

**Bionomics**



*Creating and developing innovative therapies*

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***Deborah Rathjen***  
***CEO & Managing Director***

***2014 Annual General Meeting***

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# Safe Harbor Statement

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## 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' development candidates BNC105, BNC210, BNC101, BNC420 and BNC375, its licensing agreements Merck & Co, the acquisitions of Eclipse Therapeutics and Prestwick Chemical, drug discovery programs and pending patent applications 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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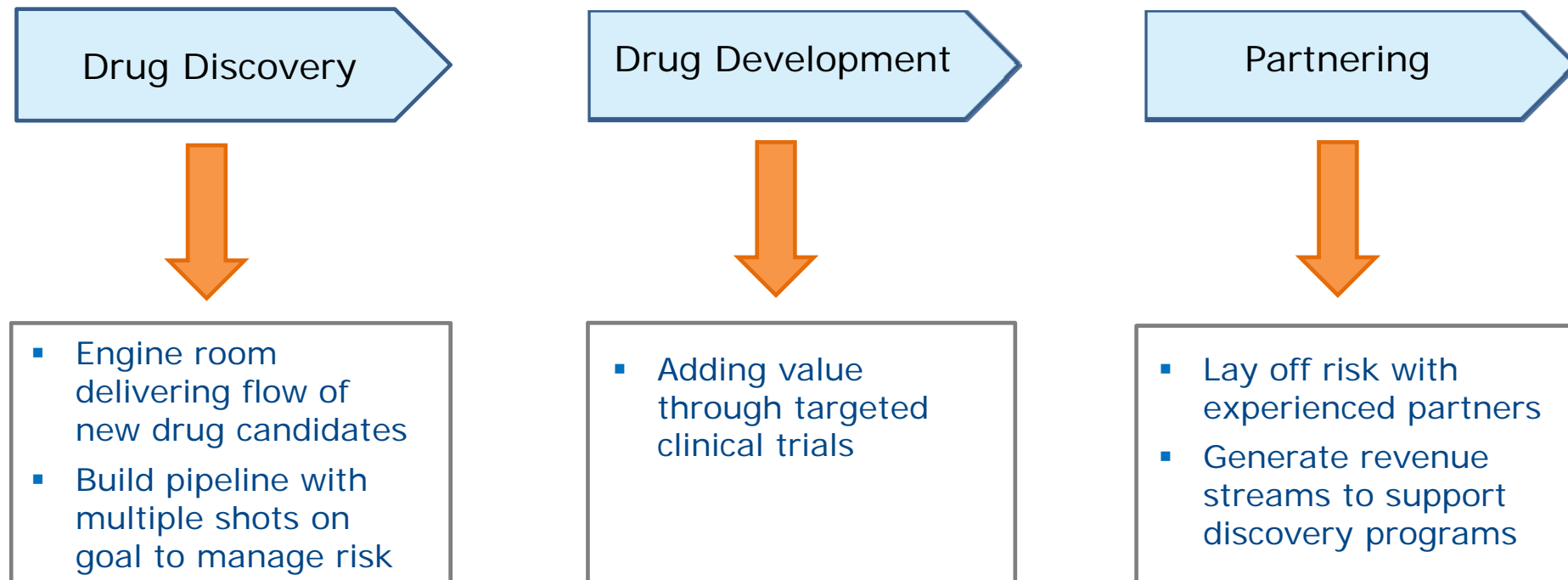
## Bionomics Overview

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- Bionomics is a leader in discovery & development of innovative biopharmaceuticals with operations in Australia, Europe & US
- BNO undertakes **discovery, development & strategic partnering** of first-in-class & best-in-class drugs
- Focus is serious medical conditions including cancer & central nervous system disorders; aim to deliver treatments with substantially improved patient outcomes
- Global, strategic partnerships facilitate advancement of our compounds through regulatory/commercial pathways



# Managing the Execution Risk: The Bionomics Business Model



## Technology Platforms:

ionX: ion channel drug discovery for CNS conditions

CSCRx: cancer stem cell therapies

MultiCore: chemistry



# Guide to Biotech Licensing Deals



- Licensing may occur at any point in the development path
- Deal example: A program is licensed during the Discovery/Preclinical stages for upfront payment, development milestones with a total value of US\$100 million (excluding upfront payment) plus additional royalties on product sales, worldwide

Milestone payments (typically paid on initiation of activities)	Indicative Cumulative Payments — excluding upfront payments, payments at each phase in brackets	Indicative time after signing (years)
Preclinical	\$5m	1
Phase I	\$15m (+\$10m)	2
Phase II *	\$40m (+\$25m)	3
Phase III *	\$70m (+30m)	5
Drug Approval*++	\$100m (+30m)	7





- Following approval – royalties on net sales are payable

\* May comprise multiple payments

++ May include separate payments related to lodgement of regulatory documents and payments for approval



# Platform technologies deliver multi-product pipeline, leveraging core strengths

THERAPEUTIC AREA	DRUG CANDIDATE/PROGRAM	DISCOVERY	PRE-CLINICAL	PHASE I	PHASE II	LICENSEE/ PARTNER
CANCER	<b>BNC105</b> – Solid tumours, renal, ovarian, mesothelioma					 
	<b>BNC101</b> – Cancer stem cells, solid tumours, colon, breast, pancreatic					
	<b>BNC102</b> – Cancer stem cells, solid tumours					
	<b>BNC420</b> – Solid tumours, melanoma, breast					
	<b>MELK. PRMT1</b>					
CENTRAL NERVOUS SYSTEM	<b>BNC210</b> – Anxiety/Depression					
	<b>BNC375</b> – Cognitive impairment, Alzheimer's disease, Parkinson's, ADHD, schizophrenia					
	<b>GABA-A</b> – Epilepsy					
	Undisclosed - Pain					
IMMUNE DISEASE	<b>BNC164</b> –Psoriasis, multiple sclerosis, rheumatoid arthritis					

★ Targeted licensing point



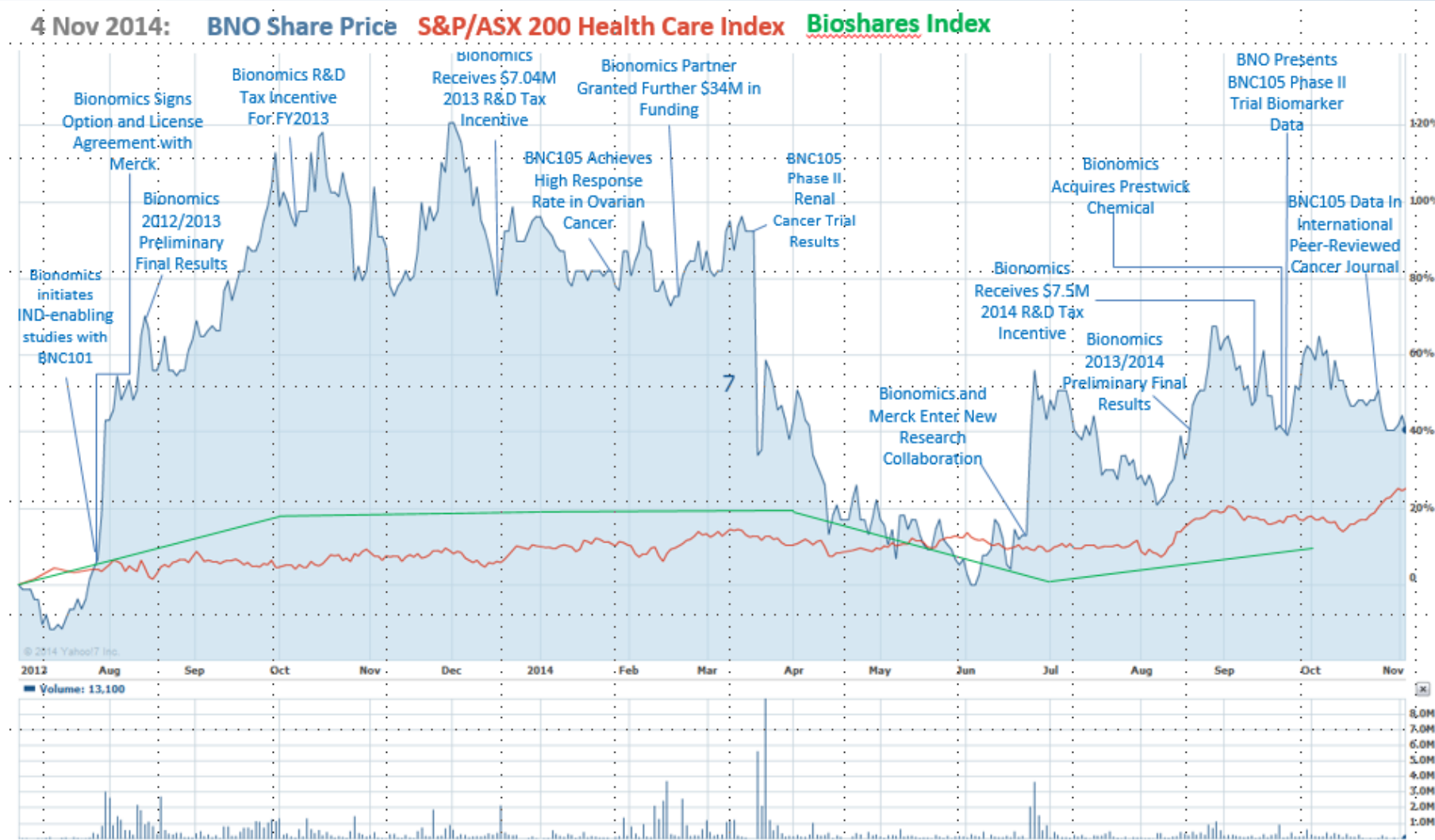
## Value creation: past 12 months

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- Pain partnership with Merck & Co (MSD) with up to US\$172 million in option fees and milestone payments in addition to potential royalties on product sales
- BNC101 evidence of targeting CSCs in models of colon, pancreatic and breast cancer – progressed towards clinic with successful completion of IND enabling studies
- BNC105 achieves high response rate in Phase I ovarian cancer clinical trial
- BNC105: Significant correlation of blood biomarkers with Progression Free Survival in renal cancer trial will determine the design of future clinical trials
- New collaboration with Merck & Co for BNC375 program with up to US\$506 million in upfront and milestone payments in addition to potential royalties on product sales
- Acquisition of French medicinal chemistry services business Prestwick Chemical strengthens our links with Pharma and enhances Bionomics capabilities
- Re-acquisition of BNC210 sets the scene for Phase II trial in 1H, CY2015



# Share Price Performance and Announcements







## Strong Financial Position

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**Cash at 30 September: \$33.41m**

**FY 2014 results:**

- Revenue for the period: \$27.5m
- Operating profit after tax: \$3.2m
- Cash at 30 June 2014: \$10.5m
  - Boosted post 30 June 2014:
    - US\$20m upfront payments from Merck
    - \$7.5m cash from Australian R&D Tax Incentive refund for FY14



## US\$172m Pain Partnership with Merck & Co

- Deal further validates ionX® & MultiCore® drug discovery platforms
- Value creation through strategic partnering business model
- Future success based revenue streams & royalties secured

Partnership Deal	<ul style="list-style-type: none"><li>▪ Option &amp; license agreement with Merck &amp; Co</li><li>▪ <b><u>US\$172m</u></b> in option exercise fees, development/regulatory milestone payments, plus royalties</li></ul>
Compound Target	<ul style="list-style-type: none"><li>▪ Treatment of chronic &amp; neuropathic pain</li></ul>
Market Size & Positioning	<ul style="list-style-type: none"><li>▪ Pain market: ~US\$22b sales in 2010</li><li>▪ Neuropathic pain segment expected to grow from ~US\$2.4bn in 2010 to~ US\$3.6bn by 2020</li><li>▪ Current medications have limited effectiveness<ul style="list-style-type: none"><li>▪ Estimated that only 1 in 4 patients achieve &gt;50% reduction in pain levels</li><li>▪ side-effects eg drowsiness, somnolence &amp; dizziness</li></ul></li></ul>



## Bionomics – Merck & Co BNC375 Program Partnership

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- Targeting cognitive impairment – Alzheimer's disease, Parkinson's disease & other conditions
- Potential for up to US\$506m payments to Bionomics *plus* royalties on net product sales
  - Upfront payments of US\$20m
- Market opportunity includes many neurodegenerative & psychiatric disorders
- BNC375 targets a receptor critical to cognitive processes
- BNC375 has demonstrated potent in vivo memory enhancing properties in animal models
  - Both episodic and working memory improved
  - 100-fold therapeutic dose range & wide safety window in studies to date



## BNC375 Program: Market Potential

- Market opportunity includes many neurodegenerative & psychiatric disorders:

	Prevalence	Estimated global sales pa
Alzheimer's disease	9.7m	\$10.2b (2012)
Cognitive Dysfunction in Schizophrenia	3.4m	No approved products
ADHD	44.9m	\$4.9b
Parkinson's disease	7m	\$3.5b

- Alzheimer's disease is the most common form of dementia & the 6<sup>th</sup> leading cause of death in the US
- 40% growth in Americans over 65 with Alzheimer's by 2025
- Direct cost of Alzheimer's care in the US in 2014 \$214b
- Need for new treatments, with no new drug for a decade



## BNC375: Potential Competitive Advantages\*

Characteristics	Bionomics BNC375	Competing Agents <sup>+</sup>
Potent	✓	✓
Rapid onset of action	✓	✗
Potentiates endogenous receptor ligand	✓	✗
Preserve the normal signalling patterns of the receptor	✓	✗
Do not cause receptor desensitization	✓	✗
No potential for development of tolerance	✓	✗

\*Based on data from preclinical animal studies

+Published information & Bionomics' in-house data



## Extensive Coverage of BNC375 Program Partnership

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- Coverage in 40+ major media & US biotech media
- Major stories in *AFR*, *The Australian*, *Adelaide Advertiser*, *SMH*, *The Age*, *Herald Sun*, *AAP* plus a variety of regional newspapers

“over 40 stories including radio, print, online and TV. Congratulations on this great result!”



## Extensive Coverage of BNC375 Partnership

**Sydney Morning Herald**  
Wednesday 25/06/2014

### Alzheimer's research gets \$20m lift

**Biotechnology**  
Brian Robins

Biotech Bionomics banked \$11.9 million (\$91.2 million) on the deal with Merck, pointing to the fact that BNC is only in the pre-clinical phase of their optimism towards the company's prospects. However, after receiving \$US20 million this week

**The Australian**  
Wednesday 25/06/2014

### Bionomics motoring on Merck deal

**SARAH DANCKERT**  
PHARMACEUTICALS

21.84 per cent, or 9.5c, on the news to close at 53c. The increase comes after a couple of rocky months for the \$172m deal to further develop drugs for chronic pain. She said the drug was still in a pre-clinical phase and had not yet

**Herald Sun (Melbourne)**  
Wednesday 25/06/2014

### US boost in bio deal

**CAMERON ENGLAND**  
**BIOTECHS**

AUSTRALIAN firm Bionomics has struck a multi-million

**Advertiser (Adelaide)**  
Wednesday 25/06/2014

### Bionomics signs Merck deal on dementia drug

**Australian Financial Review**

Wednesday 25/06/2014

### \$537m Alzheimer's deal for Bionomics

Vanessa Desloires

Dr Rathjen said funding for Alzheimer's research had not been

**Age**  
Wednesday 25/06/2014

### \$20m backing for research

**Newcastle Herald**  
Wednesday 25/06/2014

### Alzheimer's therapy deal

**Gold Coast Bulletin**  
Wednesday 25/06/2014

### Alzheimer's research pays



## BNC210 Re-acquired from Ironwood

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- Bionomics to accelerate drug development through 2 clinical trials:
  - First trial approved: will investigate safety and target engagement in the brain
  - Phase II clinical trial protocol being finalised and anticipated to commence in 1H, 2015
  - Major new data to be presented at Society for Neuroscience conference in the US next week
- BNC210 significantly advanced since January 2012 license deal
- \$US10m special purpose financing from Silicon Valley Bank





## BNC210: A next generation compound for the treatment of anxiety and depression

<b>TREATMENT</b>	<b>Anxiety and Depression</b>
<b>MARKETS</b>	<ul style="list-style-type: none"><li>▪ Anxiety – global sales of US\$5-7bn annually</li><li>▪ Depression – global sales US\$11bn in 2008</li></ul>
<b>CLINICAL/ REGULATORY</b>	<ul style="list-style-type: none"><li>▪ Phase I trial program included a trial assessing panic attack symptoms; BNC210 prevented panic attack and reduced panic attack symptoms</li><li>▪ BNC210-related changes in human brain activity observed, indicative of efficacy in absence of sedation</li><li>▪ BNC210 has an excellent safety profile</li></ul>

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	✗	✗	✗	✓	✓	✓
PROZAC	✓	✗	✓	✗	✗	✓

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



# BNC105: New Paradigm with Blockbuster Potential

TREATMENT	<ul style="list-style-type: none"><li>▪ Solid and blood cancers</li></ul>
MARKETS	<ul style="list-style-type: none"><li>▪ The current market size in treatment of all solid tumours is &gt;US\$10bn</li><li>▪ Renal cancer market size &gt;US\$2.5bn; includes TKIs Sutent (<i>Pfizer</i>), Nexavar (<i>Bayer/Onyx</i>), Afinitor (<i>Novartis</i>)</li><li>▪ Ovarian cancer market size ~US\$2.2bn; includes carboplatin (<i>BMS</i>), gemcitabine (<i>Gemzar, Eli Lilly</i>)</li><li>▪ Chronic Lymphocytic Leukaemia (CLL) market ~US\$1.4bn in 2013</li></ul>
BENEFITS	<ul style="list-style-type: none"><li>▪ <b><i>Targets both solid tumours and blood cancers (CLL)</i></b></li><li>▪ <b><i>Multi Action</i></b> – selectively targets both tumour blood vessels (solid tumours) and cancer cells</li><li>▪ <b><i>Rapid, Potent Action</i></b> – works rapidly to shut down tumour blood vessels, potent anti-tumour action as a single agent, tumour less likely to escape treatment</li><li>▪ <b><i>Enhances Effectiveness of Other Cancer Treatments</i></b> – delivers synergistic anti-cancer effects in numerous combinations</li></ul>



## BNC105: Phase I Ovarian Trial Results

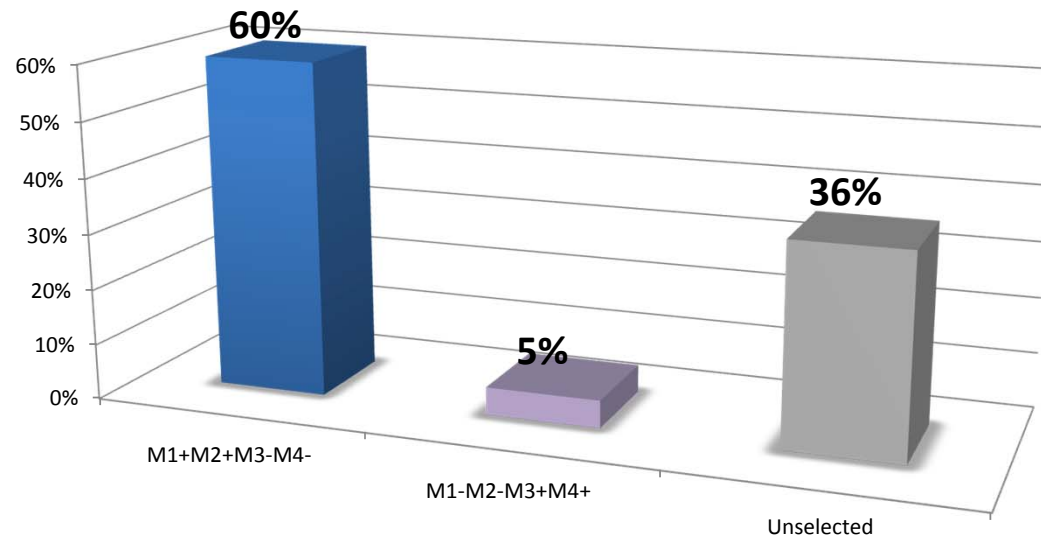
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- Combination study (carboplatin + gemcitabine chemotherapy + BNC105) in partially platinum sensitive ovarian cancer patients in first or second relapse
- 15 patients enrolled, 12 patients completed six cycles of combination therapy and commenced with BNC105 monotherapy
- 10 patients achieved a positive response according to RECIST 1.1 and/or GCIG CA125 criteria
- Side-effects related to gemcitabine + carboplatin treatment backbone; haematological origin
- Recommended BNC105 Phase II dose: 12mg/m<sup>2</sup> in combination with carboplatin and gemcitabine



# DISRUPTOR-1: Biomarkers Correlated with Patient Benefit

60% of patients displaying the biomarker signature are progression free at 6 months



Biomarker data chosen for discussion by Dr Manuela Schmidinger, of the University of Vienna, Dr Schmidinger stated that continuing this biomarker work could be ground-breaking for renal cancer patients

***A Phase II study of BNC105 + Afinitor in patients selected for biomarker expression is currently under development and will be run in collaboration with a large international pharmaceutical company***



# BNC101: Targeting Cancer Stem Cells in Solid Tumours

<b>TREATMENT</b>	Solid tumours; colon & pancreatic are priority indications
<b>MECHANISM OF ACTION</b>	<ul style="list-style-type: none"><li>▪ Humanised monoclonal antibody</li><li>▪ BNC101 binds selectively to LGR5; LGR5 marks tumour-initiating cells in colon &amp; gastric cancer</li><li>▪ LGR5 highly overexpressed in colon, ovarian, liver, breast, lung &amp; other solid tumours</li><li>▪ High expression of LGR5 in colon cancer has been linked to tumour recurrence &amp; poor prognosis</li></ul>
<b>MARKETS</b>	Market for cancer stem cell therapeutics estimated as US\$8B by 2018
<b>DEVELOPMENT STAGE</b>	IND filing and Phase I clinical trials target 2015
<b>BENEFITS</b>	<p>Inhibition of tumour recurrence</p> <p>Specific targeting of cancer stem cells which are not killed by either chemotherapy or radiotherapy</p>



## BNC420: Bionomics Latest Cancer Drug Candidate

<b>TREATMENT</b>	Solid tumours; breast cancer & melanoma are priority indications
<b>MECHANISM OF ACTION</b>	<ul style="list-style-type: none"><li>▪ BNC420 modulates the activity of the VEGFR3 receptor</li><li>▪ VEGFR3 inhibition inhibits the growth of lymph vessels, key conduits promoting cancer spread</li><li>▪ VEGFR3 inhibition promotes re-activation of the anti-tumour immune response</li></ul>
<b>MARKETS</b>	Melanoma treatment market est US\$2.8b by 2021  Breast cancer market projected to be US\$10.4b by 2019
<b>DEVELOPMENT STAGE</b>	Preclinical, partnership targeted in 2015
<b>BENEFITS</b>	Inhibition of cancer spread  Activation of the immune response against the tumour, to promote killing



## Bionomics' Acquisition of Prestwick Chemical

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Prestwick is a premium provider of medicinal chemistry services & smart screening libraries to major pharmaceutical companies

- Founded 1999 by Professor CG Wermuth, a world renowned expert in medicinal chemistry & senior scientists from Strasbourg University
  - Reported revenues for year to Dec 2013 of €4.292m
  - Assets purchased for €270,000
  - Continues business as Contract Research Organisation
- 
- *Co-located with Neurofit, expertise & customer base highly synergistic*
  - *Important role in both Bionomics' Pain and BNC375 programs partnered with Merck & Co*



## Prestwick Customers

Prestwick is a premium provider of chemistry services to:

- Big pharma



- Mid-sized pharma:  
in France, Germany, Switzerland, USA ...



- Biotech firms:  
in Austria, Australia, France, Germany, Israel, Switzerland, USA ...







# Investment Highlights

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- Robust business model with multiple revenue generating streams through strategic partnering
- Demonstrated in FY14 through two partnership deals with Merck & Co:
  - Cognition eg Alzheimer's Disease: Research collaboration and license agreement, up to US\$506 million in upfront, research and milestone payments, **plus** royalties on product sales
  - Pain: Option and license agreement, up to US\$172 million in fees and milestone payments, **plus** royalties on product sales.
- Further significant partnerships anticipated which will continue to validate business model and technology – 3 programs targeted for partnering
- Addressing major market opportunities:
  - Pain market: ~US\$22bn sales in 2010
  - Alzheimer's disease - \$10.2bn in 2012
  - Anxiety – global sales of US\$5-7bn annually
  - Depression – global sales US\$11bn in 2008
- Well financed, first profit in FY14



# The Year Ahead: What We Expect

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- BNC 210 Clinical Development:
  - Initiation and completion of Phase IB trial investigating target engagement
  - Initiation of Phase II trial in patients suffering anxiety
- BNC105 Clinical Development:
  - Initiation of Phase II clinical trial in patients with renal cancer, biomarker signatures will guide patient selection, in collaboration with a global Pharma company
  - Initiation of clinical trial in patients with Chronic Lymphocytic Leukemia, in collaboration with Dartmouth College (US)
- BNC101 Development:
  - IND filing and initiation of a Phase I clinical trial in patients with either colon cancer or pancreatic cancer
- Continued execution of Bionomics' partnership strategy



# Thankyou for your support in 2014

