Phylogica Investor Briefing

August 2017

Stephanie Unwin, Chief Executive Officer

PHYLOGICA

BREAKTHROUGH PEPTIDE THERAPEUTICS

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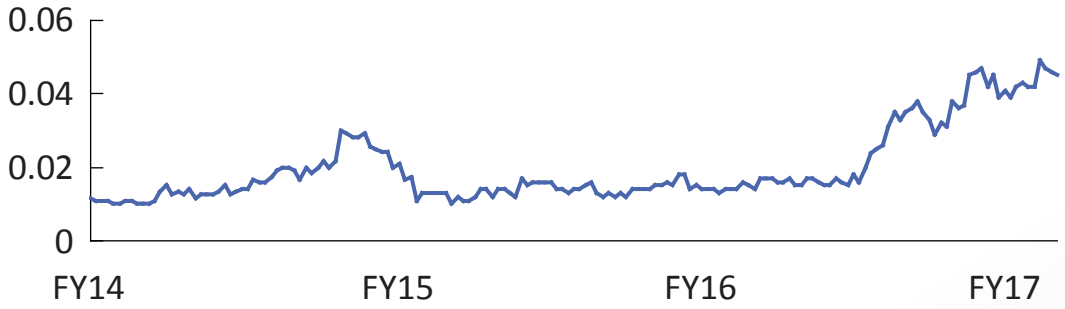
Corporate profile

Phylogica stock price, AUD



Directors

Stephanie Unwin	Executive Chairman
Dr Robert Hayes, PhD	Executive Director
Dr Bernard Hockings	Non-Executive Director
Dr Rick Kendall	Non-Executive Director
Dr Paul Watt	Non-Executive Director
Dr Rohan Hockings	Alternate Non-Executive Director

Research Coverage

Bioshares
Euroz
NDF research
ShareAnalysis
Wright Investors

Major shareholders, %

B E +D C Hockings	27.5
Sietsma Holdings Pty Ltd	10.0
Australian Land Pty Ltd	7.6
Andrew Swift	2.9
Masali Pty Ltd	2.8
B E Hockings	2.2

Capital structure

Issued ordinary shares (mn)	1,990.0
Unlisted options (mn)	52.7
Current[1] market cap (mn)	93.3 AUD
Current[1] share price	4.4c AUD
Past 12 months[1] average daily trading	1.5-5.3c AUD

1 Current as of 01/08/2017 and past 12 months covering 01/08/2016 to 01/08/17

SOURCE: ASX

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Highly valuable intracellular target space remains untapped

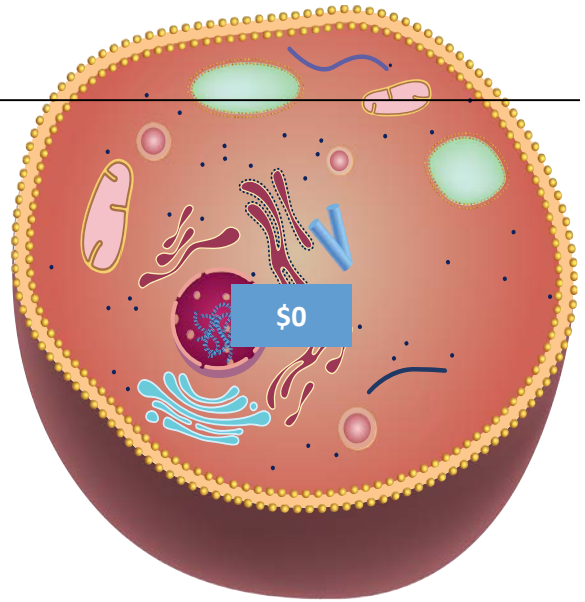
80% of drug targets are inside cells but only 10% of such targets are druggable

Distribution of drug targets

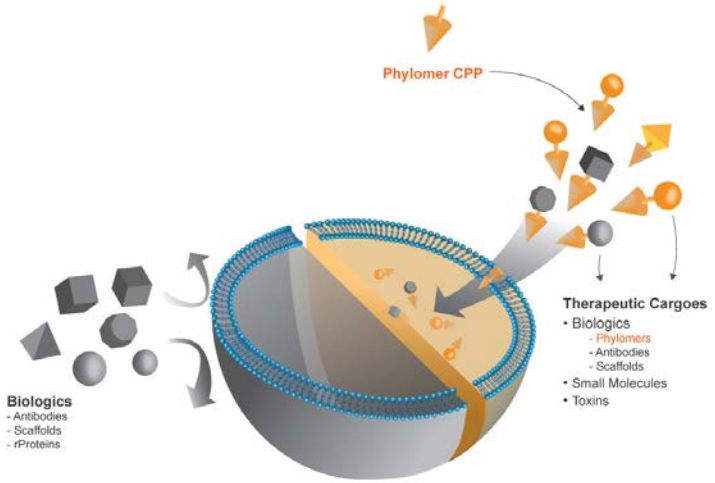
Outside cells	20%
Cell membrane Small molecules	10%
Biologics	70%

Market for biologics drugs

$220B



Phylogica's FPP platform finds peptides which can break through the cell membrane (Endosomal escape)



Phylogica's ambition: expand the druggable intracellular landscape by >10-fold with Functional Penetrating Phylomers (FPPs) – Phylogica's proprietary cell penetrating peptides

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Phylomer FPPs are able to deliver a diverse range and size of cargos

Example cargos and targeted diseases that can be delivered with FPPs

Conceptual stage
Validated efficacious delivery

Cargo class	Example cargo	Example disease	Progress[1]
RNA	PMO	Duchenne muscular dystrophy	
Anti-microbial	Antibiotics	Multi-drug resistant Gram-negative bacteria	
Scaffold	Omomyc	Breast cancer	
Peptide	Anti-amyloid fibril	Alzheimer's disease	
	DC vaccine	Mesothelioma Melanoma	
Toxin	Ribotoxin	Acute myeloid leukaemia	
Enzyme	Glucocerebrosidase	Gaucher disease	
Bi-specifics	Bcl-2 + Omomyc	Resistant cancers	

Cargo size

1 Progress measured in terms of ability to deliver efficacious cargo class into cell using FPP

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Phylogica has had early success in developing FPPs and Myc

- Phylomer screens against validated and clinically relevant oncology targets
  - c-Myc, N-Myc, Stat5 and YB1
- Validated hits already exceed potency of gold standard inhibitors
- Stat5 and YB 1 collaborations with Dana Farber Institute, Harvard Medical School

Lead program

Program	Potential targeted indications[1]	Hit ID	Hit to lead validation *in vitro*	Hit to lead validation *in vivo*	Lead selection/ optimization	Pre-clinical/ IND enabling[3]	Phase I-III
Myc	AML, Breast Cancer (TNBC), Neuro-blastoma	✓	✓	✓	*progressing*		
STAT5	AML, CML	✓	✓	*progressing*			
YB1	AML, Breast Cancer (TNBC)	✓	✓	*progressing*			
FPP[2]	Intracellular payloads	✓	✓	✓	*progressing*		

1 Current shortlisted indications only
2 Multiple diverse FPP-payload constructs at various stages (includes external collaborations)
3 Includes non GLP and GLP toxicology

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Jan 18 – In Vivo efficacy data to validate a functioning FPP platform

three focus areas - increase potency of FPP-iMyc drug conjugate

1 **Improve FPP's endosomal escape activity**

- New FPPs to be identified by assays
- Protein engineering work
  - Fine tuning existing FPPs active window and strategic aa substitution
- 13 new FPP families announced last quarter with good activity

2 **Increase the cargo's binding affinity (binding to the target)**

- Ensuring the cargo is optimised to bind to the target: iMyc to Myc
- Work in progress to increase binding

3 **Increase half life - drug conjugate where we want it for longer (biodistribution and pharmacokinetics)**

- Increasing drug half-life – time it takes for half the drug to leave the body
- Application of half life extension techniques in progress

Outcome: improved drug conjugate tested against disease in live animals, showing how much is needed for 50% inhibition of the disease (IC50s)

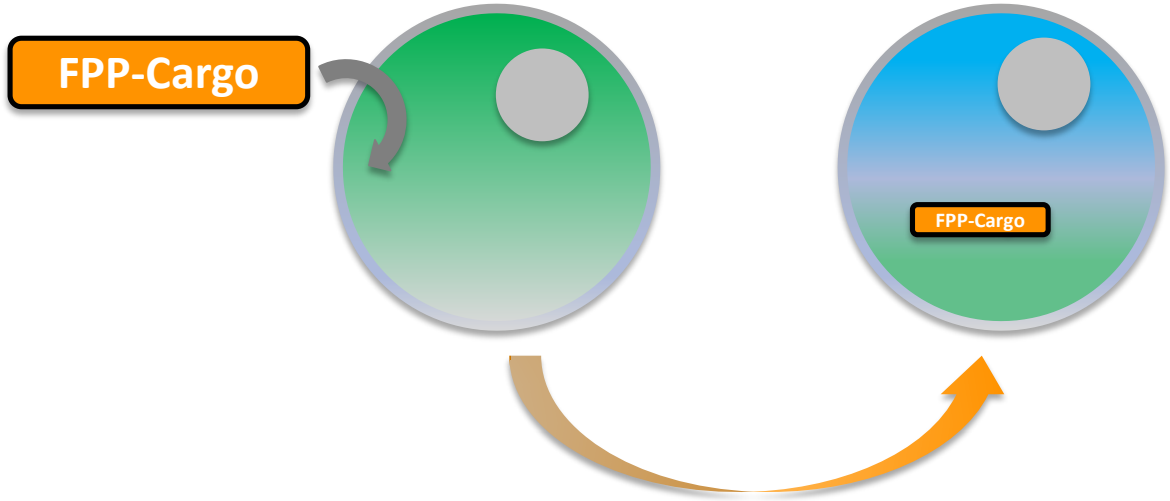
Dr Robert Hayes

Chief Scientific Officer

- Ph.D. in Protein Biochemistry from Imperial College, London
- Royal Society University Fellow, Royal College of Science Scholar
- Postdoc work at UC Berkeley in protein engineering
- In 1998, joined a start-up in Berkeley called Xencor as fourth employee, stayed for six years – company went public 2015
- Joined J&J as Head of Antibody Engineering. After three years, founded Centyrex, a J&J wholly owned biotech company
  - Six year business plan
  - 37 FTEs
- As Centyrex's CEO oversaw development of the Centyrin platform
- In 2014, joined Amgen as Head of Biologics, managing a team of 165 scientists and professionals at four north American site and one oversees site.

Current activities – FPP Platform Validation

Example: β-lactamase FPP assay

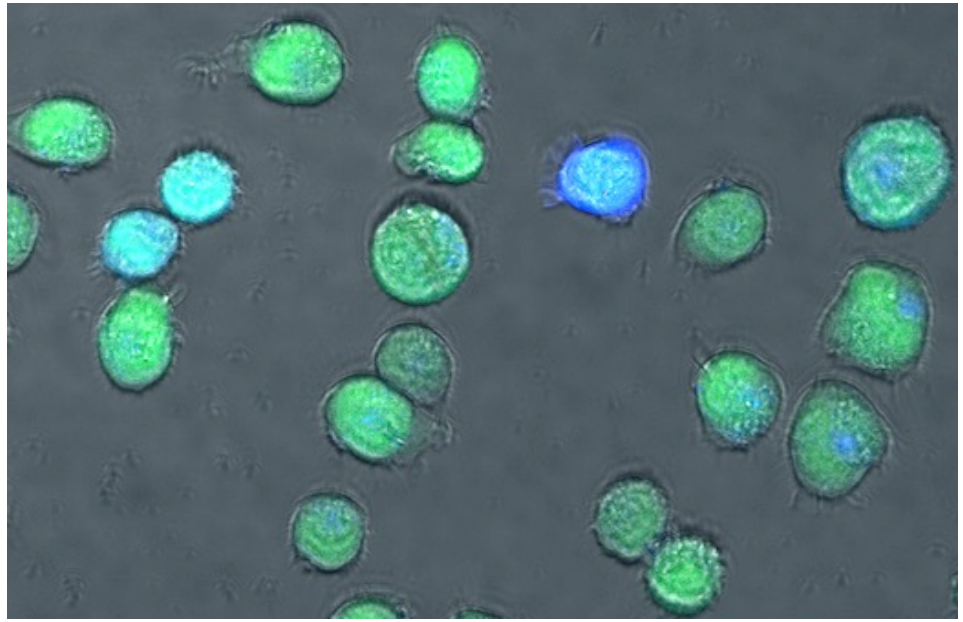


Goals

- *Provide optimised FPPs for the oncology program*
- *Develop better understanding of FPP delivery*
- *Further validation of the FPP platform*

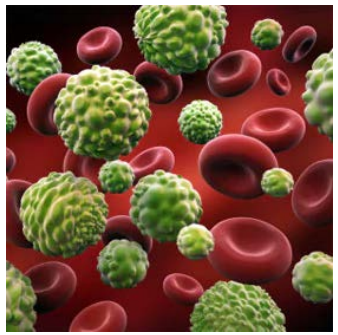
The FPP program

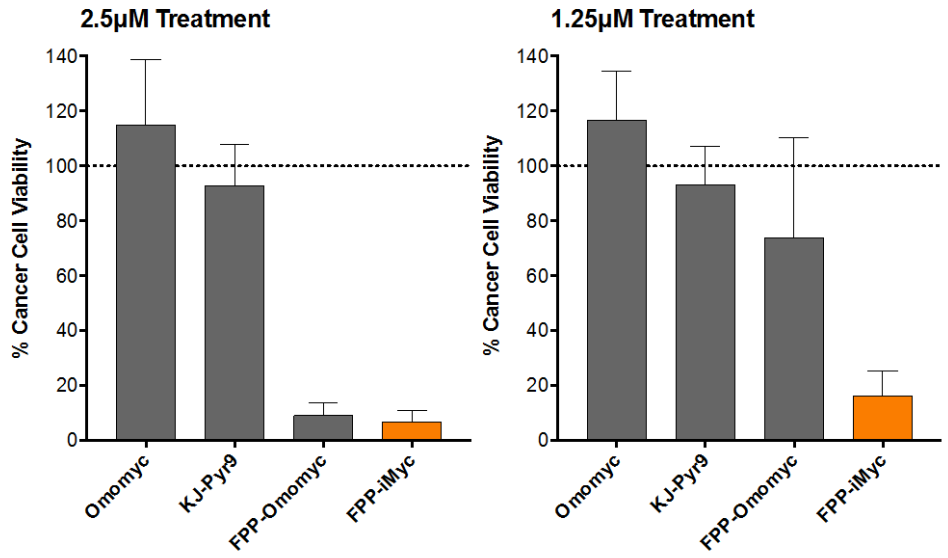
- **FPP discovery**
  - *Screening Phylomer libraries against mammalian cells to isolate more types of FPPs*
- **FPP validation**
  - *Delivery of different cargoes*
  - *Delivery into different cell types*
- **FPP maturation**
  - *Improving FPPs via focused libraries/ directed evolution*



Current activities: Oncology MYC program, validation of iMycs

- Oncology program aims to prove that Phylomers can be targeted to proteins inside cells that are important in cancer development and progression (oncoproteins such as MYC)
- Testing of MYC inhibitors: can our Phylomer iMYCs kill cancer cells better than the current best protein and small molecule inhibitors?



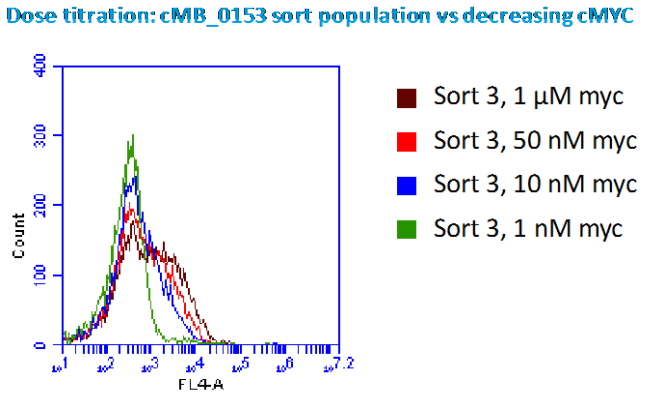


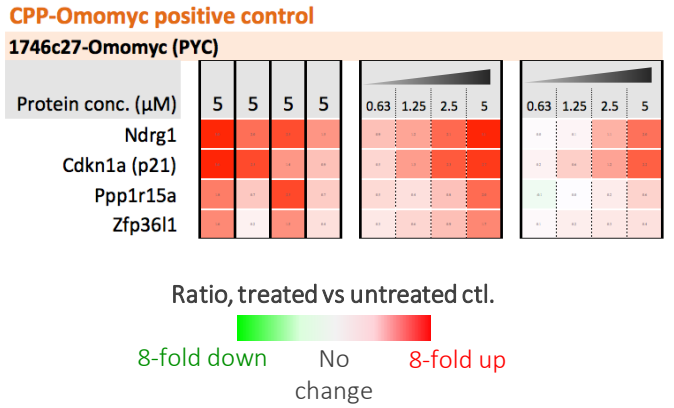
Techniques used/being optimised during Oncology program	Flow on benefit for other projects
iMyc killing of cancer cells	➢ Functional validation of FPP activity with diverse cargoes in multiple cell types
iMyc mode of action studies	➢ Establish SOPs for mode of action studies for other oncology targets ➢ Acquisition of new machinery and that will be used across all programs
In vivo tumour models	➢ Assessment of *in vivo* FPP delivery of cargoes in disease models

Current activities: Oncology MYC program, affinity maturation, MOA and PD markers

- Oncology program aims to prove that Phylomers can be targeted to proteins inside cells that are important in cancer development and progression (oncoproteins such as MYC)
  - Affinity maturation of MYC inhibitors: Can we improve our iMYCs (binding, potency)?
  - Pharmacokinetic markers: Can we establish indicators of our iMYC working?
  - Characterisation of MYC inhibitors: How do our iMYCs work?

Techniques used/being optimised during Oncology program	Flow on benefit for other projects
Can we improve our iMYCs? *(iMyc affinity maturation)*	➢ Develop affinity maturation programs ➢ Relationship of improved binding and potency
Indicators of our iMYC working? *(pharmacodynamic biomarkers)*	➢ Establish indicators (biomarkers) of iMYC effect on the target in cells
How do our iMYCs work? *(mechanism of action)*	➢ Development of assays to assess how our iMYCs work ➢ Establish SOPs for these studies for other oncology targets

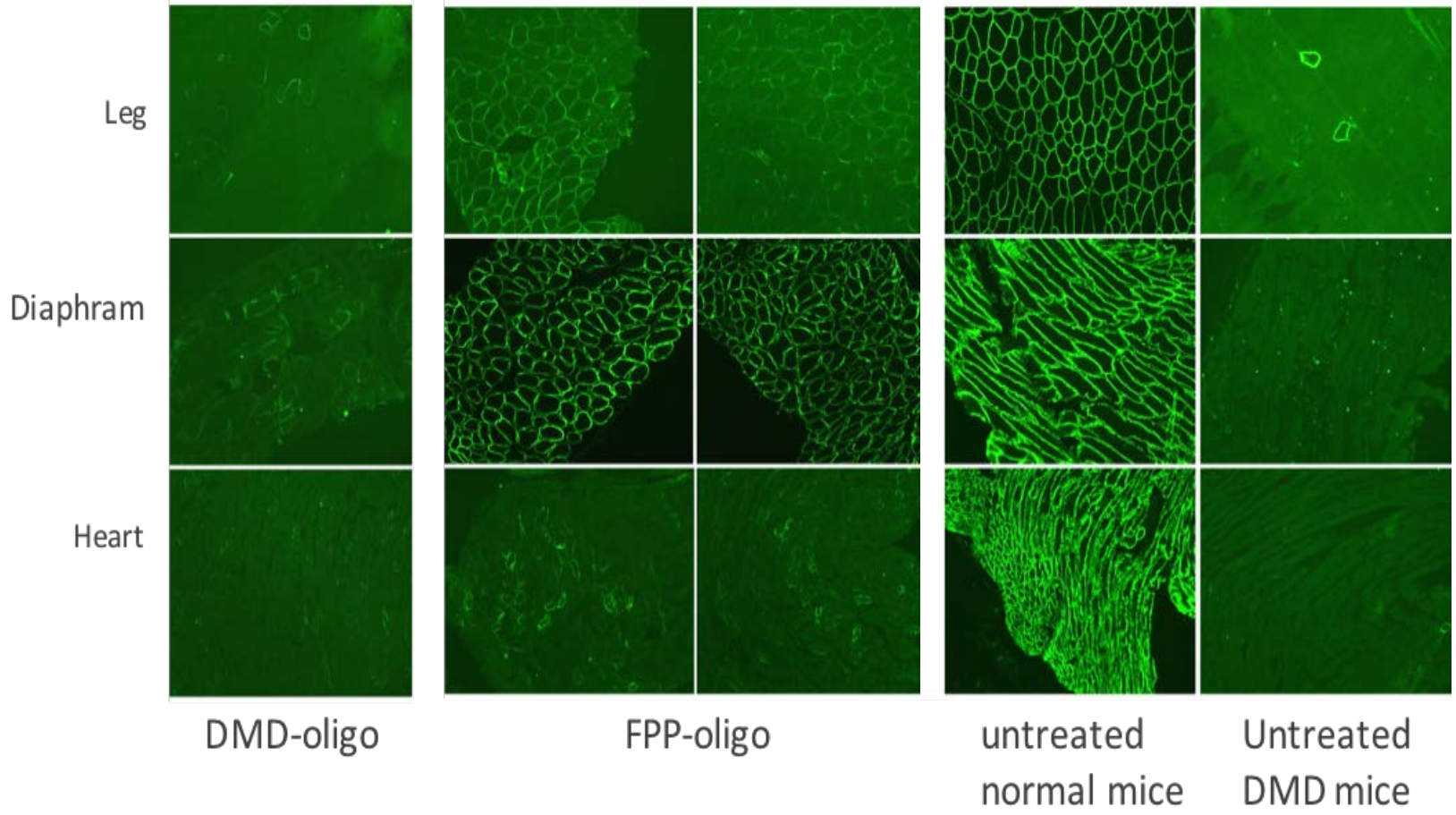




FPP delivery of an oligonucleotide *in vivo* in a model of Duchenne muscular dystrophy (DMD)

- **DMD**, a X-linked recessive neuromuscular disorder, **leads to severe muscle wasting** – by the age of 12 most boys are unable to walk
- **DMD** is **caused by a mutation of the dystrophin gene** – the oligonucleotide targets and skips the mutated exon 23 of dystrophin, leading to a shorter yet functional dystrophin variant
  - Histology staining shows **FPP-DMD oligonuceotide treatment leads to functional improvement**, inducing mouse muscle tissue to return to a more-normal phenotype with improved muscle architecture and increased dystrophin expression

Histology staining



Current activities: Genentech Collaboration

- Project with Genentech (Roche) – leading biotechnology company in the US
- Our collaboration aims at the isolation of Phylomers that can help killing multi-drug resistant “super bugs”
  - *Phylomers are expected to increase the potential to kill bacteria which can cause pneumonia, urinary tract infections, meningitis and sepsis in people with a weakened immune system*
- The principle:

Phylomer-Antibiotic ✔ ✗ ✔

GNE #1	2014 – 6 month pilot study	US $ 150,000
GNE #2	2015 - Resulted in the isolation of one Phylomer, which fulfilled all the criteria & dozens of additional potential hits, which have not been tested yet	US $ 750,000
GNE #3	2017 - Screening against additional super bugs	US $ 2,000,000

Benefits for Phylogica?

- Revenue; Platform development; Proof of continued interest of big pharma in PYC’s platform