Bionomics

Corporate Presentation

BNO (Australia: ASX)
BNOEF (USA: OTCQX)

April 2018

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.

Subject to the requirements of any applicable legislation or the listing rules of any stock exchange on which our securities are quoted, we disclaim any intention or obligation to update any forward-looking statements as a result of developments occurring after the date of this presentation.

Bionomics Overview

- Global, clinical stage biopharmaceutical company leveraging proprietary platform technologies, ionX and MultiCore, to discover and develop a deep pipeline of novel drug candidates targeting ion channels in CNS disorders
- Lead candidate, BNC210, is a novel, orally-administered, first-in-class, allosteric modulator of the α7 nicotinic acetylcholine receptor, in development for anxiety, panic, agitation, and PTSD:
  - Positive data from Phase 2 trial in Generalized Anxiety Disorder (GAD) patients reported in September 2016
  - Phase 2 trial in Post Traumatic Stress Disorder (PTSD) ongoing in Australia and US with data anticipated in 2H 2018
- Strategic partnership with Merck & Co., (MSD):
  - Cognition therapeutic 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
- Robust pipeline of first in class ion channel programs
- Financials: Market Cap ~US$233M as at 23 April 2018; Cash at 31 December 2017 US$25M

Key Investment Highlights

MISSION	▪ Global, clinical stage biopharmaceutical company leveraging proprietary platform technologies, ionX and MultiCore, to discover and develop a deep pipeline of novel drug candidates targeting ion channels in CNS disorders
EXCITING DRUG PIPELINE	▪ Two potential blockbuster drugs – BNC210 and Merck & Co. collaboration (MK#) – BNC210 – an orally-administered, first in class allosteric modulator of the α7 nicotinic acetylcholine receptor under development for PTSD, anxiety, agitation and panic – Positive data from BNC210 Phase 2 trial in Generalized Anxiety Disorder (GAD) patients reported in September 2016 – MK# – a "next generation" therapeutic candidate under development for cognitive impairment in Alzheimer's and Parkinson's disease and other conditions ▪ Additional pipeline of early stage compounds
LARGE END MARKETS WITH UNMET NEEDS	▪ BNC210 – US Anxiety and Depression market of US$20.6b annually; US PTSD market of US$4.7b annually ▪ MK# – Alzheimer's market of US$3b in 2016; Parkinson's market of US$3.1b in 2012
NEAR TERM VALUATION CATALYSTS / DE-RISKING EVENTS	▪ Bionomics is currently in monetization discussions with potential partners in relation to off-strategy oncology assets, presenting the opportunity for near term upfront payments plus future milestones/royalties ▪ BNC210 Phase 2 trial in PTSD results anticipated in 2nd half 2018, presenting a significant inflection point for Bionomics ▪ MK# Phase 1 Alzheimer's trial results anticipated Q4,2018 – Q1,2019, presenting the opportunity for the next milestone payment to Bionomics
PROVEN TECHNOLOGY PLATFORM	▪ Proprietary drug discovery/platforms to support future pipeline and deals - Multicore®, ionX®
STRATEGIC PARTNERSHIPS	▪ Merck & Co. cognition therapeutic candidate MK# 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
OWNERS OF INTELLECTUAL PROPERTY	▪ Bionomics is the owner of the intellectual property in relation to its core technology platforms, compounds and methods of use ▪ Merck & Co. is the exclusive licensee of the intellectual property in relation to MK#
WELL FUNDED BUSINESS	▪ US$25M cash at 31 December 2017, runway for the next 18 months at projected burn rates ▪ Market Cap ~US$206M as at 4 April 2018

Management Team

Strong management and scientific team with deep R&D expertise and outstanding track record of success

Dr. Deborah Rathjen ***Chief Executive Officer and Managing Director***	▪ Dr Rathjen has been CEO of BNO for 17 years, joining in 2000 from Peptech Ltd, where she was Manager of Business Development and Licensing, and a co-inventor of Peptech's TNF technology ▪ In addition to significant experience in licensing negotiation, company building, financing, and M&A, Dr Rathjen holds multiple awards in biotechnology and innovation – Awarded the AusBiotech President's Medal for her contribution to the Australian biotechnology industry, following six years as Chair of the AusBiotech board
Dr. Paul Rolan ***Consultant, Chief Medical Officer***	▪ Dr. Rolan is a clinical pharmacologist (MBBS MD FRACP), pharmaceutical physician (FFPM (UK)) and pain physician (FFPMANZCA) ▪ Career has been split between the pharmaceutical industry, mainly in the UK, and academic and clinical practice in Australia and the UK ▪ In drug development, his experience is mainly in exploratory development, having been principal investigator in over 700 clinical studies of which more than 70 were first in-man, including Bionomics' BNC210 ▪ Dr. Rolan was Professor of Clinical Pharmacology at the University of Adelaide from 2005-2014 and Head of the School of Medical Sciences in 2014 ▪ After another stint in industry, he returned to the University of Adelaide in late 2016 as Director of Innovation for the Faculty of Health Sciences
Steven Lydeamore ***Chief Financial Officer***	▪ As a Certified Practising Accountant, Mr. Lydeamore has had more than 25 years' experience in the international pharmaceuticals industry ▪ Prior to BNO, Mr. Lydeamore worked for Apotex Inc, the Canadian pharmaceuticals group, most recently as the President of Apobiologix, a division of ApoPharma which is a member of the Apotex Group ▪ Has senior executive experience in areas such as finance, business development, and M&A
Jack Moschakis ***Legal Counsel and Company Secretary***	▪ Mr. Moschakis has more than 25 years' experience as a legal practitioner ▪ Has worked in senior legal and company secretary roles in the South Australian electricity industry for more than 10 years and has expertise in energy law and energy-related commercial and contractual matters ▪ Most recent position was at the mining company Rex Minerals Ltd where he worked as a legal consultant ▪ Prior to this, Mr. Moschakis worked at Thomsons Lawyers, a top-tier Adelaide law firm that is now part of the national law firm of Thomson Geer, as an energy and infrastructure consultant ▪ Mr. Moschakis holds a Bachelor of Economics, Diploma in Law, and Graduate Diploma in Business Administration

Bionomics' CNS Focused Pipeline

Program	Mechanism of Action	Indication	Pre-IND	Phase 1 / 2a	Phase 2b	Bionomics' Commercial Rights	Market Opportunity
BNC210	α7 nicotinic acetylcholine receptor NAM	PTSD	*Ongoing; results expected 2H 2018*			WW	▪ US$4.7B ▪ 3.4-4% prevalence >18 yrs ▪ ~25% of patients diagnosed and treated
		Agitation	*Phase 2a expected to initiate Q2 2018*			WW	▪ US$1.6B ▪ ~3.1% dementia prevalence >40yrs ▪ ~9% agitation patients diagnosed and treated
		GAD	*Positive Phase 2a data*			WW	▪ US$2.7B ▪ 3.1% GAD prevalence ▪ ~25% diagnosed and treated ▪ ~50% of SSRI patients treated are partial responders or have relapsed
		Panic	*Positive CCK-4 induced panic data*			WW	▪ US$4.4B ▪ 2.7% prevalence ▪ ~50% diagnosed and treated ▪ Assumes 5% premium to Trintellix 2016 AWP for 30-day supply of $380 – compliance adjusted
MK#	α7 nicotinic acetylcholine receptor PAM	Alzheimer's, Parkinson's	*Phase 1 ongoing*			WW Merck Partnership	▪ US$506M total deal value including upfront and milestones payments ▪ Tiered royalties
Pain, Depression, Memory Enhancement	Undisclosed					WW	

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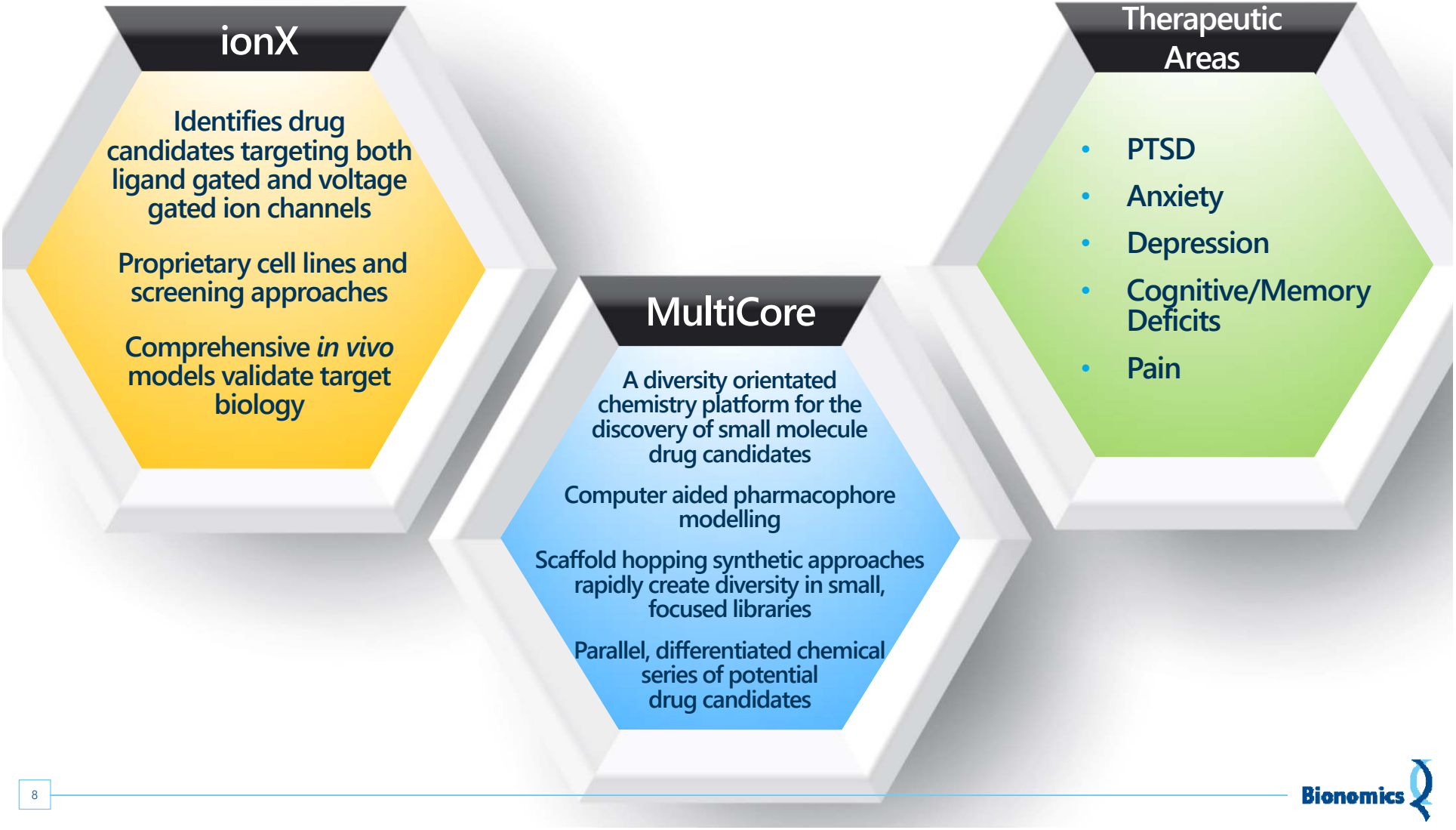
Global License and Collaboration Agreement with Merck & Co in Cognition Provides Validation

- Validates ionX and MultiCore drug discovery platforms
- Partnership with Merck & Co in cognition generated US$20M in upfront payment in 2014, research funding 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

- Agreement covers research on BNC375 and related compounds
- BNC375 demonstrated potent memory enhancing properties in animal models – both episodic and working memory improved
- Targeting cognitive impairment in Alzheimer's and Parkinson's and other conditions

Our Proprietary Platform Technologies and CNS Therapeutic Focus



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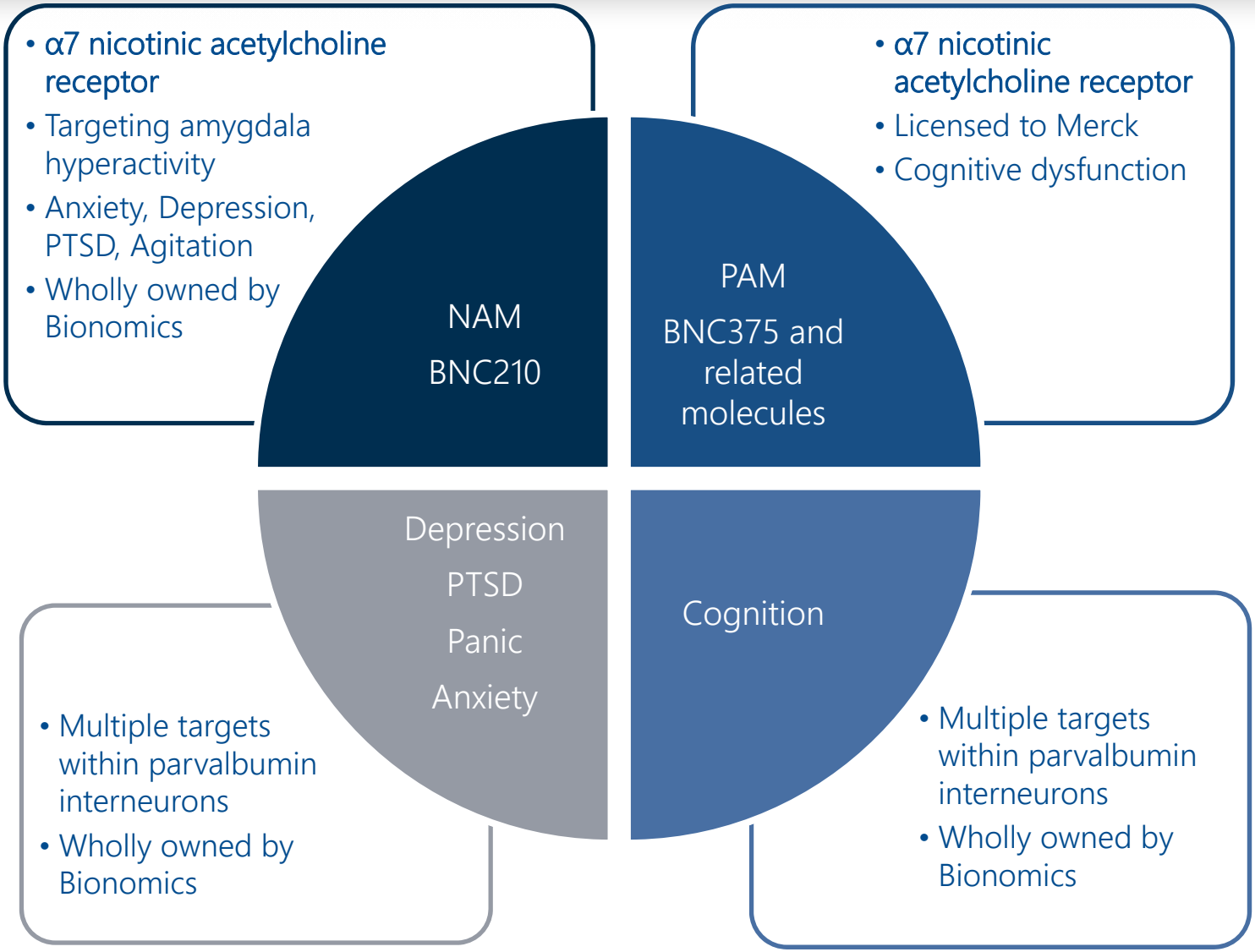
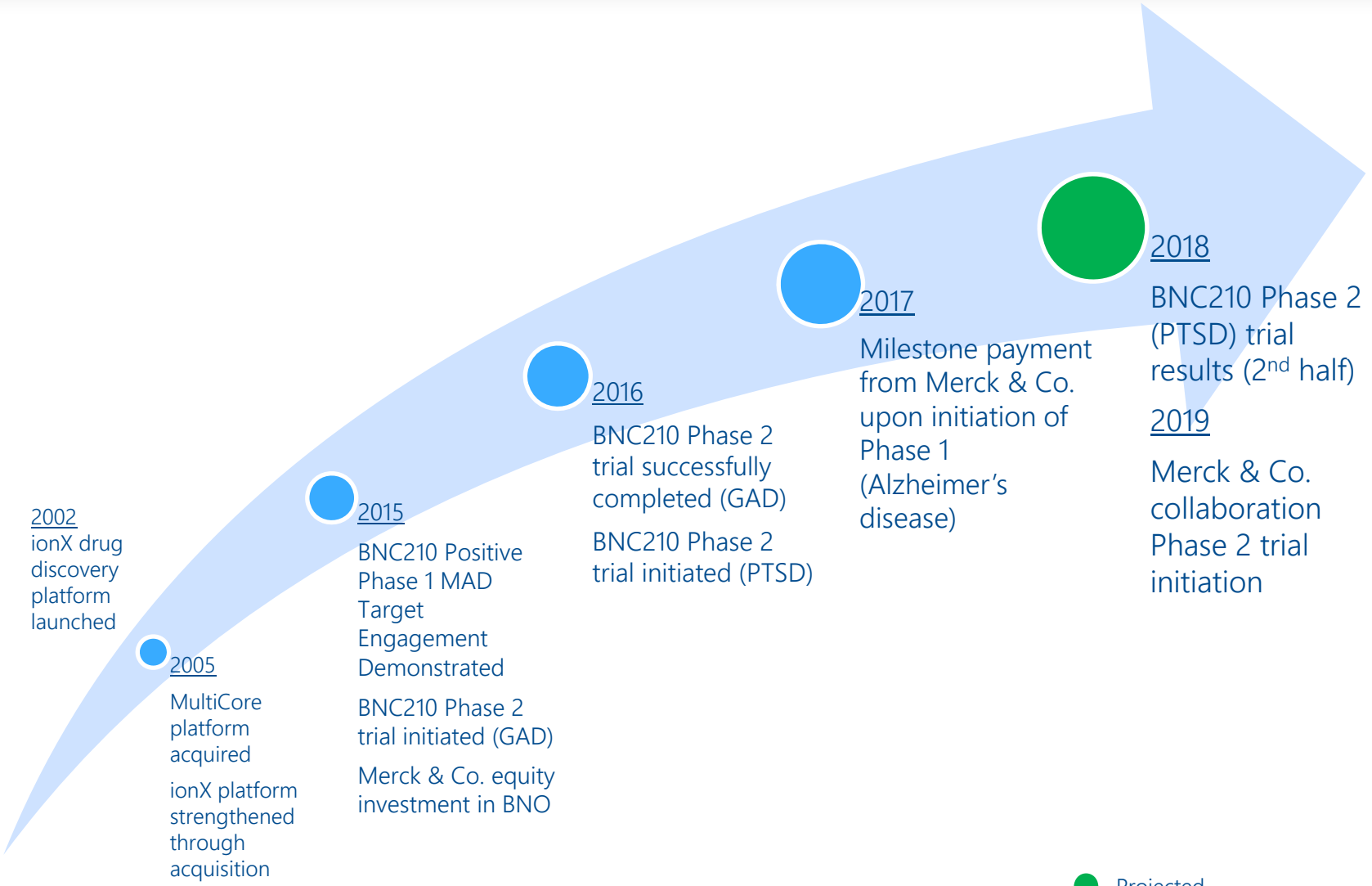
Bionomics' Discovery Engine



Bionomics

Milestones in Value Creation



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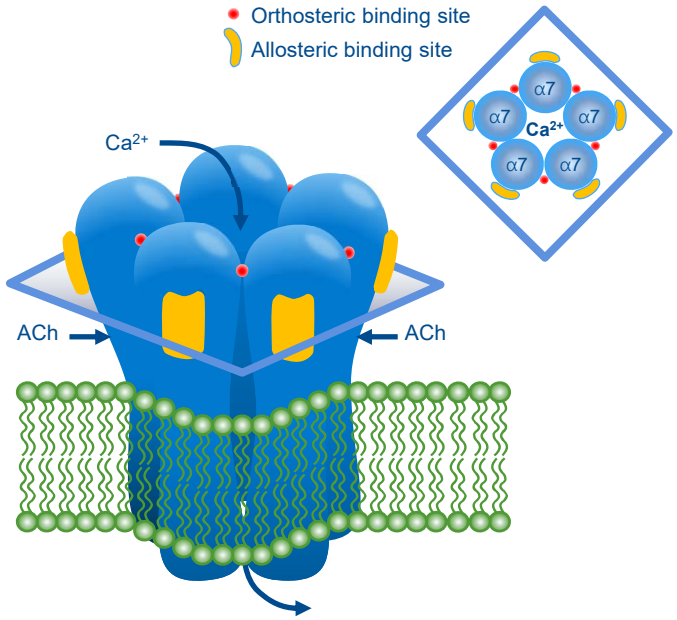
α7 Nicotinic Acetylcholine Receptor: Rich Area of Biology with Increasingly Recognised Role in Anxiety & Depression

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
- Allosteric modulation provides mechanism for selectively and specifically modulating receptor to achieve desired outcomes
  - Aim to normalise receptor activity
- Negative allosteric modulation of the α7 receptor may reduce anxiety and depression

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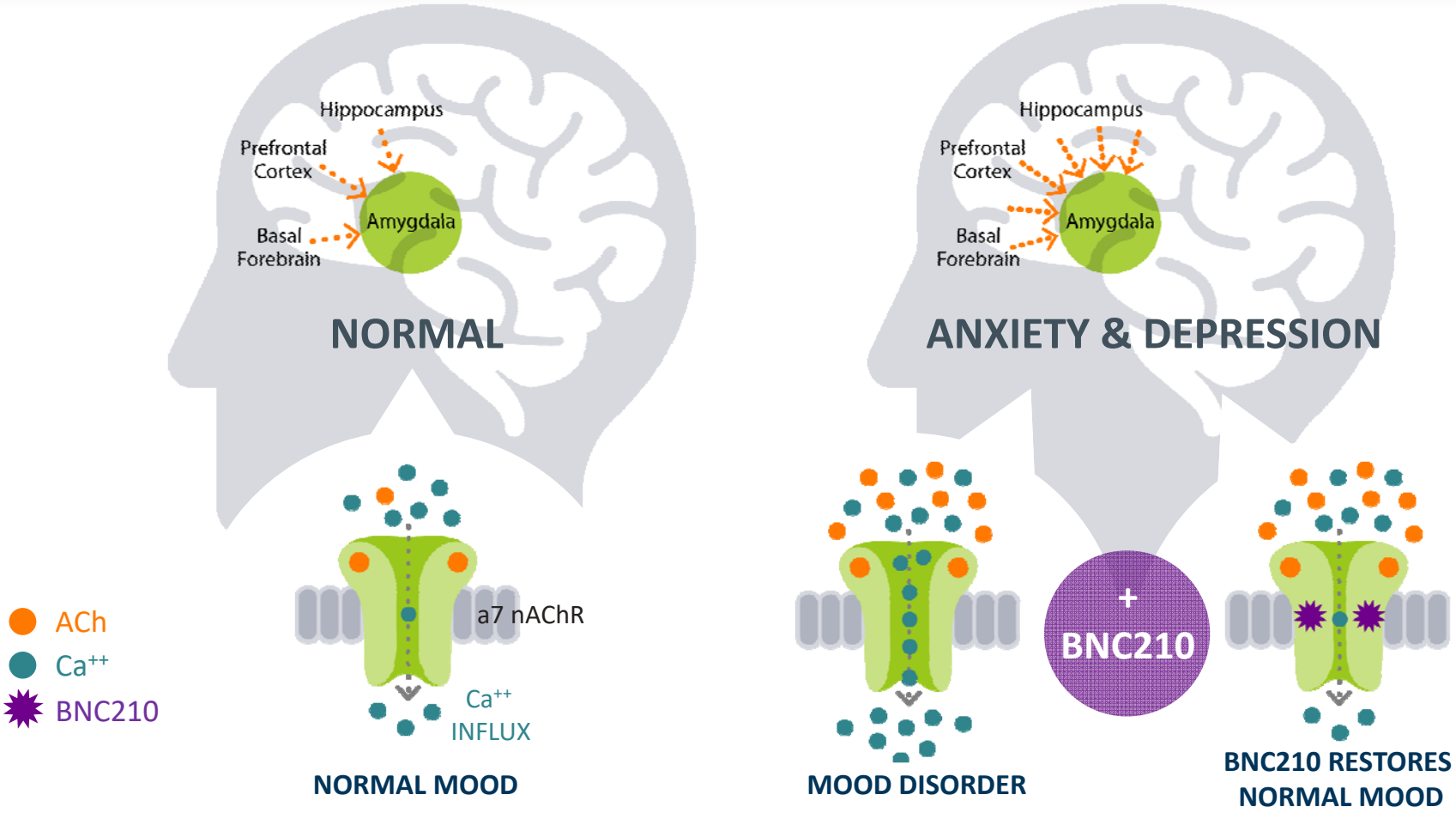
BNC210 Action Depends on Dampening the Effects of Elevated Acetylcholine Neurotransmission in Brain Circuits Involved in Mood Disorders



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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, a ligand gated ion channel
Target Indications	• Anxiety (Generalized Anxiety Disorder or GAD & Post Traumatic Stress Disorder or PTSD) • Potential for other CNS indications, including Depression
Ongoing Clinical Trials	• Phase 2b multi-centre trial in PTSD fully recruited, topline data 2H, CY2018
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

BNC210: Next Generation Drug Candidate with Potential to Treat PTSD, 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, abuse liability, 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, weight gain, sexual dysfunction and increased thoughts of suicide in adolescents
- Many have black box warnings

Post Traumatic Stress Disorder (PTSD) Treatments

- Sertraline (Zoloft) and paroxetine (Paxil) are only US FDA approved anti-depressants drugs for PTSD.
- Despite lack of efficacy, addictive potential and other harms associated with chronic use, BZDs are still over-prescribed.
- An estimated 2.8M scripts are written off-label for management of PTSD symptoms.
- VA/DoD 'Practice Guideline for PTSD' recommends against the use of benzodiazepines (BZDs) such as Valium for PTSD.
- 50% increase in overall mortality rates associated with long-term benzodiazepine use in PTSD patients– overdosing, sudden unexplained deaths, car crashes, falls.

*Based on data from preclinical studies, Phase 1 & 2 clinical trials.

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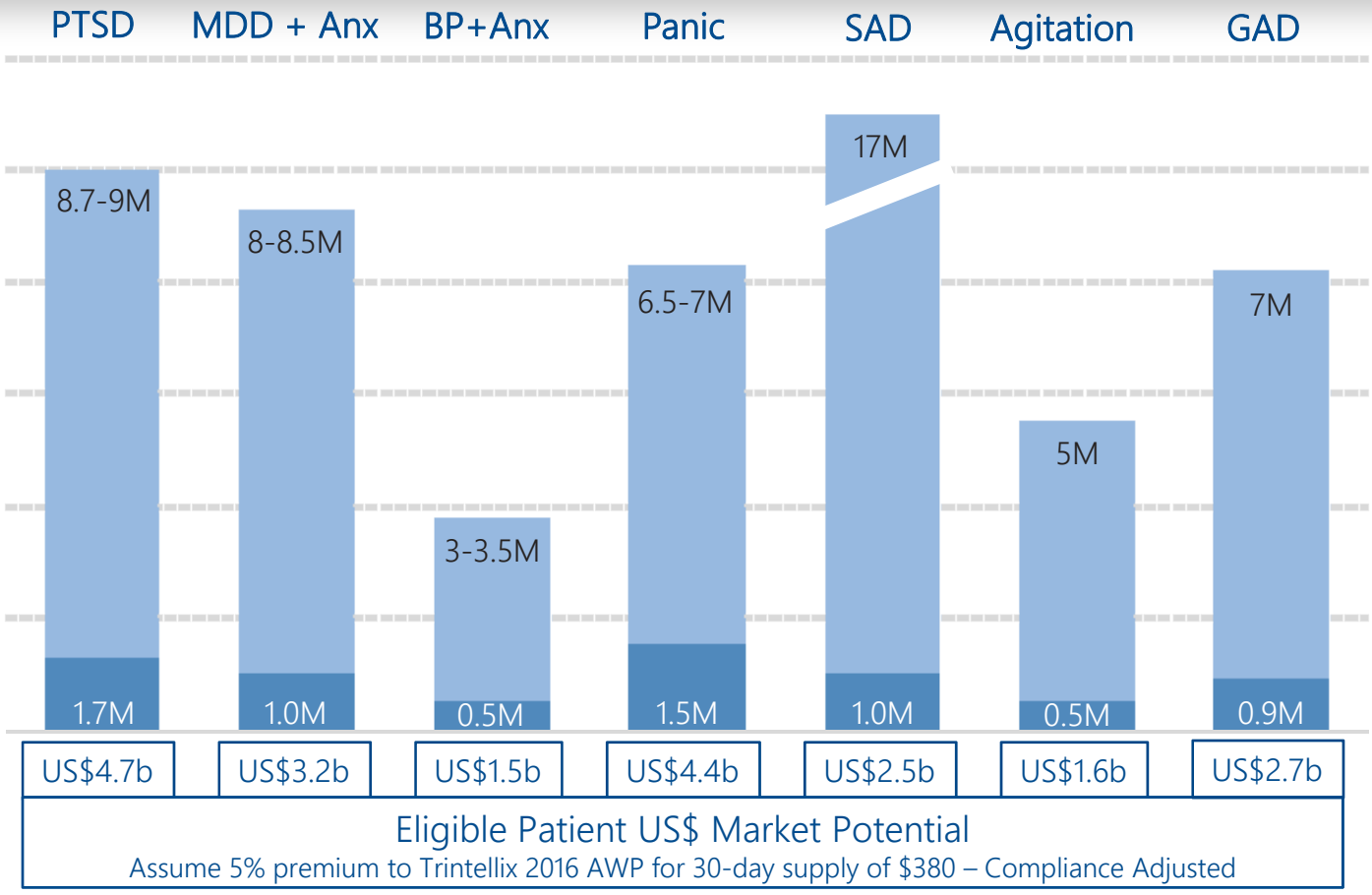
BNC210 Targets Multi-Billion Dollar Markets with Unmet Need: US Market Potential

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



US Prevalence
Eligible Patient Population

[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

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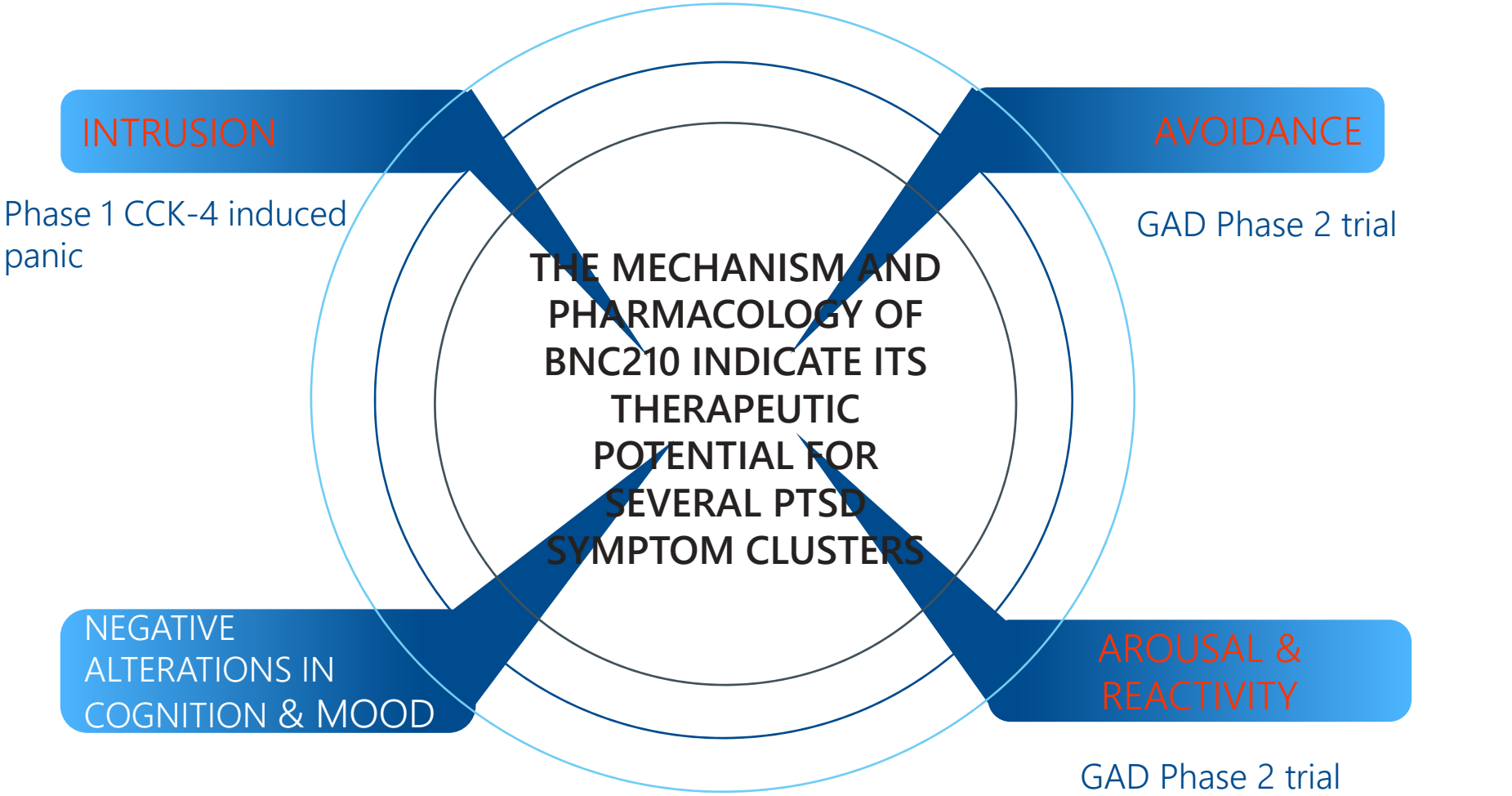
Phase 2 Trial in Post Traumatic Stress Disorder (PTSD) – Ongoing in Australia and US, Data Anticipated 2H, CY18

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

Human Clinical Data Indicates BNC210 May Impact Multiple PTSD Symptom Clusters Measured by CAPS-5



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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

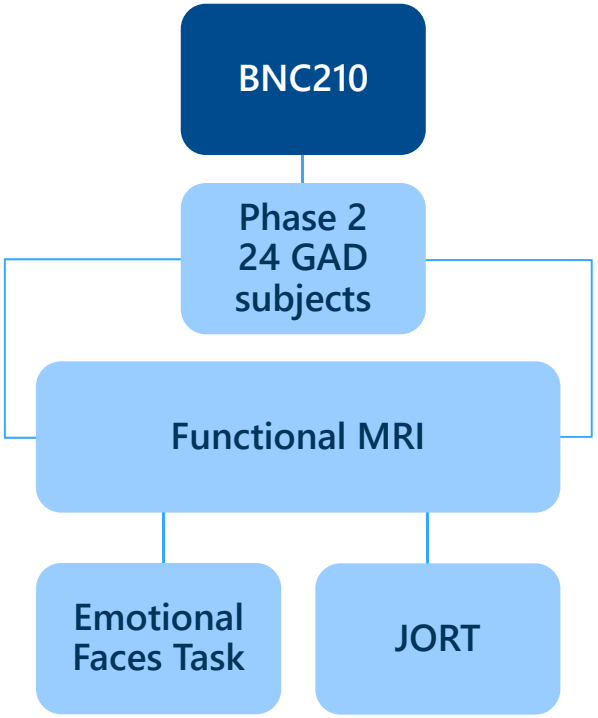
Initiated March 2015

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

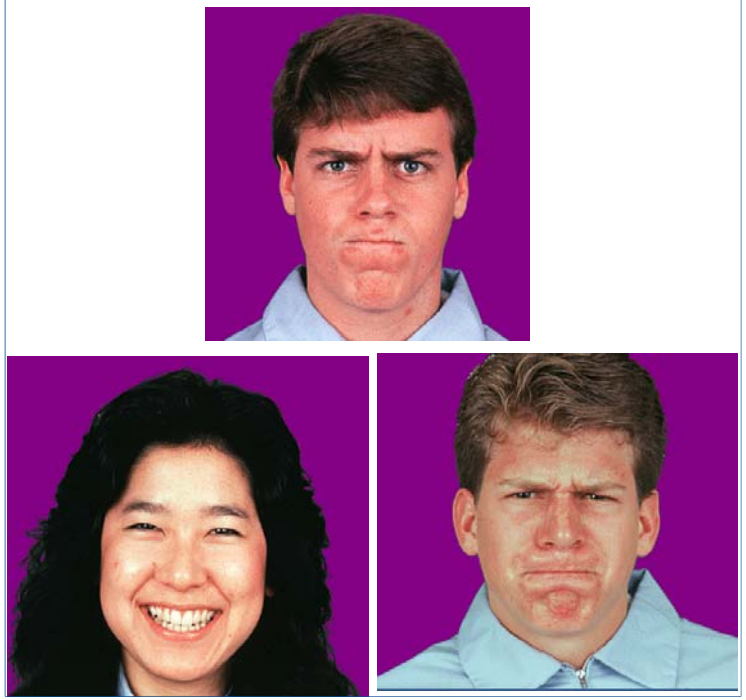
Emotional Faces Task

- 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)

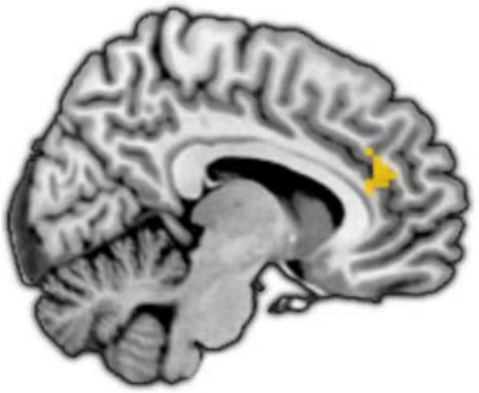


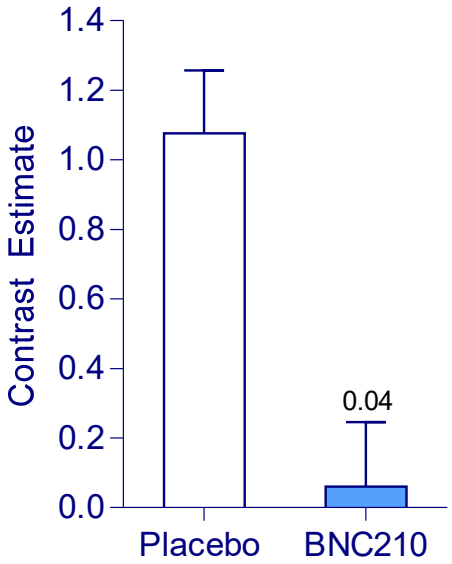
BNC210 Treatment Reduced Connectivity Between the Left Amygdala and the Anterior Cingulate Cortex in GAD Patients

- BNC210 (300 mg) reduced connectivity between the left amygdala and anterior cingulate cortex while viewing fearful faces (p = 0.04)

✓ This finding is highly supportive for the anxiolytic activity of BNC210:

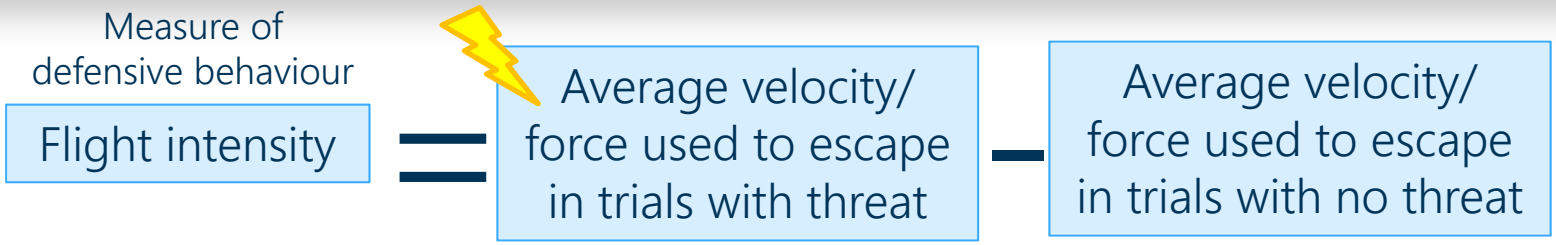
- Interactions between the dmPFC/ACC and amygdala constitute an 'aversive-amplification' circuit - increased positive coupling between these regions is associated with elevated threat processing under stress.
- In pathological anxiety this circuit becomes permanently 'switched-on' (Robinson et al. 2011).





Bionomics

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

Bionomics

BNC210 May Also Inhibit PTSD Associated Panic Attacks

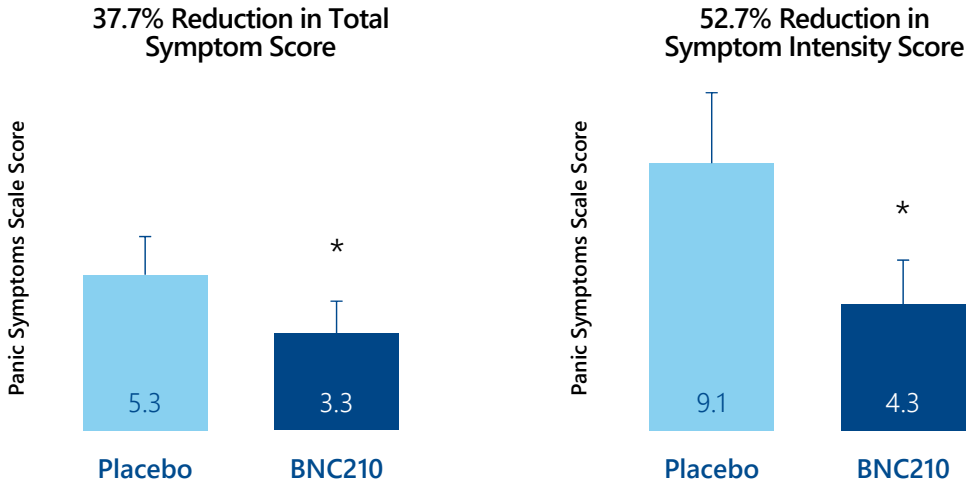
Increasing evidence that panic attacks are common in people with PTSD

US National Comorbidity Survey found that 35% of people with PTSD had panic attacks

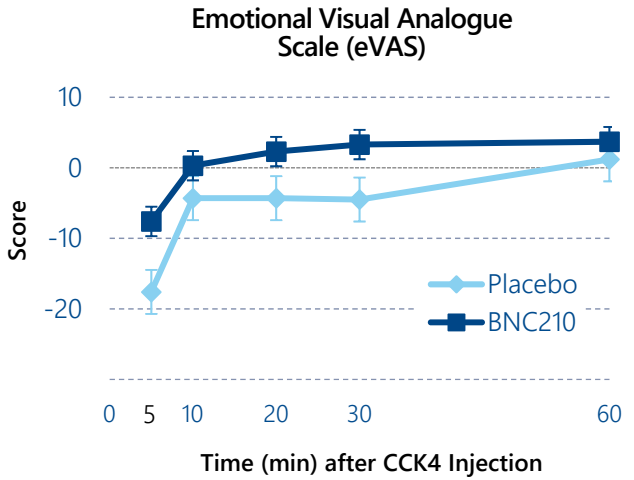
Evidence that panic attacks in the context of PTSD are associated with fear of trauma memories

BNC210 Significantly Reduced CCK4-Induced Panic Symptoms in Humans

% Reduction in Total Number of Symptoms & Symptom Intensity



Emotional Visual Analogue Scale (eVAS)



In a Double-blinded, Placebo Controlled Trial Subjects Experiencing Panic Symptoms When Treated with BNC210 Showed:

- Reduction in the number and intensity of panic symptoms compared to placebo as measured by the Panic Symptom Scale (PSS)
- More rapid return to baseline emotional stability compared to placebo reducing opportunity for embedding fear memories

Bionomics

Financial Overview

- $25M Cash and cash equivalents as at 31 December 2017
- Historical financial details:

	Fiscal Year End Jun. 30,					6 Months Dec. 30,
($ in Millions)	2013	2014	2015	2016	2017	2017
Revenue	$3	$15	$5	$6	$14	$2
Other Income	$6	$6	$8	$10	$7	$4
R&D Expense	$12	$14	$18	$19	$19	$9
Total Operating Expenses	$17	$18	$26	$30	$27	$14
Cash & cash equivalents	$17	$8	$20	$35	$33	$25

All US$. 4/4/18 conversion of 1.2987013 AUD to 1 USD

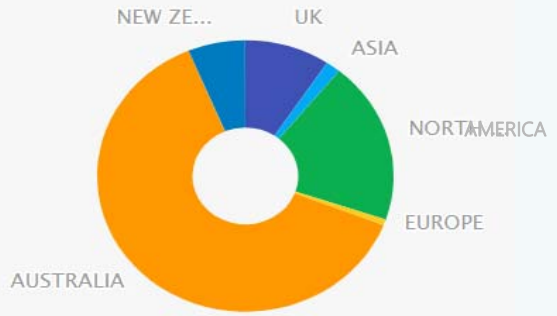
Financial and Capital Structure Overview

Bionomics is an ASX listed, Australian based international clinical stage biopharmaceutical company focused on the discovery and development of innovative small molecule therapeutics for conditions of the central nervous system ("CNS").

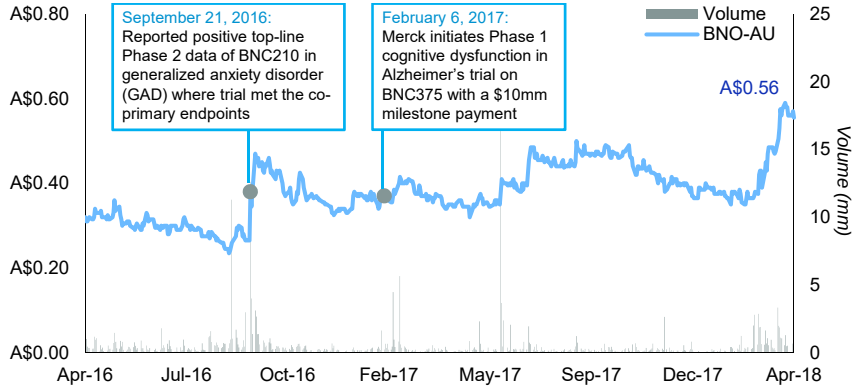
KEY STATISTICS (4.4.18)

ASX Code / OTCQX	BNO / BNOEF
Current Share Price	A$0.555
52 Week High	A$0.600
52 Week Low	A$0.315
Shares on Issue	482.42M
Market Capitalisation	US$206M
Net Cash (12.31.17)	US$25M

SHAREHOLDING STRUCTURE (2.4.18)



2 YEAR SHARE PRICE PERFORMANCE ($A)



BOARD AND MANAGEMENT

Errol De Souza	Chairman
Deborah Rathjen	CEO & MD
Peter Turner	Non-Exec Director
David Wilson	Non-Exec Director
Alan Fisher	Non-Exec Director
Paul Rolan	Chief Medical Officer
Jack Moschakis	GC & Company Secretary
Steven Lydeamore	CFO

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Bionomics

CREATING INNOVATIVE THERAPIES
FOR SERIOUS HUMAN DISEASES.

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Competitive Landscape for Industry Trials in PTSD

Compounds address different specific symptoms to achieve overall benefit

PI	PI	PII	PII	PIII	PIII	PIV	PIV
SpringWorks	Aptinyx	Bionomics	Azevan Pharmaceuticals	Tonix Pharmaceuticals	Otsuka	MSD Howard University	Takeda University of Miami
FAAH inhibitor	N-methyl-D-aspartate (NMDA)	a7 nAChR NAM	Vasopressin V1a antagonist	Multiple mono-amines	Dopamine	Orexin antagonist	Serotonin modulator and stimulator
	NYX-783	BNC210	SRX246	TNX102	Brexpiprazole	Suvorexant	Brintellix
Anxiolytic?	?	Anxiolytic, Antidepressant, Enhances fear extinction	Anti-fear, Aggression, Depression, and Anxiety	Sleep, Nightmares	Atypical Antipsychotic, Antidepressant Hyperarousal	Insomnia	Depression
No Information other than in PI	No information Fast Track	192 pts, 2H, 2018	52 pts, June 2018	550 pts, Oct. 2018 Fast Track	332 pts, December 2018	105 pts, March 2019 145 pts, March 2021	80 pts, July 2019

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