



## **Investor Presentation (August 2017)**

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# Corporate Structure



# Corporate Overview

- **PharmAust: Clinical-stage oncology** company
- Lead product is **Monepantel** (MPL) – a repurposed drug already approved for Veterinary use
- PharmAust **patented MPL** as a **novel anticancer drug**
- **Unique clinical strategy** targeting **MPL** for both **human and vet** applications
- **Option Agreement** with **Novartis Animal Health/Elanco** for veterinary cancer applications
- **Epichem**: profitable business, forecast revenues of \$4m in 2018 FY

# Corporate Snapshot

<b>ASX Code:</b>	PAA
<b>Market Cap</b>	\$10M
<b>Cash<sup>1</sup></b>	\$2.59M
<b>Debt<sup>2</sup></b>	\$0.5
<b>Epichem Revenue</b>	\$3.05M (FY17)

<b>Total Shares on Issue</b>	146,694,903
<b>Options (Unlisted)</b>	42,547,078
<b>Top 20 Own</b>	35%
<b>Board/Exec Own</b>	13%



1. As of 30 June, 2017

2. EFIC loan to Epichem: Mar 31, 2017

# Experienced Board & Management Team

## Dr. Roger Aston, Executive Chairman

- >20 years experience in the pharmaceutical and healthcare industries.
- Director or chairman on a number of boards carrying out late stage drug development
- Largest Shareholder

## Dr. Wayne Best, Director

- 30 years experience in synthetic and medicinal chemistry in academia and industry.
- MD of PharmAust's subsidiary Epichem.

## Robert Bishop, Executive Director

- >30 years experience in corporate finance and equity capital markets
- Lawyer and an investment banker
- Second largest shareholder

## Sam Wright, Director & Company Secretary

- 20 years experience in the biotech and healthcare.
- Experienced in listed companies, corporate governance and corporate finance.

## Dr Richard Hopkins, CEO

- >15 yrs biotech experience in Drug Discovery and Development
- Executive experience in ASX companies

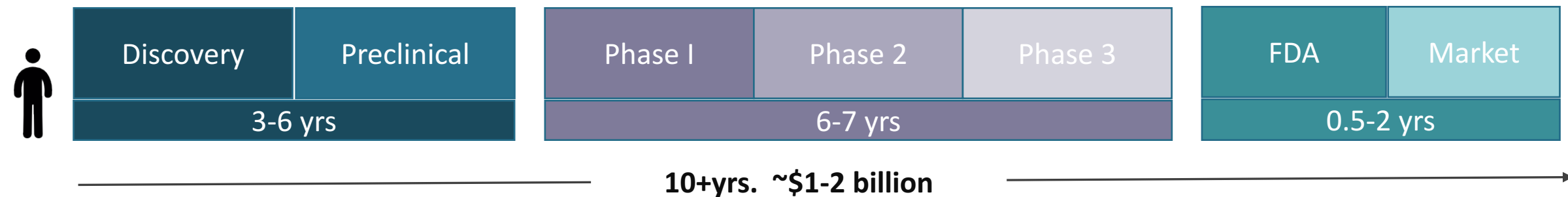
## Dr Richard Mollard, CSO

- >15 yrs biotech experience in senior scientific roles
- Broad range of biotech expertise in executive & consulting roles inc. regulation and development

# Repurposing MPL for accelerated path to commercial returns

# Drug Repurposing = Capital efficient path to market

## Typical Drug Development Phases



Drug repurposing/repositioning

6yrs. ~\$300 million



Drug repurposing/repositioning

3-5yrs. ~\$2-5 million

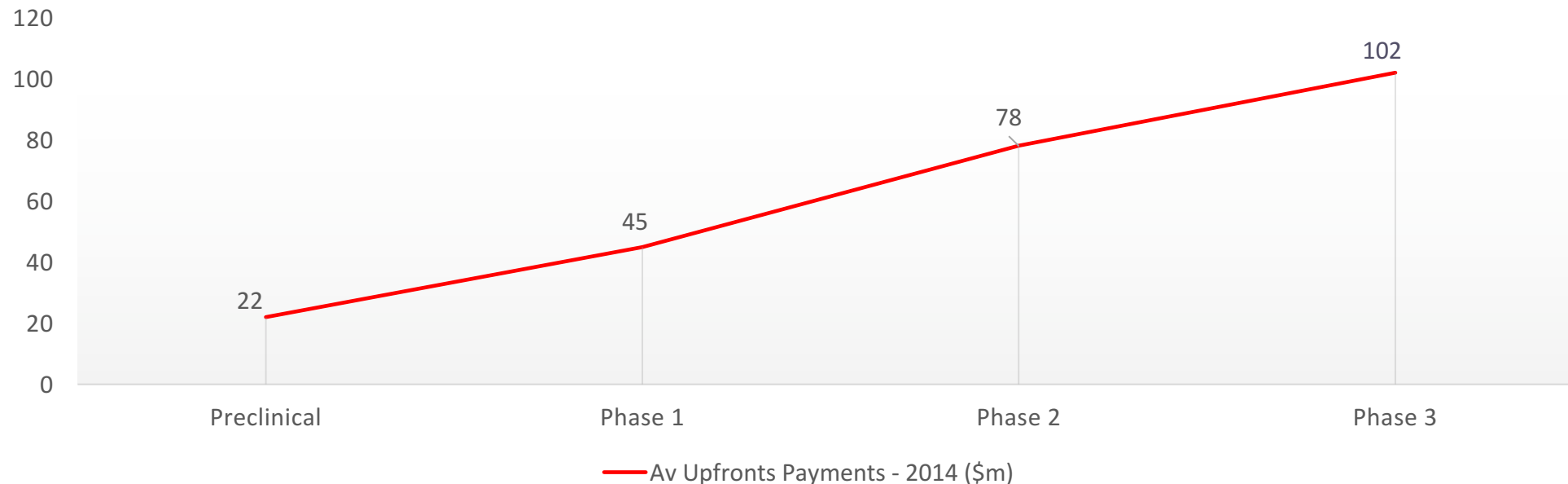




# Value can be unlocked early in development cycle



Average upfront human oncology licensing deal values at different development stages (US\$millions)

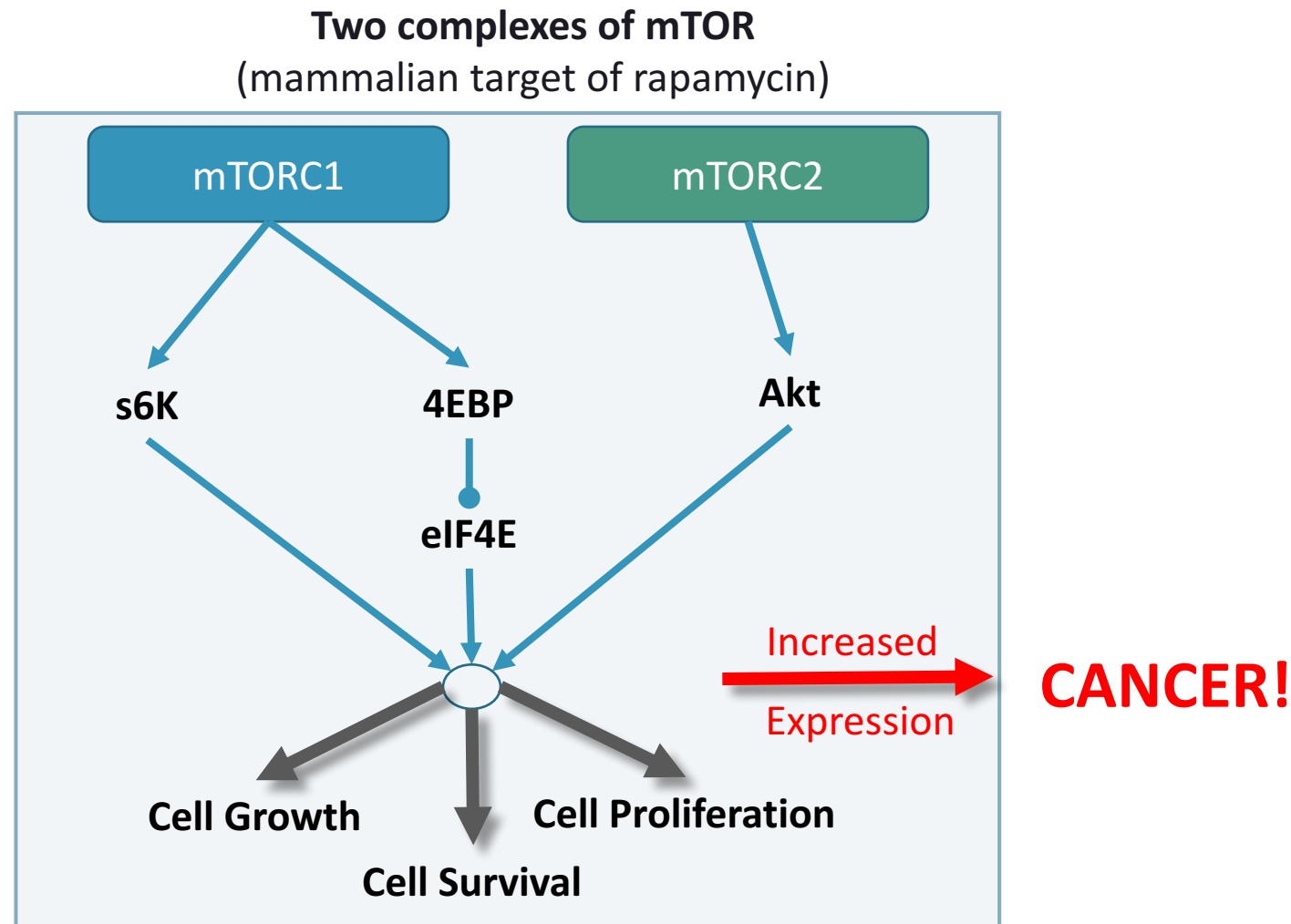


(2016). The Deloitte Recap Oncology Deal Making and Development Trends Report 2008-2012 (pp. 1–51).

# Monepantel Oncology Programme:

## Progressing towards key clinical and commercial catalysts

# MPL targets the mTOR pathway: common to many cancers



Saxton, R. A., & Sabatini, D. M. (2017). mTOR Signaling in Growth, Metabolism, and Disease. *Cell*, 168(6), 960–976.

# >\$2 Billion market for approved mTOR Drugs

Drug	Approved Indications	Company	2016 Sales (US\$m) <sup>1</sup>
<b>Sirolimus</b>	Transplantation	Pfizer	170
<b>Rapalogues (Affintor/Torisel)</b>	Transplantation Renal Cell Carcinoma Breast Cancer Pancreatic Neuroendocrine Tumours Mantle Cell Lymphoma	Novartis/Pfizer	>2,000

1. Global Data

# PharmAust's strong MPL patent position

- > 47 patents and patent applications
- 5 patent families
- **Granted patents** in US, Aus, China, NZ and Europe
- Broad 'method of use' for MPL across **cancer** and **non-cancer** applications
- Joint portfolio of **MPL analogues** (composition of matter) with Nihon Nohyaku

# Why MPL for Cancer

MPL Approved for Animal Health



Comprehensive Preclinical Data-pack  
(potent and safe)



**In vitro:** MPL kills wide range of cancer cell lines

**In vivo:** MPL monotherapy inhibits tumours in mice xenografts  
(pancreatic, ovarian, colorectal)

**In vivo:** MPL combined with front-line drugs improves potency  
in mouse xenografts (ovarian)

**Toxicology :** 4 species (mice, rats, sheep, dogs)

**Pharmacology:** (mice, sheep, dogs)

Phase I/II clinical data in dogs showing safety,  
suppression of cancer biomarkers and efficacy



Phase I clinical data in humans showing safety,  
suppression of cancer biomarkers



# Recent clinical outcomes promote commercial opportunities

Phase II pilot lymphoma trial in dogs  
MPL used as front-line therapy



Preliminary Results:  $\frac{3}{4}$  (75%) treated dogs  
showed stable disease and tumour reduction

- 1<sup>st</sup> report of MPL clinical tumour inhibition
- 1<sup>st</sup> report mTOR drug inhibiting Lymphoma in dogs

Pharma Option agreement



# MPL Achieved Key Preclinical and Phase I Clinical Endpoints

- 1. Safety:** Excellent safety profile in dogs & man as predicted by pre-clinical models
- 2. Efficacy:** Observed reduction of key cancer biomarkers (p70s6K and p4E-BP-1) and reduction in tumours in dogs (3/4) diagnosed with lymphoma
- 3. Active dose:** Identified active dose of MPL in man using biomarkers
- 4. Synergy:** Demonstrated synergy in preclinical mouse model with current standard of care cytotoxic drugs



# Strategy to develop MPL as a Cancer Therapeutic for:

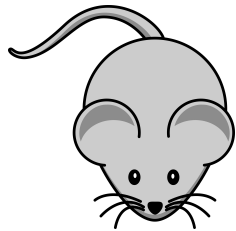
- **Veterinary Health**
- **Humans**

# Rationale for dual clinical development strategy

70% oncology drugs fail in clinical trial due to:

- Poor Efficacy
- Poor Safety

Mouse Cancer Model



**Traditional Development Path**



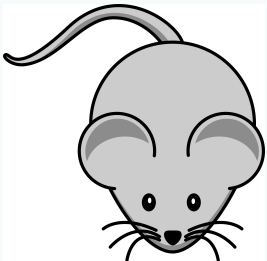
Human Clinical Trial



Mouse cancer models often poor predictors of drug activity in humans



Mouse Cancer Model

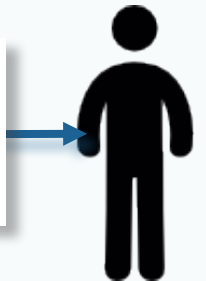


Dog Cancer Model



Dog cancer very similar to human cancer  
Cancer 5X more common in dogs  
Dog model more predictive than mouse

Human Clinical Trial



# Rationale for dual clinical development strategy

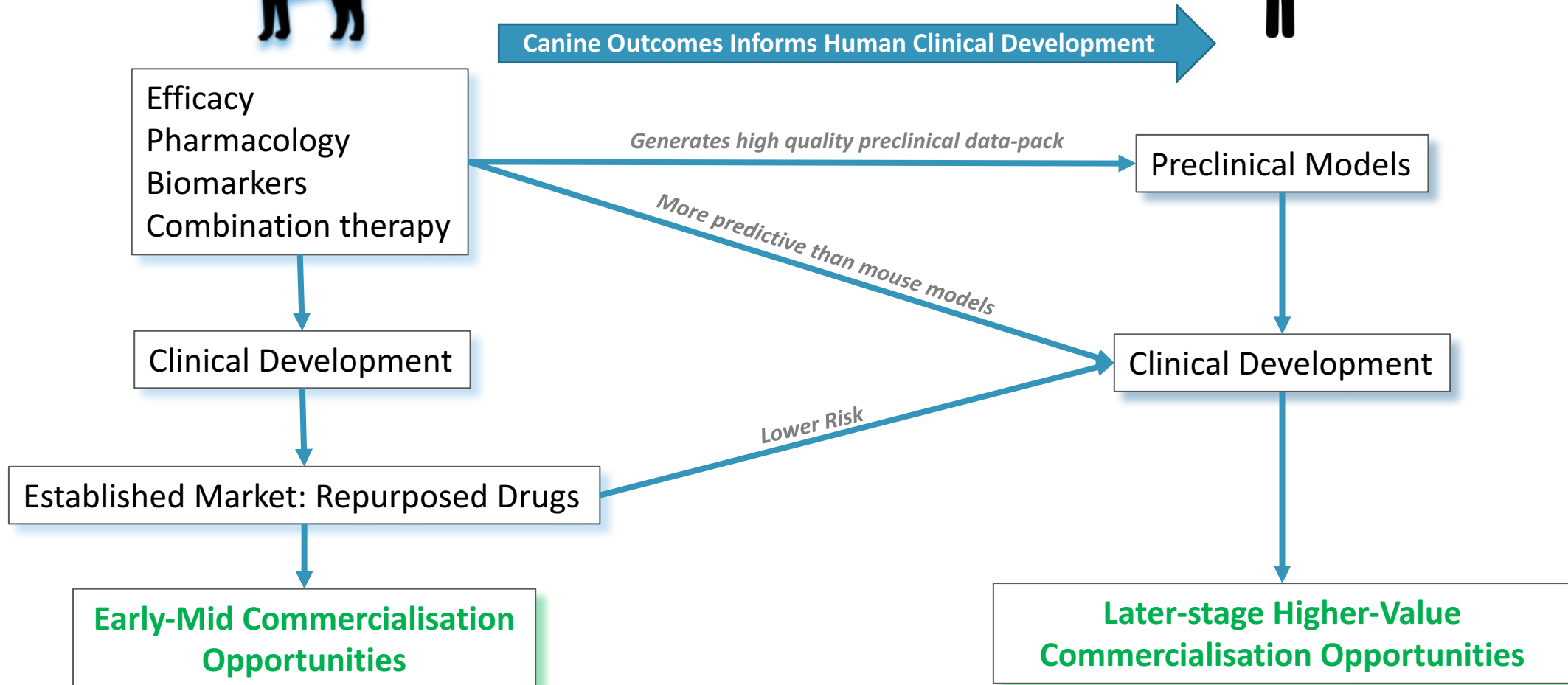
## Vet Oncology Development



## Human Oncology Development



Canine Outcomes Informs Human Clinical Development



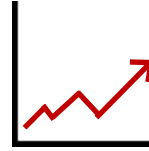
# Trends in Companion Animal Health Market (US:2016)

## US Dog/Cat Populations (2016)<sup>1</sup>



94m

90m



**Total Pet Expenditure: \$70b<sup>1</sup>**



**Vet Care Expenditure \$17b<sup>1</sup>**



**Pet drug market \$10.2b by 2018<sup>2</sup>  
(8% CAGR)**



**Willingness to pay more for treatment<sup>3</sup>  
(\$2K-\$5K/treatment)**

1. [http://www.americanpetproducts.org/press\\_industrytrends.asp](http://www.americanpetproducts.org/press_industrytrends.asp)

2. Competition in the Pet Medications Industry (2015)

3. AP-Petside.com Poll, conducted by GfK Roper Public Affairs and Media: April 7-12, 2010

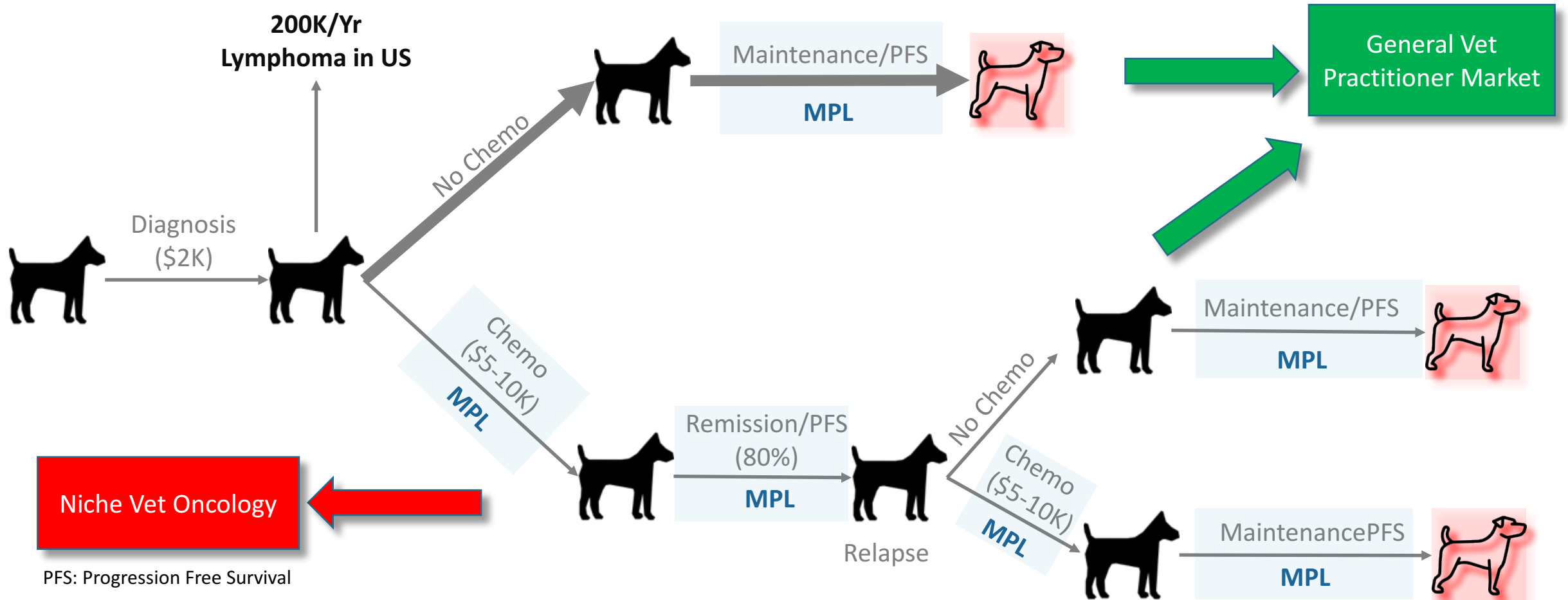
# Pets and Cancer

- 1 in 4 dogs die of cancer



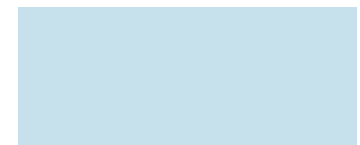
- Pets are living longer (50% dogs >10yrs die of cancer)
- 6 million dogs diagnosed with cancer in US/yr
- Significant **unmet need** for **new** oncology drugs (\$500m-\$1b market)
- Vet **therapeutic market** dominated by **repurposed drugs** already approved for use in humans and/or animals (eg. **MPL**)

# Multiple options for MPL in dog Lymphoma market



# Animal Health Commercialisation Strategy: Target General Vet Practitioner Market

- Monepantel: Meets requirements to target Vet General Practise market
  - Monepantel can be delivered orally, is non-toxic (safe) and amenable to daily dosing
  - Target vets in major markets: US (90K+) and Europe (243K).
  - Need to establish clinical efficacy for MPL (Progression Free Survival, Tumour Reduction etc)!!
- Competing Oncology Drugs:
  - Often require special handling, storage and expertise due to toxicity
  - Veterinary Oncologists often required for more complicated therapies/treatment regimens
  - Only 400 Veterinary Oncologists in US = niche market.





# About Epichem

- Specialist Synthetic & Medicinal Chemistry Services
- Highly awarded West. Aust. Company (Founded 2003)
- Staff of 23 (15 PhD's)



## Revenues

### Drug Discovery & Technical Services

- Fee for Service Consultancy
- Custom Synthesis
- Hit to Lead Validation/Optimisation
- Track record in clinical drug development

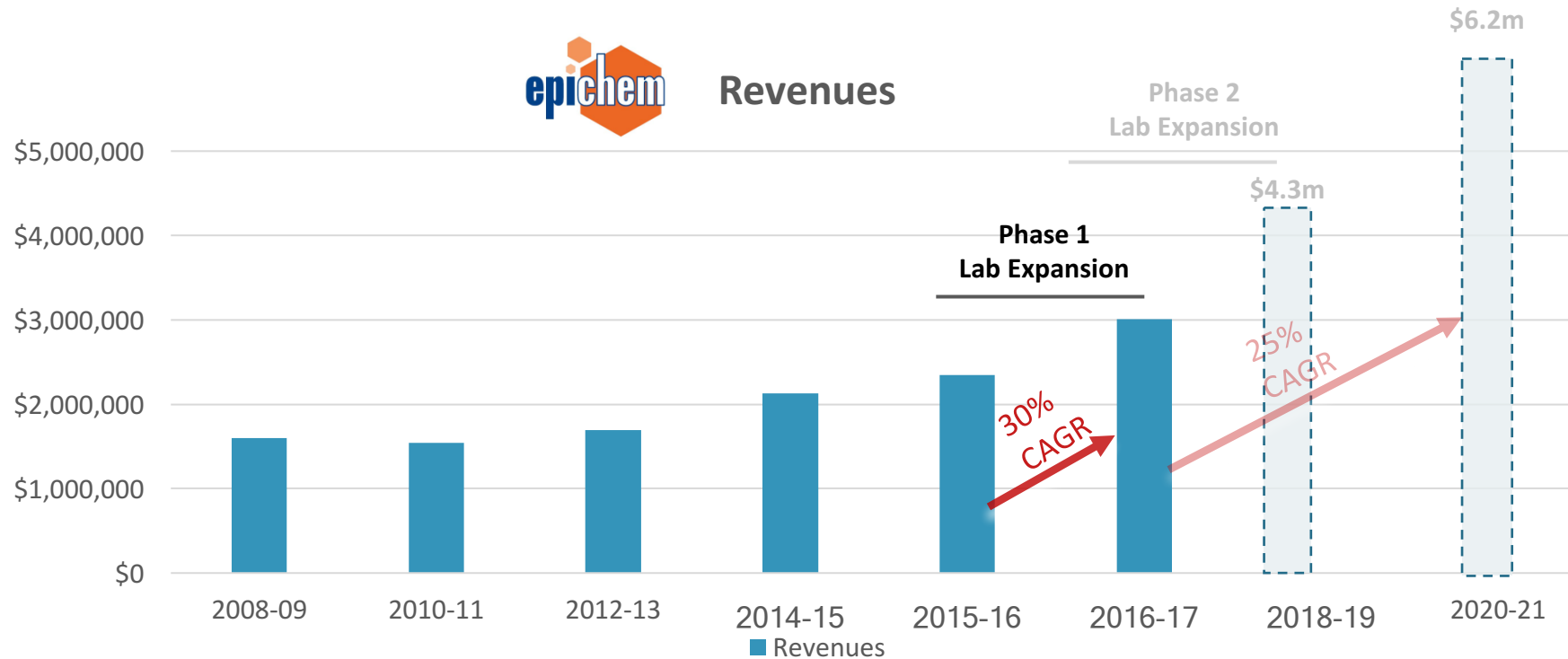
### Fine Chemicals Catalogue

- High margin supply of reference standards
- ISO 9001:2015 Certification

### Proprietary Drug Discovery Platform

- Engine to replenish development pipeline

# Epichem Revenues



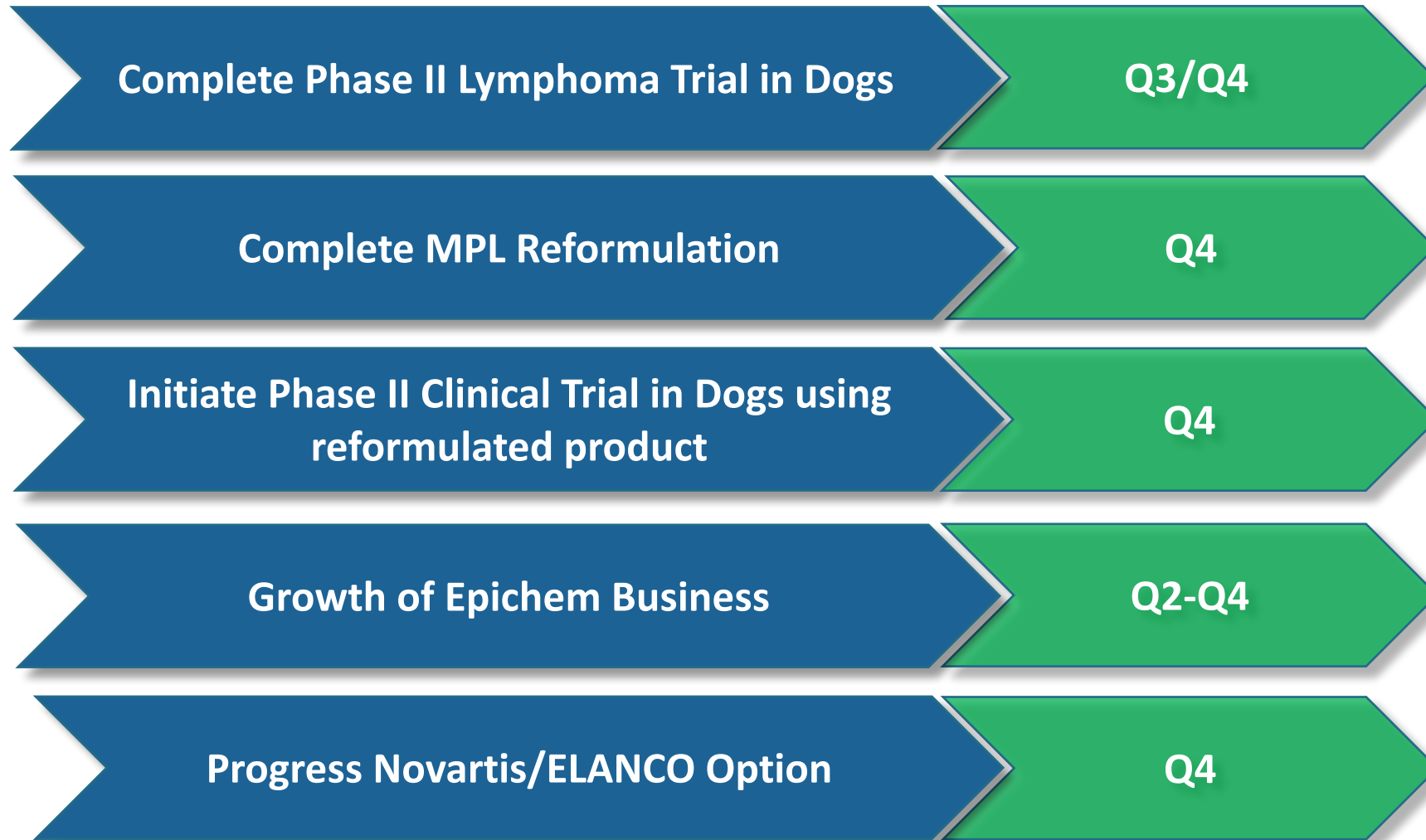
**Record \$3.05m revenues** achieved in 2017 FY

# Key Drivers for Epichem Growth

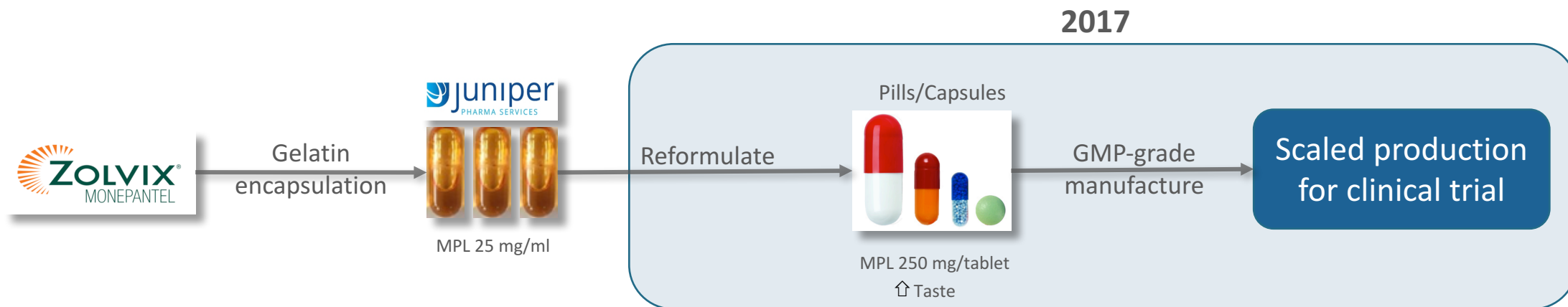
- Planned **Phase 2 Lab Expansion** increases capacity to meet demand
- Pursuing **ISO17025/34** accreditation – highest ‘calibration and testing’ stds.
- Facilitates expansion of **high margin catalogue** business
- **Lower** Australian Dollar maintains **global competitiveness**
- **Epichem**: profitable business, forecast sales of \$4m in 2018 (>25% CAGR)

# Next Steps and Roadmap

# Key Drivers for 2017



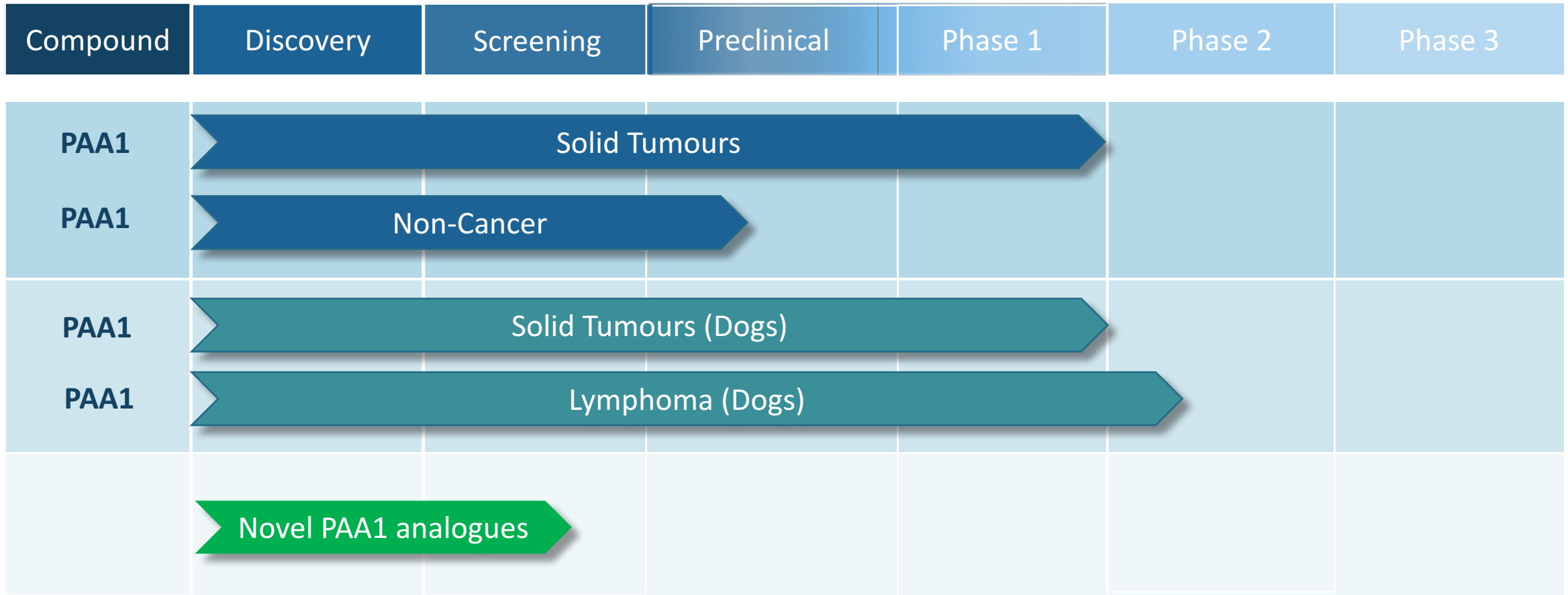
# Reformulation to resolve MPL palatability



## Reformulation achieves 3 strategic outcomes:

- Overcome foul taste of Zolvix which has resulted in significant compliance issues.
- Increase dose of MPL/capsule up to 10-fold (ie. 250 mg/capsule)
- Establish optimal formulation/manufacture protocols for all clinical development phases. Required to maximise commercial value.

# PharmAust's Therapeutic Pipeline



# Pet market value comparators (2017)

**Nexvet:** Acquired by Zoetis (Pfizer) for US\$85m  
@66% premium to closing share price



**Oasmia Pharma:** Spun out 2 Vet assets to wholly-owned subsidiary valued at US\$75-80m



Assets include Doxphos (reformulated doxorubicin) and Paccal Vet (reformulated Paclitaxel) for companion animals

**Aratana Therapeutics :** Licensed Galliprant to Elanco for US\$45m upfront/\$83m milestones



Galliprant: Registered for pain in companion animals



# Australian Peer Companies

Company	Description	Market Cap (\$Aus) <sup>1</sup>
Antara Lifesciences (ASX: ANR)	Animal/Human Health Antimicrobial (Detach) Revenues 2017 FY \$1m, EBITDA -3.4m	\$47m
National Vet Care (ASX: NVL)	Consolidated Vet Practices	\$127m
Apiam Animal Health (ASX:AHX)	Consolidated Vet Practices	\$63m
Mayne Pharma (MYX:PTX)	Reformulated/repositioned approved drugs	\$1,002m
Prescient Therapeutics (ASX:PTX)	Phase 1/II novel targeted therapeutic for human cancers	\$11m

1: 21<sup>st</sup> August 2017

# Global Peer Animal Health Companies

Company	Description	Market Cap (\$US) <sup>1</sup>
<b>Zoetis</b> (NASDAQ)	Worlds largest diversified animal health company	\$29b
<b>AB-Science</b> (Euronext)	Masitinib for human (Ph3) and pet cancers (Registered). Validates PAA model of developing one drug for multiple markets in human and animal health.	\$483m
<b>Kindred Bio</b> (NASDAQ)	Repurposed biologics/small molecules for animal health	\$196m
<b>Antara Therapeutics</b> (NASDAQ)	Diversified animal health	\$274m
<b>Oasmia Pharmaceuticals</b> (NASDAQ)	Diversified/ Repurposed human and animal health	\$40m
<b>VetDC</b>	Companion animal cancers	Private

1: 21<sup>st</sup> August 2017

# PharmAust's Value Proposition

- \$10m Market Cap = Enterprise Value (revenue + cash + phase II ready asset)
- Developing a **single product** for **multiple markets** in **human & animal health**.
- **Validated model:** Lower costs/development risks, accelerates path to **multiple** value accretion **catalysts**
- Novartis Animal Health/**ELANCO Option** - strategic access to vet health market with global heavyweight.
- **Granted** patents for **cancer** and **non-cancer** – creates license opportunities in multiple markets
- **Epichem:** profitable business, forecast sales of \$4m in 2018 (>25% CAGR)



Epichem



Pitney Pharmaceuticals

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