PITT STREET RESEARCH

Percheron Therapeutics Ltd

Immuno-oncology workhorse

Share Price: A$0.009

ASX: PER/OTC:PERCF

Sector: Biotechnology

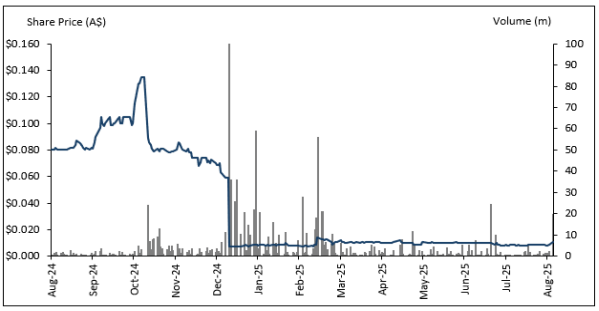
19 August 2025

Percheron Therapeutics (ASX:PER) is an Australian drug developer whose lead compound is HMBD-002, a potential immuno-oncology drug. HMBD-002 is a monoclonal antibody that targets an immune checkpoint called VISTA. The drug has shown promise in a recently completed a Phase 1 study in multiple tumour types, in terms of both its safety and potential efficacy. Percheron in-licensed the drug in June 2025 to replace a previous lead compound that failed clinical development.

Market cap. (A$ m)	9.8
# shares outstanding (m)	1,087.4
# shares fully diluted (m)	1,226.9
Market cap ful. dil. (A$ m)	11.0
Free float	100%
52-week high/low (A$)	0.135 / 0.007
Avg. 12M daily volume ('1000)	5.43
Website	https://percherontx.com

Source: Company, Pitt Street Research

Share price (A$) and avg. daily volume (k, r.h.s.)



Source: Refinitiv Eikon, Pitt Street Research

A promising asset

HMBD-002 represents a major pivot into the field of immuno-oncology. In the last decade, this new field has emerged as one of the most promising types of cancer therapy and has been headlined by the development and commercialisation of drugs including Keytruda, which have created a US$40bn market. Immuno-oncology therapies enhance the immunological response to cancer by targeting the interaction between tumours and the immune system. HMBD-002 has shown promise in a recently completed Phase 1 study in multiple tumour types, in terms of both its safety and potential efficacy.

The secret sauce

HMBD-002's secret is that plays an important part inhibiting VISTA, a pathway that plays a key role in suppressing T-cell responses to therapies like Keytruda. Pre-clinical studies have suggested that drugging VISTA, which HMBD-002 does, has a powerful anti-cancer immune response in a wide range of tumours. Percheron will work towards a Phase 2 study once it has completed gathering data from Phase 1 and the results are published. The results will inform the company as to which specific indication it should target.

Peers and market opportunity suggest substantial upside to 6.4c per share

We think there is significant upside for Percheron Therapeutics since it is only at cash backing. We observe that its peers trade at an average market cap of $78.8m – which would be 6.4c per diluted Percheron share. We have also modelled various NPV scenarios for HMBD-002's ultimate commercialisation and these likewise suggest significant upside. We think a re-rating is plausible in the next 12 months subject to the company commencing Phase 2. Please see page 18 for the key risks.

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Introducing Percheron Therapeutics

Percheron Therapeutics' flagship drug is HMBD-002, a monoclonal antibody targeting an immune checkpoint called VISTA.

Percheron Therapeutics' flagship drug is HMBD-002, a monoclonal antibody targeting an immune checkpoint called VISTA. Until late 2023, Percheron was known as Antisense Therapeutics but changed its name after coming under new management. Back then, the company was still focused on Avicursen (ATL-1102), an antisense drug for the treatment of Duchenne Muscular Dystrophy. The failure of its Phase 2b trial in late 2024 meant the company had to look for a new candidate drug – which it was able to do with $12m in cash at that time. Percheron now has that candidate in the form of HMBD-002, a cancer immunotherapy drug which it has in-licensed on very favourable terms with just US$3m payment up front and with further milestone payments only kicking in once HMBD-002 is a clinical and commercial success (as we will outline in this report). HMBD-002 has passed Phase 1 and PER plans to enter Phase 2 in CY26.

Key reasons to look at Percheron

1. **Percheron is now a player in immuno-oncology**, with HMBD-002 targeting an immune checkpoint called VISTA. There is now potential for Percheron to move into a multi-billion dollar drug class that has featured success stories such as Merck & Co.'s Keytruda, which sold a massive US$29.5 globally in 2025.
2. **Percheron's HMBD-002 drug has completed a Phase 1 study**, showing the drug to be safe and well tolerated and also providing an early hint of efficacy in various difficult to treat cancers.
3. **HMBD-002's target is promising.** HMBD targets VISTA, an immune checkpoint which plays an important part in suppressing T-cell responses. It is known as a poor prognostic indicator in multiple cancers, and pre-clinical studies have suggested that drugging VISTA has a powerful anti-cancer immune response. Importantly, there is evidence that VISTA upregulation predicts treatment failure with Keytruda.
4. **HMBD-002 will be in Phase 2 by 2026**. The company is currently gathering the data related to Phase 1 and will use this to decide on the appropriate clinical pathway into Phase 2. There is potential for the product to be focused on triple-negative breast cancer where current five-year survival figures are low.
5. **The terms of HMBD-002's in-licensing were very favourable.** Percheron paid only US$3m to the Singapore-based Hummingbird Bioscience for the global rights to the drug. While the total 'biobucks' involved in the transaction was US$287m, plus royalties on net sales, however these won't kick in until HMBD-002 is a clinical and commercial success.
6. **Percheron benefits from ongoing investor and pharma interest in immuno-oncology**, with many sophisticated players now looking for the next immune checkpoint target of interest after PD-1/PD-1 and CTLA-4. For investors interested in VISTA as a potential target, Percheron now has the best-developed product.
7. **There is potential for HMBD-002 to gain Orphan Drug Designation**, with a number of the indications evaluated in Phase 1 representing patient populations small enough to qualify. If approved, benefits would include periods of market exclusivity[1] for each indication, tax credits, waivers or reductions on fees for future regulatory submissions, among others.

[1] Meaning no other drugs could be approved for the same indication

8. **Percheron has the leadership team qualified and capable of developing the drug**. CEO Dr James Garner has spent many years in drug development for established as well as emerging pharma companies. Backing Dr Garner is a board chaired by former CSL executive Dr Charmaine Gittleson that has all of the skills required to foster an early-stage drug developer.
9. **Percheron has significant upside potential as its share price is currently attributing no value to HMBD-002**. This stock has dropped to cash backing. In other words, its market capitalisation only reflects the company's ($9m) cash balance that will be used to fund the next stage of HMBD-002's clinical development. There is no value whatsoever ascribed to HMBD-002. It is true that HMBD-002 has some way to commercialisation, but neither does it reflect the potential it has shown. In one sense this may reflect continued disappointment over the discontinuation of the legacy program and uncertainty as to the future direction, but we think investors are not appreciating the new opportunity the company has in HMBD-002.

   Percheron's closest peers (i.e. fellow Phase 2 or pre-Phase 2 oncology stocks on the ASX) trade at an average market capitalisation of $78.8m which would represent a share price of $0.064 per diluted share. At the higher end, Phase 3 oncology biotech Immutep trades at over $350m. Moreover, we have modelled multiple NPV scenarios and these all derive valuations in the hundreds of millions of dollars which would represent enormous upside for investors today, but still represent a bargain for potential M&A suitors.

The immuno-oncology field and where now Percheron fits in

Immuno-oncology is the emerging field of cancer treatment where the patient's own immune system is harnessed to attack the cancer.

Immuno-oncology is the emerging field of cancer treatment where the patient's own immune system is harnessed to attack the cancer. Percheron Therapeutics hopes to play in this emerging space with HMBD-002. We think it is essential for to understand that HMBD-002 is a checkpoint inhibitor and a monoclonal antibody and so we will delve into them.

The potential of checkpoint inhibitors

One of the most popular immuno-oncology approaches is drugging immune 'checkpoints' whose function is to turn down an immune response. There are other approaches including CAR-T therapy[2] and cytokine therapies, but the checkpoint inhibitor category is where HMBD-002 is, and this category has produced more drugs on the market than others.

Checkpoint inhibitor drugs have been on the market since 2011 and have been remarkable for their success in treating cancer in terms of survival rates and for their commercial success. These have included:

- **Ipilimumab (Yervoy)** which was the first such drug approved in 2011 for melanoma and works as a CTLA-4 inhibitor.
- **Pembrolizumab (Keytruda)** came to market 3 years later, also for melanoma initially but has since received over 3 dozen further approvals for cancers including liver, colorectal and triple negative breast cancer[3]. Keytruda targets the PD-1 protein on the surface of immune T cells, and it has been the best of all – reaching US$29.5bn in sales within a decade[4].
- **Nivolumab (Opdivo)** another PD-1 inhibitor was also approved in 2014 and has likewise received multiple dozen approvals, although some are in combination with Yervoy. It is Bristol Myers Squibb's second best-selling product after blood clot medication Eliquis.

Yervoy, Keytruda and Opdivo came to market in the early 2010s. A further 7 came onto market afterwards, but the first 3 remain the largest.

While no drugs since then have seen the success of those 3 – as none have yet surpassed US$5bn in annual sales - there have been 7 in total. Only one of these has targeted a checkpoint pathway other than PD1 – Relatimab (combined with nivolumab) which was approved in 2022 for Melanoma and targets LAG-3. The remaining 6 are Atezolizumab (Tecentriq), Avelumab (Bavencio), Durvalumab (Imfinzi), Cemiplimab-rwlc (Libtayo), Dostarlimab-gxly (Jemperli) and Penpulimab-kcqx (AK105). The latter of these was the most recent, approved in 2025 (Figure 1). Beyond these, other kinds of immuno-oncology drugs have been released which are beyond the scope of our focus on checkpoint inhibitors. But the 10 drugs generated cumulative revenue of over $75bn.

If you need any more evidence of extent to which checkpoint inhibitors have been a medical revolution, look at the fact that the discoverers of inhibitors - Drs. James Allison and Tasuku Honjo - won the 2018 Nobel Prize in Medicine[5].

[2] Investors interested in finding out more about CAR-T should read our reports on Prescient Therapeutics, the most recent of which was published on 9 July 2025.
[3] Muley, A. 2024, "Keytruda Received 40th FDA Approval", Cancer Research Institute, https://www.cancerresearch.org/blog/keytruda-receives-40th-fda-approval
[4] Merck's revenues from Keytruda in CY24
[5] https://www.nobelprize.org/prizes/medicine/2018/press-release/

Figure 1: Timeline of checkpoint drugs approval

Drug Name	Target	Company	FDA Approval	Annual sales	Indications
Yervoy	CTLA-4	Bristol Myers Squibb	2011	$25.3bn	Several
Keytruda	PD-1	Merck/Pfizer	2014	$29.5bn	Several
Opdivo	PD-1	Bristol Myers Squibb	2014	$9.3bn	Several
Atezolizumab	PD-L1	Genentech/Roche	2016	$4.1bn	NSCLC, TNBC, bladder, liber
Avelumab	PD-L1	Merck/Pfizer	2017	$795m	Merkel cell, bladder, renal
Durvalumab	PD-L1	AstraZeneca	2017	$4.7bn	NSCLC, SCLC, biliary tract, bladder
Cemiplimab	PD-1	Regeneron/Sanofi	2018	N/A	CSCC, NSCLC, BCC, cervical
Dostarlimab	PD-1	GSK	2021	$598m	Endometrial (dMMR), tumor-agnostic
Relatlimab	LAG-3	Bristol Myers Squibb	2022	$928m	Melanoma
Penpulimab	PD-1	Akeso Bio	2025	N/A	Nasopharyngeal carcinoma

Source: Pitt Street Research, Companies' annual reports

Note: In all cases, these figures are 2024 annual sales and in US dollars.

Great views - the VISTA checkpoint

Most drug developments efforts in the checkpoint area have been focused on PD-1, but HMBD-002 focuses on VISTA.

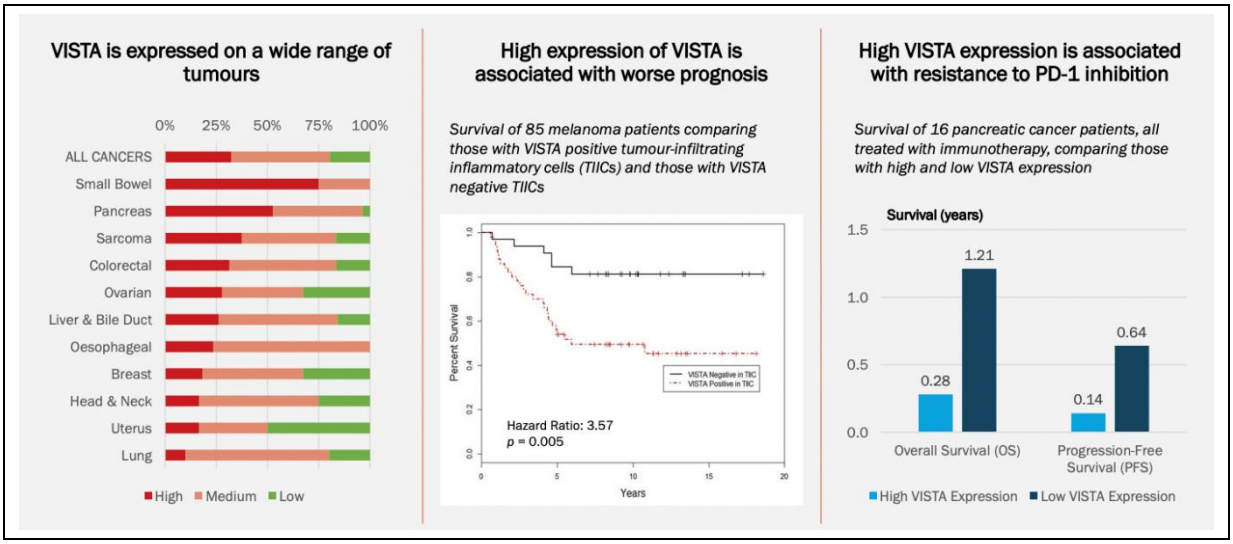
HMBD-002's target, VISTA, is an important emerging checkpoint. As was just observed, most drug developments efforts in the checkpoint area have been focused on a checkpoint called PD-1 or its ligand, PD-L1, since PD-1 had been what made Keytruda a success. There are, however, multiple checkpoints of interest to immunobiology, and one of them is VISTA. Short for 'V-domain Ig suppressor of T cell activation', VISTA sits on various immune system cells and plays an important part in suppressing T-cell responses.

Pre-clinical studies have suggested that drugging VISTA has a powerful anti-cancer immune response in a wide range of tumours (Figure 2 and Figure 3). Importantly, there is evidence that VISTA upregulation predicts treatment failure with Keytruda (and other PD-1 inhibitor drugs generally), so Percheron's new drug could be important in the cancers where that blockbuster is approved.

VISTA was previously considered 'undruggable' because of its extensive expression on myeloid cells, leading to safety issues like cytokine release syndrome (CRS) and/or a pharmacokinetic sink[6]. Even drugs that have shown potential to fight tumours have not been able to be clinically developed because of the side effects. But HMBD-002 – and the only other VISTA drug to have passed Phase 1, in Sensei's SNS-101 – have been able to overcome these problems.

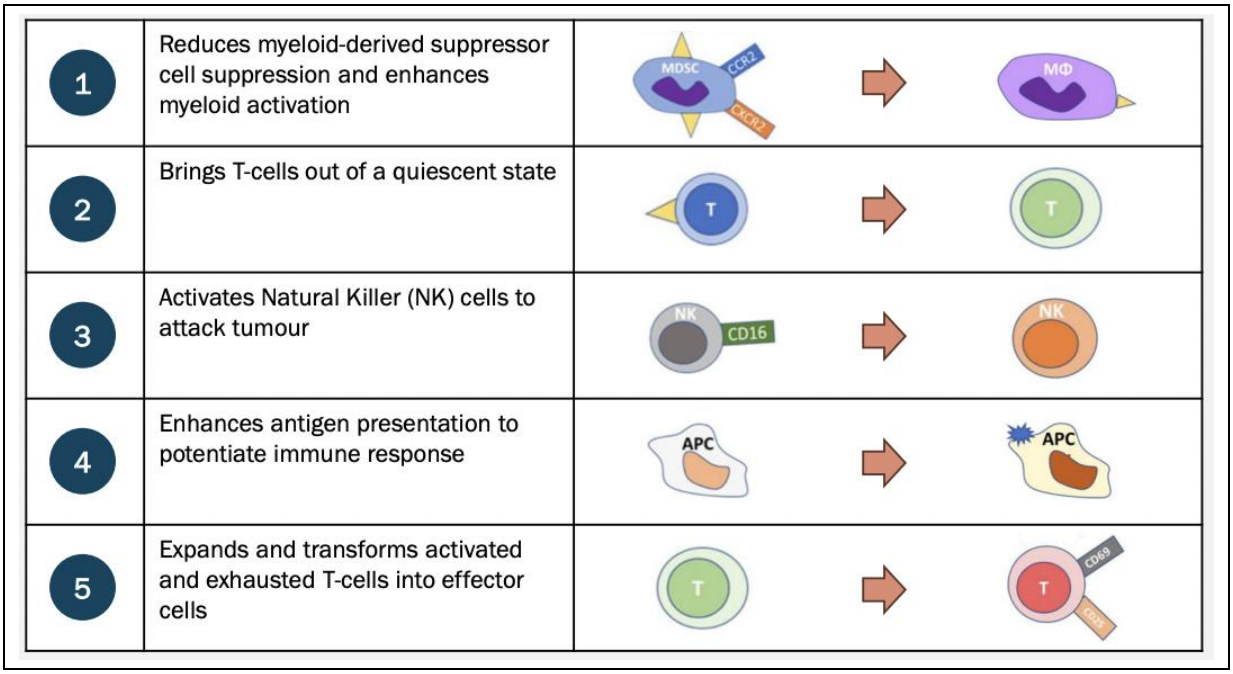
[6] https://www.biospace.com/sensei-biotherapeutics-announces-nature-communications-publication-describing-mechanism-of-action-of-sns-101-selectively-targeting-the-active-form-of-vista-within-the-tumor-microenvironment

Figure 2: The power of VISTA



Source: Company[7]

Figure 3: How VISTA works



Source: Company

[7] D Nishizaki et. al. (2024) ESMO Open 9(4):102942 (panels 1 & 3); LF Kuklinski et al. (2018) Cancer Immunol, Immunother, 67:1113-1121 (panel 2).

Monoclonal antibodies

HMBD-002 is a monoclonal antibody – another drug class that has mainstreamed in the last 25 years.

HMBD-002 is also a monoclonal antibody, that is, a drug derived from the immunoglobulin-based antibodies in the human immune system but uniformly specific for a particular molecular target. In other words, they are drugs that mimic the immune system's ability to fight off bacteria, viruses or other harmful pathogens; and crucially are designed to target a specific antigen. The term monoclonal derives from how they are produced from a single-clone of a B-Cell, meaning all antibodies are identical and bind to the same target.

Monoclonal antibodies have mainstreamed into a significant drug class over the last 25 years. There are now over 120 on the market globally, many selling in the billions targeting many indications. Keytruda and Opdivo are two such examples relevant for cancer, whilst the list of drugs targeting others is headlined by COVID-19 treatment REGEN-CV[8]. Importantly, antibodies are easy to develop against specific targets of interest, minimise (if not eliminate) collateral damage to healthy cells which happens with chemotherapy, and are easy to manufacture at low cost. These are normally administered via IV (intravenous) injection and can be very expensive for patients. But if HMBD-002 can provide a better chance of results, patients will 'pay up' for the drug.

HMBD-002

HMBD-002 was picked up in June 2025, not long after it completed a Phase 1 study.

As we have established, HMBD-002 was picked up in June 2025, not long after it completed a Phase 1 study. HMBD-002 is a monoclonal antibody that is a suppressor of VISTA, an immune checkpoint. The belief of the scientists behind the drug was that VISTA represented a promising therapeutic target due to its role in suppressing pro-inflammatory, anti-tumour responses in the body. Hummingbird, the developer of the drug, was founded in 2015 to develop antibody cancer therapeutics.

Within 6 years, Hummingbird had raised US$150m in Venture Capital Funding and HMBD-002 had been granted Investigational New Drug (IND) Status in 2021 following earlier pre-clinical work[9]. This pre-clinical work depicted that treatment of cancers with HMBD-002 could counteract immune suppression, due to decreased infiltration of immune-suppressing myeloid cells into the local tumour environment and increased activity of T-cells[10].

The subsequent Phase 1 study was the first in human study for the drug and its encouraging results offered confidence that a Phase 2 study is the logical next step. When Percheron picked HMBD-002 up in June 2025, it was only after pursuing more than a hundred individual drug candidates from more than seventy companies[11].

The promise of HMBD-002 lies not just in its clinical results, but also the fact that it can work at picomolar concentrations, has IP protection to at least 2038, and can be reliably manufactured at 500L scale with high yield and recovery, as well as with viable COGs.

Why is Hummingbird offloading HMBD-002 if there is opportunity? We would speculate that licensing drugs post-early-stage clinical development is

[8]

[9] https://hummingbirdbioscience.com/hummingbird-bioscience-announces-us-fda-clearance-of-ind-for-first-in-human-phase-1-trial-of-hmbd-002-in-patients-with-advanced-solid-tumors/

[10] See Ingram, P/ et. al 2017 HMBD002, a novel neutralizing antibody targeting a specific epitope on the co-inhibitory immune checkpoint receptor VISTA, displays potent anti-tumor effects in pre-clinical models, Proceedings of the American Association for Cancer Research Annual Meeting 2017, Doi:10.1158/1538-7445.M2017-587.

[11] https://www.nasdaq.com/press-release/hummingbird-bioscience-licenses-hmbd-002-phase-ii-ready-anti-vista-monoclonal

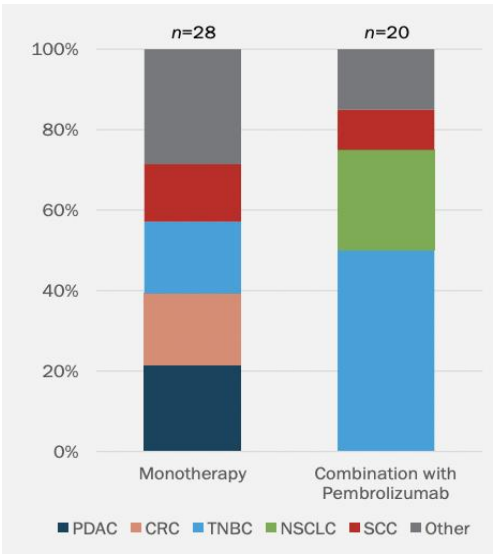
the business of Hummingbird as it licensed its other original therapy HMBD-001 (which targets the HER-3 protein) to Endeavour BioMedicines. But having licensing deals enables it to keep the potential upside.

Phase 1 study

The Phase 1 study evauated 48 patients with various advanced tumours

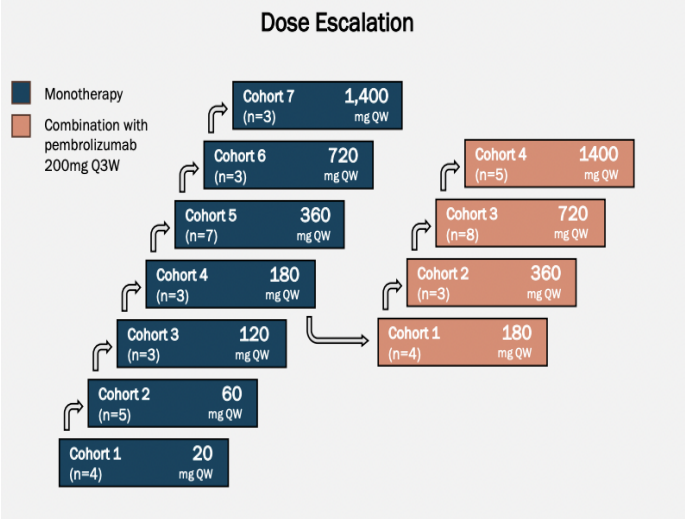
The Phase 1 study of HMBD-002 evaluated 48 patients in 6 locations across the USA. These patients had various tumours including triple negative breast cancer but in all instances were advanced (i.e. locally advanced and unresectable or metastatic)[12]. The patients evaluated received various dosages (ranging from 1,400mg to 20 mg) but most had advanced tumours, had been heavily pre-treated, and many had failed previous rounds of immunotherapy drugs. 28 patients just received HMBD-002 and 20 received HMBD-002 plus Keytruda (Figure 4 and Figure 5).

Figure 4: Patients in the Phase 1 trial



Source: Company

Figure 5: Dosages in the Phase 1 trial



Source: Company

Preliminary Phase 1 results show excellent safety, and some patients showed [an] 'encouraging duration of response'.

The full data set from this study isn't yet available, but what we know is that the safety profile of the drug is excellent, with no dose limiting toxicities reached and only a modest level of treatment-related adverse events. Part of HMBD-2's success as a drug in terms of its safety is because its immunoglobulin class is IgG4 which can modulate immune responses but not kill the cells that it binds to.

This study was measuring safety and optimal dosing for later studies rather than efficacy – any efficacy measures were secondary outcomes rather than primary[13]. Percheron has, however, noted that 'several patients showed encouraging duration of response'.

[12] https://www.clinicaltrials.gov/study/NCT05082610

[13] The 3 primary outcomes were Dose Limiting Toxicity, Dose-Finding and Frequency & Severity of Adverse Events. The secondary outcomes included the Pharmacokenetics of HMBD-002, Objective Response Rate, Duration of Response, Progression Free Survival and Overall Survival.

Percheron's plans with HMBD-002

Percheron anticipates a Phase 2 study in 2026 and will formalise its specific plan once final results are available in Q4 of 2025.

Percheron is now working on bringing the data from Phase 1 together and getting it published, if possible, in a prestigious peer-reviewed journal. Then comes the choice of development pathway - to run a Phase 2 as a monotherapy or a combination, which kind of patients to recruit, and what other drugs, if any, to use in the combination. The company hopes to be able to initiate this study in 2026, having finalised plans in Q4 of this year, following the final data from the completed Phase 1 study.

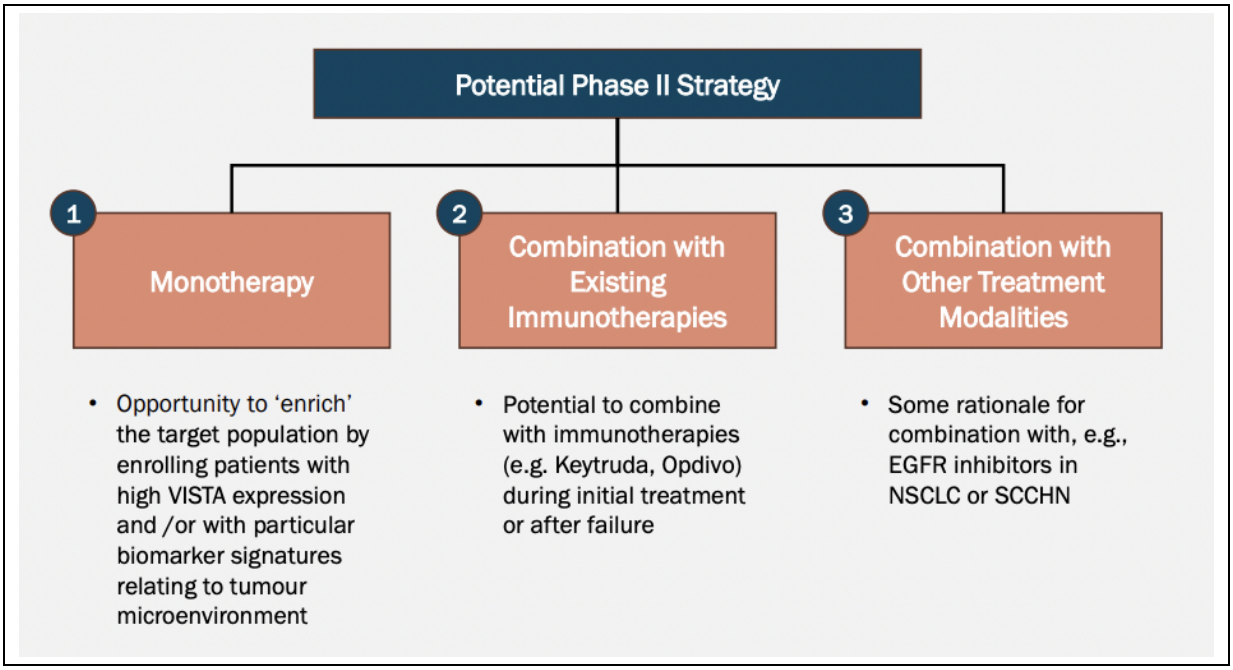
Possibilities for Phase 2

The strategy with Phase 2 is yet to be determined and will be informed by the final Phase 1 results.

It remains to be seen if the proposed Phase 2 will indicate multiple cancer types or just one. It is also yet to be determined if HMBD-002 will be used alone or in combination with existing therapies or other treatment modalities. It may ultimately be the case that there could be multiple smaller Phase 2 trials rather than 1 larger one (Figure 6).

All of this will be determined once the final set of Phase 1 results become available, in consultation with the company's clinicians and advisors, based on what would be most promising.

Figure 6: Phase 2 options for Percheron



Source: Company

Potential indications

Triple-negative breast cancer (TNBC) and Aquamous cell cancer of the head and neck (SCCHN) would be two possibilities.

If Percheron's trial targets a single type of cancer, we suspect **Triple-negative breast cancer (TNBC)** and **Squamous Cell Cancer of the Head and Neck (SCCHN)** would be two possibilities, given the specific efficacy evidence of HMBD-002's efficacy against these types from Hummingbird's clinical work.

In respect of TNBC, it is so-called because of the absence of three common receptors that mean it does not respond to conventional therapies[14]. TNBC accounts for 10-15% of all breast cancer cases, representing 30,000 new diagnoses annually. 25-30% of TNBC tumours express VISTA, signifying potential for HMBD-002 to work against TNBC because it is a VISTA suppressor. In August 2025, the results of pre-clinical studies conducted by Professor Josh Gruber at the University of Texas Southwestern Medical Center (UTSW) were released and showed that the drug effectively blocked tumour growth in a mouse model and the results showed a statistically significant reduction in tumour size in VISTA-expressing models[15].

That research made other important findings including identifying a specific amino acid signature that could provide a patient selection biomarker, and that the activity of HMBD-002 may also derive from the modulation of growth signals such as EGFR – something which may provide a crucial differentiation to Keytruda and other therapies that only act via the immune system.

Turning to SCCHN, research from Stanford University, publicly released to investors just two weeks prior to the aforementioned TNBC data, has solidified its potential too[16]. SCCHN alludes to a group of cancers affecting the mouth, throat, larynx and neck – specifically developing in the squamous cells lining them- representing 4% of all cancers in the USA, or. Approximately 70,000 patients per annum. The key component of treatment for SSCHN is various forms of radiotherapy, but VISTA acts as an important resistance mechanism, supressing the activity of the immune system in the irradiated tumour. Inhibition of VISTA, was shown to substantially improve the activity of radiotherapy in mouse models of SCCHN, doing so by shifting the immune system to 'pro inflammatory (M1)' state, where it is better able to attack irradiated cancer cells. This contrasts with prior research that shows inhibiting PD-1 only when combined with radiotherapy has been disappointing, suggesting that inhibiting VISTA could be more effective.

The biotech patent cliff

The late 2020s will see several blockbuster drugs come 'off patent', one being Keytruda. In this context, there are strong levels of M&A with drugs that could give Big Pharma 'soft landings'.

We think there could be M&A interest in HMBD-002 given the forthcoming patent cliff. The late 2020s will be a time of several major drugs coming off patent including Ketruda. EY has estimated that the world's top 20 biotechs could lose US$180bn[17] due to patents for their drugs expiring and other companies being able to produce and sell generic versions of the drug, typically at a lower price[18].

Investors should look at AbbVie's Humira as a case in point. When its 20-year exclusivity period ended in 2023, nine biosimilars entered in the months following and sales dwindled by 35% in the 12 months thereafter[19]. This was

[14] Specifically Estrogen receptor, progesterone receptor (PR) and HER2 (human epidermal growth factor receptor 2).
[15] ASX announcement 6 August 2025.
[16] ASX announcement 23 July 2025
[17] This figure was derived from the cumulative sales of drugs coming off-patent owned by the World's Top 20 Biotechs just in 2027 and 2028, including (but not limited to) Keytruda
[18] https://www.stifel.com/newsletters/investmentbanking/bal/marketing/healthcare/biopharma_timopler/2025/BiopharmaMarketUpdate_071425.pdf
[19] https://www.labiotech.eu/in-depth/abbvie-beyond-humira/

only a few years after it had been the highest selling biotech drug in the world[20].

For this reason, big pharma is on the lookout for drugs. In July 2025, Merck spent US$10bn to buy London-based Verona Pharma, which has Ohtuvayre, drug for COPD[21]. Only a few months prior, in January 2025, Johnson and Johnson spent almost US$15bn to buy neuroscience specialist Intra-Cellular Therapies which has the first and only US FDA-approved treatment for bipolar, among other treatments[22]. This was inevitably done to minimise the impact of the patent cliff it has with Crohn's treatment Stelara.

An M&A deal for Percheron would not be beyond the realm of possibility.

Now, we're not suggesting Percheron will be bought out for tens of billions of dollars anytime soon – the cases of Verona and Intra-Cellular Therapies are the two extremes. Nonetheless, a few years down the track, an M&A deal would not be beyond the realm of possibility, especially if the asset could be bought at a 'bargain', relative to the sales that could be generated, or if such a treatment could even 'extend' a drug's patent life (i.e. if hypothetically Keytruda could gain longer exclusivity when combined with HMBD-002).

And while tens of billions of dollars is arguably unattainable for all but the most advanced assets, deals in the tens or hundreds of millions of dollars would not be completely out of the question, particularly with immuno-oncology assets and those that target unique signalling pathways (i.e. any other than PD-1), at least if recent precedent is any guide (Figure 7).

Figure 7: M&A deals in the immuno-oncology space

Date	Asset	Licensor	Licensee	Target	Stage	Deal Terms
Early-Mid Clinical						
Oct 2018	COM701	COMPUGEN	Bristol Myers Squibb	PVRIG	Phase I / II	$20M upfront; $200M milestones; royalties
Jun 2021	EOS-448	iTEOS THERAPEUTICS	GSK	TIGIT	Phase I / II	$625M upfront; $1.45B milestones; royalties
Dec 2022	XTX-101	Xilio THERAPEUTICS	GILEAD	CTLA-4	Phase I / II	$30M upfront; $604M milestones; royalties
Jan 2023	ICB-01	ImCheck	maruho medical	BTN3A	Phase I / II	*Japan rights only* €15M upfront; milestones; royalties
Late Clinical						
Jan 2021	Tislelizumab	BeiGene	NOVARTIS	PD-1	Phase III	*Ex-China rights only* $650M upfront; $1.55B milestones; royalties
Dec 2021	Ociperlimab	BeiGene	NOVARTIS	TIGIT	Phase III	$300M upfront; $700M milestones; royalties
Jul 2022	Cemiplimab	REGENERON	sanofi	PD-1	Phase III	$900M upfront; $1.5B milestones; profit split

Source: Company

Crucial to HMBD-002 being attractive to would-be suitors, will be maintaining its status as the most advanced VISTA antibody in clinical development, and perhaps the only active member of the IgG4 class rather than IgG1. IgG1 antibodies can be effective but have high toxicity – for instance causing cytokine release syndrome. As an IgG4 antibody, HMBD-002 blocks VISTA signalling, but does not necessarily destroy VISTA-positive cells, thus making it less toxic in clinical use. Of HMBD-002's 4 closest peers, 2 have been discontinued, 1 is still in Phase 1 and the other is inactive post-Phase I (Figure 8).

[20] Moorkens, E. et al. 2021 The Expiry of Humira Market Exclusivity and the Entry of Adalimumab Biosimilars in Europe: An Overview of Pricing and National Policy Measure,
[21] https://www.merck.com/news/merck-to-acquire-verona-pharma-expanding-its-portfolio-to-include-ohtuvayre-ensifentrine-a-first-in-class-copd-maintenance-treatment-for-adults-and-expected-to-drive-growth-into-the-next-dec/
[22] https://www.jnj.com/media-center/press-releases/johnson-johnson-closes-landmark-intra-cellular-therapies-acquisition-to-solidify-neuroscience-leadership

Figure 8: Where HMBD-002 sits relative to competitors

Program	HMBD-002	CI-8993	JNJ-61610588	SNS-101	W0180
Company	Hummingbird Bioscience / percheron THERAPEUTICS	CURIS / ImmuNext	janssen	sensei BIO	Pierre Fabre
Isotype	IgG4	IgG1	IgG1	IgG1	IgG1
Stage	Phase I Complete	Phase I Complete	Phase I Terminated	Phase I Ongoing	Phase I Terminated
Exposure to Date	48 patients	26 patients	12 patients	-	33 patients
Combination Data Available	Monotherapy & Combination with Pembrolizumab	Monotherapy	Monotherapy	Monotherapy & Combination with Cemiplimab	Monotherapy & Combination with Pembrolizumab
Status	**Ongoing**	Inactive	Discontinued	**Ongoing**	Discontinued
Notes				pH-sensitive antibody	

Source: Company

The potential upside for investors

Percheron is trading below cash backing, but its closest comparable peers trade at an average of $78.8m. This would equate to $0.064 per share.

This stock has dropped to cash backing, which is the $9m that Percheron will use to fund the next stage of HMBD-002's clinical development. The market is not ascribing any value whatsoever to this asset. It is true that HMBD-002 is at least a couple of human clinical trials away from development and shouldn't be valued at multiple billions of dollars right now. But Percheron trades at a discount relative to oncology companies at similar stages of development.

Peer-weighted analysis

There is a diversity of market capitalisations amongst ASX oncology stocks, but for companies in (or about to be in) the first trials beyond safety trials and the first measuring efficacy, the average market capitalisation is $78.8m (Figure 9).

Figure 9: List of ASX oncology developers

Company	Code	Market Cap	Stage	Indication
Partys	PAB	$2.1m	Pre-clinical	Various
Invion	IVX	$7.4m	Phase 1/2	Skin
Chimeric	CHM	$13.1m	Phase 1/2	Various
Cynata	CYP	$39.4m	Phase 2/3	Osteoarthritis & GvH disease
Prescient	PTX	$47.3m	Phase 2	Lymphoma
Radiopharm	RAD	$70.1m	Phase 1	Various (immune checkpoint)
Imugene	IMU	$76.5m	Phase 2/3 (2026)	Blood cancers (CAR-T therapy)
Amplia	ATX	$90m	Phase 1b/2a	Pancreatic (FAK inhibor)
Arovella	ALA	$110.1m	Phase 1	Lymphoma & others (cell therapy)
Race Oncology	RAC	$202.4m	Phase 1/2	Leukemia
Immutep	IMM	$381.7m	Phase 3	Lung and others
Clarity	CU6	$1.2bn	Phase 3	Prostate cancer

Source: Pitt Street Research

Note: Market cap as of 13 August 2025. Data excludes companies developing cancer 'tests' like Rhythm Biosciences and commercial-stage companies like Telix, even if they have other assets in the clinic.

Applying this to Percheron would derive a share price of $0.064 per share under the current number of diluted shares on issue. Of course, this too should be taken with caution because there is a diversity of capitalisations even amongst the group, we think Percheron fits in to. At the same time, these are companies trading above cash backing which Percheron isn't – which is to say investors are recognising some value in them beyond their 'cash at bank' but none for Percheron. It may be arguable that investors want more clarity on Percheron's Phase 2 direction, but this clarity will come in a few months. It may also be valid to argue pre-clinical companies should be trading at cash backing because of the lack of clarity for their future direction, but Percheron is no 'pre-clinical' company, it has picked up an asset that will be in Phase 2 in less than 12 months from now.

Immutep is an example of what might be possible down the track

If and when Percheron reached Phase 3, Immutep could be a guide as to what Percheron could be valued at.

Further on our list is Immutep which is $381.7m and we think this is what Percheron could get to down the track (i.e. if it passed Phase 2 and entered Phase 3). Immutep's lead product is Eftilagimod Alfa for the treatment of various cancers. The company represents a good comparable to Percheron because it represents the main listed play related to an immune checkpoint, in this case LAG-3, short for lymphocyte activation gene-3.

LAG-3 is expressed mainly on activated T cells and NK cells, with MHC Class II molecules as its natural ligand. On activated T cells LAG-3 is an inhibitory receptor. On dendritic cells LAG-3 is an activator, causing increased antigen presentation when it binds to MHC Class II. Eftilagimod Alfa is the soluble LAG-3 protein used as an antigen presentation cell activator. The product is now in Phase 3 in First Line Non-Small Cell Lung Cancer, in combination with Keytruda. The data in this setting is outstanding – in an investigator-initiated study called INSIGHT-003 which evaluated 149 patients the Objective Response Rate was 60.8% and the Disease Control Rate 90.2% according to the RECIST criteria. Eftilagimod Alfa is also under evaluation for head and neck squamous cell carcinoma, and metastatic breast cancer. The product has received Fast Track designation in first line HNSCC and in first line NSCLC from the FDA.

NPV scenarios

We modelled NPV scenarios for commercialisation for TNBC and SCCHN in their own right.

We have also modelled multiple NPV scenarios for HMBD-002 assuming successful passage through Phase 2, Phase 3 and eventual commercialisation. The two scenarios we modelled were exclusive commercialisation for TNBC and for SCCHN in their own right, then modelled base and bull cases for each. We stress that these are by no means the only options available, but we thought were the most plausible to provide an idea of upside investors could expect, given the specific data for these types of cancers.

Our assumptions are as follows (Figure 10):

- **Revenue model.** We assume an average annual price of US$52,800 which marks 6 3-week treatments of US$8,800 each, following the cost of Keytruda[23]. We acknowledge there is no 'one size fits all' solution because the duration of treatments varies from patient-to-patient dependant on how they respond to the treatment.
- **Timing.** We assume Phase 2 is completed by mid-2027 and that Phase 3 commences shortly thereafter. We envision 2029 as the year when Phase 3 is complete and regulatory approval is granted, then 2030 as the year when sales begin. We then assume 7 years of market exclusivity and our model concludes thereafter.
- **Market size.** We assume 30,000 patients for TNBC and 70,000 SCCHN. As these are smaller markets (and it would not be unreasonable to expect demand if it can demonstrate game-changing results), we assume 75% penetration for the former and 50% for the latter in our base case. In our bull cases we assume 100% and 75%.
- **Milestone payments.** One of the biggest challenges we faced modelling the company was accounting for milestone payments to Hummingbird. Percheron has given investors a final figure of US$287m and given some

[23] https://ww.ncbi.nlm.nih.gov/books/NBK612727/

of the points at which milestone payments will be given, the exact timing and amounts at those points has remained confidential. We assume half of the costs are paid after commercialisation and hit at various sales milestones, and the rest are to be paid at the initiation and passage of Phase 2 and 3, then at FDA approval. We then assume a 12.5% sales royalty to Hummingbird as has been disclosed to investors. We have not assumed any sublicensing to another company which would enable Percheron (or a future acquirer) to keep more revenues than it otherwise would.

- **Margins and taxes.** Once commercialised, we assume operating costs worth 75% of sales and a 21% corporate tax rate.
- **Exchange rate.** We use A$1=US$0.65.
- **Discount rate.** We arrive at a WACC of 16% representing a 4% risk-free rate of return, an 8% equity premium and 1.5x beta. Our final NPV is further risk-discounted by 50%.

Figure 10: Our assumptions on HMBD-002

Assumptions	TNBC	SCCHN
US Market (patients per annum)	30,000	70,000
Annual price paid (US$)	52,800	52,800
Probability Factor	50%	50%
Discount Rate	16.0%	16.0%
Tax Rate	21%	21%
Pre-tax margin	25%	25%
Discount rate		
Risk free rate of Return	4%	4%
Equity premium	8%	8%
Beta	1.5	1.5
Milestone payments to Hummingbird		
Initiation of Phase 2	5	5
Passage of Phase 2	25	25
Initiation of Phase 3	50	50
Passage of Phase 3	25	25
Regulatory approval	25	25
Balance to be paid	157	157
Royalty rate	12.50%	12.50%
Timing		
Phase 2	2026	2026
Phase 2 passage & prepare for Phase 3	2027	2027
Phase 3	2028	2028
Phase 3 passage, regulatory approval	2029	2029
Sales begin	2030	2030
Exclusivity period (years)	10	10

Source: Company

For TNBC, our NPV is $162.4m in our base case and $207.7m in our bull case which would be $0.13-0.17 respectively. For SCCHN, our NPV is $329.3m base case and $467.3m bull case or $0.27-0.38 per share respectively.

If Percheron chose to pursue clinical trials and commercialisation for TNBC, our NPV is $162.4m in our base case and $207.7m in our bull case which would be $0.13-0.17 respectively. As for the SCCHN opportunity, our NPV is $329.3m base case and $467.3m bull case or $0.27-0.38 per share respectively (Figure 11 and Figure 12). We stress that the per share figures should not be taken literally right now because there will need to be a lot of funding (and inevitably dilution) to bring this drug through the clinic and through to commercialisation, even if it can 'sub-license' the drug to another company to help bring it through the clinic. But we hope this shows that there is upside in Percheron's opportunity and that it is wrong that it should be trading at cash backing. Although these valuations are a significant premium to the current valuation, a big pharma might consider these a bargain relative to other M&A deals done in the billions of dollars.

Figure 11: Our assessment of Percheron's NPV opportunity (base case)

HMBD-002 Valuation	TNBC	SCCHN
NPV (US$m)	211.12	428.03
Risk Factor	**50%**	**50%**
rNPV (US$m)	105.56	214.01
AUD/USD	0.65	0.65
rNPV (A$m)	**162.40**	**329.25**
Shares on issue (diluted)	1,227	1,227
Implied price	**0.13**	**0.27**
Current share price	0.009	0.009
Premium	*1471%*	*2982%*

Source: Company

Figure 12: Our assessment of Percheron's NPV opportunity (bull case)

HMBD-002 Valuation	TNBC	SCCHN
NPV (US$m)	270.04	607.50
Risk Factor	**50%**	**50%**
rNPV (US$m)	135.02	303.75
AUD/USD	0.65	0.65
rNPV (A$m)	**207.72**	**467.31**
Shares on issue (diluted)	1,227	1,227
Implied price	**0.17**	**0.38**
Current share price	0.009	0.009
Premium	*1881%*	*4232%*

Source: Company

Catalysts for Percheron's re-rating

We foresee Percheron being re-rated driven by the following factors:

- Percheron's clinical advisory board determining the optimal clinical path forward for HMBD-002 (which should occur by the end of CY25);
- Initiating Phase II for HMBD-002,
- Applying for (and ultimately receiving) Orphan Drug Designation in the USA,
- Potential sub-licensing of HMBD-002, and
- Percheron pursuing further pipeline expansion opportunities.

Risks

We see the following key risks to our investment thesis:

- **Funding risk**: To get HMBD-002 to commercialisation, Percheron will continue to require external funding to support its plans. Raising funds on favourable terms (both debt and equity) along with timeliness may be a key challenge for the company.
- **Regulatory risk.** The company's ability to commercialise its products down the track is contingent on regulators maintaining approval where it already exists (including meeting ongoing regulatory compliance requirements) and giving approval to new products. A failure to give new products approval, or even a withdrawal of approval, could be catastrophic to its future ambitions.
- **Commercial risk**. There is the risk that the company may fail to execute its commercial objectives for a variety of reasons including clinical trial failure, a lack of regulatory approval, supply chain issues and a lack of ability to obtain Medicaid reimbursement among others.
- **Key personnel risk**: There is the risk the company may lose key personnel and be unable to replace them and/or their contribution to the business.

Risks related to pre-revenue Life Science companies in general.

The stocks of biotechnology and medical device companies without revenue streams from product sales or ongoing service revenue should always be regarded as speculative in character.

Since most biotechnology and medical device companies listed on stock exchanges in Australia fit this description, the term 'speculative' can reasonably be applied to the entire sector.

The fact that the intellectual property base of most biotechnology and medical devices lie in science not generally regarded as accessible to laypersons adds further to the riskiness with which the sector ought to be regarded.

Caveat emptor. Investors are advised to be cognisant of the abovementioned specific and general risks before buying shares in any company issued in this report, including Percheron.

Appendix I - Percheron's management

Percheron's management team is as follows (Figure 13):

Figure 13: Percheron's leadership composition

Board of Directors	
Name and Designation	**Profile**
Charmaine Gittleson Chair	Dr Gittleson has extensive international experience as a pharmaceutical physician and enterprise leader in pharmaceutical drug development, governance and risk management gained during her 15-year tenure (2005-2020) with global specialty biotechnology company CSL Limited (ASX: CSL). During her time at CSL, Dr Gittleson had at various times accountability for clinical research, medical safety, medical and patient related ethics for development and on market programs, providing leadership in strategic product development, planning and implementation across multiple therapeutic and rare disease areas. Dr Gittleson held the key leadership roles of: Senior Director, Head Safety and Clinical Development (2006-2010) in Melbourne Australia; Vice President Clinical Strategy (2010-2013) and Senior Vice President Clinical Development (2013-2017) in Pennsylvania United States; and Chief Medical Officer in Melbourne from 2017 to 2020.
Gil Price Non-Executive Director	Dr Price is an experienced biotech executive and entrepreneur with depth of expertise across clinical asset investment strategy, evaluation, financing and execution. Additional leadership experience within R&D, Medical, and strategic corporate functions. Dr. Price was previously responsible for the strategic and tactical management of all business at Drug Safety Solutions. After a successful 20-year history, Drug Safety Solutions was acquired in June 2017 by Linden Capital Partners. From that date to January 2020, Dr. Price served as the Chief Medical Officer for the global ProPharma Group, a Linden subsidiary. Over the years Dr. Price has served on multiple corporate boards, including public, private, and not-for-profit. His board duties have included the Chairman's role on Compensation and Governance as well as a member's role on Audit. He has served on boards that report to; TSX, NYSE American, and NASDAQ. His most recent experience, Rexahn Pharmaceuticals, Inc. (NYSE American: RNN) he served on Compensation, Governance, and Business Development. In his previous role with Sarepta Therapeutics NASDAQ: SRPT, he helped to guide the company transition from $80 million market (2008) to its 2019 market cap of $8.4 billion. Dr. Price is a clinical trial Medical Monitor and Pharmacovigilance expert. He has years of experience as the head of Safety Management Teams (SMTs), multiple Data Safety Monitoring Boards, as well as protocol development and safety support from FIH to Phase IV clinical trials. While his therapeutic horizon is broad, it has been dominated by oncology, infectious disease, and rare disease.

James Garner Managing Director & CEO	Dr Garner is an experienced life sciences executive, whose career has focused on the development and commercialization of novel therapeutics for diseases with high unmet medical need. Over the course of a twenty-year career in industry, James has worked principally with Biogen (NASDAQ: BIIB), Takeda (NYSE: TAK), and Sanofi (NASDAQ: SNY), in regional and global roles. He has overseen more than thirty national product approvals, more than a dozen multinational clinical trials, several partnering transactions, and numerous scientific collaborations. His experience spans multiple therapeutic areas, including oncology, immunology, CNS, and orphan diseases. In his seven-year tenure as CEO and Managing Director of Kazia Therapeutics (NASDAQ: KZIA), James drove a transformation of the company's pipeline by in-licensing clinical-stage assets from Genentech and Evotec, deployed an extensive pipeline of more than a dozen clinical trials across multiple oncology indications, and inked partnering deals with Simcere (HKSE:2096) and Vivesto AB (STO: VIVE). James has raised approximately US$40 million in equity financing for Kazia, and the company has also benefited significantly from non-dilutive opportunities. In addition to his medical qualifications and MBA, James holds a master's degree in continental philosophy and a bachelor's degree in the history of medicine, and is a member of the Australian Institute of Company Directors (AICD) and the American Society for Clinical Oncology (ASCO).
Deborah Ambrosini CFO and Company Secretary	Ms Ambrosini is a highly experienced CFO and Company Secretary. She is a Fellow of Chartered Accountants Australia and New Zealand with over 20 years' experience in leading financial strategies to facilitate growth plans. Her experience spans the biotechnology, mining, IT communications and financial services sectors. Ms Ambrosini possesses extensive experience in debt and equity capital raising activities, regulatory compliance, process improvement, investor relations, large contract management and leading all aspects of accounting, budgeting, forecasting and financial analysis. She also has significant experience both nationally and internationally in financial and business planning, compliance and taxation. Deborah has held Director roles in both listed and unlisted entities. Ms Ambrosini has been a state finalist in the Telstra Business Woman Awards. She was also named as one of the Top 40 pre-eminent business leaders in the highly prestigious WA Business News 40 under 40 awards.

Source: Company

Appendix II – Glossary

Amino Acids – Organic compounds or molecules that are the building blocks of protein – they combine to form proteins. They are named amino because they all contain an -NH2 (amino) group.

Amino Acid signature – A specific combination or pattern of amino acids that can be used to identify or characterise a particular protein, cell type, or even a disease state.

CAR-T – Chimeric Antigen Receptor –T cell therapy which is an immunotherapy that uses altered T cells to target cancer cells.

COPD – Chronic Obstructive Pulmonary Disease, a long-term lung condition characterised by airflow obstruction that makes breathing difficult.

Crohn's – A type of inflammatory bowel disease that causes swelling and inflammation in the digestive tract.

CTLA-4 – A protein receptor that acts as an immune checkpoint and is primarily found on T-Cells

Cytokine therapies – A type of immunotherapy using cytokines, which are signalling molecules of the immune system, to help the body fight diseases like cancer and infections.

Efficacy – In general terms, the ability to perform a task to a satisfactory or expected degree. In the context of biotechs, it is used to describe drugs that work.

EGFR – Estimated Glomerular Filtration Rate, a calculation based on a blood test that measures a kidney's performance (i.e. how well they are filtering waste from the blood.

Immuno-oncology – A cancer treatment using the immune system to fight cancer.

Immune checkpoint – Parts of the body's immune system that regulate immune responses.

IgG1 – An antibody that is a subclass of Immunoglobulin G (IgG1) antibodies in humans.

IgG4 – An antibody that is a subclass of Immunoglobulin G (IgG4) antibodies in humans – unlike IgG1, this is the least abundant subclass of IgG in human serum and has unique functional features.

Immunoglobulin – Also known as an antibody, this is a crucial protein produced by the immune system that identifies and neutralises foreign substances like bacteria and viruses.

Irradiated – Exposed to radiation.

IV – An abbreviation for intravenous which means within or into a vein. It alludes to medical procedures of administering medications, fluids or other substances into patient's veins via a needle or catheter.

LAG-3 – Short for Lymphocyte Activation Gene-3 which is an immune checkpoint molecule involved in regulating the immune system.

Ligand – An ion or molecule attached to a metal atom by coordinate bonding.

Metastatic – Cancer that has spread from its original site to another part of the body.

Monoclonal antibody – Laboratory-made proteins that mimic the body's natural immune system response to fight diseases.

Oncology – The branch of medicine focused on the study, diagnosis, treatment and prevention of cancer.

PD-1 – Short for Programmed cell death protein 1. This is a protein receptor found on the surface of immune cells, primarily T cells, which act as a checkpoint to regulate the immune system's response.

PD-L2 – A protein that acts as a ligand for the PD-1 receptor, playing a crucial role in regulating the immune response.

Proteins – Molecules composed of amino acids that play critical roles in the body's structure, function and regulation.

Protein receptor – Specialised proteins which act as signal receivers and transducers for cells.

SCCHN – Squamous Cell Carcinoma of the Head and Neck. It is a cancer that develops in the squamous cells lining the moist surfaces of the head and neck, such as the mouth, throat and voice box.

Squamous – In biology, it describes cells with a flattened, thin and irregular shape.

T-Cell – White blood cells that play a crucial role in the immune system. They are responsible for fighting off infections and potentially even cancer by recognising and destroying abnormal cells.

TNBC – Triple-Negative Breast Cancer, so-called because of the absence of three common receptors which are targeted in most breast cancers.

Unresectable – Unable to be removed with surgery.

VISTA – Short for V-domain Ig suppressor of T cell activation'. It is a checkpoint that plays an important part in suppressing T-Cell responses.

Appendix III – Capital Structure

Security Class	Number	%
Ordinary shares	**1,087,437,633**	**88.6%**
Options		
PERAO (Ex. 20/5/28 Def)	107,056,816	
PERAI (Ex. 7/8/28 at $0.07)	6,690,000	
PERAJ (Ex. 30/6/28 at $0.06)	3,000,000	
PERAL (Ex. 29/11/29 at $0.26)	4,036,487	
PERAN (Ex. 29/11/29 at $0.52)	4,036,486	
PERAM (Ex. 29/11/29 at $0.39)	4,036,487	
PERAK (Ex. 4/7/29 at $0.08)	10,600,000	
Total	**139,456,276**	**11.4%**
Total diluted shares	**1,226,893,909**	

Source: Company

Appendix IV – Analysts' Qualifications

Stuart Roberts, lead analyst on this report, has been an equities analyst since 2002.

- Stuart obtained a Master of Applied Finance and Investment from the Securities Institute of Australia in 2002. Previously, from the Securities Institute of Australia, he obtained a Certificate of Financial Markets (1994) and a Graduate Diploma in Finance and Investment (1999).
- Stuart joined Southern Cross Equities as an equities analyst in April 2001. From February 2002 to July 2013, his research speciality at Southern Cross Equities and its acquirer, Bell Potter Securities, was Healthcare and Biotechnology. During this time, he covered a variety of established healthcare companies, such as CSL, Cochlear and Resmed, as well as numerous emerging companies. Stuart was a Healthcare and Biotechnology analyst at Baillieu Holst from October 2013 to January 2015.
- After 15 months over 2015–2016 doing Investor Relations for two ASX-listed cancer drug developers, Stuart founded NDF Research in May 2016 to provide issuer-sponsored equity research on ASX-listed Life Sciences companies.
- In July 2016, with Marc Kennis, Stuart co-founded Pitt Street Research Pty Ltd, which provides issuer-sponsored research on ASX-listed companies across the entire market, including Life Sciences companies.
- Since 2018, Stuart has led Pitt Street Research's Resources Sector franchise, spearheading research on both mining and energy companies.

Nick Sundich is an equities research analyst at Pitt Street Research.

- Nick obtained a Bachelor of Commerce/Bachelor of Arts from the University of Sydney in 2018 and the designation of Financial Modelling & Valuation Analyst by the Corporate Finance Institute. He has also completed the CFA Investment Foundations program.
- He joined Pitt Street Research in January 2022. Previously he worked for over three years as a financial journalist at Stockhead.
- While at university, he worked for a handful of corporate advisory firms

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