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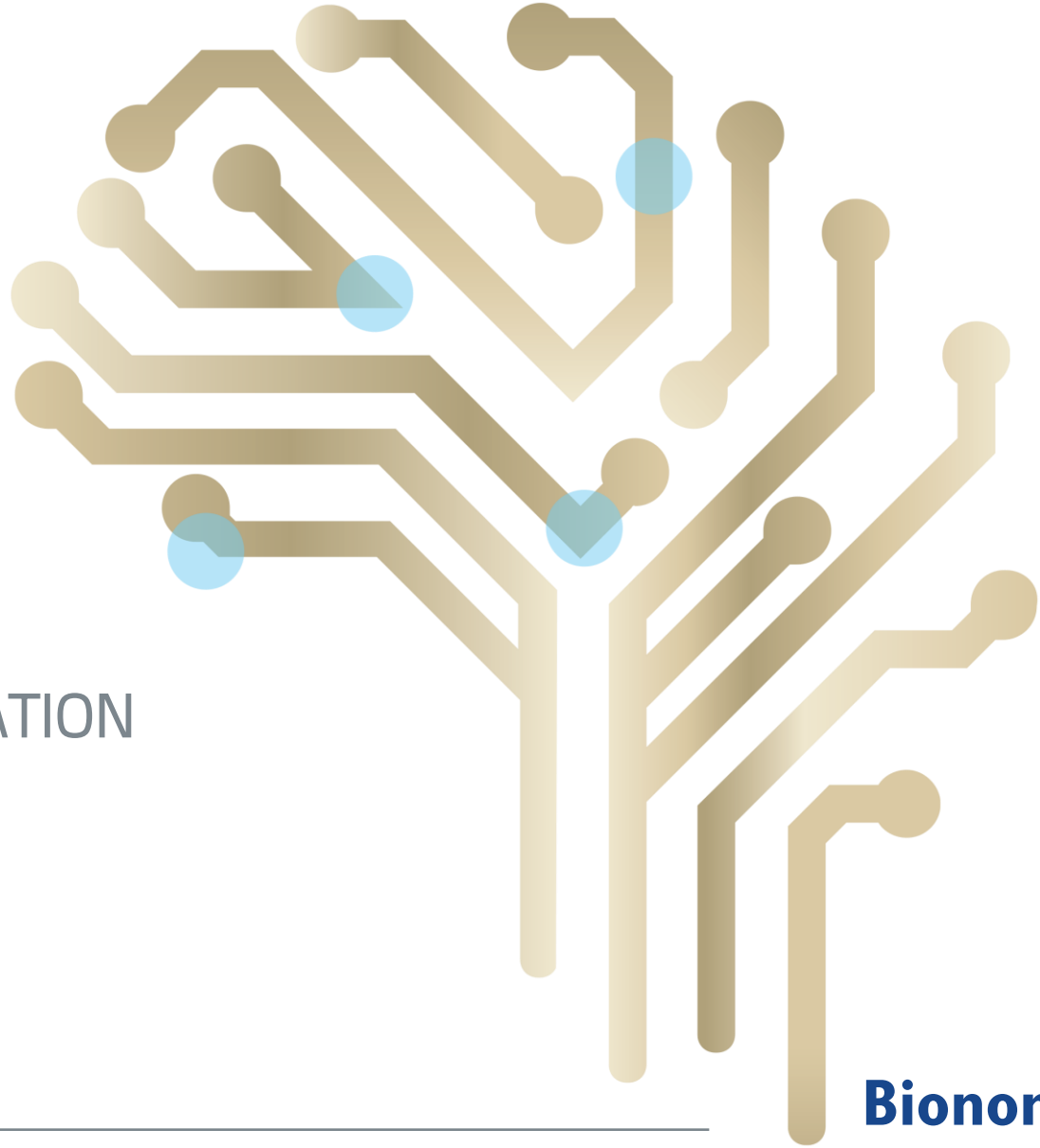
TO IMPROVE THE LIVES OF PATIENTS WITH SERIOUS **CNS DISORDERS**

2021 ANNUAL GENERAL MEETING
EXECUTIVE CHAIRMAN'S PRESENTATION

ASX: BNO
OTCQB: BNOEF

02 December 2021



Bionomics

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, BNC101 and BNC375), 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 arrangements, delays or difficulties associated with conducting clinical trials, our failure to introduce new drug candidates 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, 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 has announced a proposed public offering of American Depositary Shares ("ADSs"), each of which will represent a number of the Company's ordinary shares in the United States. The Company has filed a registration statement with the U.S. Securities and Exchange Commission but the registration statement has not yet become effective. The ADSs may not be sold, nor may offers to buy be accepted, prior to the time the registration statement becomes effective.

Certain information contained in this presentation relates to, or is based on, studies, publications, surveys and other data obtained from third party sources and Bionomics' own internal estimates and research. While we believe these third party sources to be reliable as of the date of this presentation, we have not independently verified, and make no representation as to the adequacy, fairness, accuracy or completeness of, any information obtained from third party sources. In addition, all of the market data included in this presentation involves a number of assumptions and limitations, and there can be no guarantee as to the accuracy or reliability of such assumptions. Finally, while we believe our own internal research is reliable, such research has not been verified by any independent source.

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- Clinical-stage biopharmaceutical company developing novel, allosteric ion channel modulators designed to transform the lives of patients suffering from serious Central Nervous System (CNS) disorders
- BNC210 entering Phase 2 for acute treatment in Social Anxiety Disorder (SAD) - Established clinical PoC in GAD[1] and Fast Track designation from FDA for SAD
- BNC210 in ongoing Phase 2b ATTUNE trial with Fast Track designation from FDA for PTSD
- Large underserved markets with over 22 million patients in the United States alone suffering from SAD and PTSD and no new FDA approved therapies in nearly two decades
- Strategic partnership with Merck & Co. for cognitive impairment in Alzheimer's disease and other CNS conditions
- Pipeline of partnering candidates targeting potassium (Kv) and sodium (Nav) ion channels
- Well-capitalized balance sheet with multiple potential near term value-driving milestones

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PoC = Proof of Concept
GAD = Generalized Anxiety Disorder
PTSD = Post-Traumatic Stress Disorder

1. *Wise et al 2020, Biological Psychiatry; Perkins et al 2021, Molecular Psychiatry*

Focused CNS Pipeline with Multiple Potential Catalysts on the Horizon

	PROGRAM	PRECLINICAL	PHASE 1	PHASE 2	PHASE 3	EXPECTED TIMING
WHOLLY-OWNED	**BNC210** α7 receptor NAM	**Post-Traumatic Stress Disorder (PTSD)** 200 patients, ~25 centers in US ATTUNE Study				*Study underway* *Topline Data: 1H'23*
		Social Anxiety Disorder (SAD) 150 patients, ~15 centers in US PREVAIL Study				*Starting Ph2: YE'21* *Topline Data: YE'22*

	PROGRAM	PRECLINICAL	PHASE 1	PHASE 2	PHASE 3	EXPECTED TIMING
COLLABORATIONS	MERCK COLLABORATION α7 receptor PAM	**2 candidates for cognitive deficits in Alzheimer's Disease**				*Ph1 Safety & biomarker studies ongoing*
	EmpathBio & BNC210	**+MDMA derivative EMP-01 (PTSD)**	*Memorandum of Understanding to explore combination treatment regimen for PTSD*			*Ongoing*

NAM = Negative Allosteric Modulator
PAM = Positive Allosteric Modulator

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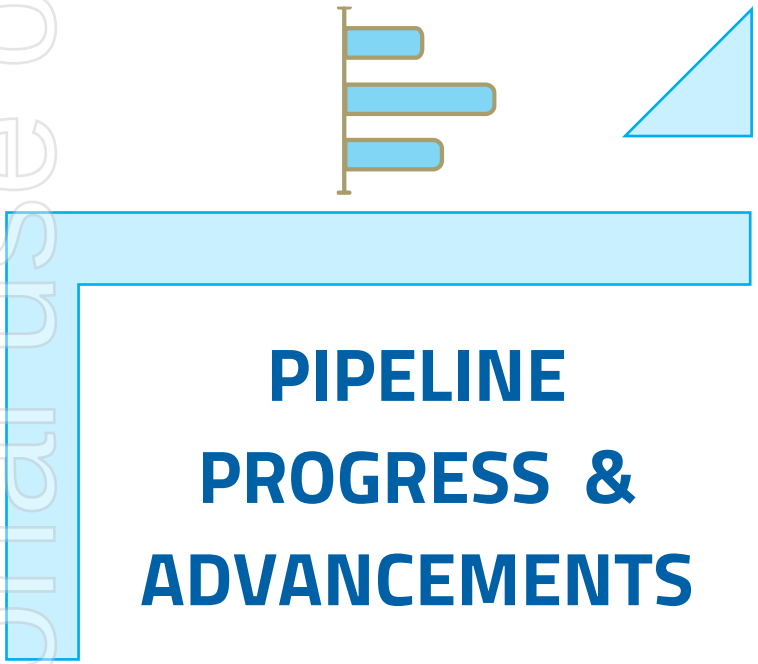
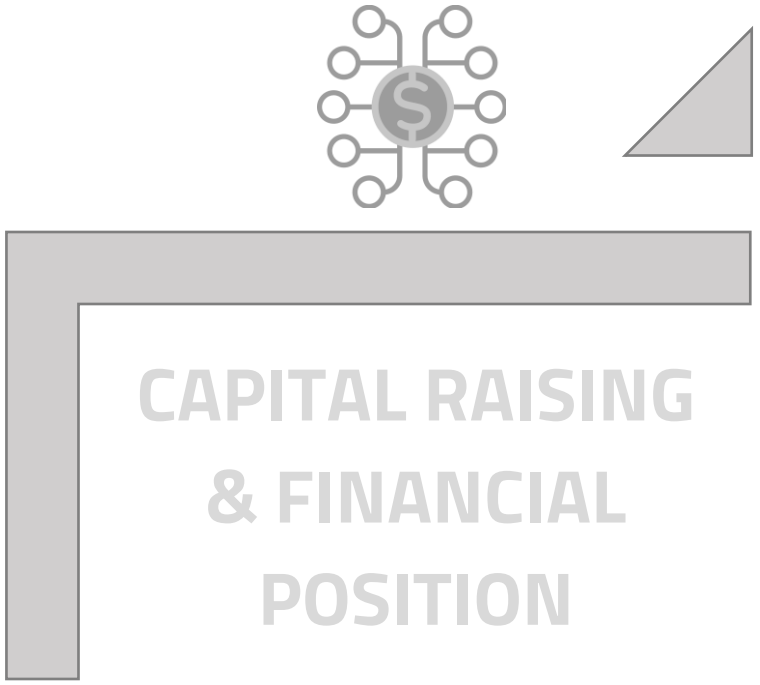
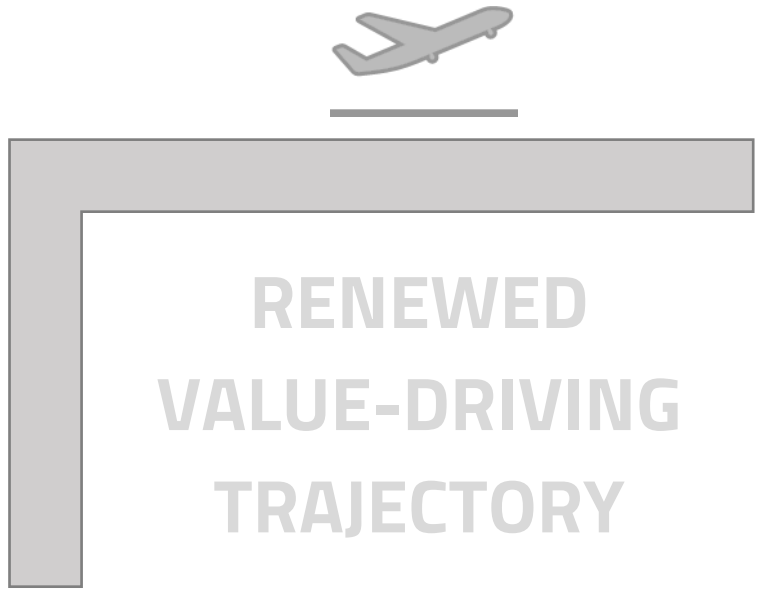


PIPELINE PROGRESS & ADVANCEMENTS



CAPITAL RAISING & FINANCIAL POSITION



RENEWED VALUE-DRIVING TRAJECTORY

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- Completed multiple dosing pharmacokinetic study of novel proprietary tablet formulation – February 2021
- Initiated BNC210 ATTUNE Post-Traumatic Stress Disorder (PTSD) Phase 2b trial – July 2021
- Newly added acute Social Anxiety Disorder (SAD) indication; IND cleared & entering PREVAIL Phase 2 trial before YE2021

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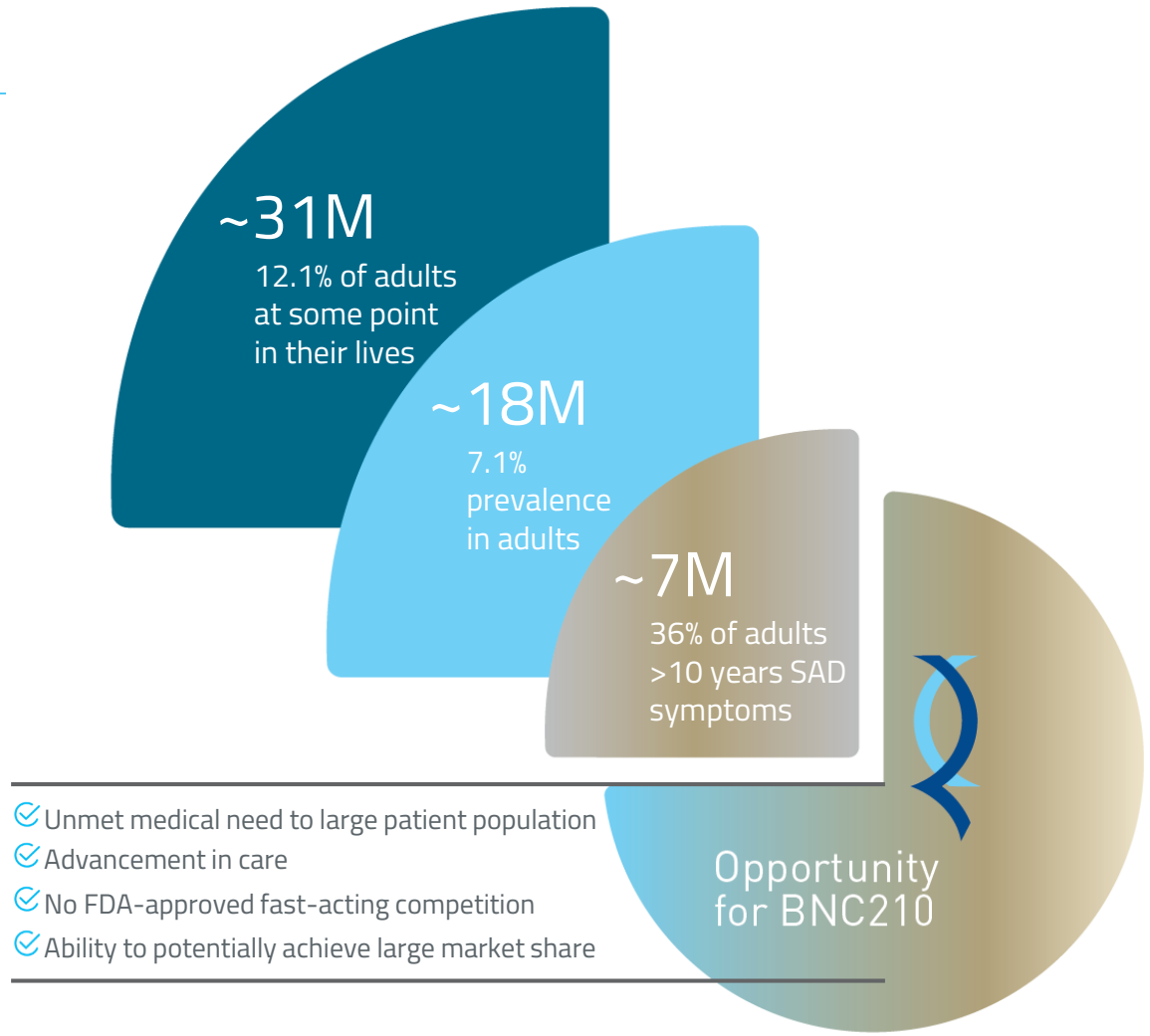
Acute Anxiety in SAD Represents a Significant Unmet Need

Social Anxiety Disorder (SAD), or Social Phobia, is a significant and persistent fear of social and performance-related situations

Includes anxiety from everyday social situations including "Fear of Public Speaking"

A disorder that substantially impacts many people's daily lives

- Amongst the largest mental health conditions with lifetime prevalence affecting >31M Americans
- No FDA-approved fast-acting medications for as-needed treatment
- Medications with the right pharmacokinetic profile and a novel mechanism are needed



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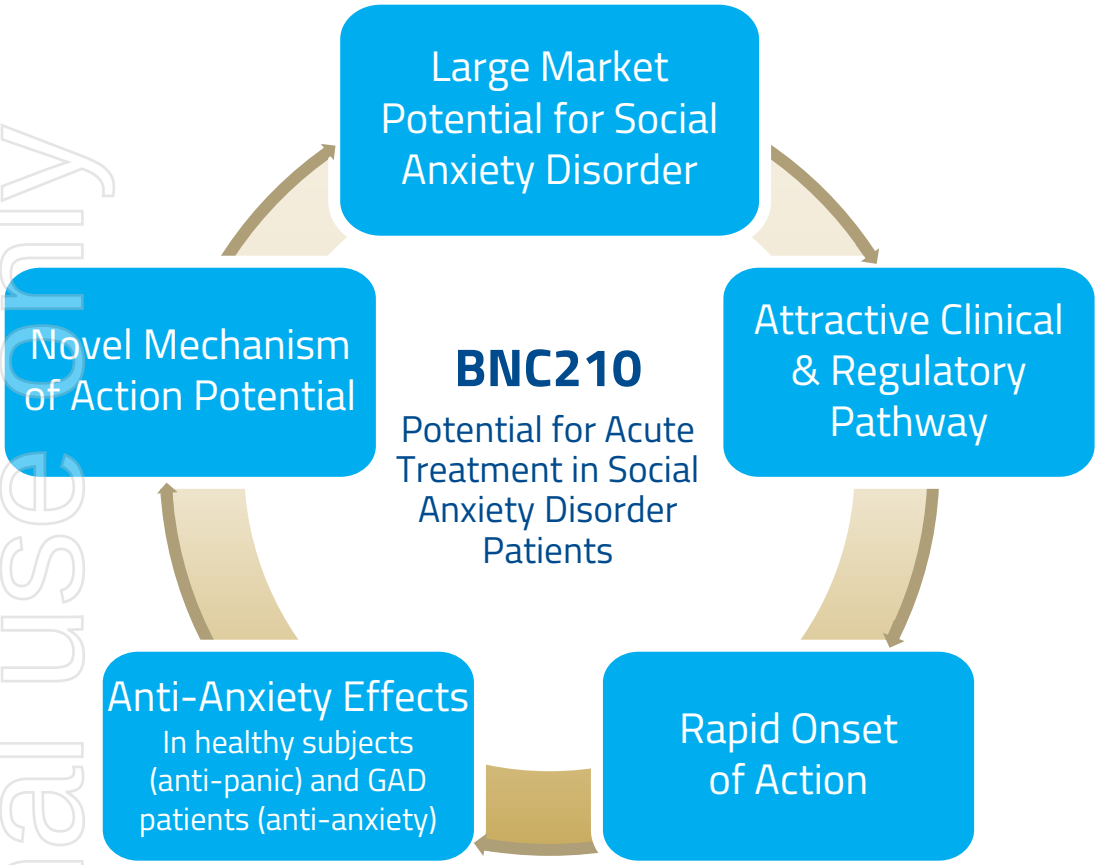
Sources:
US Census Bureau. https://www.census.gov/library/stories/2021/08/united-states-adult-population-grew-faster-than-nations-total-population-from-2010-to-2020.html
NIMH. 'Social Anxiety Disorder' data from 2017 National Comorbidity Survey (NCS). https://www.nimh.nih.gov/health/statistics/social-anxiety-disorder.shtml
Anxiety and Depression Association of America (ADAA). 'Social Anxiety Disorder - Understand the Facts' https://adaa.org/understanding-anxiety/social-anxiety-disorder



CURRENT TREATMENTS FOR SOCIAL ANXIETY DISORDER

DRUG	FAST ACTING	NO SEDATION	NO WITHDRAWAL SYNDROME	NO MEMORY IMPAIRMENT	NO MOTOR IMPAIRMENT
Benzodiazepines[1]	✓	X	X	X	X
SSRIs / SNRIs[2]	X	✓	X	✓	✓

BNC210 IS DESIGNED TO PROVIDE POTENTIAL ADVANTAGES COMPARED TO CURRENT THERAPIES*

1. *Includes Valium and certain other benzodiazepines*
2. *Includes Prozac and certain other SSRIs (Selective Serotonin Reuptake Inhibitors) / SNRIs (Serotonin-Norepinephrine Reuptake Inhibitors)*

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BNC210's Rapid Onset of Action is Potentially Well-Positioned for Social Anxiety Disorder

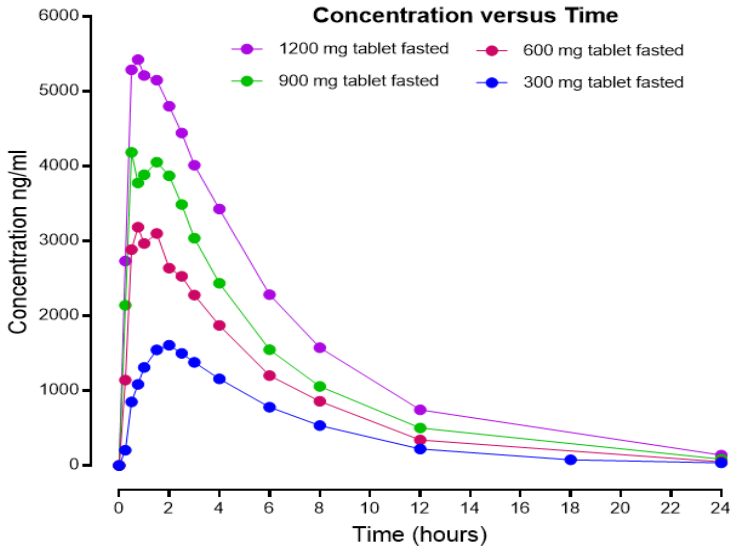
✓ Emerging Regulatory Landscape & Unmet Need

- No fast-acting FDA-approved medications for as-needed treatment of SAD
- Benzodiazepines prescribed off-label have significant side effects of sedation, cognitive impairment and potential for addiction
- Growing unmet need based on improving awareness and evolving social dynamics
- FDA precedent on simplified public speaking challenge endpoint for acute anxiety reduction *vs.* placebo*

✓ Rapid Onset of Action with BNC210 Formulation

- Clinically demonstrated potential for reducing anxiety in acute treatment of GAD patients and following panic induction
- Observed acute anxiolytic efficacy of BNC210 similar to lorazepam without sedative properties and addiction liability
- Formulation potentially well-suited for acute dosing – rapidly absorbed to high concentrations within a short period of time

Maximum concentrations reached in ~45 – 105 min. across the dose range



*Based on path of CNS peer proceeding with registrational Phase 3 endpoint

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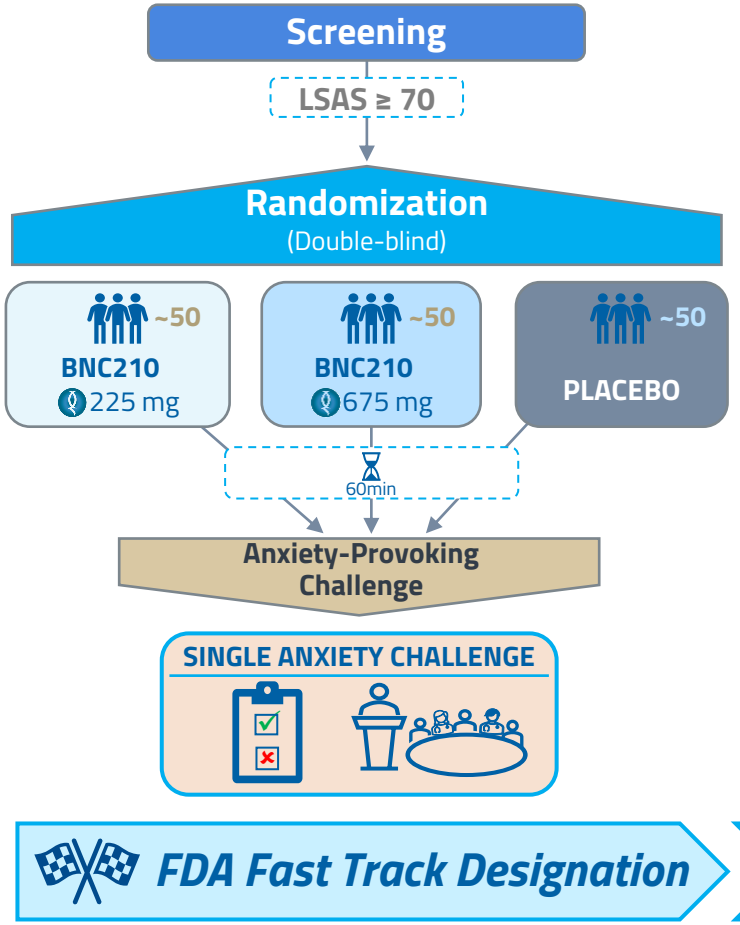
Social Anxiety Disorder Phase 2 Planning

- ✓ Potential to conduct a cost-effective trial with an efficacy endpoint conducive to rapid data generation
- ✓ Ability to leverage development strategies of other Social Anxiety Disorder public CNS trial designs
- ✓ Received FDA clearance for IND filing and Fast Track designation from FDA
- ✓ *Phase 2 trial on target to start by end of 2021 and read out topline data by end of 2022*

Phase 2 Acute Social Anxiety Disorder PREVAIL Study Design



Liebowitz Social Anxiety Scale:

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

Efficacy Endpoint

SUBJECTIVE UNITS OF DISTRESS SCALE (SUDS): Measures the self-reported intensity of anxiety and/or distress in SAD patients

FDA Fast Track Designation ***Topline data in YE'22***

LSAS = Liebowitz Social Anxiety Scale

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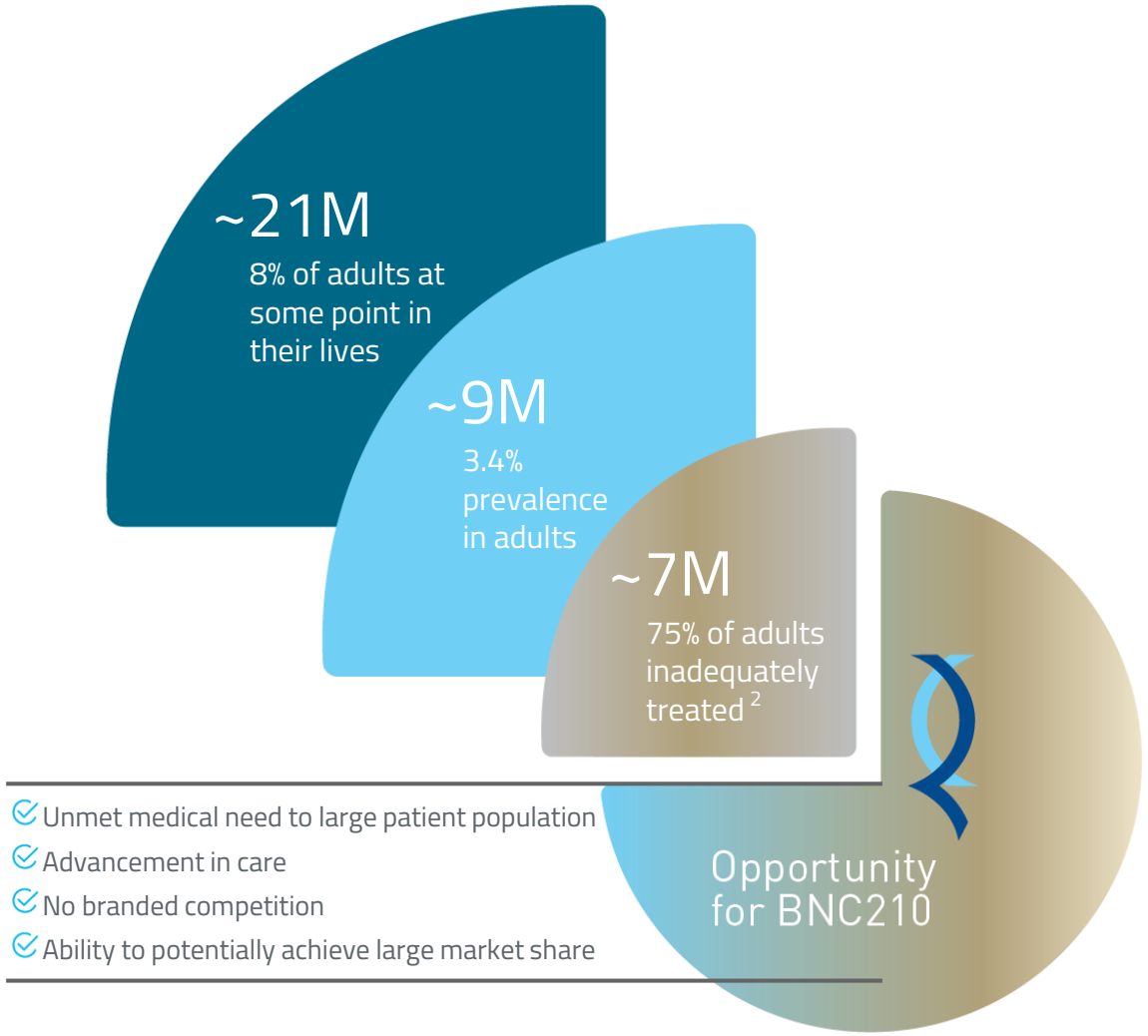
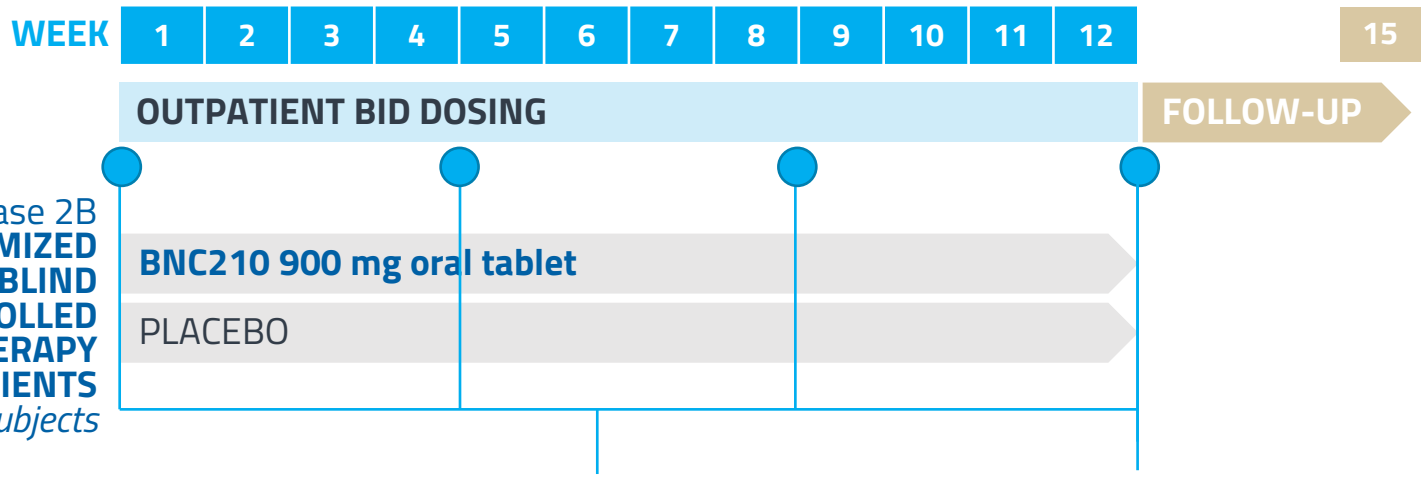
PTSD Represents a Significant Unmet Need

- 70% of people will experience a traumatic event in their lifetime, but most people recover normally
- PTSD results from exposure to actual or threatened death, serious injury or sexual violence
- PTSD affects up to 8% of adults during their lifetime[1]
- PTSD is a global mental health problem that is associated with significant morbidity and mortality and shows up in all facets of peoples' lives
- No newly approved pharmacotherapy in almost two decades
- Medications with a novel mechanism of action that can address the pathophysiology of PTSD are needed



1. Kilpatrick, D., Resnick, H., Milanak, M., Miller, M., Keyes, K. and Friedman, M., 2013. National Estimates of Exposure to Traumatic Events and PTSD Prevalence Using DSM-IV and DSM-5 Criteria. Journal of Traumatic Stress, 26(5), pp.537–547; 2 Mayo LM, Asratain A., Lindé J et al. Elevated Anandamide, Enhanced Recall of Fear Extinction, and Attenuated Stress Responses Following Inhibition of Fatty Acid Amide Hydrolase: A Randomized, Controlled Experimental Medicine Trial. Biol Psychiatry. 2020 Mar 15; 87(6): 538-54
2. Only 20 to 30% of PTSD patients achieve clinical remission on SSRI therapies.
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



SECONDARY ENDPOINTS

Various patient-reported symptoms of PTSD, changes in anxiety and depression symptoms, and global and social functioning;
Safety & tolerability endpoints

PRIMARY ENDPOINT

Investigator-rated PTSD symptoms on CAPS-5 Total Symptom Severity Scores in change from Baseline to Week 12 compared to placebo

PHASE 2B

Single potential registrational-supporting trial for monotherapy treatment in PTSD

KEY INCLUSION CRITERIA

Female and male (18 – 75 years)
Current PTSD diagnosis
CAPS-5 ≥ 30 (Screening & Baseline)
(& ≤ 25% decrease Screening to Baseline)

~25 Sites

Fast Track designation from FDA

Topline data in 1H'2023

BID = Twice daily dosing
CAPS-5 = Clinician-Administered PTSD Scale for the Diagnostic and Statistical Manual of Mental Disorders, 5th Edition (DSM-5)

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Merck α7 receptor PAM collaboration continuing to progress; 2nd candidate entered clinical development

Entered into MoU with EmpathBio for BNC210 & EMP-01 (MDMA derivative) combination for treatment of PTSD

Carina Biotech expects to advance BNC101 into clinical development in late 2022

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Ongoing Strategic Collaboration with Merck & Co.

MSD Collaboration Overview

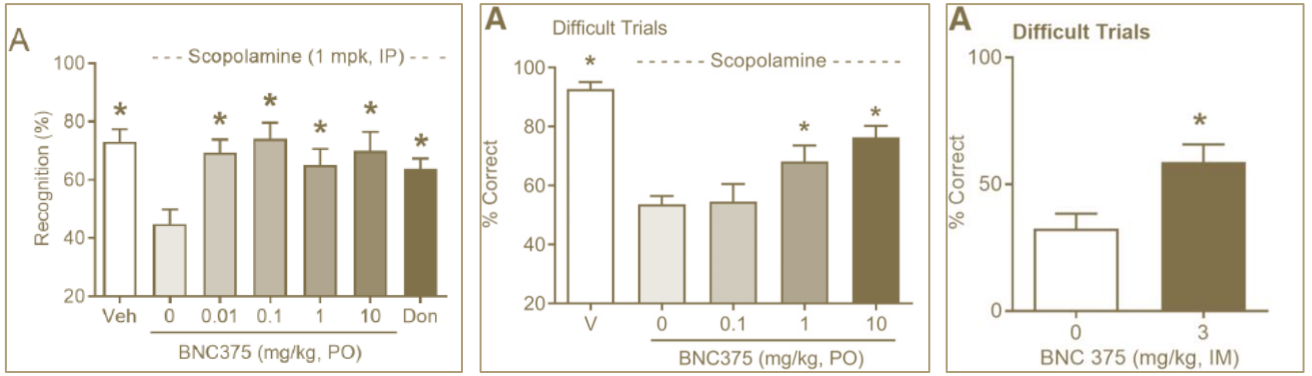
- Entered into in 2014 to develop α7 receptor PAMs targeting cognitive dysfunction associated with Alzheimer's disease and other central nervous system conditions
- Merck funds all R&D activities including clinical development and WW commercialization of any products from collaboration
- Milestone payments of ***US$20M upfront*** and ***US$10M in 2017*** when 1st compound entered Phase 1 clinical trials
- ***Eligible to receive up to US$465M in additional development and commercial milestone payments and royalties***

Development Updates

- Includes 2 candidates which are PAMs of the α7 receptor in early-stage Phase 1 safety and biomarker clinical trials for treating cognitive impairment
- *The 1st compound has completed Phase 1 safety clinical trials in healthy subjects and there are ongoing plans for further biomarker studies*
- *In 2020, a second molecule that showed an improved potency profile in preclinical animal models was advanced by Merck into Phase1 clinical trials*

MERCK PARTNERSHIP

Snapshot of Early BNC375 Studies



Wang et al. J Pharmacol Exp Ther 373:311–324, May 2020 https://pubmed.ncbi.nlm.nih.gov/32094294/
PAM = Positive allosteric modulator
MSD = A tradename of Merck & Co., Inc., Kenilworth NJ USA

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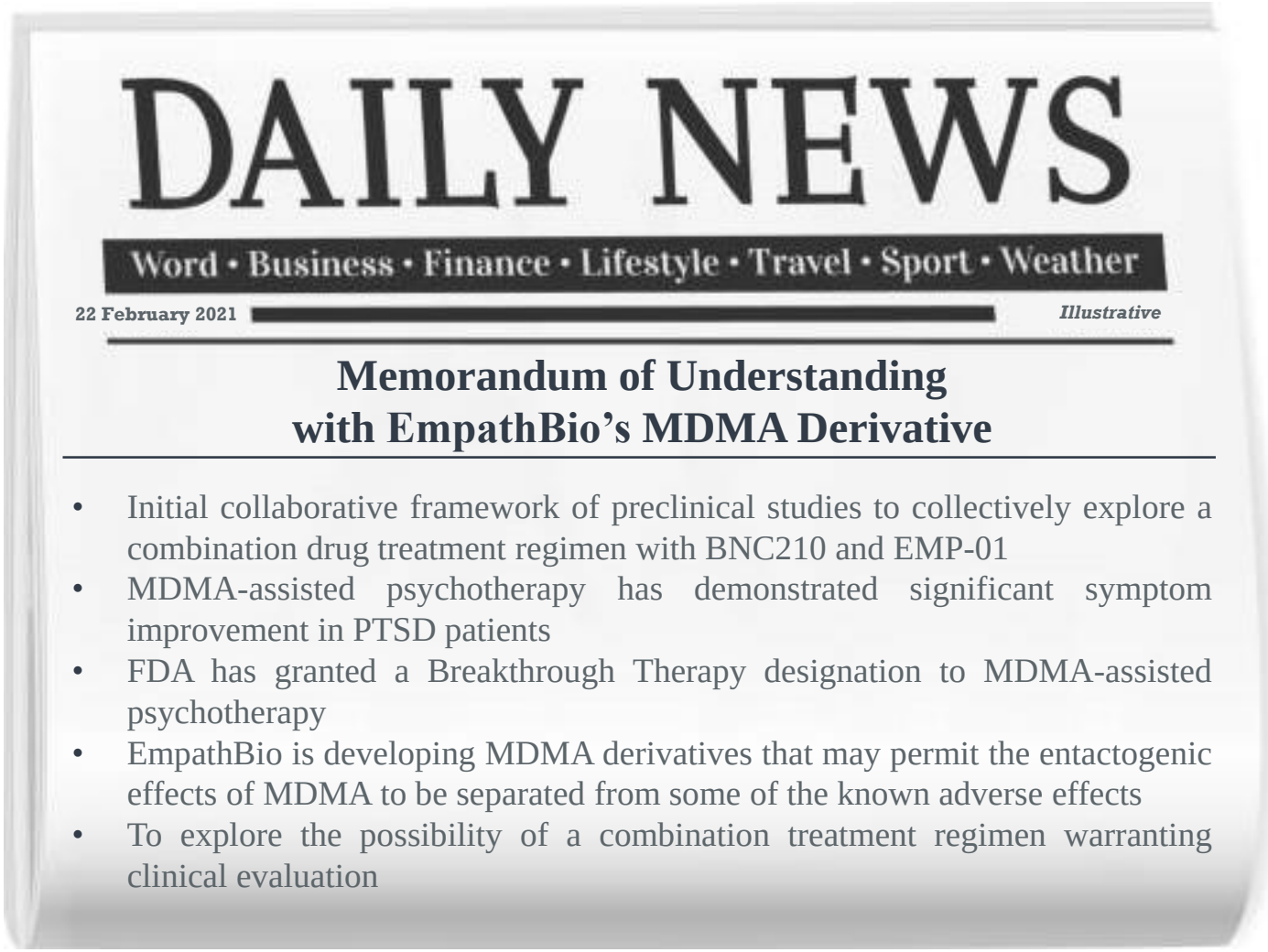
Joint Feasibility Assessment with:

EmpathBio

ATAI LIFE SCIENCES

***EMP-01** = 3,4-Methylenedioxymethamphetamine (MDMA) derivative*


DAILY NEWS

Word • Business • Finance • Lifestyle • Travel • Sport • Weather

22 February 2021 *Illustrative*

Memorandum of Understanding with EmpathBio's MDMA Derivative

- Initial collaborative framework of preclinical studies to collectively explore a combination drug treatment regimen with BNC210 and EMP-01
- MDMA-assisted psychotherapy has demonstrated significant symptom improvement in PTSD patients
- FDA has granted a Breakthrough Therapy designation to MDMA-assisted psychotherapy
- EmpathBio is developing MDMA derivatives that may permit the entactogenic effects of MDMA to be separated from some of the known adverse effects
- To explore the possibility of a combination treatment regimen warranting clinical evaluation

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Exclusive BNC101 Oncology License Agreement for the Development of CAR-T Therapeutics

- Exclusive Agreement to license Bionomics' BNC101 oncology drug candidate to Carina Biotech for the development of Chimeric Antigen Receptor T cell (**CAR-T**) therapy, which harnesses the body's immune system to fight cancer.
- Bionomics is eligible to receive up to A$118 million in clinical & development milestones plus royalty payments if Carina fully develops and markets the new therapy. In the event that Carina sub-licenses the CAR-T treatment, Bionomics is eligible to share in the sub-licensing revenues in early clinical development and receive a substantial double-digit portion of the revenues in later stages of clinical development.
- ***In September 2021, Carina announced that it plans to initiate a clinical trial of BNC101 CAR-T therapy for the treatment of advanced colorectal (bowel) cancer in late 2022***
- Bionomics retains BNC101 for other types of therapies

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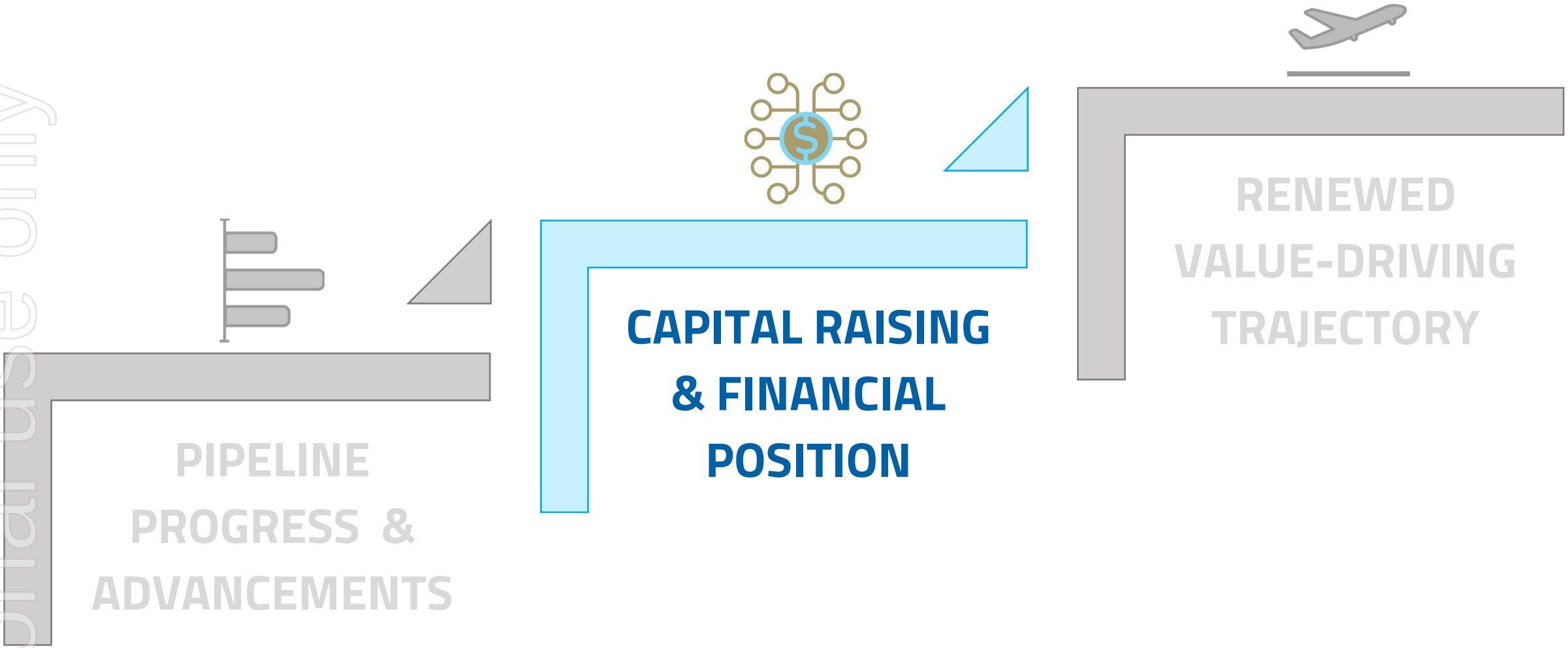

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Key Financial Achievements in 2021

- ✓ Equity financing activities **raising a total of ~A$44M** in gross proceeds between placements and rights offerings
- ✓ Satisfied Apeiron Subscription Agreement underwriting obligation
- ✓ Successfully **prepaid the entirety of ~A$6.2M** of outstanding external debt obligations
- ✓ **Public filing of Form F-1** registration statement with the U.S. SEC in relation to a proposed **public offering of ADSs** and planned **Nasdaq listing**[2]

Current Financial Snapshot

- Cash: US$16.4M (A$22.2M)
- Debt: $0
- Shares Outstanding: ~1,017.6M (ASX:BNO)
- Warrants Outstanding: 158.1 (WAEP = US$0.08 / A$0.11)
- Significant Investors:
  - Biotechnology Value Fund
  - Apeiron Investment Group Ltd.
  - Merck & Co

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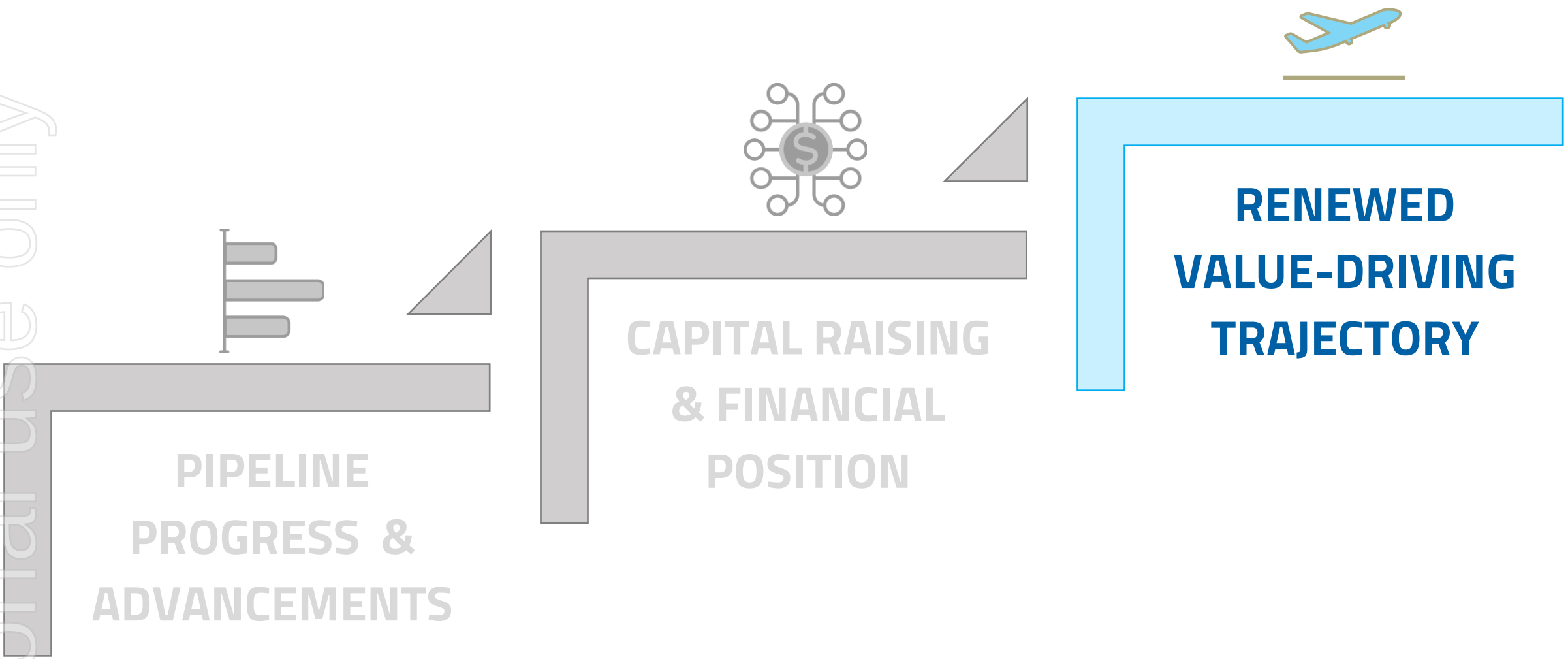
SEC = Securities and Exchange Commission
ADSs = American Depositary Shares
Figures as of September 30, 2021 unaudited financials, Based on USD/AUD conversion rate of 1.38
1. *Pro forma for cash exercise of 8M warrants exercised in October 2021; Includes ~16.1M warrants @ ~US$0.43 / ~A$0.57 exercise price expiring December 11, 2021*
2. *Refer to 23 Nov. 2021 ASX Announcement 'BNO Files Registration Statement for Proposed IPO in the US'*



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- Multiple potential value-driving clinical milestones expected in the next 4 – 8 quarters
- BNC210's novel rapid onset formulation granted Fast Track designation for acute treatment of SAD
  Established clinical proof-of-concept[1]; Phase 2 Study start by YE'21 & topline data expected by YE'22
- BNC210 Phase 2b ATTUNE PTSD study under way with Fast Track designation for 1H'23 topline data
  Tablet formulation achieves exposure projected from pharmacometric analysis
- Merck strategic partnership for treatment of cognitive impairment in Alzheimer's disease with two compounds in clinical development
- Diverse early-stage pipeline of partnering prospects targeting Kv and Nav ion channels for treatment of schizophrenia and pain, respectively
- F-1 filing with SEC for US Nasdaq listing led by bolstered leadership team

PTSD = Post-Traumatic Stress Disorder

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