Global leader in drug discovery and development

Corporate Presentation

July 2015

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 and BNC101), its licensing agreements 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.

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Bionomics

Highly Experienced Management Team

Management Team

Dr. Deborah Rathjen – CEO & Managing Director
Peptech

Dr. Jens Mikkelsen – CSO
H. Lundbeck, Azign Biosciences, NeuroSearch

Dr José Iglesias MD – CMO
Celgene, Abraxis, Eli Lilly

Melanie Young – CFO
Deloitte Touche

Jack Moschakis – Counsel & Company Secretary
Rex Minerals, Thomson Greer

Board of Directors

Graeme Kaufman – Chairman
CSL Limited, Circadian Technologies

Dr. Deborah Rathjen – CEO & Managing Director
Peptech

Errol De Souza – Non-Executive Director
Biodel, Aventis, Neurocrine

Trevor Tappenden – Non-Executive Director
Ernst & Young

Jonathan Lim – Non-Executive Director
Ignyta

Bionomics

Company Overview

- Deep understanding of ion channel physiology, CNS and cancer stem cells
- Three drug discovery platforms to support a robust pipeline
- Partnerships with Merck & Co. in cognition and pain
- Lead drug, BNC210, is a novel, best-in-class, modulator of α-7 nicotinic acetylcholine receptor
  - Ongoing Phase 2A trial in anxiety patients, results expected Q3 2016 calendar year
  - Clinical and preclinical data suggests safe and well-tolerated as well as potential for use in other CNS indications
- BNC101 is a first-in-class anti-LGR5 antibody targeting cancer stem cells
  - LGR5 is a receptor along the Wnt pathway
  - Entering Phase 1 trial in solid tumors in Q4 2015 calendar year
- Experienced management team
- Financials: Market Cap US$134M (Jul 21, 2015) | Cash US$28M (Dec 31, 2014)

All financials displayed as USD. USD:AUD of 0.7427 as of July 21, 2015.

Bionomics

Our Proprietary Platform Technologies

Focused on discovery of drug candidates for CNS disorders and oncology

ionX

- Identifies drug candidates targeting both ligand gated and voltage gated ion channels for CNS indications
- 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 drugs
- Computer aided pharmacophore modelling
- Scaffold hopping synthetic approaches rapidly create diversity in small, focused libraries
- Parallel, differentiated chemical series of potential drug candidates

CSCRx

- Identifies drug candidates that inhibit the growth of cancer stem cells
- Enables dissection and validation of target biology
- Proprietary *in vitro* assays combined with *in vivo* assays

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Merck Partnerships: Technical Validation

Two major partnerships with Merck & Co – up to US$678m combined future potential milestones plus additional royalties on product sales

MERCK

PARTNERSHIP

- Validates ionX and MultiCore drug discovery platforms
- Value creation through strategic partnering business model
- Future success based revenue streams & royalties secured

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Platform Technologies Deliver Multi-Product Pipeline

Drug Candidate	Indication(s)	Preclinical	Phase 1	Phase 2	Milestones (Calendar Year)
Central Nervous System (ionX and MultiCore)					
BNC 210	Generalized Anxiety Disorder				Results from P2A trial in Q3 2016
	Other indications				
Undisclosed	ADHD, Alzheimer's, Cognition, Parkinson's, Schizophrenia				
Undisclosed	Chronic and neuropathic pain				
Others	Pain, Parkinson's dyskinesia, epilepsy				
Cancer Stem Cells (CSCRx)					
BNC101	Colorectal cancer				Initiate P1 trial in Q4 2015
	Pancreatic cancer				Initiate P1 trial in H1 2016
	Other solid tumors				
Cancer Stem Cells (CSCRx and MultiCore)					
MELK	Solid tumors				
Others	Solid tumors				
Other Programs					
BNC105	Solid tumors, renal, ovarian, mesothelioma				
BNC 420	Solid tumors, melanoma, breast				
BNC 164	Psoriasis, uveitis				

MERCK Be well

MERCK Be well

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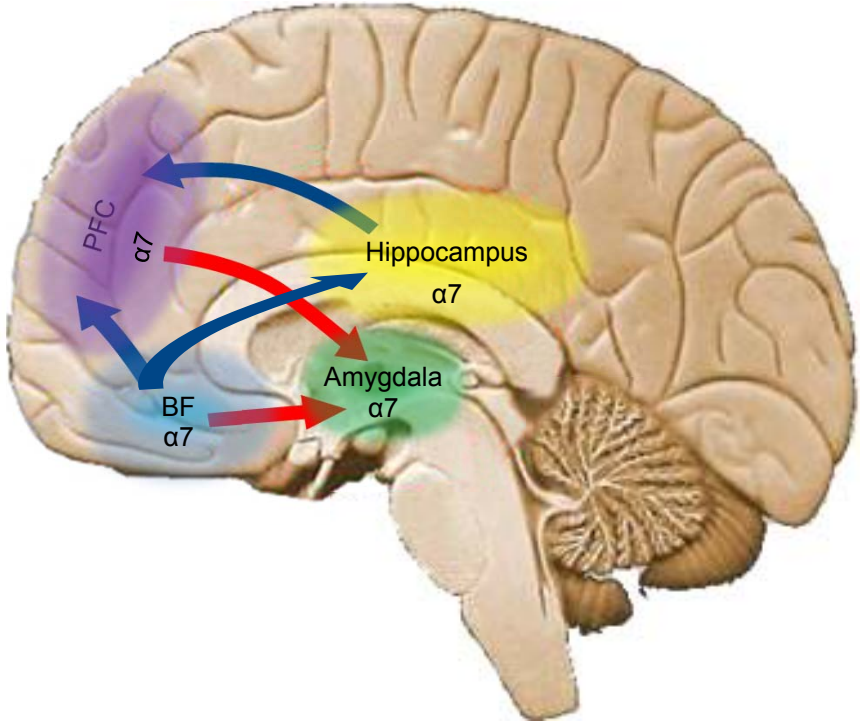
α7 Receptor Plays a Distinct Role in Brain Function



Arrows represent flow of ACh in the brain

- Cognition
- Anxiety and depression

- Key driver of emotional and memory responses
- α7 receptor ligand ACh activity is linked to anxiety and depression symptoms, memory and reasoning
- Inhibition of the α7 receptor in the amygdala may reduce anxiety and depression

PFC – Prefrontal Cortex, BF – Basal Forebrain.

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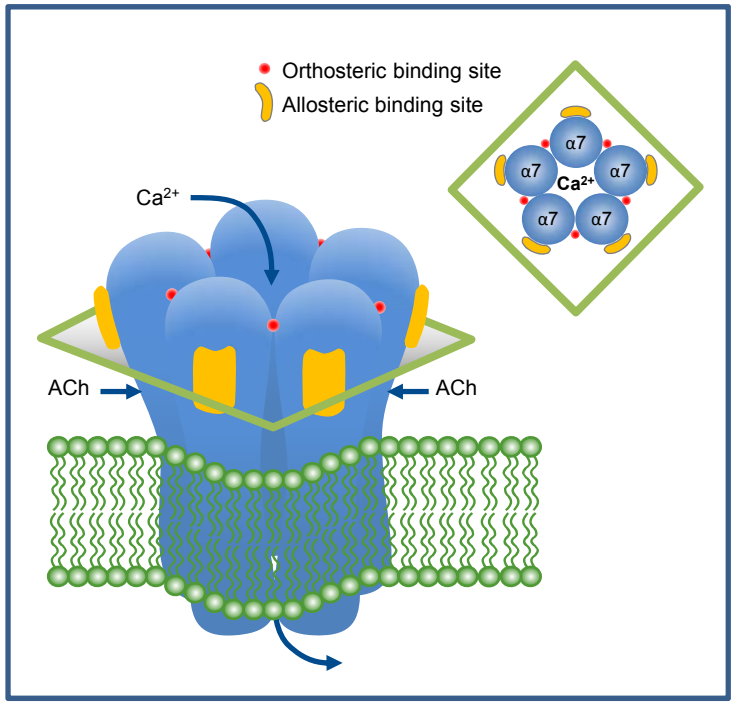
α7 Nicotinic Acetylcholine Receptor

α7 receptor has both orthosteric and allosteric binding sites



- Ligand gated ion channel highly expressed in the brain
- Opening and closing of the ion channel allows the flow of calcium ions that govern neuronal function and neurotransmission
- 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

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BNC210 Overview: Novel, Best-in-Class Modulator of α-7 Receptor

Mechanism of Action	▪ Negative allosteric modulator α-7 nicotinic acetylcholine receptor
Target Indications	▪ Anxiety (Generalized Anxiety Disorder or GAD) ▪ Potentially other indications
Ongoing Clinical Trials	▪ Phase 2A trial in GAD patients, results expected Q3 2016 calendar year ▪ Phase 1B multiple ascending dose trial in healthy subjects, results expected Q3 2015 calendar year
Completed Clinical Trials	▪ 5 completed Phase 1 trials in 148 healthy subjects ▪ Demonstrated safety and tolerability ▪ Brain activity consistent with potential to reduce anxiety in the absence of sedation ▪ BNC210 significantly reduced CCK4-induced panic symptoms

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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 suicide ideation in adolescents
- Many have black box warnings

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

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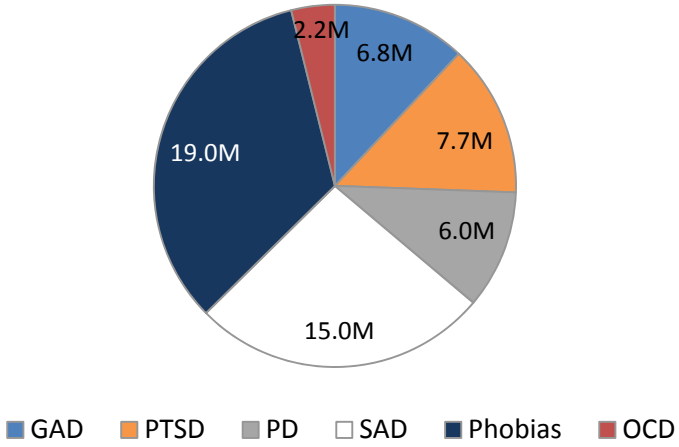
Anxiety and Depression Market

Anxiety and depression have overlapping symptoms ~50% of those diagnosed with depression are also diagnosed with an anxiety disorder

Anxiety Market

- Projected to reach $18.2 billion by 2020
- Approximately 40 million people suffer from anxiety in the US
- Anxiety patients may have more than one anxiety disorder



Depression Market

- Projected to reach $14.0 billion by 2020
- Approximately 21 million people suffer from depression in the US
- Major types of depression:
  - Bipolar depression
  - Dysthymia
  - Major depression

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BNC210 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	▪ Double-blinded, placebo controlled ▪ Subjects received single dose of placebo or BNC210 (2,000 mg)
Primary Endpoints	▪ Changes in the PSS (Panic Symptom Scale)
Secondary Endpoints	▪ Change in anxiety symptoms by means of the STAI (Spielberger State-Trait Anxiety Inventory) and e-VAS (emotional-Visual Analog Scale) scales ▪ Change in mood parameters by means of the ARCI 49 (Addiction Research Center Inventory) ▪ Heart rate ▪ ACTH and cortisol release in blood ▪ Blood concentrations of BNC210 post administration ▪ Safety and tolerability

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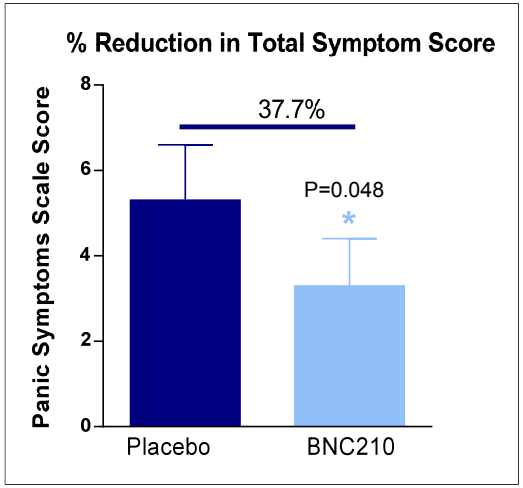
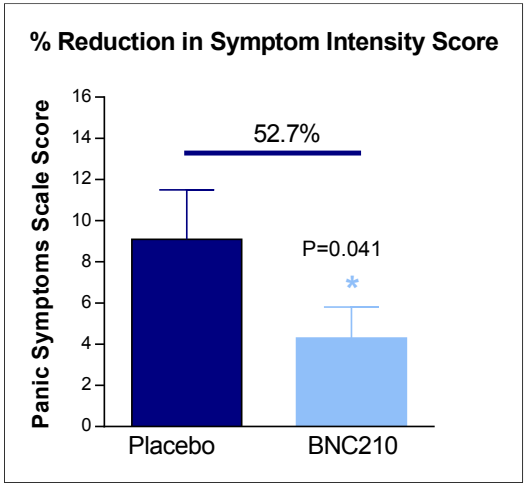
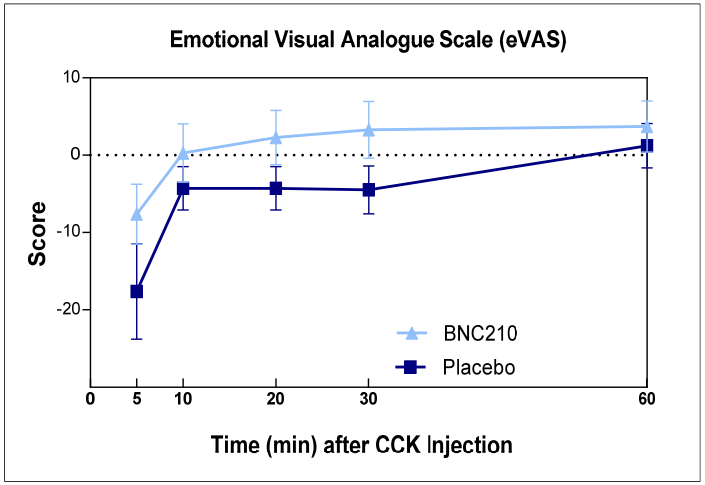
BNC210 Significantly Reduced CCK4-Induced Panic Symptoms

% Reduction in Total Number of Symptoms & Symptom Intensity





Emotional Visual Analogue Scale (eVAS)



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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BNC210 Phase I EEG Trial Design

Subjects	▪ 21 healthy subjects
Protocol	▪ Double-blinded, placebo controlled ▪ Subjects received placebo, Lorazepam and two doses of BNC210 (300 to 2,000 mg) ▪ Randomized sequence with wash-out period between treatments
Primary Endpoints	▪ Change in attention
Secondary Endpoints	▪ Visual-motor coordination ▪ Emotion ▪ Cognition ▪ EEG ▪ Measure of addiction ▪ Others

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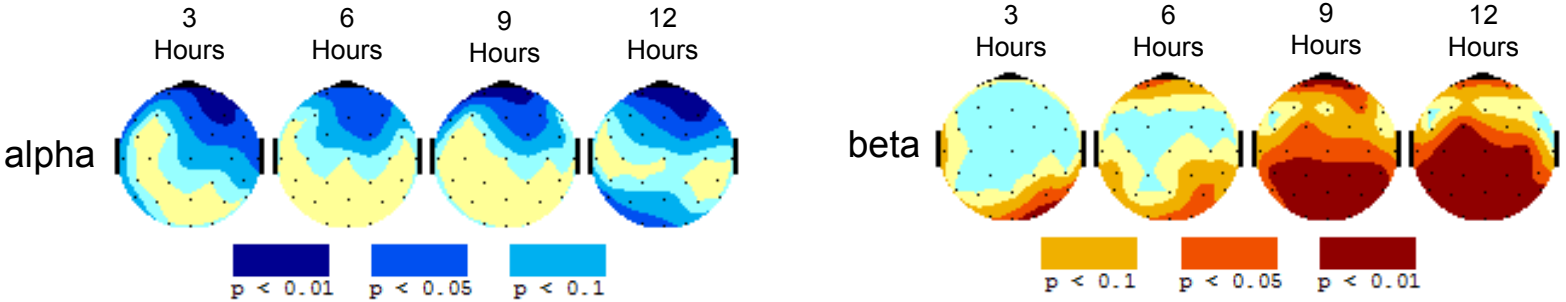
BNC210 Induced Changes on EEG Indicate Anxiolysis in the Absence of Sedation

Drug/ EEG Spectrum*	δ	γ	α	α1	α2	β	β1	β2	β3
BNC210			↓		↓	↑			↑
Lorazepam	↑	↓	↓	↓	↓	↑	↑	↑	↑

Increase in delta spectral power during vigilance control session is signature of Lorazepam-induced sedation

Increase in β3 spectral power is associated with the anxiolytic activity of Lorazepam

Brain Maps showing temporal effect of BNC210 on α and β frequency bands



*Arrows represent statistically significant changes in spectral power (p<0.05) displayed over considerable surface or scalp regions measured at 6 hours (cMAX for Lorazepam and BNC210).

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Ongoing BNC210 Phase 2A Trial

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

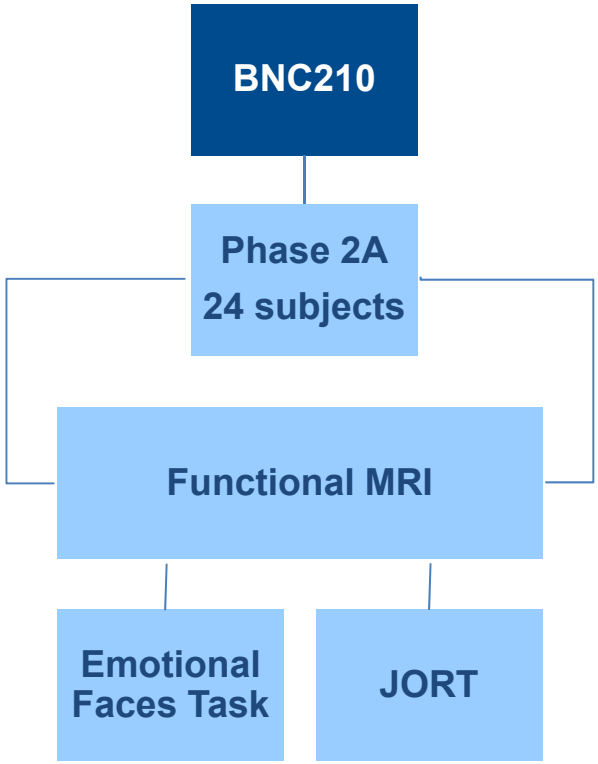
King's College London Institute of Psychology, Psychiatry and Neuroscience

Initiated March 2015

Results expected September 2016

Primary endpoints:

- Changes in cerebral perfusion
- Changes in emotional control (amygdala) during the performance of an emotional task



Secondary endpoints:

- Changes in defensive behavior using the Joystick Operated Runway Task
- Changes in self-reporting of affective parameters

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

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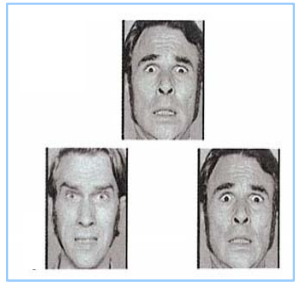
Emotional Faces and Joystick Operated Runway Task (JORT)

We believe GAD patients treated with BNC210 will have reduced amygdala activity and less defensive behavior than placebo treated

Emotional Faces Task

Primary Endpoint

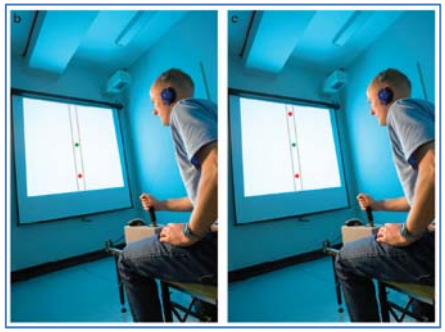
- Evaluates activity in the amygdala via Function MRI
- Several FDA-approved anxiety drugs reduce amygdala activation in the Emotional Faces task



Joystick Operated Runway Task

Secondary Endpoint

- Computer simulation used to evaluate changes in defensive behavior including flight and risk taking behavior



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Ongoing BNC210 Phase 1B Multiple Ascending Dose Trial

Subjects	▪ 54 healthy subjects
Protocol	▪ Double-blinded, 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 (2,000 mg dose level) ▪ Pharmacokinetics of multiple ascending doses
Timeline	▪ Results in Q3 2015 calendar year

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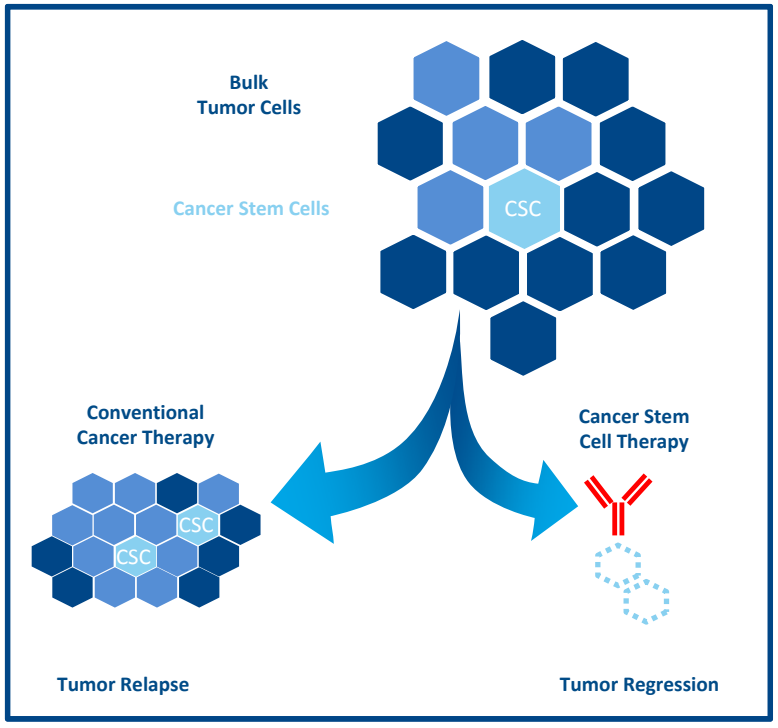
Bionomics Approach to Targeting Cancer Stem Cells



- Bionomics' CSCRx platform can identify drugs that inhibit the growth of cancer stem cells
  - CSC have the potential to differentiate into all cell types within a tumor
  - Many drugs do not specifically target CSC leading to tumor recurrence and metastasis
- Wnt signaling has been implicated in proliferation and survival of CSC
- LGR5 is a receptor that modulates Wnt signaling in CSCs

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Planned BNC101 Phase 1 in Solid Tumors Patients

Subjects	▪ 2 cohorts of 25 metastatic colorectal cancer patients ▪ 1 cohort of 25 metastatic pancreatic cancer patients
Protocol	▪ Subjects received multiple ascending dose ▪ BID treatment for 8 days
Primary Endpoints	▪ Safety and tolerability
Secondary Endpoints	▪ ORR ▪ PFS ▪ OS
Exploratory Endpoints	▪ Circulating tumor cells ▪ Disease-related biomarkers such as LGR5 expression
Timeline	▪ Planned trial commences in Q4 2015 calendar year ▪ Results from first cohort in Q3 2017 calendar year ▪ Results from remaining cohorts in Q4 2017 calendar year

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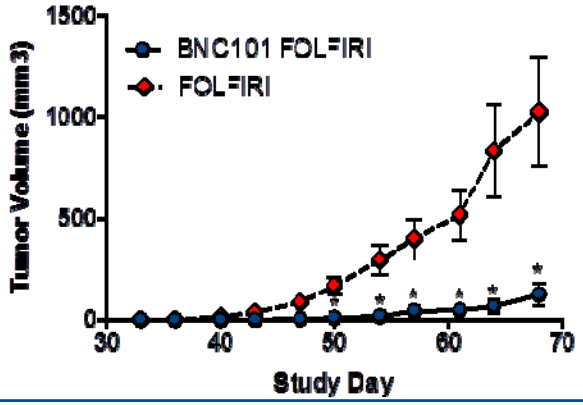
BNC101 Shows Anti-Tumor Activity

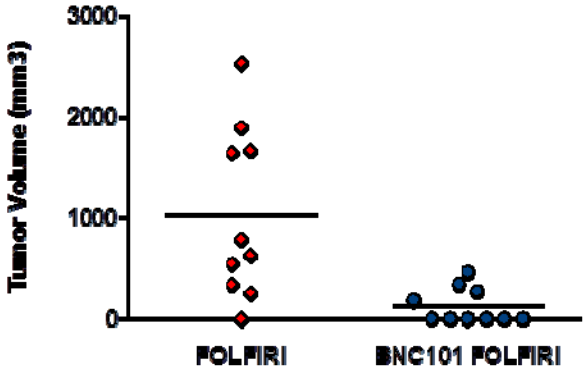
Colorectal Cancer: Preclinical Activity

Cancer Stem Cell Recurrence Assay

CT3 LDA Tumor Growth

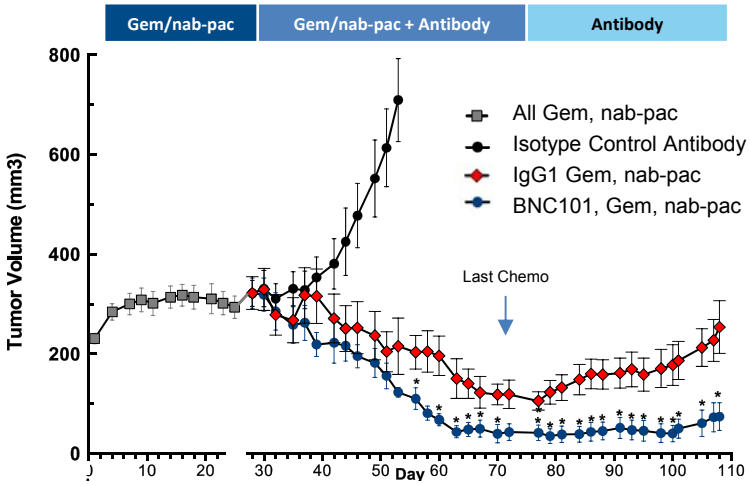


Individual Tumors @ Day 68

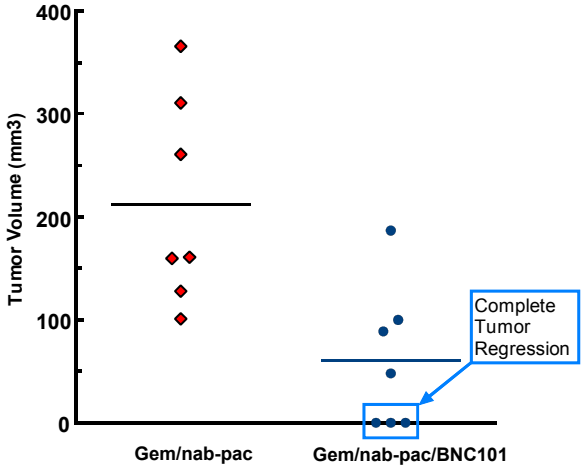


Pancreatic Cancer: Preclinical Activity

Mean Tumor Volumes



Individual Tumors @ Day 105



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Asterisk indicates P<0.05.

BNC101 Phase 1 Clinical Trial

Dose escalation trial to examine safety, tolerability and preliminary signals of efficacy

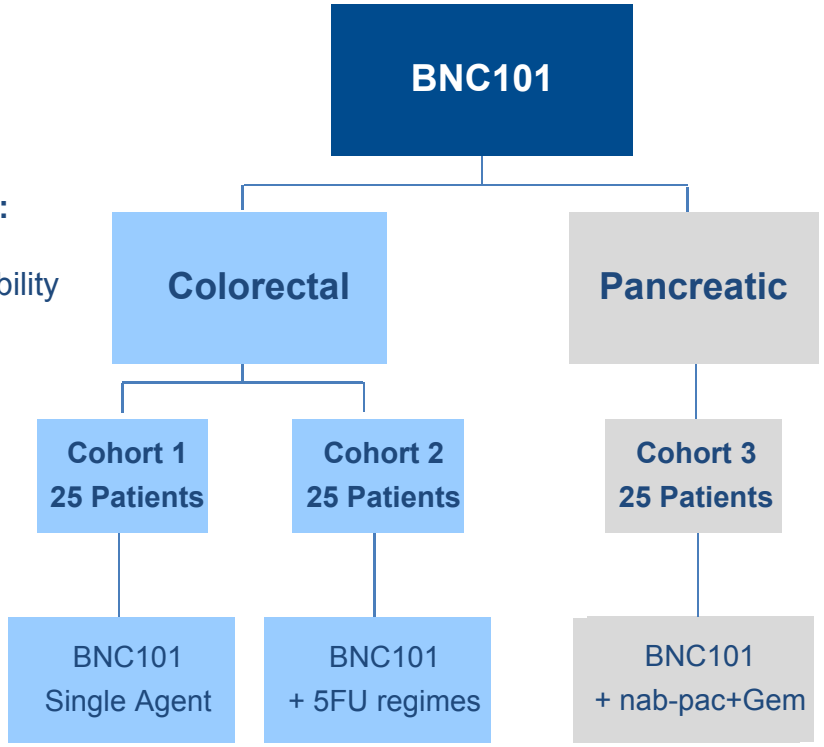
5 global treatment sites

Initiation
Cohort 1: Q4 2015
Cohort 2: H1 2016
Cohort 3: H1 2016

Results
Cohort 1: Q3 2017
Cohort 2: Q4 2017
Cohort 3: Q4 2017

Primary endpoints:

- Safety and tolerability



Other endpoints:

- PFS, ORR, OS
- Changes in biomarkers including circulating tumor cells and LGR5 expression as well as other disease-related biomarkers

All dates reflect calendar years.

Bionomics

Cognition Program: Partnership with Merck & Co.

Combines the platform expertise from ionX and MultiCore

Bionomics × MERCK *Be well*

Scope / Market Opportunity

- Small molecule drugs for the treatment of cognitive impairment in ADHD, Alzheimer's disease, Parkinson's disease, Schizophrenia and other conditions
- Targeting cognitive impairment through a receptor critical to cognitive processes

Partnership Economics

- Covers Bionomics' research program on BNC375 and related compounds
- Upfront payments of US$20M
- Up to US$506M in payments to Bionomics plus potential royalties
- Merck funds all R&D

Pain Program:
Partnership with Merck & Co.

Combines the platform expertise from ionX and MultiCore

Bionomics × MERCK *Be well*

Scope / Market Opportunity

- Target related to chronic and neuropathic pain
- Neuropathic pain market expected to grow to US$3.6B by 2020
- Current medications have limited effectiveness and multiple side effects

Partnership Economics

- Option and license agreement
- US$172M in option exercise fees, development/regulatory milestone payments, plus potential royalties

Milestones

Continue to evaluate BNC210 for other CNS indications

Continue to trigger milestone payments from strategic partner

BNC210
Q2 2015:
Initiated Phase 2A trial in GAD patients

BNC210
Q3 2015:
Results from Phase 1B multiple ascending dose trial

BNC210
Q3 2016:
Results from Phase 2A trial in GAD patients

Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
2015 Calendar Year				2016 Calendar Year				2017 Calendar Year			

BNC210
Q1 2015:
Initiated Phase 1B multiple ascending dose trial

BNC101
Q4 2015:
Initiate trial and the enrollment of the first mCRC cohort

BNC101
H1 2016:
Initiate enrollment of the second mCRC cohort and pancreatic cohort

BNC101
Q3 2017:
Results from first mCRC cohort

BNC101
Q4 2017:
Results from second mCRC and pancreatic cohorts

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