



CREATING INNOVATIVE THERAPIES FOR CNS DISORDERS.

Corporate Presentation BNO (Australia: ASX) BNOEF (USA: OTCQB)

January 2020

Central Nervous System (CNS)

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.

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Bionomics Overview

- Global, clinical stage biopharmaceutical company leveraging proprietary ionX and MultiCore platforms to deliver a pipeline of novel drug candidates targeting ion channels in CNS disorders
- Lead clinical candidate BNC210 in Phase 2 with Fast Track designation from FDA for Post-Traumatic Stress Disorder (PTSD)
 - Strong safety database, demonstrated target engagement and proof-of-biology in healthy subjects and Generalized Anxiety Disorder (GAD) patients
- Strategic partnership with Merck & Co., with therapeutic candidate for cognitive impairment in clinical development for Alzheimer's Disease
- Emerging partnering pipeline of ion channel candidates for treatment of pain and cognitive deficits
- Additional value in non-core Phase 1-2 oncology assets through external funding and partnering
- Strong US investor base (BVF Partners, L.P. ownership of ~19.9% & Merck & Co. equity investment)
 - Financials: Cash at 31 December 2019: A\$9.3M



Management Team



Errol De Souza PhD Executive Chairman

- More than 35 years experience in biotech, big pharma and academia
- Previous President & CEO of multiple public (Biodel, Synaptic) & private (Neuropore, Archemix) biotech companies
- Founder of Neurocrine Biosciences
- Previous SVP Aventis Pharmaceuticals
- Previous Head of CNS Diseases, DuPont Merck
- Multiple public and private boards



Jack Moschakis BEc, DIPLaw (BAB) NSW, G DipBA, FCIS, FGIA Legal Counsel & Company Secretary

- Over 26 years experience as a legal practitioner
- Joined Bionomics in 2015
- Held senior Legal / Company Secretary roles in the Energy and Resources sectors
- Extensive experience in commercial, contractual and regulatory related legal matters



Adrian Hinton BAEc, FCA Acting Chief Financial Officer

- Over a 43 year career at Deloitte (Adelaide)
- Retired in 2018 as Principle Audit and Assurance
 Group
- Broad-based knowledge of contemporary accounting and audit issues in a wide range of industries
- Experience in preparing Due Diligence reviews, investigative accounting reports and review of profit forecasts



Sue O'Connor PhD VP Strategic Initiatives & Innovation

- Joined Bionomics in 2003
- Worked on the BNC210 anxiety program from its inception
- As VP Neuroscience R&D, led the biology effort to discover BNC375 and the resulting Merck& Co. collaboration
- Led early discovery efforts to identify novel compounds to treat chronic pain, cognitive impairment and social withdrawal



Liz Doolin MSc VP Clinical Development

- 25 year international career in drug discovery, clinical and life sciences research
- Joined Bionomics in 2008
- Extensive clinical operations and regulatory experience
- Oncology and CNS drug development
- Strong biotechnology research and manufacturing background

Our Proprietary Platform Technologies and CNS Therapeutic Focus

ionX

Ion channel drug discovery capabilities Ligand- & voltage-gated channels Proprietary cell lines Multiple screening platforms *In vivo* models to measure target biology & safety

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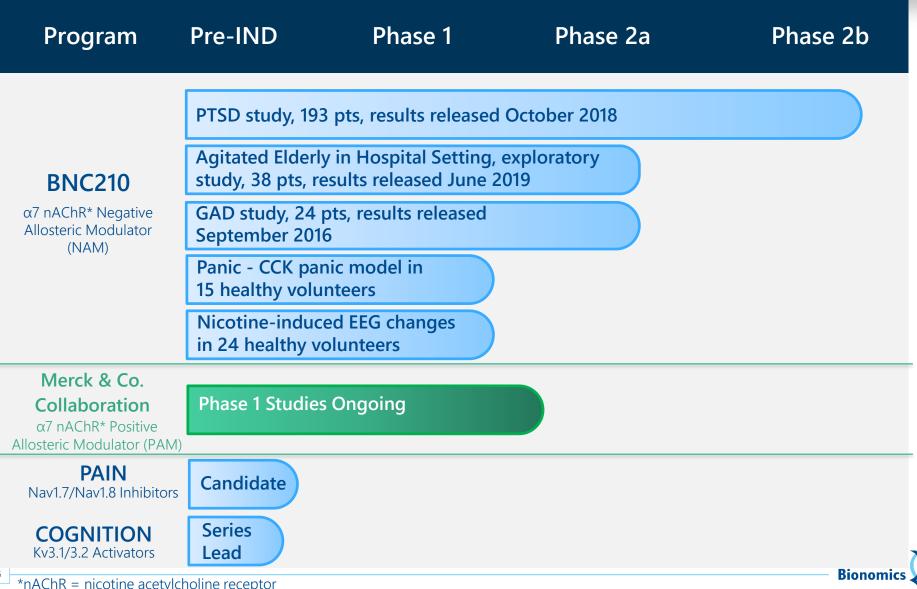
MultiCore

A diversity orientated chemistry platform for the discovery of small molecule drug candidates Scaffold-hopping synthetic approach rapidly creates diversity in focused libraries Parallel, differentiated chemical series Areas PTSD Anxiety Agitation Depression Cognitive Impairment

Therapeutic

Pain

Bionomics' CNS Focused Pipeline



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



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- 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, Parkinson's and other conditions

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BNC210: novel, orally-administered, first-in-class, negative allosteric modulator (NAM) of the α7 nicotinic acetylcholine receptor

BNC210: Next Generation Drug Candidate with Potential to Treat Anxiety, Depression, PTSD and other Stress-Related Disorders

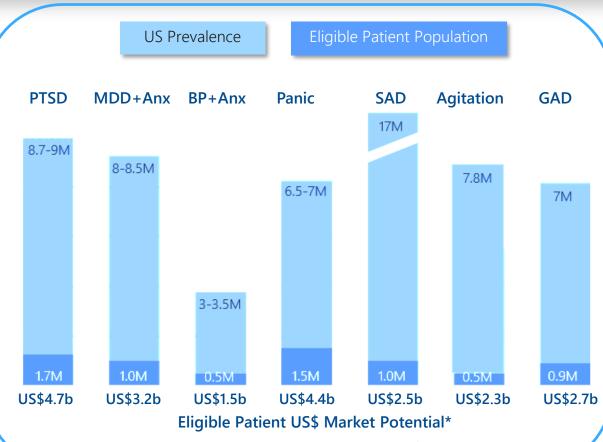
Potential Competitive Advantages of BNC210*

Drug	No sedation	No withdrawal syndrome	No memory impairment	Fast acting	No drug/drug interactions
BNC210	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark
Valium and other benzodiazepines	X	X	X	\checkmark	\checkmark
Prozac and certain other SSRIs/SNRIs	\checkmark	X	\checkmark	X	X



Bionomics

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



 Innovative, first-inclass

- Unmet need in large patient population
- Advancement in care
- Limited branded competition
- Ability to achieve large market share

*Assume 5% premium to Trintellix 2016 AWP for 30-day supply of \$380 – Compliance Adjusted

¹ 3.4-4% prevalence >18yrs., ~25% of patients diagnosed and treated

 2 6.7% prevalence, $\sim\!50\%$ co-morbid anxiety, $\sim\!50\%$ 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
- $^{\rm 6}$ ~3.1% dementia prevalence >40yrs., ~9% agitation patients diagnosed and treated

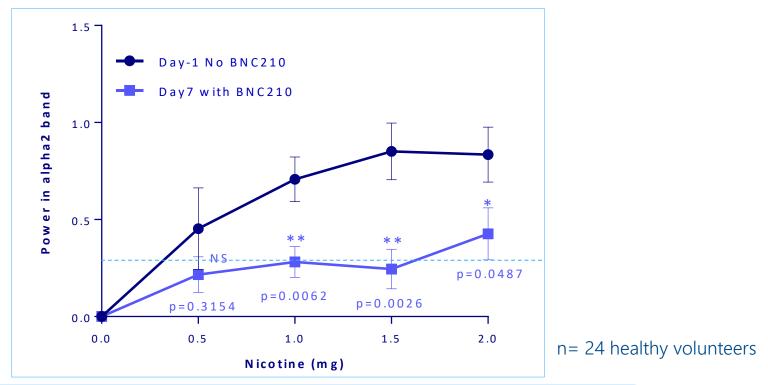
⁷ 3.1% GAD prevalence, assumes ~25% diagnosed and treated, ~50% of SSRI patients treated are partial responders or relapsers



Post-Traumatic Stress Disorder (PTSD) Major Depressive Disorder (MDD) Bipolar Disorder (BP) Social Anxiety Disorder (SAD) Generalized Anxiety Disorder (GAD)

BNC210 Treatment Reduced Nicotine-Induced EEG Responses: Demonstration of Target Engagement in Humans

- The EEG response to nicotine is achieved through activation of nicotinic receptors in the brain. The major populations targeted are $\alpha 4\beta 2$ and $\alpha 7$ receptors.
- Oral dosing with 2000 mg BNC210 for 7 days reduced nicotine-induced EEG power in the α 2 band.

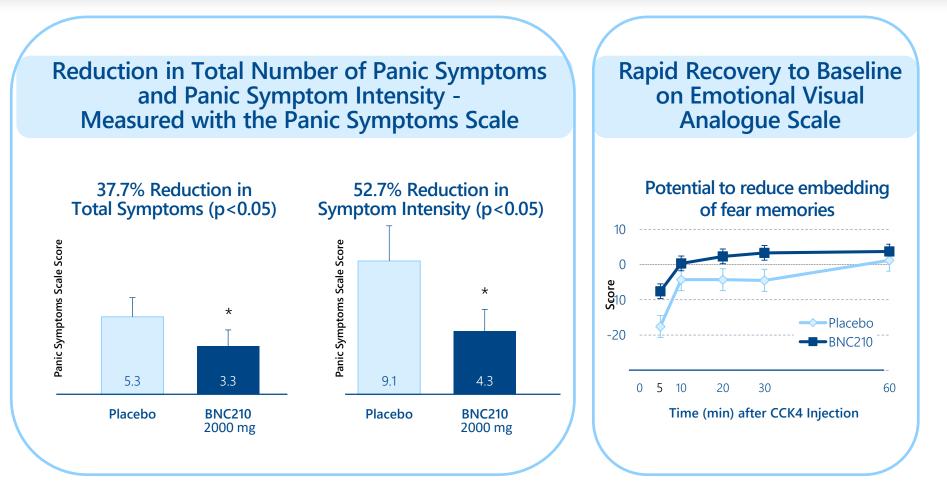


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Reduction in the EEG response is due to negative allosteric modulation of the α 7 receptors by BNC210

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BNC210 Significantly Reduced CCK4-Induced Panic Symptoms in Humans

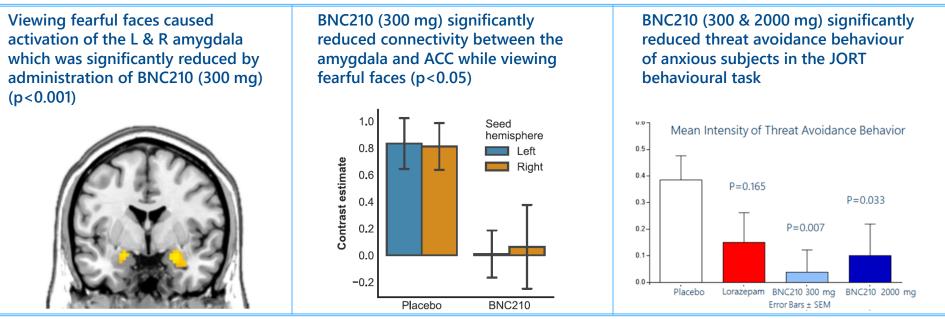


Evaluation conducted in 15 healthy volunteers who experienced a CCK-induced panic attack

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

- Two single doses of BNC210 (300 and 2000 mg), lorazepam (1.5 mg) and placebo were administered to GAD patients
- 24 subjects received all treatments (4-way crossover study)
- Patients were exposed to 'fearful faces' while in a Magnetic Resonance Imaging (MRI) machine and also performed a behavioral task called the Joystick Operated Runway Task (JORT)



Wise T. et al., Biological Psychiatry 2020 (https://doi.org/10.1016/j.biopsych.2019.12.013)

- Amygdala activation is an imaging surrogate for anxiety
- Connectivity between the amygdala and anterior cingulate cortex (ACC) is very strong in high anxiety Bionomics

Phase 2 Trial of BNC210 in Adults with Post-Traumatic Stress Disorder (PTSD)

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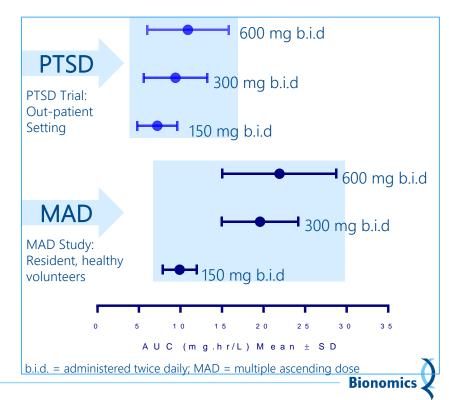
Study Design	 Multi-center, randomized, double-blind, placebo-controlled BNC210 150 mg, 300 mg, 600 mg and placebo (1:1:1:1) (liquid suspension formulation taken twice daily, b.i.d.) 12-week treatment period 193 participants 20 US sites / 6 Australian sites
Key Selection Criteria	 Current diagnosis of PTSD as defined by CAPS-5 (Clinician- Administered PTSD Scale for DSM-5) Concomitant use of one anti-depressant medication allowed
	• To assess the effects of BNC210 on investigator-rated symptoms of
Key Study Objectives	PTSD measured by CAPS-5To assess the safety and tolerability of BNC210 in subjects with PTSD

PTSD Trial Conclusions: Analyses Performed on a Dosage Basis

- No overall effect on the CAPS-5 total severity score at 12 weeks ۲
- BNC210 was safe and well tolerated in patients with PTSD •
 - No trend for increased adverse events with treatment

 - No evidence of cognitive impairment
 No evidence of suicidal ideation or behavior worsening

Population pharmacokinetic (PK) modelling indicated that plasma levels of BNC210 were ~50% lower than expected using the liquid suspension formulation in this out-patient trial setting



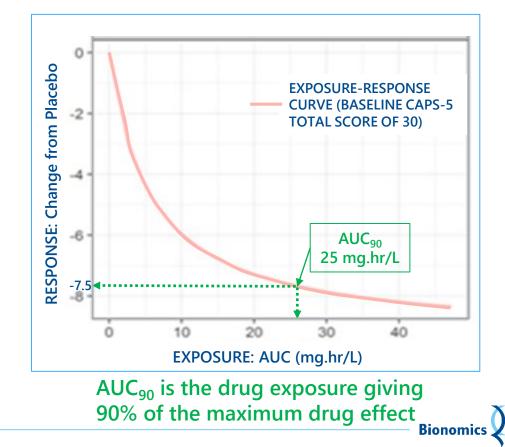


Exposure-Response Analysis Showed the Potential for a Significant Response when Adequate Drug Exposure is Achieved

Pharmacometric analysis of the Phase 2 data established an exposure-response relationship for CAPS-5 total severity scores where higher AUC values (plasma exposure) were related to a larger effect (p<0.01)</p>

The figure shows the model-predicted exposure-response curve for a subject with a baseline CAPS-5 total severity score of 30 (this was the mean baseline score for the PTSD trial patients in the 600 mg b.i.d. BNC210 treatment group.)

> ~25 mg.hr/L is the model predicted AUC₉₀ being targeted in future BNC210 trials in PTSD patients.



A Solid Dose Formulation of BNC210 is being Developed to Achieve Target Exposure in Clinical Trial Subjects

PTSD trial results indicated that the liquid suspension formulation of BNC210 did not achieve sufficient exposure in the out-patient setting

Benefits of a solid dose formulation (tablets):

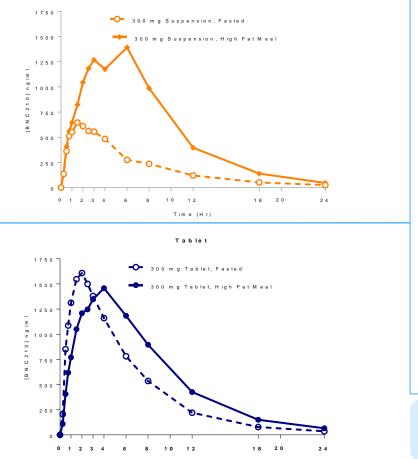
- Simple to administer with no need for thorough resuspension
- Formulated to overcome the need to take with food (the liquid suspension was administered with food to give best exposure)

Progress to Date:

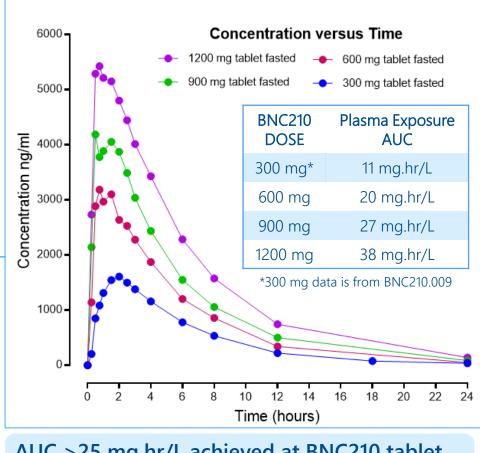
- Spray dry dispersion technology used to manufacture BNC210 tablets
- Human single dose PK studies completed

BNC210 Tablet Formulation Overcomes Food Effect of the Liquid Suspension and has Dose Linear Exposure

Trial BNC210.009: single 300 mg dose of BNC210 liquid suspension *versus* solid dose formulation (fed and fasted conditions)



Trial BNC210.010: single 600, 900 and 1200 mg doses of solid dose formulation in fasted subjects



AUC >25 mg.hr/L achieved at BNC210 tablet doses of 900 mg and higher in fasted subjects Bionomics

Bionomics has Achieved Key Milestones Towards Continuing Development of BNC210 for the Treatment of PTSD

2019

- Pharmacometric analysis of the Phase 2 PTSD trial data showed that there is potential for significant patient benefit in future trials provided adequate drug exposure is achieved
- Successful development of a BNC210 solid dose formulation and evaluation in single dose PK studies achieved exposures adequate for future development
- FDA Type C Meeting provided positive feedback on the BNC210 development program for the treatment of PTSD

✓ FDA granted Fast Track designation to BNC210 for the treatment of PTSD

BNC210 is Back on Track to Leverage Large Opportunity for Treatment of PTSD

2020: Preparations for Phase 2b PTSD Trial

- Optimize the tablet formulation for a Phase 2b clinical trial, including dog PK studies
- Manufacture BNC210 tablets for a multiple dosing PK trial in healthy volunteers to select the dose for the Phase 2b trial (targeting plasma exposure ≥25 mg.hr/L)
- Large scale manufacture of BNC210 drug substance and tablets for Phase 2b
 trial

2021 – 2022: Implementation of Phase 2b PTSD Trial

- Conduct a Phase 2b clinical trial in ~200 PTSD patients comparing one dose of BNC210 with placebo on the change in CAPS-5 total severity scores at 12 weeks
- CAPS-5 is the FDA-accepted primary endpoint for PTSD clinical trials



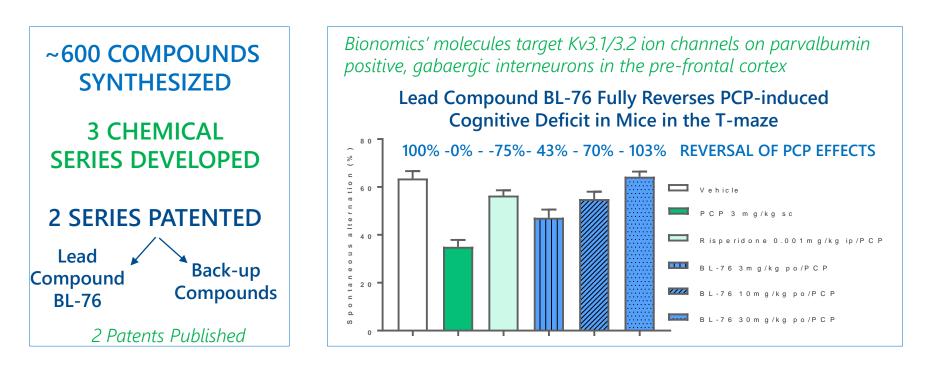


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Emerging CNS Pipeline For Partnering

Small Molecule Kv3.1 / Kv3.2 Ion Channels Activators for Treatment of Cognitive Dysfunction & Negative Symptoms

Kv3.1 / Kv3.2 activators represent a promising therapeutic strategy for improving cognitive dysfunction and negative symptoms in schizophrenia and other illnesses such as Autism Spectrum Disorder and Alzheimer's Disease



Pan Nav Inhibitors Offer Potential to Develop Non-Addictive Therapeutics for Chronic Pain with Less Side Effects

Disease-Related Genomics Gain & Loss-of-function mutations in Nav1.7, 1.8 and 1.9 have been associated with human pain syndromes where extreme pain or no pain is experienced.

Bionomics' Pan Nav inhibitors are small molecules with functional selectivity for voltage gated sodium channels: Nav1.7, Nav1.8, hERG and potentially Nav1.9 1000+ COMPOUNDS SYNTHESIZED 3 CHEMICAL SERIES DEVELOPED 3 SERIES PATENTED Lead Back-up Compound BL-017881 Compounds

Lead Candidate Identified

BL-017881

- 100% pain reduction (100 mg/kg)
- No side effects (300 mg/kg)
- ✓ 40x selectivity over hERG
- ✓ CNS penetrant





CREATING INNOVATIVE THERAPIES FOR SERIOUS HUMAN DISEASES.

Oncology Assets: Build Value Through External Funding

BNC105 - a Multi-Modal Small Molecule Tubulin Polymerization Inhibitor

- Multiple modes of BNC105 anti-cancer action have been identified:
 - Tumor starvation by selective disruption of tumor vasculature
 - Induction of cancer cell death by upregulation of pro-apoptotic proteins
 - Suppression of tumor growth by inhibition of cancer cell proliferation
 - Modulation of the tumor microenvironment
 - Tumor immunomodulation with a significant reduction in PD-L1 expression
- BNC105 clinical dose and schedule have been established in four Phase 1 and 2 clinical trials
- BNC105 has been generally well tolerated in clinical trials in patients with solid tumors (including renal cell cancer, ovarian cancer, colorectal cancer and mesothelioma) and liquid tumors (chronic lymphocytic leukemia) (including in combination with other chemotherapeutics)

Two externally-funded investigator-initiated clinical trials are in progress:

- Microsatellite stable refractory colorectal cancer:
 - Phase 2 trial of BNC105 in combination with nivolumab (Opdivo)
 - The trial is sponsored by the Australasian Gastro-Intestinal Trials Group (AGITG) and funding support is provided by BMS
- <u>Chronic lymphocytic leukemia:</u>
 - Phase 1 trial of BNC105 in combination with ibrutinib (Imbruvica)
 - Funding support is provided by the Leukemia & Lymphoma Society (US)

BNC101 - a First-in-Class Humanized Monoclonal Antibody to LGR5, a Cancer Stem Cell Receptor

- LGR5 is a cancer stem cell receptor overexpressed in a number of solid cancers such as colorectal, pancreatic, breast and lung cancers, and has a role in tumor growth and survival
- BNC101 binds to LGR5 with high affinity and selectivity and internalizes the receptor
- BNC101 clinical dose and schedule were established in a Phase 1 trial in patients with metastatic colorectal cancer (CRC) the recommended Phase 2 dose (RP2D) was identified
- BNC101 was safe and well tolerated with no dose-limiting toxicities (DLTs)
- Co-localization of BNC101 and LGR5 was demonstrated in patient tumor tissue
- A cGMP manufacturing process is established at Lonza (UK)

Future development:

- Phase 2 ready: BNC101 in combination with standard of care treatment for gastro-intestinal cancers overexpressing LGR5
- BNC101 has the potential to be developed as an Antibody-Drug-Conjugate (ADC) therapeutic

Bionomics Outlook

- Balanced business model with potential for short term milestones to drive shareholder value:
 - Internal development of BNC210 which is back on track with a solid dose formulation to achieve the blood exposure required for future PTSD trials, positive feedback from the FDA and Fast Track designation providing a promising opportunity for the company in 2020 and beyond
 - We continue to pursue licensing and partnering possibilities for our core CNS pain and cognition programs and have an ongoing collaboration with Merck & Co. (known as MSD outside the United States and Canada)
 - Maximize the value and partnering potential of legacy oncology assets through external funding of clinical programs
 - Cost cutting measures implemented in 2019 along with leveraging Australian R&D Tax Incentive Refund allow us to extend cash runway with non-dilutive funding





CREATING INNOVATIVE THERAPIES FOR SERIOUS HUMAN DISEASES.

Appendix

Board of Directors



Errol De Souza PhD Executive Chairman

- More than 35 years experience in Biotech, Big Pharma and Academia
- Previous President & CEO of multiple public (Biodel, Synaptic) & private (Neuropore, Archemix) biotech Companies
- Founder of Neurocrine Biosciences
- Previous SVP Aventis Pharmaceuticals
- Previous Head of CNS Diseases, DuPont Merck
- Multiple public and private Boards



Alan Fisher

- 24 years at accounting firm Coopers & Lybrand as lead Advisory Partner – Melbourne Corporate Finance Division
- Last 22 years as founder of his own Corporate Advisory company specializing in M&A business restructurings, strategic advice and capital raisings for small cap companies
- Non-Executive chairman Centrepoint Alliance Ltd & IDT Aust.
- Non-Executive Director and chair of Audit and Risk committee of Thorney Technology



Mitchell Kaye

- COO BVF Partners
- Founding member of Xmark Opportunity Partners LLC
- Founding member of Brown Simpson Asset Management LLC
- Founder of MedClaims Liaison LLX
- Previous Managing Director Navigant Capital Advisors, Head of Navigants Financial Institutions restructuring Solutions team.



Peter Turner

- Previous Executive Director and COO of CSL
- Founding president of CSL Behring working in US & Europe.
- Experience encompasses integration of large company acquisitions in Europe, US and Japan, Company re-structuring, overseen 13 new product launches in US & Europe.
- Non-Executive Director, Virtus Health
- Chairman, NPS MedicineWise
- Previous Chairman of Ashley Services Group



David Wilson

- · Chairman & Founding partner of WG Partners
- Over 30 years' experience in investment banking in City of London
- Previous CEO of Piper Jaffray
- Previous Joint Head of UK Investment Banking Group, ING Barings
- Previous head of Small Companies Corporate Finance, Deutsche Bank
- Previous Head of Small Companies Corporate Broking, UBS

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Summary of BNC210 Clinical Trials: Excellent Safety and **Tolerability Profile in Healthy Subjects and Patients**

Protocol Number	Phase	Description	Subjects Enrolled/ Administered BNC210	Location
BNC210.001 BNC210.002 ICP-2143-101	1	Safety and Tolerability of Single Ascending Doses in Healthy Volunteers	83/67	Australia US
BNC210.003	1b	Lorazepam & BNC210 Comparison in Healthy Volunteers	24/22	France
BNC210.004	1b	Panic Attack Model in Healthy Volunteers	60/59	France
BNC210.005	1b	Safety and Tolerability of Multiple Ascending Doses and EEG Target Engagement Study with Nicotine in Healthy Volunteers	56/44	France
BNC210.006	2a	Imaging and Behavioral Study In Generalized Anxiety Disorder Patients	27/25	UK
BNC210.007	2	Post-Traumatic Stress Disorder	193/143	Australia US
BNC210.008	2a	Agitation in the Elderly in Hospital Setting	38/18	Australia
BNC210.009 BNC210.010	1	Pharmacokinetics of a Recently-Developed BNC210 Solid Dose Formulation in Healthy Volunteers	11/11	Australia
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Bionomics' Oncology Assets

	Preclinical	Phase 1	Phase 2			
BNC105: a multi-modal, small molecule tubulin polymerization inhibitor						
	COLORECTAL: in combination with nivolumab; externally funded	; Phase 2 ongoing (AUS)				
	RENAL: in combination with everolimus; Phase 2 completed; biomarker-based Phase 2/3 ready					
Solid Cancers	MESOTHELIOMA: monotherapy; Phase 2 completed					
	OVARIAN: in combination with gemcitabine + carboplatin; Phase Phase 2 ready	e 1 completed;				
	ADVANCED SOLID TUMORS: monotherapy dose escalation; Pha	se 1 completed				
	CHRONIC LYMPHOCYTIC LEUKEMIA: in combination with ibrutin Phase 1 ongoing (US)	nib; externally funded;				
Blood Cancers	ACUTE MYELOID LEUKEMIA: preclinical data available; Phase 1/2 ready					
BNC101: a first-in-class humanized monoclonal antibody to LGR5, a cancer stem cell receptor						
Solid Cancers	COLORECTAL: monotherapy dose escalation; Phase 1 completed	; Phase 2 ready				
	PANCREATIC: in combination with SOC; preclinical data					
	COLORECTAL: in combination with anti-PD-1; preclinical data					
	ANTIBODY DRUG CONJUGATE: preclinical data		×			
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BNC105 Clinical Development Summary

Study ID	Indication	Design	Intervention	# Subjects Dosed with BNC105P (Doses)	Key Objectives	Location	Status
BNC105P.001	Advance Stage Solid Tumors	Ph 1; Dose escalation	BNC105P monotherapy	21 (2.1-18.9 mg/m ²)	MTD; PK	Australia	Complete
B2P2M2	Advanced Malignant Pleural Mesothelioma	Ph 2; Single arm	BNC105P monotherapy	30 (16 mg/m ²)	PFS; Response Rate	Australia	Complete
ANZGOG- 1103	Partially Platinum Sensitive Relapsed Ovarian Cancer	Ph 1; Dose escalation	BNC105P + carboplatin/gemcitabine (with sequential BNC105P monotherapy)	15 (12-16 mg/m ²)	RP2D; PFS; Response Rate	Australia NZ USA	Complete
GU09-145	Metastatic Clear Cell Renal Cell Cancer	Ph 1/2; Randomized two arm	BNC105P + everolimus vs everolimus monotherapy (with sequential BNC105P monotherapy)	113 (4.2-16 mg/m ²)	MTD & RP2D; 6-month PFS; Response Rate	USA Australia Singapore	Complete
CA209-99U	Microsatellite Stable Refractory Colorectal Cancer	Ph 2	BNC105P + nivolumab	(16 mg/m ²)	PFS; Response Rate	Australia	In progress
D14234	Relapsed/Refractory Chronic Lymphocytic Leukemia	Ph 1; Dose escalation + expansion	BNC105P+ ibrutinib	(8-16 mg/m ²)	MTD; EFS; Response Rate	USA	In progress

EFS = event-free survival; MTD = maximum tolerated dose; PFS = progression-free survival; PK = pharmacokinetics; RP2D = recommended phase 2 dose

Bionomics