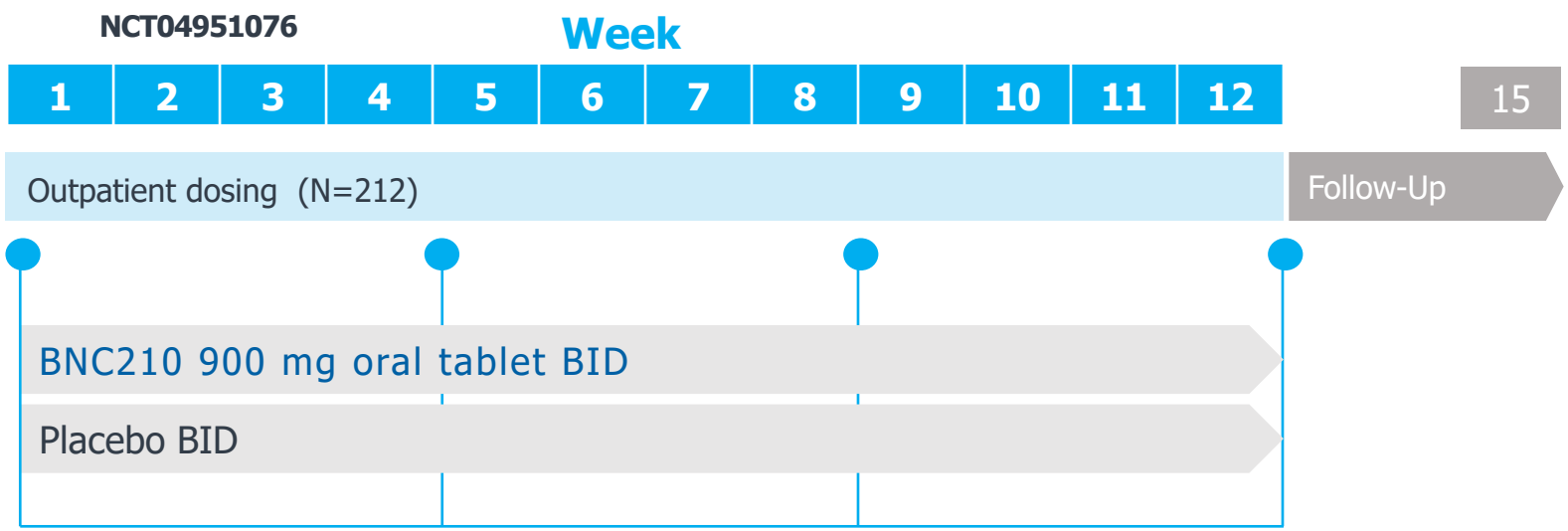
↓ Anxious behavior in rodents and humans†,‡

↓ 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.

Completed Monotherapy Phase 2b Study of BNC210 in PTSD Patients

Robustly designed study based on FDA feedback, completed on-time and on-budget



Primary Endpoint

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

Secondary Endpoints

Change from Baseline to Week 12 compared to placebo in:

- Depression (MADRS)
- Sleep (ISI)
- CAPS-5 symptom clusters
- Anxiety (HAM-A), CGI/PGI, Disability (SDS)
- Safety & tolerability endpoints

ATTUNE Study
NCT04951076

Phase 2b Study

Key Inclusion Criteria

Females and males (18 – 75 years)

Current PTSD diagnosis

CAPS-5 ≥ 30 (Screening & Baseline) & ≤ 25% decrease Screening to Baseline

Index trauma event must have occurred in adulthood

Key Exclusion Criteria

Complex PTSD

MADRS score ≥35

No antidepressants, benzodiazepines, other psychotropics

No prior history of significant psychiatric or neurological condition

Moderate or severe substance use disorder in the last 12 months

34 Sites across the US and UK

CGI-S/I = Clinical Global Impression – Severity/Improvement Scales; CAPS-5 = Clinician Administered PTSD Scale for DSM-5; HAM-A = Hamilton Anxiety rating Scale; ISI = Insomnia Severity Index; MADRS = Montgomery-Asberg Depression Rating Scale; PCL-5 = PTSD Checklist for DSM-5; PGI-S/I = Patient Global Impression – Severity/Improvement Scales; SDS = Sheehan Disability Scale

Subject Disposition and Well-Balanced Demographics

Dataset enabled robust data analysis and interpretation

Disposition	BNC210 900 mg	Placebo	Overall
Randomized Population	106	106	212
Safety Population*	105	104	209
Efficacy Population**	89	93	182
Completed Through to End of Treatment	57	66	123
Discontinued Study Early	48	38	86

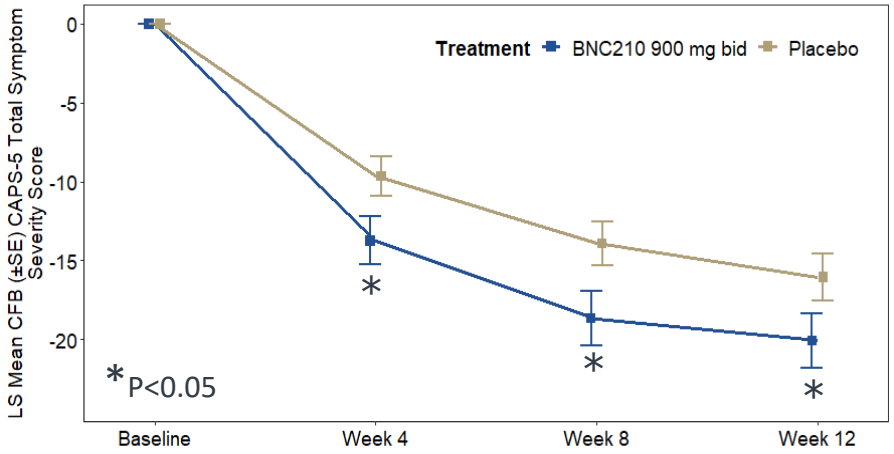
Demographics- Randomized	BNC210 900 mg	Placebo	Overall
Age (years) - Mean (min, max)	42.3 (19, 67)	42.4 (21, 68)	42.3 (19, 68)
Male / Female	41 / 65	35 / 71	76 / 136
CAPS-5 Total Severity Score at Baseline – Mean (min, max)	41.9 (30, 57)	41.2 (30, 59)	41.5 (30, 59)

* Safety population includes all participants who receive any amount of the study intervention.
** Includes all randomized participants who receive any amount of study drug and have at least one post-baseline primary efficacy assessment (CAPS-5).

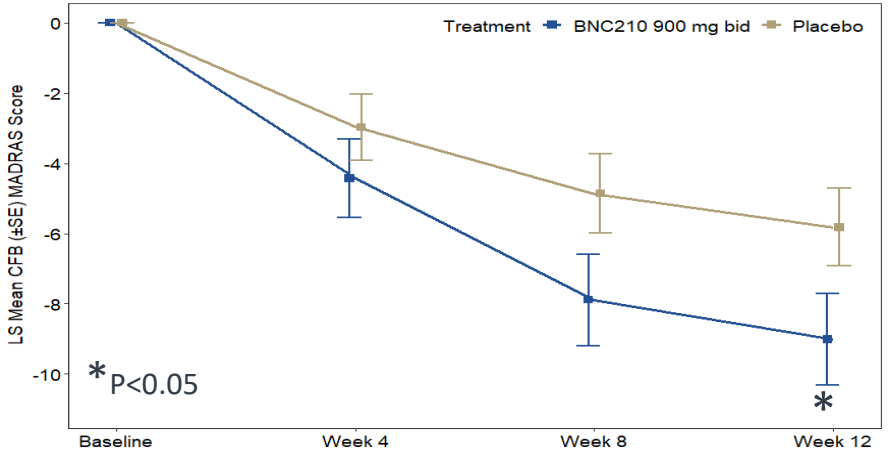
BNC210 Significantly Reduced PTSD Symptoms During 12 Weeks of Treatment

Primary and several secondary endpoints met with clinically meaningful improvement in several PTSD symptoms

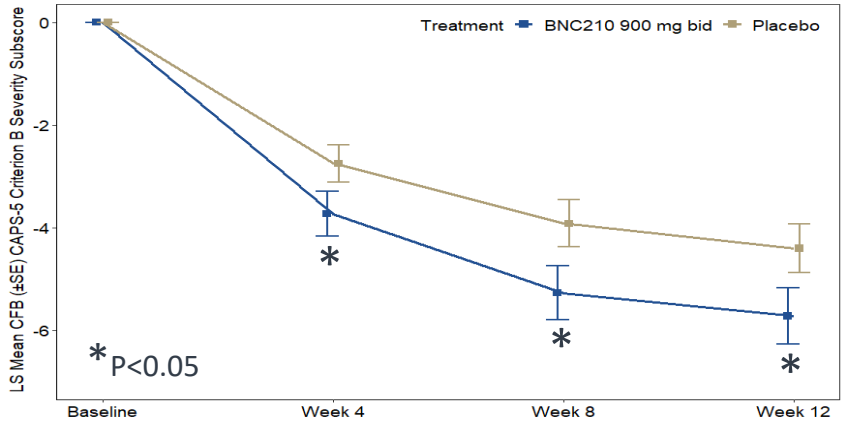
Primary Endpoint: CAPS-5 Total Symptom Severity Scores



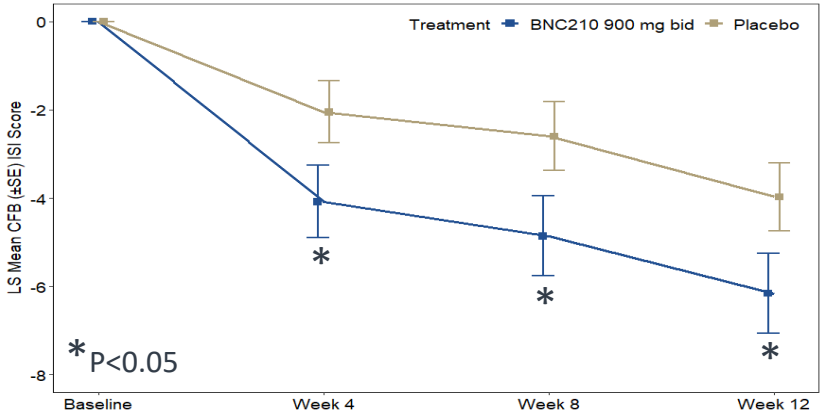
Secondary Endpoint: MADRS Depression Scores



Secondary Endpoint: CAPS-5 Intrusion Criterion



Secondary Endpoint: ISI Sleep Scores



mITT population: MMRM data

BNC210 Showed a Favorable Safety Profile for Chronic Dosing

Number of Subjects	BNC210 900 mg	Placebo	Overall
With at Least 1 TEAE	70 (66.7%)	56 (53.8%)	126 (60.3%)
Related/Not Related	55 (52.4%)/15 (14.3%)	34 (32.7%)/22 (21.1%)	89 (42.6%)/37 (17.7%)
Mild/Moderate/Severe	24.8%/37.1%/4.8%	21.2%/26.9%/5.8%	23.0%/32.1%/5.3%
SAEs Related/Not Related	0/0	0/2 (1.9%)	0/2 (1.0%)
Leading to Discontinuation	21 (20.0%)	10 (9.6%)	31 (14.8%)

Frequently reported adverse events (reported by ≥5% of subjects in either group):

Number of Subjects	BNC210 900 mg	Placebo	Overall
Nervous System Disorders: Headache	18 (17.1%)	13 (12.5%)	31 (14.8%)
Gastrointestinal Disorders: Nausea	13 (12.4%)	8 (7.7%)	21 (10.0%)
Investigations: Elevated liver enzyme(s)*	14 (13.3%)	2 (1.9%)	16 (7.7%)
Subjects completed study treatment	9 (8.5%)	0	9 (4.3%)
Subjects discontinued due to liver enzyme elevation	5 (4.8%)	2 (1.9%) Both >4x ALT and >10x AST elevations	7 (3.3%)

Vital signs, physical examinations and ECG – no clinically significant results.
Clinical chemistry, hematology, urinalysis - no clinically significant results deemed related to study drug, apart from the elevated liver enzyme(s)
* No liver findings in the preclinical program or in 13 other clinical trials with BNC210.

ATTUNE is Expected to Enable Late-Stage Development of BNC210 in PTSD

Clear evidence of efficacy demonstrated with path forward to registrational trials

BNC210 Efficacy & Safety

- Clear evidence of **clinically meaningful efficacy** across primary and several secondary endpoint
- Positive secondary endpoints confirm overall profile of BNC210
- **Only positive dataset in PTSD** with a novel MoA small molecule with a favorable safety and tolerability profile
- **Opportunity for Breakthrough Designation**

Study Design & Dose Identification

- CAPS-5, the gold standard endpoint for PTSD **performed robustly** for primary efficacy measure
- **Key secondary endpoints identified** for registrational trials
- 900 mg BID as well as a lower dose may be deployed in registrational trials

Next Steps

- Meet with FDA to determine path forward in PTSD: **Q2/Q3 2024**
- **Engaged in strategic partnering** to co-develop BNC210 in PTSD: significant interest from multiple parties

BNC210 in Social Anxiety Disorder

Bionomics

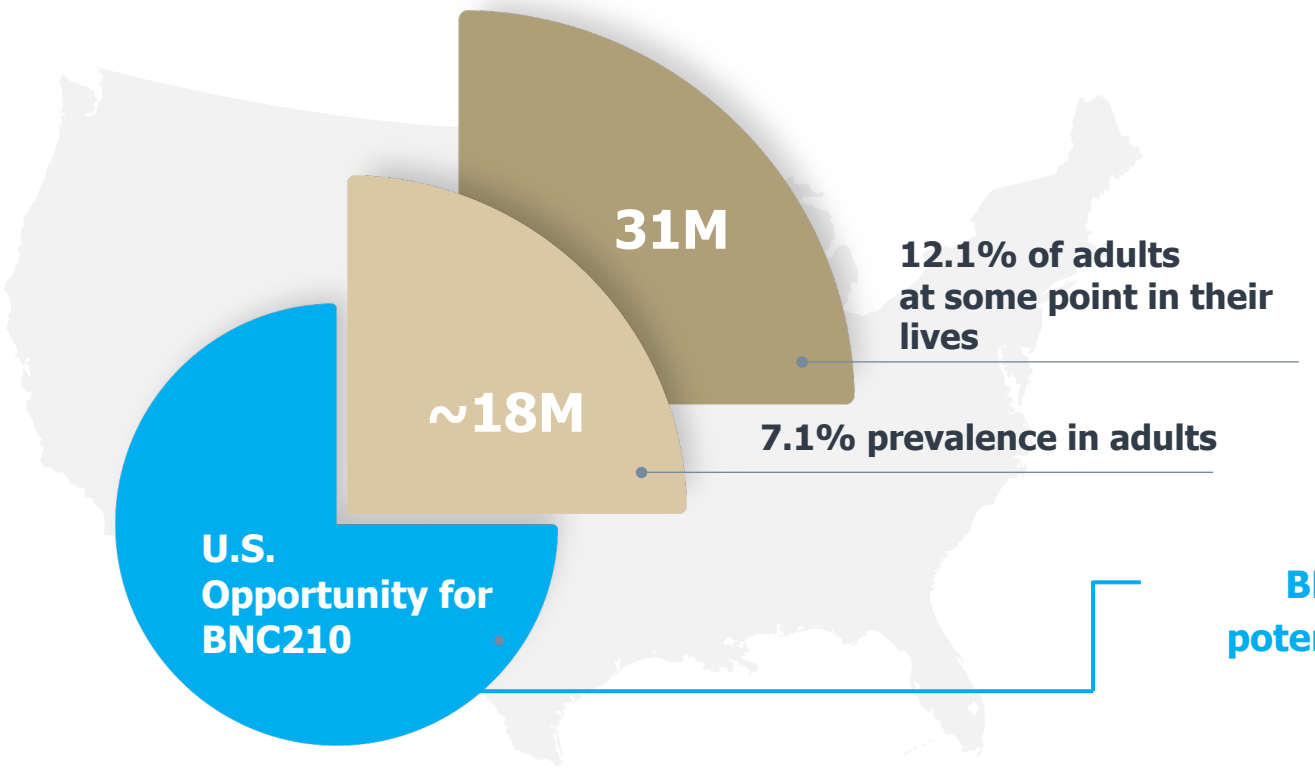
Social Anxiety Disorder: A Significant Unmet Need

A fast-acting, non-sedating, non-habit-forming anxiolytic is considered the "holy-grail" for anxiety disorders

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



No approved acute therapy for SAD

Significant patient population

Limited competition

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

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.

Targeting a Large Segment of the Anxiety Market

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

BNC210's Potential Advantages*[7]

	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 2023. *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).

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

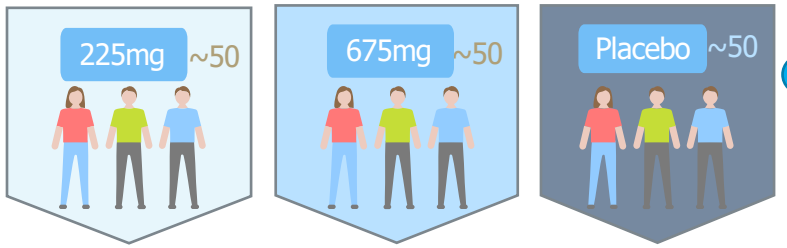
PREVAIL Study
NCT05193409

Phase 2 Study Design

SCREENING
LSAS score ≥ 70

15 US CENTERS
N=151

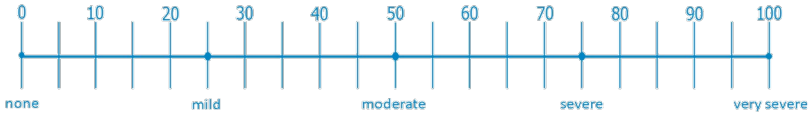
1:1:1 RANDOMIZATION
(DOUBLE-BLIND)



Single Dose Administration

PRIMARY EFFICACY MEASURE

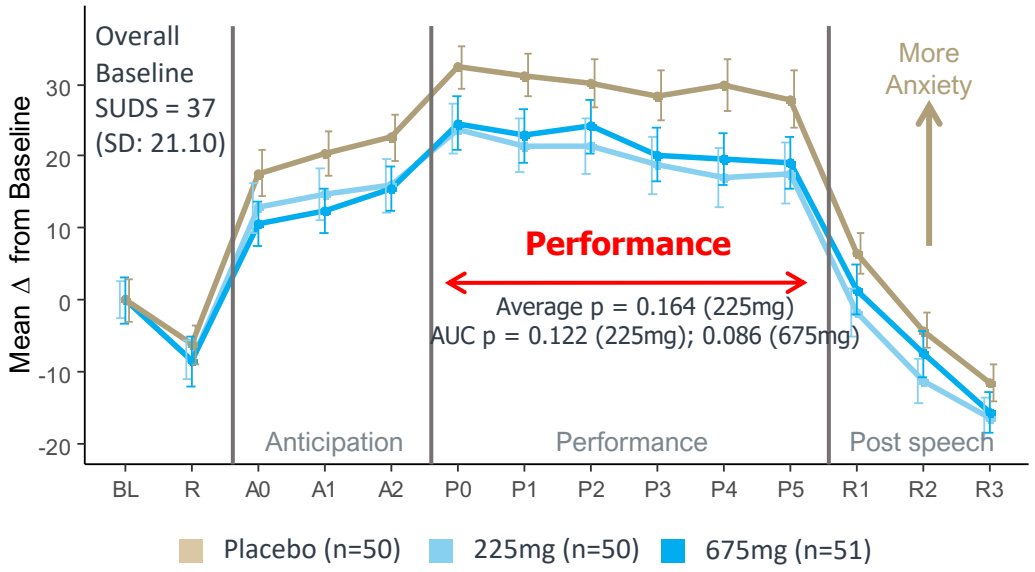
Subjective Units of Distress Scale (SUDS):
Visual Analogue Scale (VAS) that measures the self-reported intensity of anxiety and/or distress.



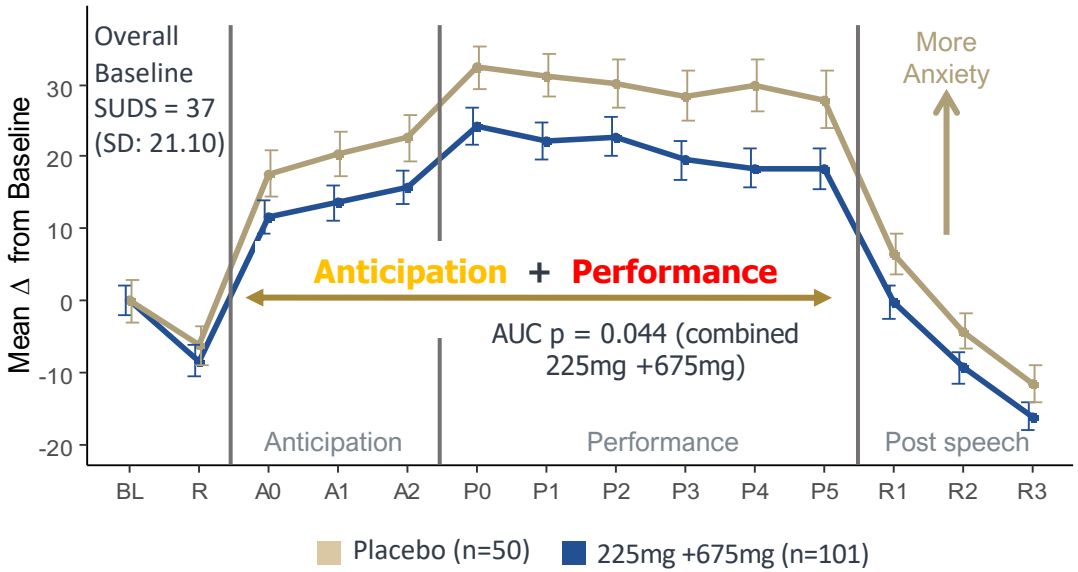
Acute BNC210 Administration Reduces Anxiety During Public Speaking Task

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

*Primary endpoint

†Baseline demographics of the population: Mean age 35.9 years (min 18, max 65); Male/Female 56/95 (62.9% Females).

BNC210 Showed a Favorable Safety Profile in SAD

Patients receiving the 225mg dose reported placebo-like AEs supporting the non-sedating anxiolytic profile of 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)

- No serious nor severe adverse events reported
- The majority of adverse events were reported as mild (17 out of 21)

AE = Adverse Events. TEAE = Treatment-Emergent Adverse Events.

EoPh2 FDA Meeting High-Level Outcomes for NDA submission

FDA acknowledged the successful, Ph3 enabling outcomes of the PREVAIL study

Clinical Plan Agreement on the plan to conduct 2 single dose randomized, placebo-controlled studies, and 1 long-term open-label safety study using a PRN dosing paradigm

Ph3 Design Elements Agreement was reached on patient characteristics, dose, primary and secondary endpoints, sample size, statistical analysis methodologies

Safety Database ICH E1 applies: 1500 exposures, at least 300>6 months and at least 100>12 months

Non-Clinical Plan Agreement was reached on the nonclinical requirements and BNC210 tablet specifications paving the way for Ph3 initiation

Strong PREVAIL Data Support Advancement of BNC210 to Phase 3 in SAD

FDA endorsed the PREVAIL dataset as Ph3 enabling

BNC210 Efficacy & Safety

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

Study Design & Dose Identification

- **BNC210 225 mg** is the top dose to be tested in late-stage trials
- Prevail was completed in less than a year
- Future studies are capital and timeline efficient

Next Steps

- **Successful FDA End-of-Phase 2 Meeting announced Sep 2023**
- Potential for First Patient Dosed expected in Q1/Q2 ’24

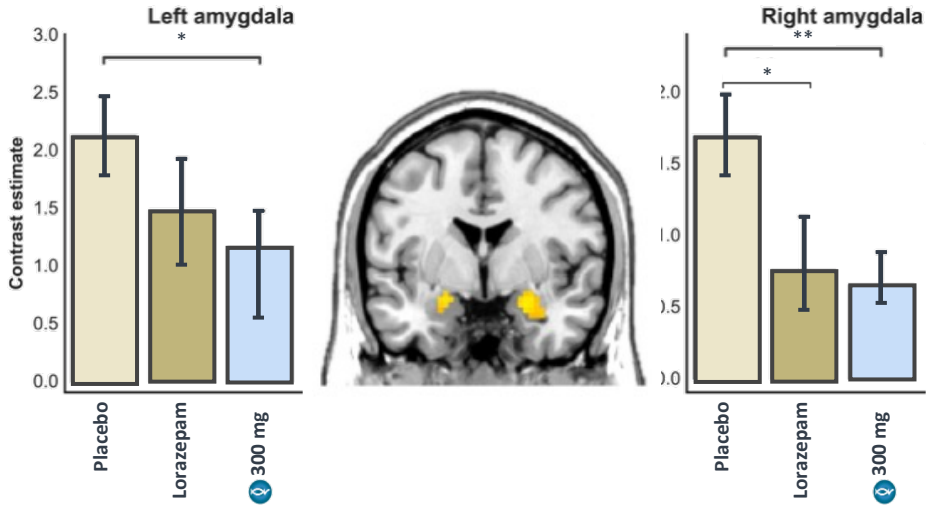
*Post-hoc analysis of mean SUDS; no manipulation applied.

BNC210's Potential Extends Beyond PTSD and SAD

Early positive clinical and biomarker data supports development in Generalized Anxiety Disorder and Panic Attacks

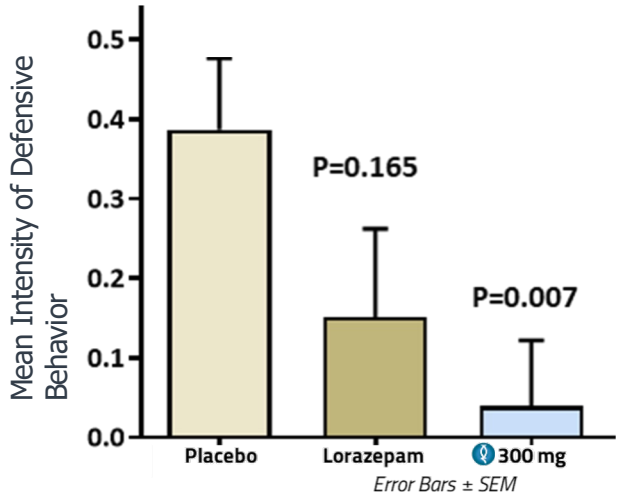
Phase 2 GAD Study
BNC210 reduced amygdala activation in GAD

Amygdala activation is an imaging surrogate for anxiety

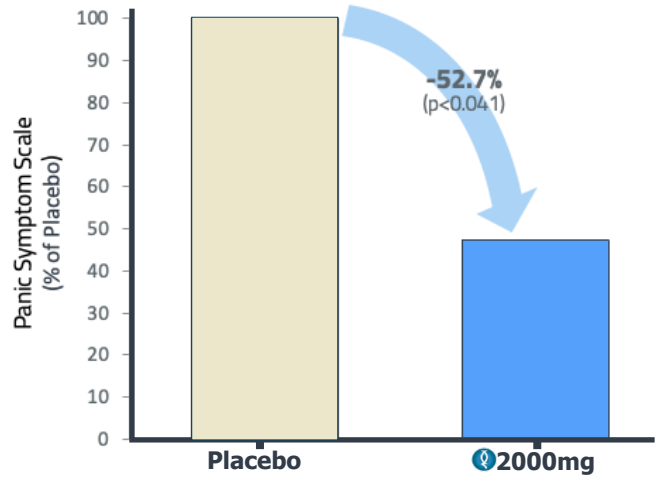


*P<0.05 **P<0.01

Phase 2 GAD Study
BNC210 reduced threat avoidance behaviour in GAD



Ph1b Panic Attack Study
BNC210 significantly reduced CCK4-induced panic symptoms



Additional Study Datasets Support BNC210's Clinical Efficacy Potential

CNS-focused Collaborations

MDMA Derivative in combination with BNC210 for PTSD

Cognitive Impairment in Alzheimer's and other CNS disorders

Bionomics

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

MSD* Collaboration Overview

In 2014 Bionomics entered an exclusive Research Collaboration with MSD to develop α7 receptor PAMs targeting cognitive dysfunction associated with Alzheimer's disease and other CNS conditions

MSD 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 on net sales of licensed drugs

Development Updates

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

Candidates developed based on learning from initial Bionomics compound, including MK-4334 which have shown promising results in early preclinical studies

MK-4334 is currently in ongoing Phase 1 studies to assess safety, tolerability, pharmacokinetics and impacts on relevant biomarkers

*MSD is a tradename of Merck & Co., Inc., Kenilworth NJ USA.

Preclinical Pipeline

KV3 and PanNav Programs

Bionomics

Bionomics pipeline extends beyond BNC210

Two Promising Preclinical Pipeline Programs with Lead Candidates Identified

BNOX Kv3.1 / Kv3.2 Ion Channel Activators

Small molecules for treatment of Cognitive Dysfunction and Negative Symptoms

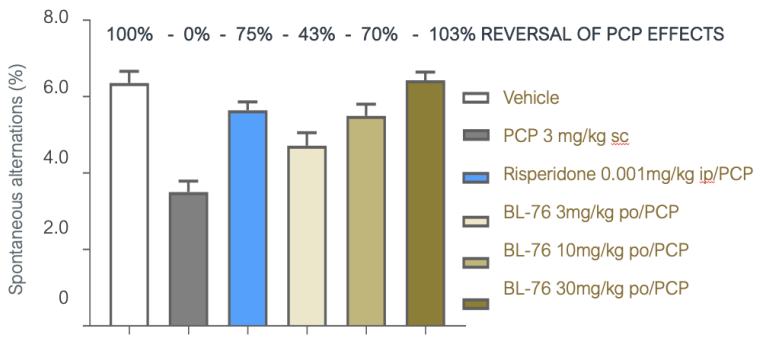
Bionomics' molecules target Kv3.1/3.2 ion channels on Parvalbumin (+), GABAergic interneurons in the PFC

Potential in schizophrenia, Autism Spectrum disorders and conditions with cognitive impairments

Lead Candidate Identified: BL-76

Two patented series with a multiple back-up compounds

Lead compound BL-76 fully reverses PCP-induced cognitive deficit in mice in the T-maze



BNOX Pan Nav Inhibitors

Small molecules with functional selectivity for voltage gated sodium channels: Nav1.7, Nav1.8 and potentially Nav1.9

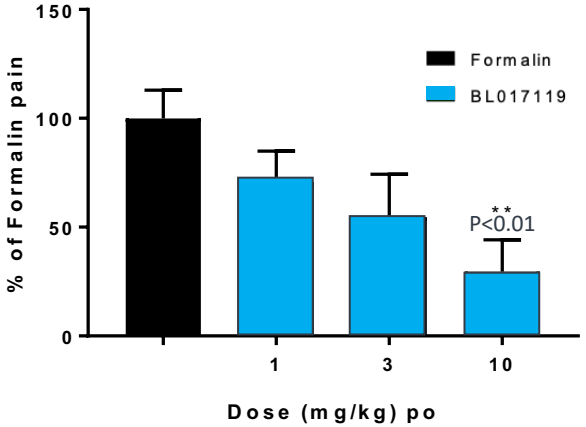
Potential non-addictive, reduced side-effect chronic pain therapies

Disease-related genetics: Gain & Loss-of-function mutations in Nav1.7, 1.8 and 1.9. associated with human pain syndromes where extreme pain or no pain is experienced

Lead Candidate Identified: BL-017881

Two Patented series with a multiple back-up compounds

Dose dependent pain reversal pain (up to 70%) in the formalin paw model in mice



Stock, Financial, and IP Snapshot: Potential for significant return on investment

Lean Operations with Low Burn

~$10M of net cash[1]

Runway for ~12 months

US-focused corporate strategy with low burn

Nasdaq : BNOX

Leading Significant Investors

APEIRON INVESTMENT GROUP

Point72

Tang Capital Management

PRESIGHT CAPITAL

Lynx1

Other Key Points

BNC210 IP coverage extends into ~ 2040

Strong Pipeline & Management

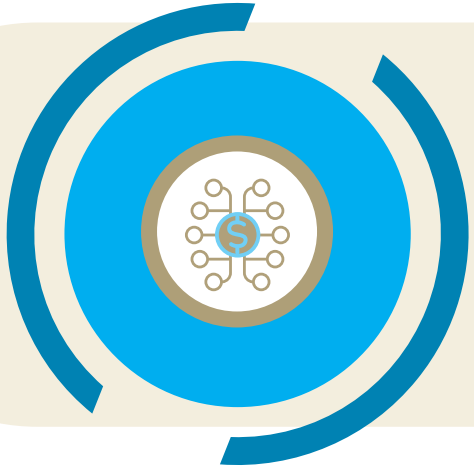
No outstanding debt, convertible securities, or warrants

Analyst coverage

Favorable trading volume

1. Figures as of January 30, 2024

Bionomics is exploring options to fully fund late-stage BNC210 programs through both equity and non-dilutive financing



Capital Markets/Equity Financing

- A capital raise in 1H2024 will enable seamless execution of our development plan in PTSD and SAD to important future milestones

Strategic Partnerships

- Significant interest post-PTSD readout
- Focus on US co-development / co-commercialization for BNC210 in PTSD and potentially SAD
- Opportunity for full ex-US or regional licensing for BNC210

Thank you!