Bionomics

CREATING INNOVATIVE THERAPIES
FOR SERIOUS HUMAN DISEASES.

Corporate Presentation

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CEO & Managing Director

May 2017

Safe Harbor Statement

Factors Affecting Future Performance

This presentation contains "forward-looking" statements within the meaning of the United States' Private Securities Litigation Reform Act of 1995. Any statements contained in this presentation that relate to prospective events or developments, including, without limitation, statements made regarding Bionomics' drug candidates (including BNC210, BNC105 and BNC101), its licensing agreement with Merck & Co. and any milestone or royalty payments thereunder, drug discovery programs, ongoing and future clinical trials, and timing of the receipt of clinical data for our drug candidates are deemed to be forward-looking statements. Words such as "believes," "anticipates," "plans," "expects," "projects," "forecasts," "will" and similar expressions are intended to identify forward-looking statements.

There are a number of important factors that could cause actual results or events to differ materially from those indicated by these forward-looking statements, including unexpected safety or efficacy data, unexpected side effects observed in clinical trials, risks related to our available funds or existing funding arrangements, our failure to introduce new drug candidates or platform technologies or obtain regulatory approvals in a timely manner or at all, regulatory changes, inability to protect our intellectual property, risks related to our international operations, our inability to integrate acquired businesses and technologies into our existing business and to our competitive advantage, as well as other factors. Results of studies performed on our drug candidates and competitors' drugs and drug candidates may vary from those reported when tested in different settings.

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Bionomics Overview

- Global, clinical stage biopharmaceutical company leveraging our proprietary platform technologies to discover and develop a deep pipeline of novel drug candidates
- Strategic partnership with Merck & Co.:
  - Cognition drug candidate entered clinical development and triggered US$10M milestone payment in deal valued up to US$506M in upfront, research and milestone payments plus additional royalties on net sales of licensed drugs
  - Merck & Co equity investment in October 2015, 4.5% ownership
- Lead drug, BNC210, is a novel, orally-administered, first-in-class, modulator of α7 nicotinic acetylcholine receptor, in development for the treatment of anxiety and depression
  - Positive top line in Phase 2 clinical trial in Generalized Anxiety Disorder (GAD) patients reported 21 September 2016
  - Phase 2 trial in Post Traumatic Stress Disorder (PTSD) ongoing
- Two clinical stage oncology assets:
  - BNC101 is a first-in-class anti-LGR5 antibody targeting cancer stem cells, in development for the treatment on colon cancer and other solid tumours
    - Ongoing Phase 1 trial in colon cancer patients, data in CY2018
  - BNC105 in development for the treatment of both solid and blood cancers
    - Novartis funding biomarker study in renal cancer, US investigator initiated clinical trial in patients with Chronic Lymphocytic Leukemia and Keytruda combination trial in melanoma patients
- Financials: Market Cap A$166M, Cash at 31 March 2017 A$49.9M, FY16 revenue and other income A$21.73M, Operating loss after tax A$16.61M (30 June 2016). Net cash generated to 31 March 2017 (9 months) $4.485M

Clinical Progression of Cognition Drug Candidate in Merck Collaboration Provides Technical Validation

Partnership with Merck & Co in cognition generated US$20M in upfront payments in 2014, research payments 2014-2017 and US$10M first clinical milestone in February 2017

Deal valued up to US$506M in upfront, research and milestone payments plus additional royalties on net sales of licensed drugs

Cognitive Decline is Manifest in a Range of Indications

	Social Cognition	Executive Function	Attention	Language	Memory	Perceptual Motor
Schizophrenia	■	■	■	■	■	■
Alzheimer's disease		■	■	■	■	■
Depression/Anxiety			■		■	
Tourette's Syndrome+	■		■		■	
ADHD			■			■
Parkinsons disease		■	■	■	■	■
Huntington		■	■	■	■	■
Epilepsy		■	■			
Autism+	■	■	■	■	■	

+ Tourettes patients may have co-morbid ADHD, autism spectrum disorder or OCD. Est 63% ADHD, 35% autism spectrum disorder, 30% OCD

Our Proprietary Platform Technologies

ionX

Identifies drug candidates targeting both ligand gated and voltage gated ion channels

Proprietary cell lines and screening approaches

Comprehensive *in vivo* models validate target biology

MultiCore

A diversity orientated chemistry platform for the discovery of small molecule drug candidates

Computer aided pharmacophore modelling

Scaffold hopping synthetic approaches rapidly create diversity in small, focused libraries

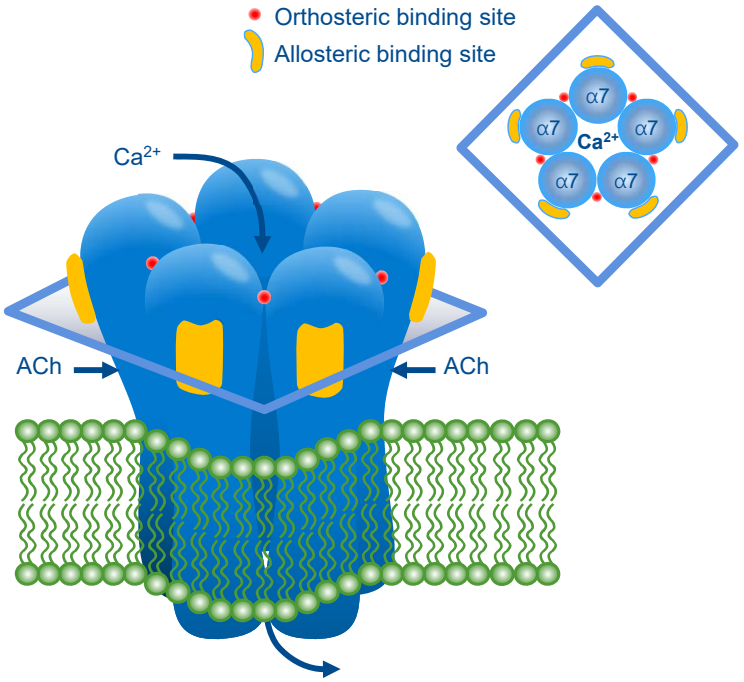
Parallel, differentiated chemical series of potential drug candidates

Therapeutic Areas

- Anxiety
- Depression
- Alzheimer's disease
- Cognition/Memory
- Pain

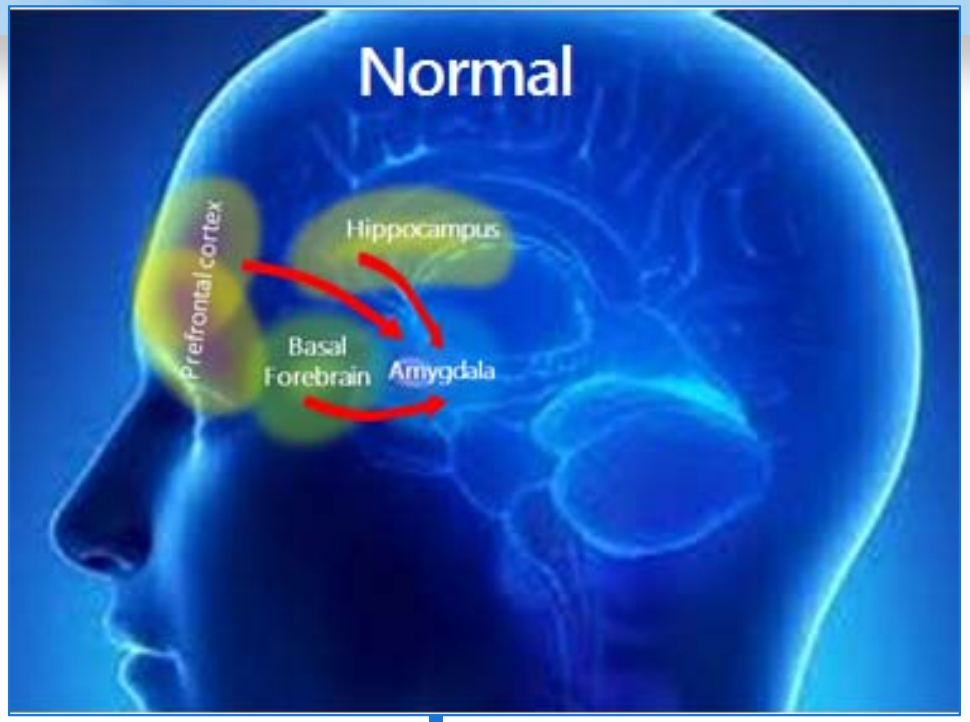
α7 Nicotinic Acetylcholine Receptor: Rich Area of Biology with Increasingly Recognised Role in Anxiety & Depression

α7 receptor has both orthosteric and allosteric binding sites



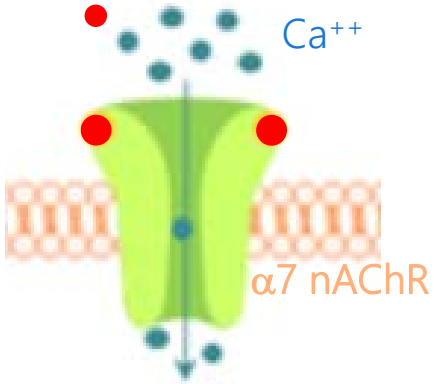
- Ligand gated ion channel highly expressed in the brain
- Key driver of emotional and memory responses
- Allosteric modulators have no effect on the receptor alone and do not desensitize the receptor
- This approach provides a mechanism for selectively and specifically modulating the receptor to achieve desired outcomes
  - Aim to normalise receptor activity
- Allosteric inhibition of the α7 receptor may reduce anxiety and depression

BNC210 Action Depends on Acetylcholine Neurotransmission



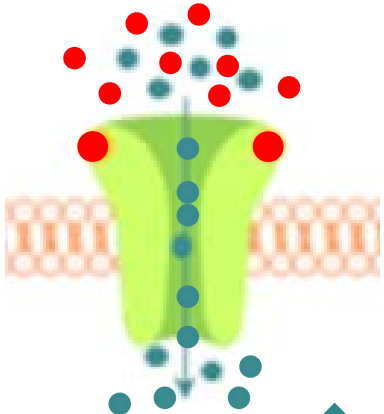
- ACh
- Ca^{++}
- BNC210

NORMAL MOOD



Ca^{++} INFLUX ⟷

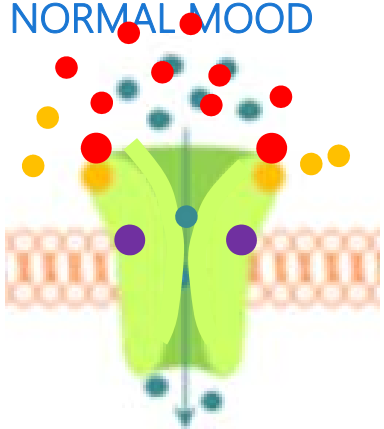
MOOD DISORDER



Ca^{++} INFLUX ↑

\+ BNC210

BNC210 RESTORES NORMAL MOOD



Ca^{++} INFLUX ⟷

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BNC210 Overview: Novel, Best-in-Class Modulator of α7 Nicotinic Acetylcholine Receptor

Mechanism of Action	• Negative allosteric modulator of α7 nicotinic acetylcholine receptor
Target Indications	• Anxiety (Generalized Anxiety Disorder or GAD & Post Traumatic Stress Disorder or PTSD) • Potential for other CNS indications
Ongoing Clinical Trials	• Phase 2 trial in GAD patients, reported positive topline data Sept 2016 • Phase 2 trial in PTSD initiated Q2 2016 calendar year
Completed Clinical Trials	• 6 completed Phase 1 trials in > 200 healthy subjects • Demonstrated safety and tolerability, no sedation, cognitive impairment or impaired motor co-ordination; suppressed symptoms of CCK4 induced panic; target engagement in human brain demonstrated • Phase 2 in GAD patients met co- primary endpoints; low dose BNC210 outperformed Lorazepam, measured by cerebral perfusion and degree of amygdala activation • Secondary endpoint met; high and low dose BNC210 outperformed Lorazepam in an anxiety provoked behavioural task (JORT)

BNC210: Next Generation Drug Candidate to Treat Anxiety & Depression

Potential Competitive Advantages of BNC210*						
Drug	No sedation	No withdrawal syndrome	No memory impairment	Fast acting	No drug/drug interactions	Once-a-day dosing
BNC210	✓	✓	✓	✓	✓	✓
Valium and other BZD	X	X	X	✓	✓	X
Prozac and certain other SSRI/SNRI	✓	X	✓	X	X	✓

Anxiety Treatments

- Dominated by benzodiazepines
- Associated with sedation, addiction and tolerance and cognitive disturbances
- Not recommended for long-term treatment

Depression Treatments

- SSRIs and SNRIs used to treat depression and anxiety
- Modest efficacy, late onset of action, discontinuation, changes in weight, sexual dysfunction and increased thoughts of suicide in adolescents
- Many have black box warnings

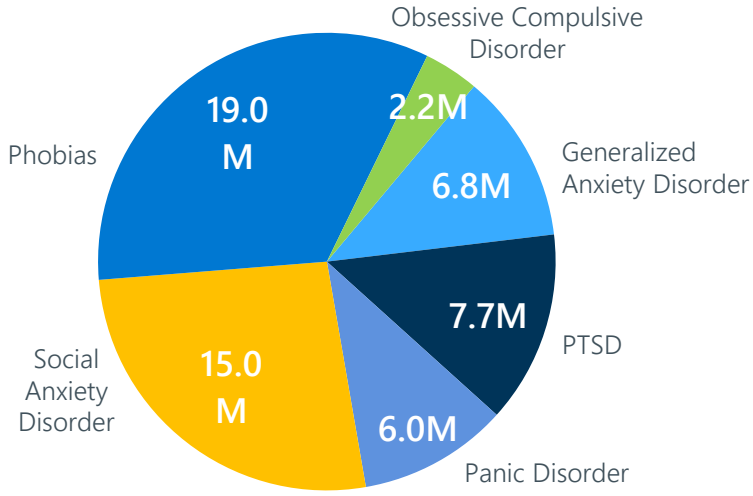
*Based on data from preclinical studies and Phase 1 clinical trials.

Anxiety and Depression Market: BNC210 is Uniquely Position to Adresse a Large and Underserved Market

Anxiety and depression have overlapping symptoms: over 40% of those diagnosed with depression are also diagnosed with an anxiety disorder

Anxiety Market

- Projected to reach $18 billion globally by 2020
- Approximately 40 million adults suffer from anxiety in the US
- Anxiety patients may have more than one anxiety disorder



Depression Market

- Approximately 18.2 million people suffer from depression in the US
- Sales of top 10 depression drugs reached a total market of $8.8bn in 2012
- Major types of depression:
  - Bipolar depression
  - Dysthymia
  - Major depression

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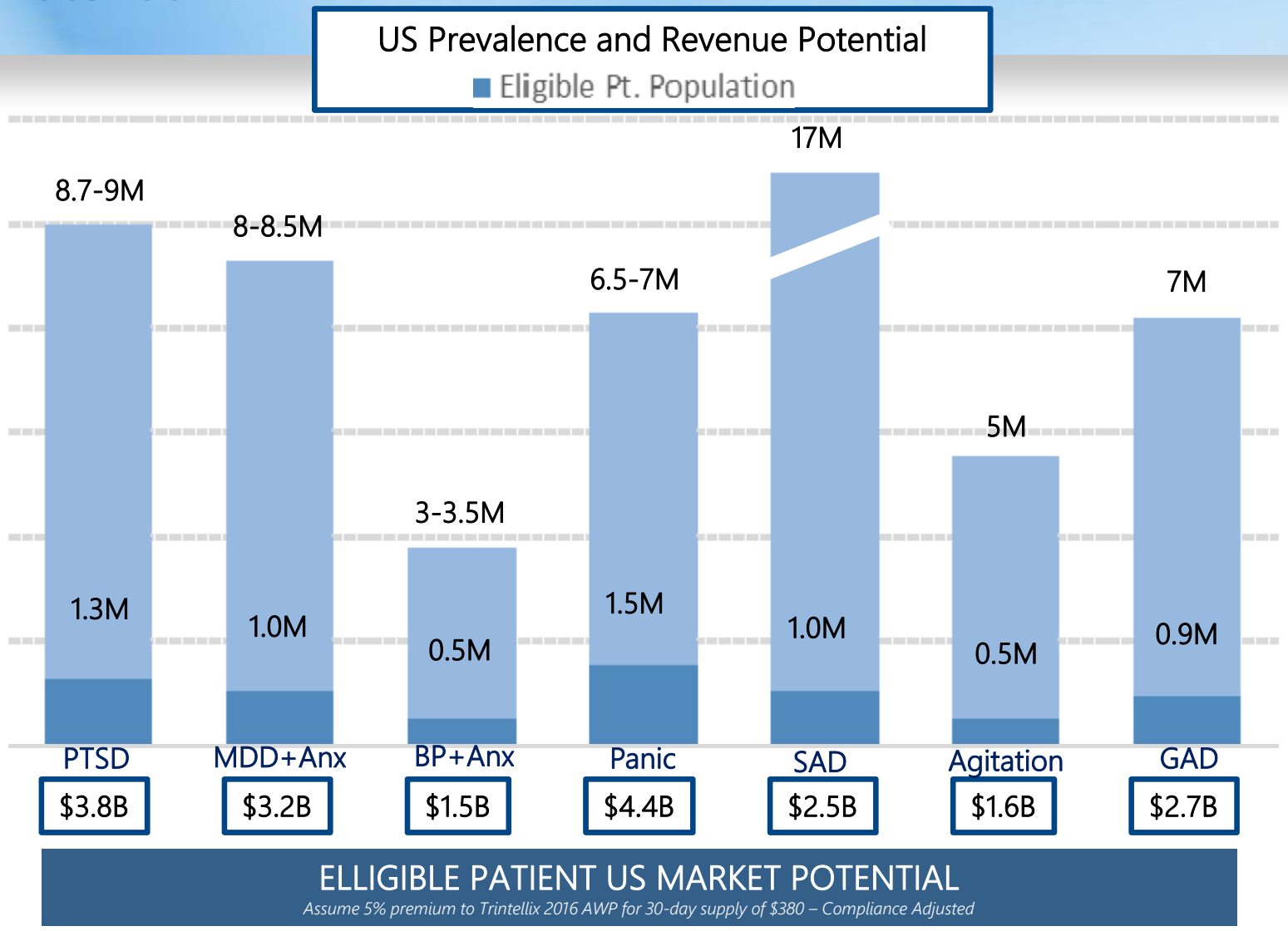
BNC210, if Successfully Developed, may have Significant Revenue Potential



- ✓ *Innovative, first-in-class*
- ✓ *Unmet need in large patient population*
- ✓ *Advancement in care*
- ✓ *Limited branded competition*
- ✓ *Ability to achieve large market share*

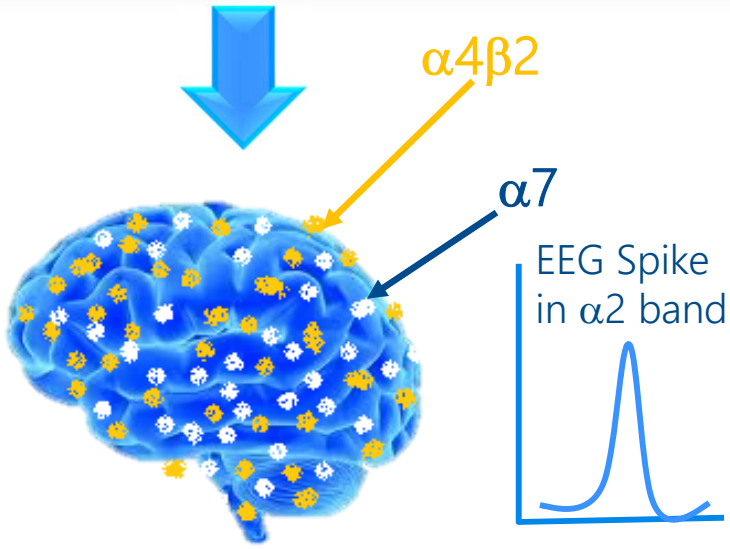
[1] 3.4-4% prevalence >18yrs., ~25% of patients diagnosed and treated
[2] 6.7% prevalence, ~50% co-morbid anxiety, ~50% diagnosed and treated
[3] ~2.9% prevalence, 50% co-morbid anxiety (range in literature 25 to 75%), ~50% diagnosed and treated
[4] ~2.7% prevalence, ~50% diagnosed and treated
[5] ~6.8% prevalence, 15-20% diagnosed and treated
[6] ~3.1% dementia prevalence >40yrs., ~9% agitation patients diagnosed and treated
[7] 3.1% GAD prevalence, assumes ~25% diagnosed and treated, ~50% of SSRI patients treated are partial responders or relapsers

BNC210 Phase 1 Multiple Ascending Dose Trial Provided Evidence of Target Engagement

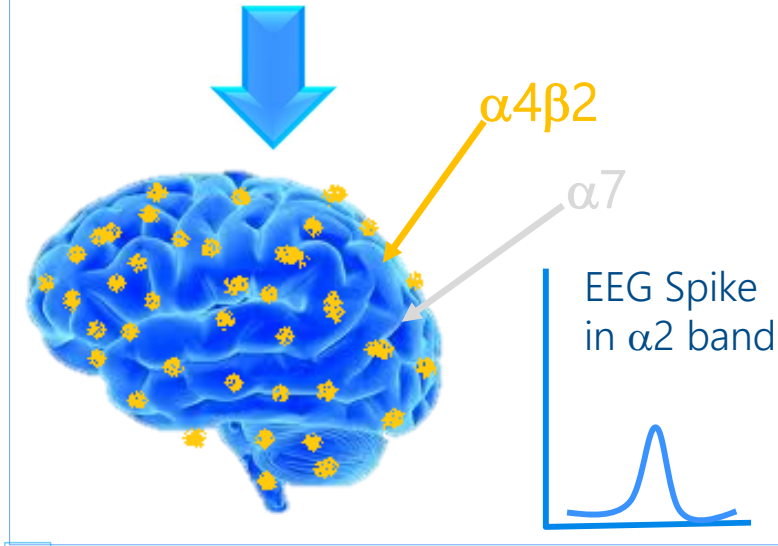
Subjects	• 54 healthy subjects
Protocol	• Double-blind, placebo controlled • Subjects received multiple ascending dose • BID treatment for 8 days
Primary Endpoints	• Safety and tolerability of multiple doses
Secondary Endpoints	• Changes in cognitive functions • Pharmacodynamic profile on nicotine shift assay (EEG) (2,000 mg dose level) • Pharmacokinetics of multiple ascending doses
Results	• All primary and secondary endpoints met • No adverse effects on cognition or emotional stability and no abuse potential indicated • BNC210 reduced the effect of nicotine, as measured by EEG, consistent with its mechanism of action

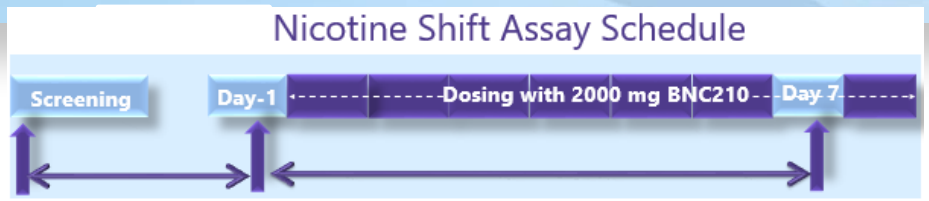
Multiple ascending dose study provided evidence of BNC210 target engagement

NICOTINE



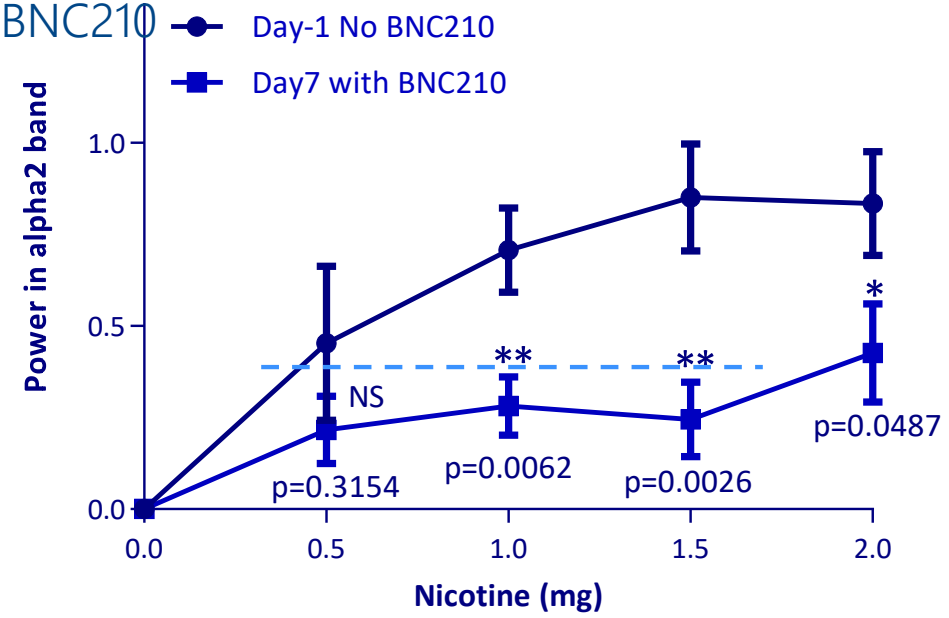
NICOTINE PLUS BNC210





Analyses compared nicotine dose response data on Day-1 (before drug) with dose response data on Day 7 (after 2000 mg BNC210)

Spectral EEG power in the α2 bandwidth (10-12.5 Hz) is reduced in subjects dosed with 2000 mg BNC210



The EEG response to nicotine is achieved through activation of nicotinic receptors in the brain. The major populations targeted are α4β2 and α7 receptors. Reduction in the response by BNC210 is due to antagonism of the α7 receptors

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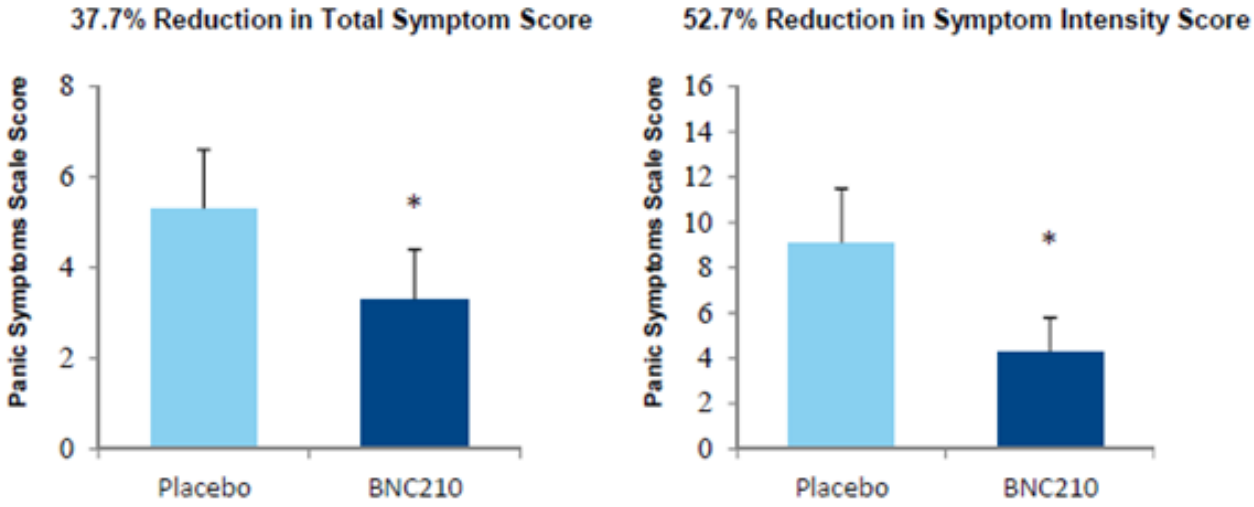
BNC210 was evaluated in humans in a Single Dose Phase 1 CCK4 Challenge Trial

Subjects	• 59 healthy subjects administered CCK4 to induce panic symptoms • 15 responders (consistent with panic attack rates in other studies)
Protocol	• Randomized double-blinded, placebo controlled • Subjects received single dose of placebo and BNC210 (2,000 mg)
Primary Endpoints	• Changes in the PSS (Panic Symptom Scale)
Secondary Endpoints	• Change in anxiety symptoms by means of the e-VAS (emotional-Visual Analog Scale) scales

BNC210 Significantly Reduced CCK-4 Induced Panic Symptoms in Humans

% Reduction in Total Number of Symptoms & Symptom Intensity



Subjects Experiencing Panic Symptoms When Treated with BNC210 Showed:

- Reduction in the number and intensity of panic symptoms compared to placebo
- More rapid return to baseline emotional stability compared to placebo

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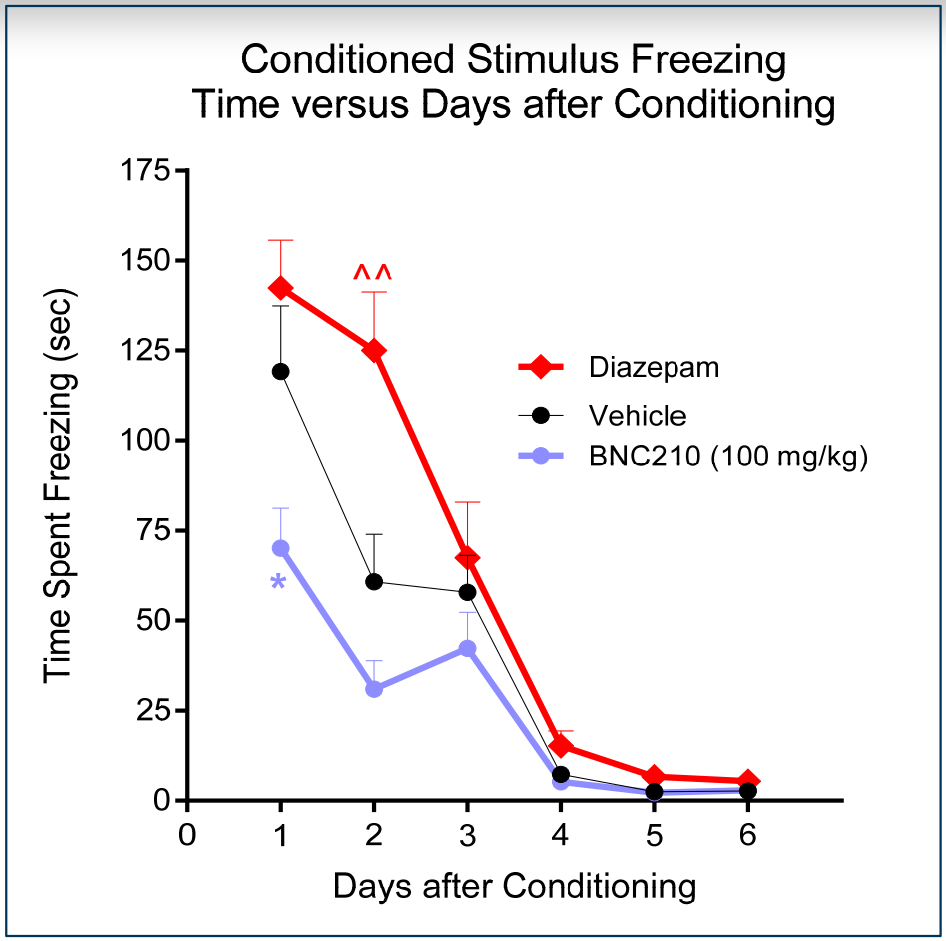
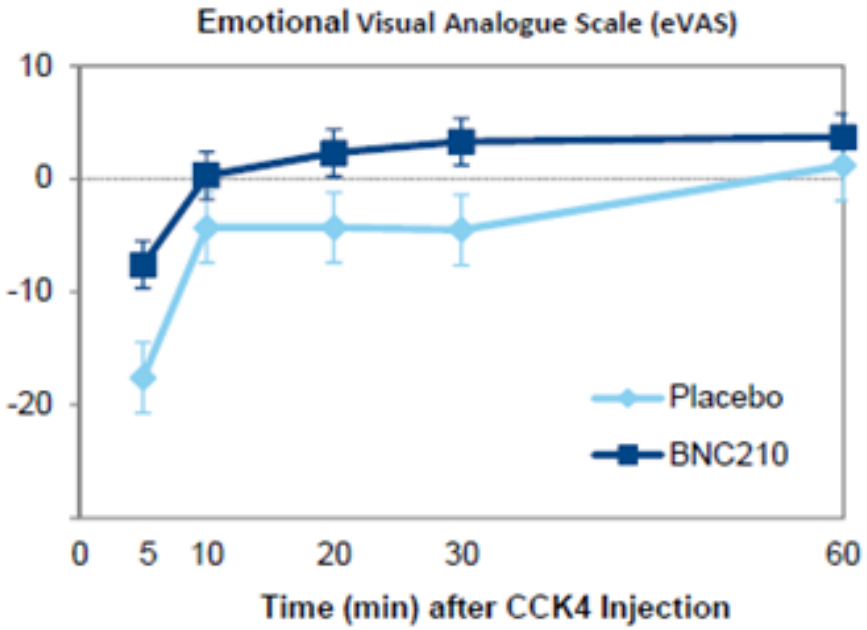
The Effect of BNC210 in a Mouse Fear Extinction Assay Translated to the eVAS results following a CCK-4 Challenge-Induced Panic Attack in Humans



	Day 1	Day 2
BNC210 vs Vehicle	*0.0318	0.06
BNC210 vs Diazepam	***0.0004	****0.0001
Vehicle vs Diazepam	NS	**0.01

Emotional Visual Analogue Scale (eVAS)



BNC210 enhanced fear extinction following conditioned stimulus training

BNC210 improved rate of return to emotional stability following CCK-4 challenge

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BNC210 Phase 2 Trial in Generalized Anxiety Disorder (GAD) Demonstrated Acute Anxiolytic Activity

Randomized, double-blind, placebo and Lorazepam-controlled, 4-way crossover design

King's College London Institute of Psychology, Psychiatry and Neuroscience

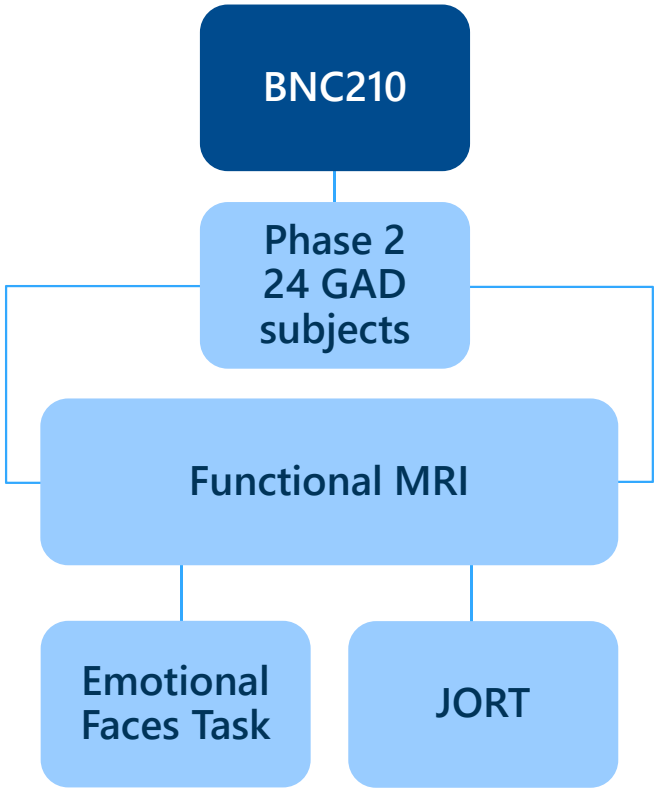
Initiated March 2015

Positive results reported Q3 2016

Primary Endpoints Met:

✓ Changes in cerebral perfusion with BNC210

✓ Changes in brain activation (amygdala) and pathways relevant to anxiety during the performance of an emotional faces task



Secondary Endpoints Met:

✓Significant Changes in defensive behavior using the Joystick Operated Runway Task

✓Safe and well tolerated

BNC210 is not sedating or addictive and does not impair memory or motor co-ordination

All years reflect calendar years. JORT – Joystick Operated Runway Task.

Primary Endpoints Achieved: BNC210 Outperformed Lorazepam in Anxiety Provoked Task

We believe GAD patients treated with BNC210 will have reduced activity in the amygdala during performance of an anxiety provoking task

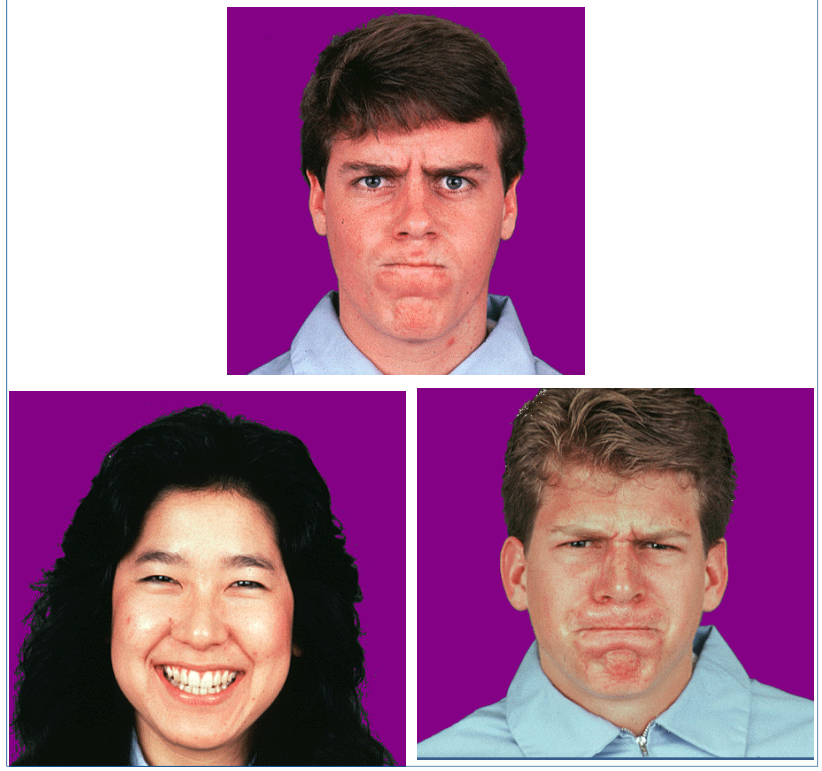
Emotional Faces Task

- Primary Endpoint
- Evaluate activity in the amygdala via Functional MRI
- Several FDA-approved anxiety drugs reduce amygdala activation evoked by performance of the Emotional Faces Task

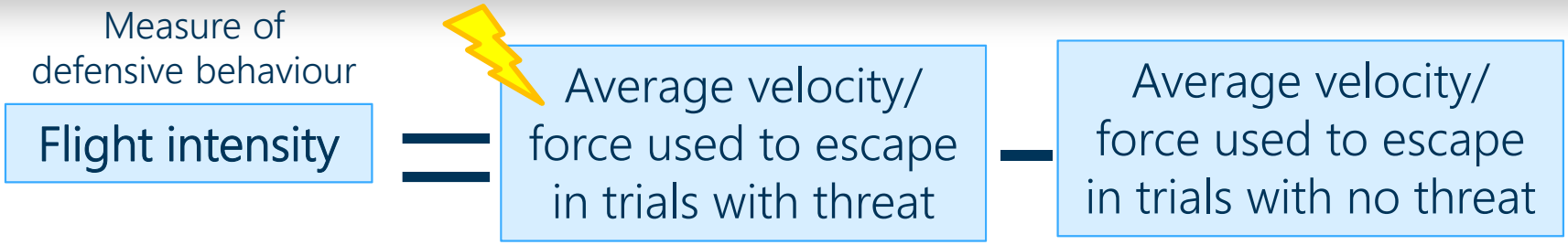
300 mg BNC210 significantly reduced bilateral amygdala reactivity to fearful faces $p<0.05$

Clear reduction in amygdala activity produced by lorazepam; approaching significance in the right amygdala at $p = 0.069$

Emotional Faces Task (Hariri Faces)



BNC210 Suppressed Anxiety-Related Defensive Behavior in the Joystick Operated Runway Task (JORT)



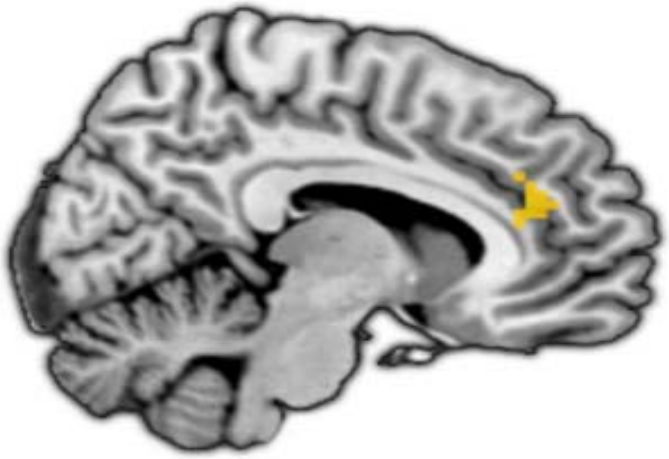
Fear or anxiety result in the expression of a range of defensive behaviors, which are aimed at escaping from the source of danger or motivational conflict

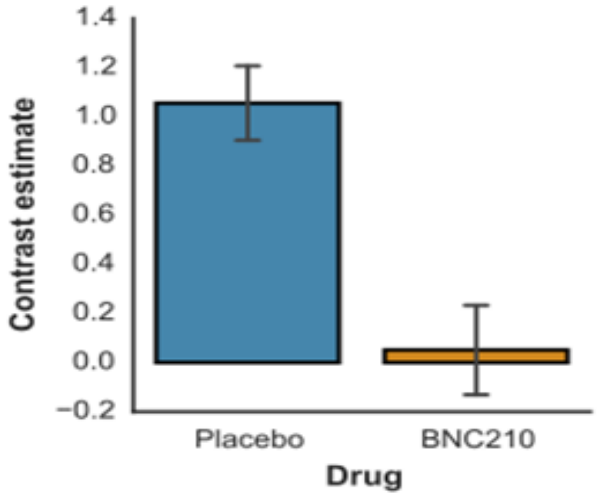
- BNC210 administration was associated with a significant decrease in the intensity of threat avoidance behaviour (300mg BNC210, p=0.007; 2,000mg BNC210, p=0.033)
- Lorazepam also decreased the intensity of threat avoidance behaviour but did not reach significance (p=0.165)

The results of the JORT further support the anti-anxiety effect of BNC210

BNC210 Suppresses Neural Circuits Involved in Anxiety

Anterior cingulate cortex





Left Amygdala

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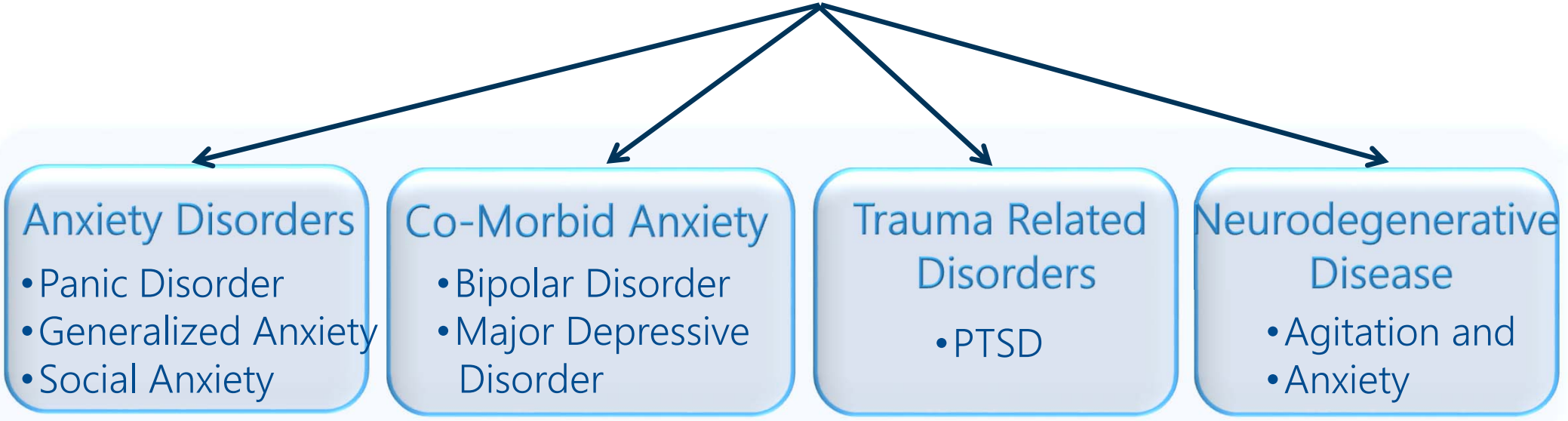
Mechanism of Action of BNC210 Supports Broad Commercial Opportunity

RESULTS OF GAD ANXIETY CLINICAL TRIAL PROVIDES PROOF OF BIOLOGY FOR ADDITIONAL INDICATIONS



PTSD: Poorly Served by Current Medications

- High prevalence of PTSD worldwide and it is a condition receiving greater attention.
- Patients are not well served with current medications and there is high off-label usage with unproven or contraindicated treatments.
- BNC210 may represent a potential opportunity to displace current therapies and expand market.

BNC210 as a Potential Therapy for PTSD Patients

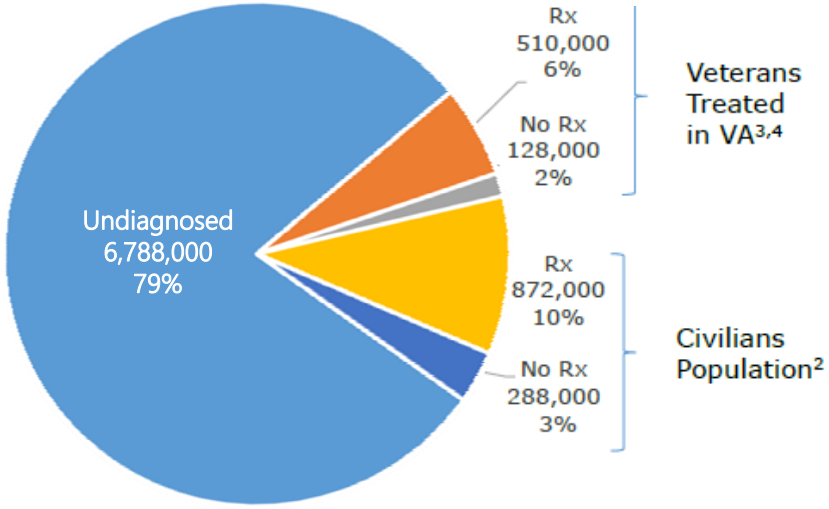
- The anti-depressants sertraline (Zoloft) and paroxetine (Paxil) are the only FDA approved drugs for PTSD.
- The Veteran's Affairs/Department of Defence also recommend fluoxetine (Prozac) & venlafaxine (Effexor) as first-line treatments.
- Their 'Practice Guideline for PTSD' recommends *against* the use of benzodiazepines (BZDs) such as Valium for PTSD.
- Evidence is mounting on the harms associated with chronic benzodiazepine use in PTSD patients.
- Despite their lack of efficacy, addictive potential and other harms associated with chronic use, BZDs are still over-prescribed
- VA has several initiatives in place to reduce use of BZDs among patients with PTSD
- There is a 50% increase in overall mortality rates associated with long-term benzodiazepine use in PTSD patients– overdosing, sudden unexplained deaths, car crashes, falls

Diagnosed PTSD patients are highly likely to be treated with a therapeutic, with Benzos and SSRIs being Tx of choice

An estimated 2.8M benzodiazepine scripts are written off-label for the management of PTSD symptoms

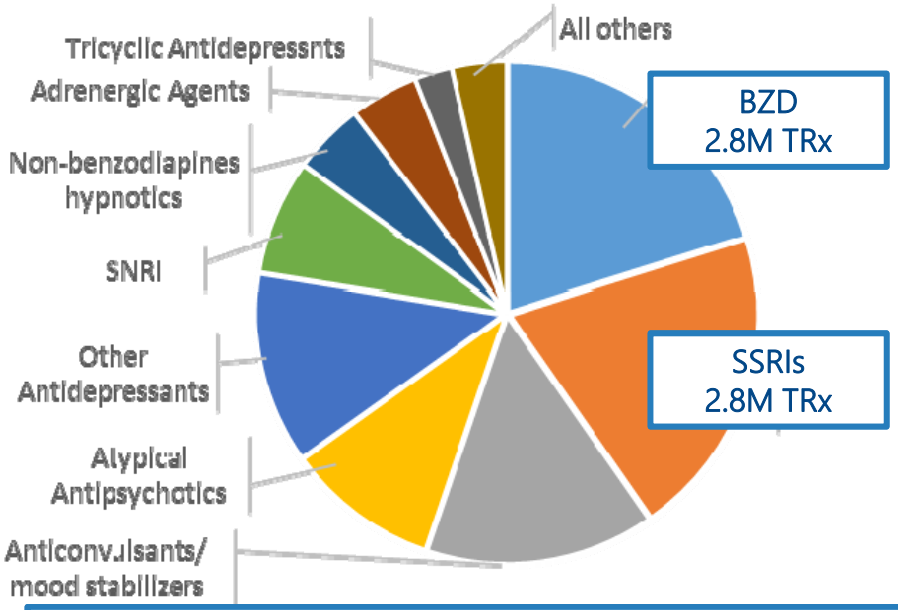
DIAGNOSED AND RX TREATED PTSD PATIENT POPULATION

Prevalent Population
~8.6M[1] (US)



DRUG CLASSES USED TO TREAT PTSD

Estimated PTSD Market Volume (Civilian pop. only)
~14.1M TRx[2]



OBSERVATIONS BASED ON EXTERNAL RESEARCH :

- 1.8M (~20%) patients diagnosed
- MAJORITY (~75%) of diagnosed patients receive drug treatment
- Dx rate expected to increase with increased focus and development activity in stress related disorders

OBSERVATIONS BASED ON EXTERNAL RESEARCH :

- Benzos and SSRIs representing the largest classes
- Polypharmacy is the norm
- High switch rates, within and between different classes of therapeutic agents, presents an opportunity for trial and usage

1. Kessler, et al., 2005; Prevalence rate 3.5% applied to US Census estimate of 247M US adults (≥18) population in 2015.
2. IMS/Quintiles Consulting, Market Sizing & Treatment Dynamics: PTSD, 2016
3. Bowe and Rosenheck, 2015 (638,451 veterans dx with PTSD in the VA in fiscal year 2012 across all medical centers.
4. Bernardy et al., 2012 (80% of veterans diagnosed with PTSD has a least one medication form the Clinical Practice Guidelines)

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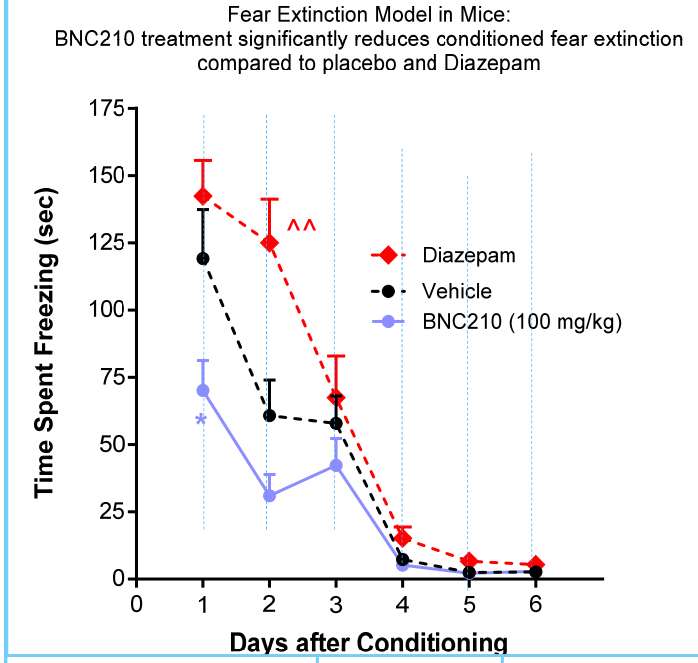
The Pharmacology of BNC210 Demonstrates Potential for the Treatment of PTSD

Posttraumatic stress disorder (PTSD) develops in response to a traumatic event and describes clusters of symptoms and behaviors that includes persistent:

Intrusive Memories	Avoidance & Numbing	Anxiety & Increased Arousal	Negative alterations in Cognition and Mood)

BNC210 has:

- ✓ Potential to dampen hyper-arousal by:
  - Suppression of noradrenaline release
  - Suppression of the HPA axis and ACTH/Cortisol release
- ✓ Anxiolytic activity demonstrated in man
- ✓ Evidence for enhancement of fear extinction in man
- ✓ Safe, Well tolerated, No drug-drug interactions, Not sedating, No memory impairment, No addictive potential



	Day 1	Day 2
BNC210 vs Vehicle	*0.031	0.06
BNC210 vs Diazepam	***0.0004	****0.00001
Vehicle vs Diazepam	NS	**0.0056

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Phase 2 Trial in Post Traumatic Stress Disorder (PTSD) Initiated in Q2 2016 - Ongoing

restore

Subjects	• 192 PTSD Patients
Protocol	• Double-blind, placebo controlled, randomized, multi-centre • 4 arms, 1 placebo, 3 BNC210 dose level treatment arms • 12 weeks, twice daily oral treatment
Primary Objective	• To determine whether BNC210 causes a decrease in symptoms of PTSD as measured by CAPS-5
Secondary & Exploratory Endpoints	• To determine the effects of BNC210 on anxiety (HAM-A), depression (MADRS) and cognitive functions • Correlation of genotype and imaging pharmacodynamics markers

PTSD is a risk factor for depression, alcohol or substance abuse, absenteeism/unemployment, homelessness, violent acts, suicidal thoughts and suicide

Outlook & Milestones

- Continue to recruit patients into the ongoing clinical trial of BNC210 in patients with PTSD. Recruitment anticipated end CY2017.
- Explore both partnership options and pathways for broader Phase 2 development of BNC210.
- Work closely with MSD, enabling MSD to reach milestones and demonstrate Bionomics strength in drug discovery.
  - Cognition drug candidate entered clinical development triggering a US$10M milestone payment in February 2017
- Add to our strategic partnerships
- Phase 1 BNC101 trial results in patients with colon cancer Q2,2017 and Q3, 2017
- Financials: Market Cap A$166M, Cash at 31 March 2017 A$49.9M, Net cash generated to 31 March 2017 (9 months) $4.485M