# pharmaxis





## **Presentation by Chief Executive Officer**

**Gary Phillips** 

## Forward looking statement

This document contains forward-looking statements, including statements concerning Pharmaxis' future financial position, plans, and the potential of its products and product candidates, which are based on information and assumptions available to Pharmaxis as of the date of this document. Actual results, performance or achievements could be significantly different from those expressed in, or implied by, these forward-looking statements. These forward-looking statements are not guarantees or predictions of future results, levels of performance, and involve known and unknown risks, uncertainties and other factors, many of which are beyond our control, and which may cause actual results to differ materially from those expressed in the statements contained in this document. Except as required by law we undertake no obligation to update these forward-looking statements as a result of new information, future events or otherwise.

## **Pharmaxis overview**

Pharmaxis is a global leader in drug development for fibrosis & inflammation

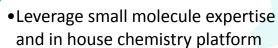
- Pharmaxis has built a successful platform of small molecule drugs targeting fibrosis and inflammation across various stages of development and approval
- Proven track record of early stage partnering and taking products through to commercialisation – delivered two products to market
- Potential to receive total up front and milestone payments of A\$625m plus further sales based payments (% and milestones) from first deal – A\$68m already received
- Strong discovery pipeline targeting high value indications one drug in 2 phase 2 trials,
   one drug program to start phase 1 in 2017, three compounds in development
- Growing revenues from approved product sales (A\$4.8m in FY17) & milestones (A\$27m FYTD 2018)
- Strong balance sheet A\$39m at 9/17 and A\$15m milestone expected H2 2017
- Purpose built manufacturing and research facility in Sydney
- Strong institutional share register; including offshore specialist biotech funds

# pharmaxis

Pharmaxis has a successful track record of research, development and commercialisation of human healthcare products for the treatment and management of fibrotic and inflammatory diseases



Clinical Trials  Utilise global experience and extensive clinical networks to execute value adding Phase 1 and 2 clinical trials



- Efficiencies from global academic & CRO networks
- Target high value diseases with validated targets

Drug Discovery Engine



- Extensive Big Pharma network
- Partnering after phase 1 or 2 to realise value and mitigate program and corporate risk



## **Senior management**

#### Significant experience in drug development, commercialisation and partnering



#### **Gary Phillips - CEO**

- more than 30 years of operational management experience in the pharmaceutical and healthcare industry in Europe, Asia and Australia
- joined Pharmaxis in 2003 and was appointed Chief Executive Officer in March 2013 at which time he was Chief Operating Officer
- previously held country and regional management roles at Novartis – Hungary, Asia Pacific and Australia



#### Wolfgang Jarolimek – Drug Discovery

- more than 18 years' experience in pharmaceutical drug discovery and published more than 30 peer reviewed articles.
- previously Director of Assay Development and Compound Profiling at the GlaxoSmithKline Centre of Excellence in Drug Discovery in Verona, Italy
- spent 8 years as post-doc at the Max-Plank Institute in Munich, Germany; Baylor College of Medicine, Houston, Texas; Rammelkamp Centre, Cleveland Ohio; and University of Heidelberg, Germany



#### **David McGarvey – CFO**

- more than 30 years' experience building and funding Australian based companies from inception to globally successful enterprises
- joined Pharmaxis as Chief Financial Officer and Company Secretary in December 2002
- previously Chief Financial Officer of the Filtration and Separations Division of US Filter (1998-2002), and Memtec Limited (1985-1998)
- commenced career at PriceWaterhouseCoopers



#### **Brett Charlton - Medical**

- more than 25 years experience in clinical trial design and management
- author of more than 80 scientific papers
- founding Medical Director of the National Health Sciences Centre
- previously held various positions with the Australian National University, Stanford University, the Baxter Centre for Medical Research, Royal Melbourne Hospital, and the Walter and Eliza Hall Institute



#### Kristen Morgan – Alliance Management

- responsibility for alliance management and medical and regulatory affairs
- more than 19 years' experience in the pharmaceutical industry having previously held a senior role in medical affairs at Sanofi-Aventis, and a commercial sales role at GlaxoSmithKline.

#### **Board of Directors**

- Malcolm McComas Chair
  - former investment banker at Grant Samuel, County Natwest and Morgan Grenfell
- **Gary Phillips** Chief executive officer and managing director

- Will Delaat Non executive director
  - former CEO of Merck Australia
  - former chair of Medicines Australia
- Simon Buckingham Non executive director
  - former President Global Corporate and Business Development at Actellion
  - Kathleen Metters Non executive director
    - former head of global research at Merck

## **Drug discovery capability**

Significant experience in drug development, commercialisation and partnering

#### **Drug discovery leadership**



# Wolfgang Jarolimek – Head of Drug Discovery, Pharmaxis

 Previously Director of Assay Development and Compound Profiling at the GlaxoSmithKline Centre of Excellence in Drug Discovery in Verona, Italy; Max-Plank Institute in Munich, Germany; Baylor College of Medicine, Houston, Texas; Rammelkamp Centre, Cleveland Ohio; and University of Heidelberg, Germany



# Dieter Hamprecht – Head of Chemistry, Pharmaxis

 Previously Managing Director – Boehringer Ingelheim's research group in Milan; senior medicinal chemistry positions at GSK

#### **Scientific Advisory Board**



**Prof Jacob George** 

Professor of Hepatic Medicine – Westmead Millennium Institute, University of Sydney; Head of Dept of Gastroenterology and Hepatology – Westmead Hospital



**Prof Carol Pollock** 

Chair, NSW Cardiovascular Research Network; Chair, Research Advisory Committee of ANZ Society of Nephrology, Chair, Northern Sydney Local Health District Board



**Prof Andrew Boyle** 

Professor of Cardiovascular Medicine, Director of Priority Clinical Centre for Cardiovascular Health, University of Newcastle and John Hunter Hospital



**Prof Darren Kelly** 

Associate Dean (Innovation and Enterprise), The University of Melbourne; Director of Innovation and Enterprise, Centre for Eye Research Australia; Director of Biomedical Research, Department of Medicine, St Vincent's Hospital Melbourne. Former CEO of Fibrotech Ltd, CEO of OccuRx.



Dr Kathleen Metters

Formerly Senior Vice President and Head of Worldwide Basic Research for Merck & Co. Non executive Director, Pharmaxis Ltd



**Dr Alan Robertson** 

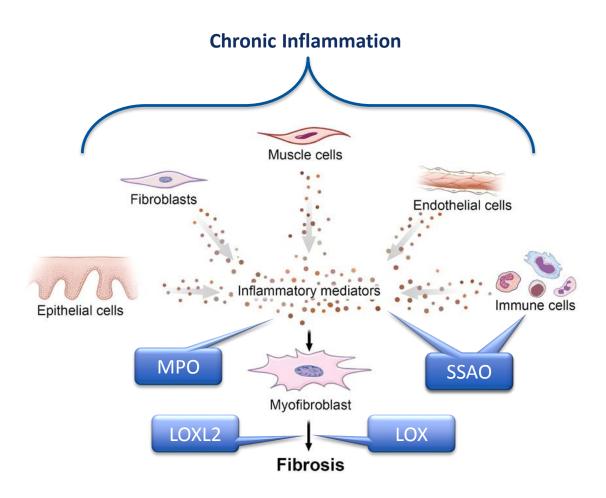
Medicinal chemist with extensive global drug development experience including GSK, Faulding and Amrad. Inventor of migraine drug Zomig. CEO of Pharmaxis 2000 to 2013

# **Pharmaxis portfolio**

	Indication	Discovery	Lead Optimisation	Pre Clinical	Phase I	Phase II	Phase III	Marketed
<u>Commercial</u>								
Bronchitol® US	Cystic fibrosis	responsibility (incurring	ry endpoint in 2017. Subject all costs) for completing th	e New Drug Applica	tion with the FDA a	nd US commercialis		Chiesi Prople and Ideas for Innovation in healthcare
Bronchitol RoW	Cystic fibrosis	Bronchitol is currently s in Russia. Bronchitol &	old in the UK and Germany Aridol business segment ex US. A\$2.8m revenue in FY17	by Chiesi and recen	ntly added Italy (laur	nch H2 17). Recently		Distributors
Aridol®	Asthma diagnosis	Aridol is approved and	Aridol is approved and sold in Australia, South Korea and a number of European countries. A\$2m revenue in FY17.			Direct & Dist		
In the clinic								
SSAO (PXS-4728A)	NASH		heim in May 2015. PXS rece ments of A\$290m during de ones following approval.			00	Boehringer ngelheim	
SSAO (PXS-4728A)	Diabetic retinopathy	triggers a €10m (A\$15)	ommenced a Phase 2 trial in to Pharmaxis. Total potentia er royalties and sales related	i al milestone paymer	nts of A\$290m durir	/ III / T	Boehringer ngelheim	
<u>Discovery</u>								
LOXL-2	NASH, fibrosis - liver, pulmonary, kidney	the state of the s	opment and set to enter ph er at end of Phase 1 – H2 20			syna	irgen	
SSAO/MPO	Respiratory & cardiovascular	Dual inhibitor with poter applications. Targeting I						
LOX	Scarring; cancer	Anti-fibrotic. Commencii studies H2 2017 . Targeti	•					

# A pipeline of drugs for inflammation and fibrosis

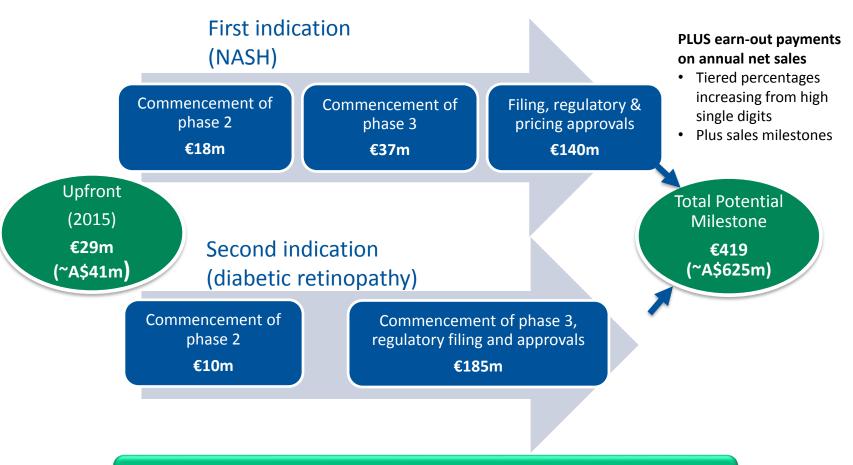
Targeting multiple different pathways



# **Boehringer Ingelheim deal**



Deal structure illustrates value generating potential of Pharmaxis business model



- Price sensitive interim news flow on trial results H2 2018
- No further investment required from Pharmaxis

## Validated amine oxidase chemistry platform

Pharmaxis has developed a commercial pipeline of small molecule drugs against high value targets

Active Program Target Indications				
Cardiac Fibrosis				
COPD / Asthma				
Kidney fibrosis				
NASH / Liver fibrosis				
Pancreatic cancer & myelofibrosis				
Pulmonary Fibrosis				
Scarring				
Diabetic retinopathy				

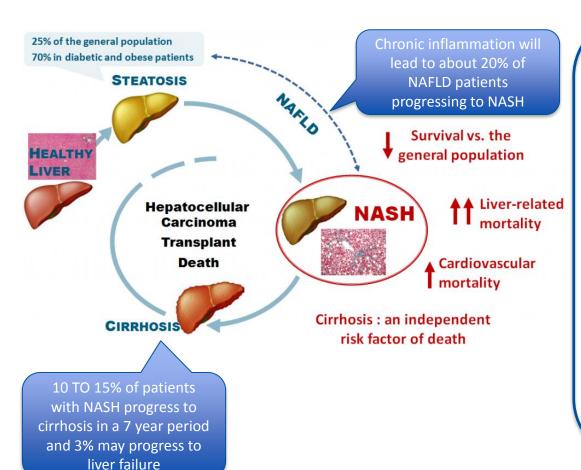
#### **Pharmaxis Drug Discovery**

Amine oxidase enzymes are well validated as targets in diseases with a high unmet medical need:

- Pharmaxis are global leaders in amine oxidase enzyme inhibition
- Pharmaxis owned IP
- Since 2015 the platform has delivered:
  - 1 compound in 2 phase 2 trials
  - 2 compounds to enter phase 1 in 2017
  - 2 compounds planned to enter phase 1 in 2018

Key areas of current focus are NASH and Pulmonary Fibrosis

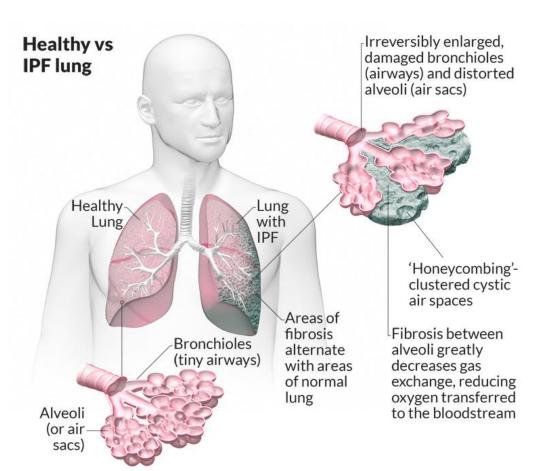
## **Disease focus - NASH**



#### Nonalcoholic steatohepatitis

- NASH is a liver disease characterised by fat deposits, inflammation and tissue damage
- Risk factors are insulin resistance, type 2 diabetes, obesity, hypertension, high blood lipid levels and age
- Up to 16% of liver transplants in the US are due to NASH and by 2020 will overtake hepatitis C as the leading cause of liver transplant
- There no approved drugs
- Deutsche Bank predicts a global market >US\$35b by 2025.

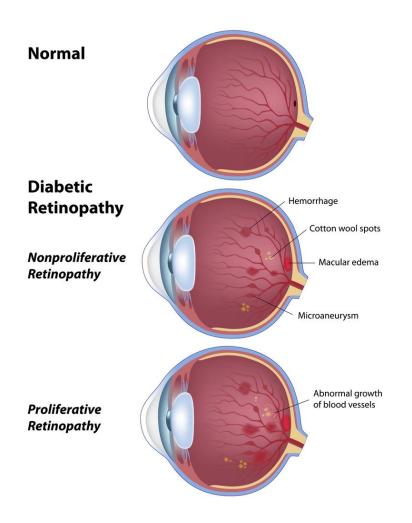
## **Disease focus - IPF**



#### **Idiopathic Pulmonary Fibrosis**

- IPF primarily affects people over the age of 50
- 5,000 IPF patients in Australia
- 100,000 IPF patients in the US
- Prognosis is worse than that of many cancers
- Two drugs approved recently
  - Nintedanib (Boehringer Ingelheim)
  - Pirfenidone (Roche)
- Need for new therapies
- Current products expected to produce global revenues > \$1.1
   billion by 2017

## Disease focus – diabetic retinopathy

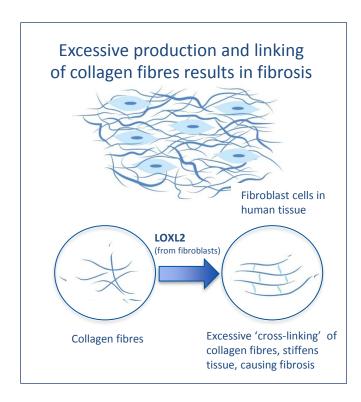


#### **Diabetic retinopathy**

- DR is the leading cause of visionloss in adults aged 20-74
- Progresses from mild nonproliferative DR through to proliferative DR.
- Characterised by growth of new blood vessels on retina
- Diabetic macular oedema (DMA) can develop at all stages of DR
- Estimated 95 million people worldwide have DR – vision threatening to 1/3<sup>rd</sup>
- Urgent need for new therapies

# Pharmaxis LOXL2 inhibition for NASH & other fibrotic diseases

An attractive target and development program



#### Potential indications:

- NASH / Liver Fibrosis
- Pulmonary fibrosis (IPF)
- Kidney
- Cardiac fibrosis

Significant market opportunity

#### Development status:

- Pharmaxis discovery patent filed 2016
- Effective in pre clinical models of fibrosis and cancer
- 2 candidate compounds completed pre-clinical trials and 28 day toxicity studies
- Phase 1 clinical study due to commence in Q4 17

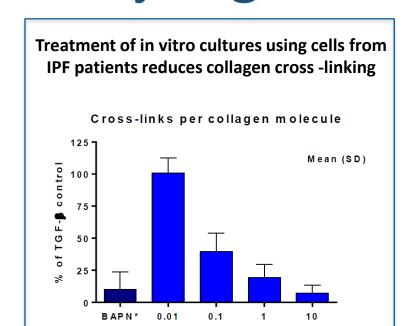
#### Competitive profile:

- Novel target and mechanism of action
- Once daily oral drug
- Complete inhibition of LOXL2 enzyme
- Opportunity to use in combination with other Pharma pipeline drugs

# Pharmaxis LOXL2 Synairgen collaboration

#### Collaboration with Synairgen

- Shares risk and reward based on investment in program
- Access to Synairgen's strength in fibrosis biology and human tissue models technology platform
- Faster time to value appreciation and partnering points of phase 1 or 2a
- Risk share Synairgen funding preclinical tox and phase 1 of first compound
- Revenue share for IPF phase 1 partnering deal: 50/50
- Partnering deal(s) from additional indications (eg NASH) results in larger PXS deal share



In Vitro human IPF tissue data supports mechanism of action

\* Pan LOXL/LOXL inhibitor

Compound 2

## Fibrosis and NASH M&A

### Attractive deal values for phase 1 and phase 2 clinical assets

Acquirer	Company	Indication	Deal Type	Stage	Upfront (US\$M)	Potential (US\$M)
Gilead	Nimbus	NASH - metabolic	Partnership	P1	400	1,200
Gilead	Phenex	NASH – metabolic	Asset Acqun	P2	U	470
Novartis	Conatus	NASH - inflammatory	Option	P2	50	650
Allergan	Tobira	NASH - inflammatory	Acquisition	P2	600	1.7b
Allergan	Akarna	NASH - metabolic	Acquisition	Pre	50	U
BMS	Promedior	IPF+	Acquisition	P2	150	1,250
BMS	Galecto	IPF	License	P1	U	444
BMS	Nitto Denko	NASH - fibrotic	License	P1	100	U
Boehringer	Inventiva	IPF+	License	Discovery	U	€189+
Boehringer	Dicerna Pharm	NASH - undisclosed	Collaboration	Pre	10	190
Boehringer	MiNA	NASH – metabolic+	Collaboration	Pre	U	356
Boehringer	Pharmaxis	NASH - inflammation	Asset Acqun	P2	A\$40	A\$750+
BMS	Amira	IPF	Acquisition	P1	325	150
Gilead	Arresto	NASH – fibrosis +	Acquisition	P1	225	225
Biogen Idec	Stromedix	IPF	Acquisition	P2	75	487
Shire	Lumena	NASH – inflammatory	License	P1	260	U
Shire	Fibrotech	Diabetic nephropathy	Acquisition	P1b	75	482
AZ	Regulus	NASH- metabolic +	License + equity	Pre	U	500

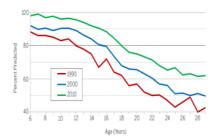
## LOXL2 inhibitor deal value drivers

Feature	What do Pharma value?	Pharmaxis LOXL2 program status
Disease target	Independent validation	Multiple references including Pharma company authored.
Pre clinical proof of concept	2 or more different animal models	9 different models across 5 different diseases.
Drug like qualities	No development flags	Cleared to develop
Dosing regimen	Ease of use	Oral once a day tablet or capsule
Patent	<ul><li>Uncomplicated</li><li>Composition of matter</li><li>As long as possible</li></ul>	<ul><li>100% Pharmaxis owned</li><li>Composition of matter</li><li>2016 filing date</li></ul>
Cost of Goods	Low	Small molecule with easy synthesis
# Compounds	1 plus backups	2 lead candidates plus back ups
Toxicity	Wide therapeutic window As long as possible	Phase 1 trials will inform 28 day tox studies complete
Clinical phase	Phase 1 or 2	Planned for phase 1 in H2 17

LOXL2 program is expected to be partnered at the end of phase 1 - estimated H2 2018

## **Bronchitol for cystic fibrosis**

#### Overview



Median FEV<sub>1</sub> % Predicted versus Age

#### **Cystic fibrosis**

- Patients
  - US: 30,000;
  - Europe: 37,000;
  - Rest of world: 21,000
- Disease characterised by poorly hydrated, tenacious, thick mucus
- Rapid decline in lung function
- Frequent infections



#### **Bronchitol**

- Active ingredient mannitol delivered as an inhalable dry powder
- Restores airway surface liquid
- Mucus clearance enhanced
- Improves lung function
- Reduces incidence of lung infections



#### **Business model - RoW**

- Global Bronchitol distributors responsible for promotion & support
  - Chiesi in UK,
     Germany and Italy
  - Other distributors in Russia, Eastern Europe, Middle East
- PXS revenue share ~50%+



#### **Business model - US**

- Phase 3 trial (CF303) reported June 2017
- Chiesi responsible for regulatory filing & commercialisation
- File updated NDA 2018
- ~A\$13m milestone payment on launch, plus sales milestones
- PXS supplies US market from Sydney factory
- PXS receives high mid teens % of in-market sales plus cost of goods

## **Key catalysts**

#### Pharmaxis platform is built to deliver strong news flow

- Phase 2a SSAO (PXS-4728A) NASH trial commenced with first dosing in third quarter 2017 triggering €18m milestone payment (A\$27m) from Boehringer Ingelheim. Trial to reports H2 2018
- Boehringer Ingelheim developing SSAO (PXS-4728A) for second indication (diabetic retinopathy). Phase 2 trial initiated in September 2017 – first patient dosed will trigger a milestone payment of €10m (A\$15m). Trial to report H2 2018
- LOXL-2 program completed preclinical development, set to begin Phase 1 clinical trials in second half of 2017 and targeting partnering deal H2 2018
- Two further compounds with potential as first in class drugs in diseases with high unmet need planned to progress to Phase 1 in 2018
- Bronchitol FDA re-submission by Chiesi in 2018
- Productive R&D engine currently working on new drug discovery technologies
- Evaluating external opportunities for in-license or acquisition



## **Financial Overview**

David McGarvey CFO

## Financials – highlights

#### 30 June 2017

A\$'000	2017	2016	2015	2014
Income Statements				
Sales revenue	4,823	6,135	5,999	5,036
Other revenue	13,178	12,885	53,248	5,450
Total revenue	18,001	19,020	59,247	10,486
Expenses	(36,437)	(35,476)	(40,739)	(62,201)
Net profit (loss) before tax	(18,436)	(16,456)	18,508	(51,715)
Net profit (loss) after tax	(18,346)	(16,463)	18,466	(51,818)
Segment results - adjusted EBITDA				
Bronchitol & Aridol	(7,100)	(8,228)	(10,045)	(22,555)
New drug development	(4,114)	(2,625)	35,068	(1,620)
Corporate	(4,017)	(3,988)	(3,532)	(6,226)
	(15,231)	(14,841)	21,491	(30,401)
Cash flow				
Operations	(15,151)	(11,989)	21,780	(28,132)
Investing activities	(725)	(1,381)	(264)	(313)
Financing activities	(1,721)	(1,714)	(1,791)	(1,357)
	(17,627)	(15,084)	19,725	(29,802)
Cash at bank	21,504	39,209	54,138	34,182

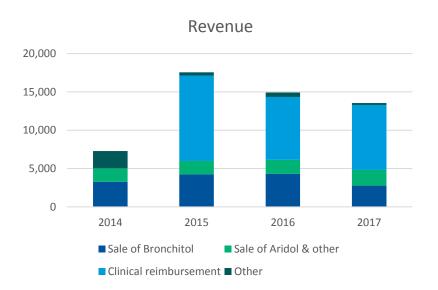
#### Highlights of 2017

- Sales revenue reduced mainly reflecting inventory levels at distributors
- Other revenue mainly consists of reimbursement of clinical trial costs, plus R&D tax credit.
- Slight increase in expenses

   additional drug
   development research
- Business segments tracking to plan – Bronchitol & Aridol loss reducing, increased investment in new drug development, corporate costs stable
- Cash flow tracking to plan

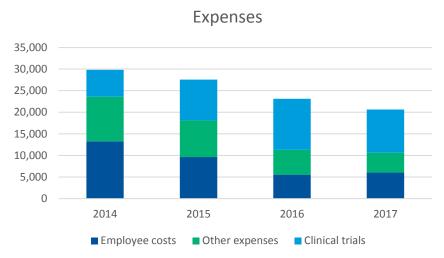
## **Bronchitol & Aridol**

#### 30 June 2017





- Sales of Aridol continue to grow without any sales/marketing investment by PXS – sales now \$2m. Plans to re-enter US and enter Canada in CY 2018 via a distributor.
- Sales of Bronchitol reduced Chiesi (EU distributor) reducing inventory levels.
- Clinical trial cost reimbursement (by Chiesi) in line with clinical trial expenditure. \$1m remaining for FY2018

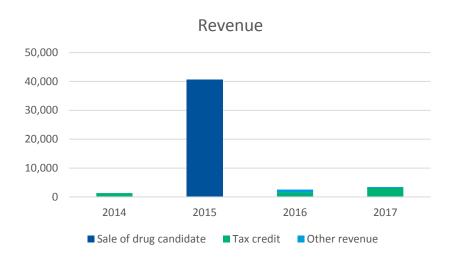


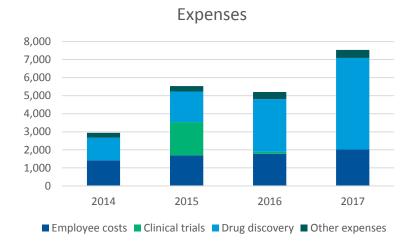
#### Comments - expenses

- Employee costs stable
- Other costs continue to reduce
- Clinical trial costs reduce as CF303 completes -\$1m for FY 2018

## New drug development

#### 30 June 2017





#### Comments - revenue

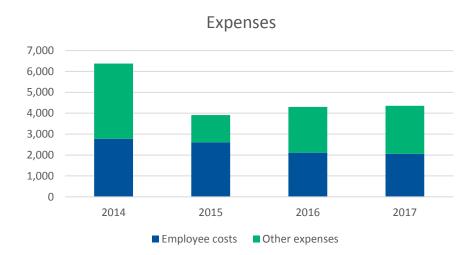
- First payment from Boehringer Ingelheim received in 2015. Received \$27m in first quarter of FY 2017, expect additional \$15m this financial year
- R&D tax credits available when income below \$20m. Received \$3.1 million in FY 2017

#### Comments - expenses

- Marginal increase in employee costs strengthen team
- Drug discovery represents external research costs – increased as drug programs progress towards human clinical trials

## **Corporate**

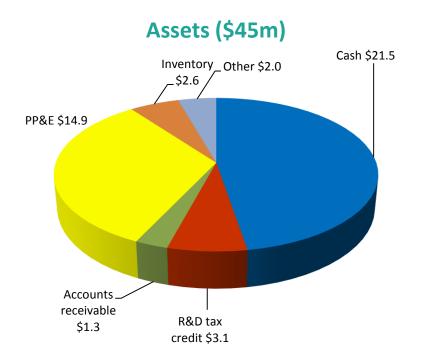
#### 30 June 2017



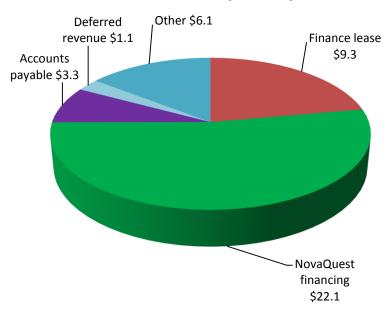
#### Comments - expenses

- Employee costs stable
- Other costs stable change in mix as cost reduction initiatives etc offset other increases

## Balance sheet - 30 June 2017



#### Liabilities (\$42m)



- Finance lease over 20 Rodborough Rd (to 2024)
- NovaQuest financing not repayable other than as % of Bronchitol revenue

# **Shareholders & trading**



Financial Information	
ASX Code	PXS
Market Cap <sup>1</sup>	\$83m
Shares on Issue	320m
Employee Options	13m
Liquidity (2017 turnover YTD) <sup>1</sup>	65m shares
Cash Balance (30 Sept)	\$39m

Institutional Ownership	%
BVF Partners (US)	20%
Australian Ethical	10%
Allan Gray	7%
Montoya Investments (UK)	6%
Other Institutions	8%
Total Institutional Ownership	51%



1. 8 November 2017