IMMUTEP LIMITED

Biotechnology

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COMPANY NOTE

Immutep Limited (IMM-AU)

First in class opening the cancer immune throttle

OUTPERFORM

Target Price AUD0.610
Current Price AUD0.150

KEY TAKEAWAY

Immutep continues to accumulate data supporting the use of Eftilagimod alpha ("efti") in cancer therapy. Data from the TACTI-002 study in non-small cell lung cancer ("NSCLC") and positive signals in head and neck suggest the drug may extend the benefits of immune checkpoint inhibitors ("ICI"); boosting ORR (Overall Response Rate) to >50% from the usual 10% - 20% with PD-1 / PD-L1 ICIs alone. While the AIPAC Phase IIb in metastatic breast cancer ("mBC") fell short of significance in overall progression-free survival ("PFS"), there are positive signals from efti in patient sub-groups totalling >50% of mBC patients. Having missed the anticipated 'slam-dunk' regulatory data in the AIPAC trial and resulting rapid out-licensing, we are optimistic for a substantial efti out-licensing deal within 12 - 18 months with the promise of further data. Now financed to c.YE2021E and with potential news flow and milestones from GSK and Novartis licensed programs, we see substantial upside. We reiterate our OUTPERFORM recommendation and increase our TP to AUD 0.61 (from AUD 0.32).

Potential to extend benefits of PD-1 / PD-L1 ICIs - Dramatic benefits of ICI treatments are mostly confined to a minority of patients in certain cancers. With efti opening the throttle and ICIs releasing the immune brake, data from TACTi-002 Phase II trial suggest that efti could extend the impact of the ICI pembrolizumab in NSCLC and perhaps head and neck cancer. With an ORR of >50%, the response is on a par with much harsher ICI / chemo, but better tolerated. With encouraging initial results in head and neck patients, the expansion phase first line NSCLC and second line head and neck has been initiated generating news flow within 12 months.

Data supports efti development in mBC patient subgroups - Although the positive trend in overall PFS over paclitaxel did not achieve significance, positive responses in patient sub-groups indicate benefits for >50% of mBC patients. Stratifying patients by weakened immunity or more aggressive disease could provide the basis for mBC Phase III design.

Evidence of synergy with chemo - Data analysis suggested an increased benefit from efti when patients were actively receiving chemo, which disappeared when chemo was stopped. This suggests not only that efti anti-tumour effects might improve from exploring different chemo regimens, but also combination with other inflammatory / immune stimulating interventions such as radiotherapy.

Substantial upside - Our risk adjusted sum-of-the-parts valuation of efti and other pipeline assets, indicates that the market ascribes little value to efti following the AIPAC trial 'disappointment'. Given positive data from the TACTI-002 trial and response in substantial patient subgroups mBC, we believe efti is substantially undervalued. With further data anticipated over the next 12 months leading to a potential licensing deal, we see upside 3 - 4 fold from current levels.

AUD	2019A	2020E	2021E	2022E
Sales	7	13	10	22
EBIT	(19)	(16)	(13)	(2)
Net Profit	(19)	(16)	(13)	(2)
Net Cash/Debt ($M)				
FY Jun	5.8	11.6	(0.9)	(3.0)

Source: Company data, goetzpartners Research estimates. Warning Note: Past performance and forecasts are not a reliable indicator of future results or performance. The return may increase or decrease as a result of currency fluctuations.

FINANCIAL SUMMARY

Net Cash/Debt (M):	11.65

MARKET DATA

Current Price:	AUD0.150
Target Price:	AUD0.610
52 Week Range:	AUD0.500 - AUD0.100
Total Enterprise Value:	61
Market Cap (M):	73
Shares Out (M):	487.6
Float (M):	456.2
Average Daily Volume:	3,145,553

EQUITY RESEARCH

DR. CHRIS REDHEAD
Research Analyst
T +44 (0) 203 859 7725
chris.redhead@goetzpartners.com

PRICE PERFORMANCE

Source: Factset

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Company overview

Listed on the ASX and with ADR's traded on NASDAQ, Immutep is uniquely focussed on the development of cancer and immunotherapies utilising the LAG3 (Lymphocyte Activation Gene-3) protein. With its HQ in Sydney, Australia and operations in Germany and the USA, Immutep has established a pipeline of in-house and large-pharma-out-licensed programmes (FIGURE 1), which utilise the LAG-3 protein's dual role as both an activator and inhibitor of the adaptive immune system.

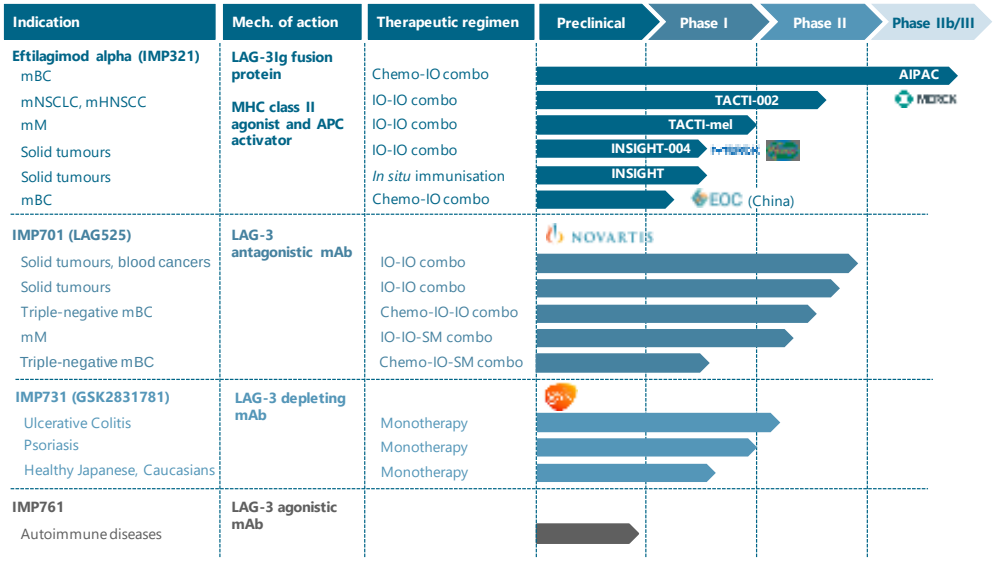
The company's lead in-house programme is a first-in-class LAG-3 fusion protein IMP321 / eftilagimod alpha ("efti") that exploits the protein's ability to stimulate immunity through the activation of antigen presenting cells ("APCs"). Currently in Phase 2 trials, efti has already demonstrated evidence of efficacy in combination with PD-1 inhibitors in non-small cell lung cancer ("NSCLC") and head and neck carcinoma ("HNSCC") as well as with chemo in metastatic breast cancer ("mBC"). Now in expansion phase, recent data from the Two ACTive Immunotherapies-002 (TACTI-002) Phase 2 trial suggest that combination of efti with PD-1 inhibitor pembrolizumab ("pembro") elicits an overall response rate ("ORR") >50% of all NSCLC patients compared to the 10% - 20% with pembro alone. While recent data from the Active immunotherapy PAClitaxel trial ("AIPAC") mBC Phase 2b trial combining efti with chemotherapy failed to achieve the hoped for response across all patients, data indicated efficacy in sub-populations amounting to >50% of the mBC population. The investigator initiated INSIGHT-004 Phase I trial is studying the combination of efti with the PD-L1 inhibitor avelumab in solid tumours.

LAG-3 antagonism in immuno-oncology is being pursued by a large number of players, foremost BMS. Immutep out-licensed its LAG-3 antagonist IMP701/LAG525 to CoStim Pharmaceuticals Inc. now owned by Novartis ("NVS"). NVS has LAG525 in 5 clinical trials encompassing both solid tumours, including mBC and melanoma, and blood cancers. These studies involve the use a variety of drugs in combination with LAG525, including chemotherapy, immune-oncology biologics and small molecules.

The cytotoxic LAG-3 T-cell depleting antibody IMP731 (GSK2831781) has been out-licensed to GSK, which currently has the drug in Phase I and II trials for inflammatory diseases including ulcerative colitis and psoriasis.

Led by experienced CEO Marc Voigt, Immutep recently raised A$12m. Now financed to the end of 2021E, the company aims to use the data from the on-going TACTI-002, AIPAC and possibly INSIGHT-004 to secure an out- licensing deal during the course of 2020 / 2021E.

FIGURE 1: Immutep product pipeline

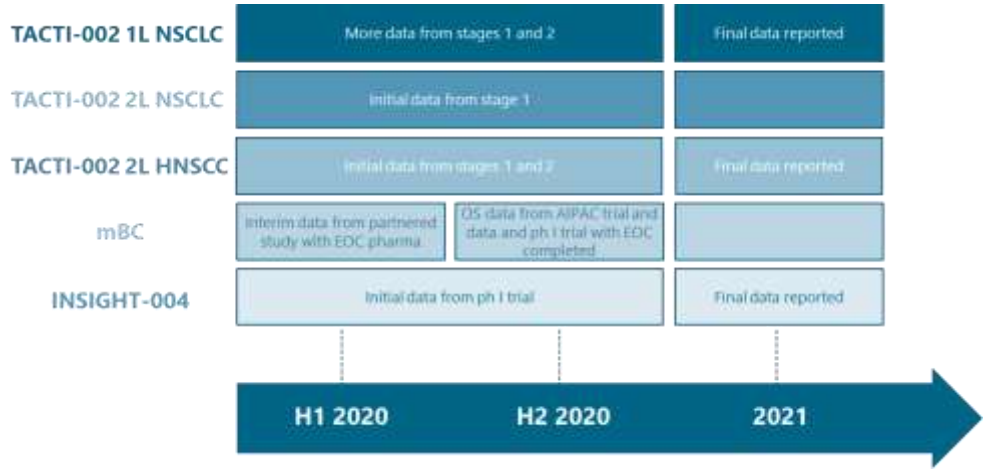


Source: Company data, goetzpartners Research estimates

News flow

We anticipate the pipeline will generate significant news flow during 2020 / 2021. With the TACTI-002 trial in its second stage expansion phase, we expect further PD-1 combination data in both first and second line NSCLC as well as second line HNSCC. Overall survival data from the AIPAC mBC trial is expected by YE2020E with first interim data in mBC from the studies performed by Chinese partner EOC. Further data on efti-PD-1 combination is expected from the Phase 1 INSIGHT-004 trial during the course of 2020E with final read-out anticipated in 2021E. The out-licensed programmes should provide news flow with NVS possibly releasing further data on LAG525 during the course of 2020E / 2021E. This should be supported by further data from the BMS LAG-3 programme. Further data from the GSK inflammatory programme is likely during 2021E. Immutep anticipate that, while recruitment will slow down, with TACTI-002 70% and INSIGHT-004 fully recruited, the impact should be small.

FIGURE 2: Upcoming milestones expected for Immutep in 2020 and 2021

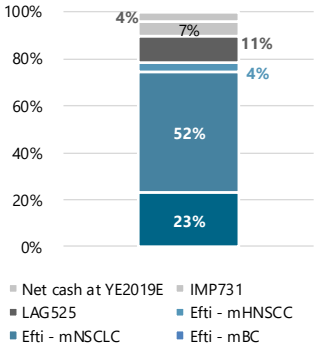


Source: Company data, goetzpartners Research estimates

SoTP valuation

With a fair value of A$0.609 per share, our SoTP (Sum of the Parts) valuation indicates substantial upside from current levels (FIGURE 4); based on risk-adjusted net present values ("rNPVs") for efti in mBC, lung and head & neck cancer, LAG525 in multiple tumours, GSK2831781 in ulcerative colitis (all discounted using a WACC of 12.4%) and net cash at YE2020E). Now funded until the end of 2021E and with the expectation of additional data, we believe that the company has a strong chance of out-licensing efti during the course of 2021E to crystalise value and further de-risk efti development. While in the light of the recent data, we have decreased our probability of success of efti in mBC to 20% from 40%, the positive TACTI-002 trial has allowed us to increase the probablity to 22% from 10%. The NSCLC indication now accounts for c.52% of our fair value (FIGURE 3).

FIGURE 3: Immutep SoTP valuation



Source: goetzpartners Research estimates. Warning Note: Forecasts are not a reliable indicator of future results or performance. The return may increase or decrease as a result of currency fluctuations.

FIGURE 4: Immutep sum-of-the-parts valuation

Product	Indications	Stage	Peak sales ($m)	Year	NPV (A$m)	Prob.	Adj. NPV (A$m)	NPV/sh (A$)
Eftilagimod alpha	mBC	Phase IIb	889	2029E	340	20%	68	0.139
Eftilagimod alpha	mNSCLC	Phase II	1,826	2035E	700	22%	154	0.316
Eftilagimod alpha	mHNSCC	Phase II	326	2035E	110	10%	11	0.023
LAG525	Cancer	Phase II	4,000	2033E	132	25%	33	0.068
GSK2831781	UC	Phase II	2,267	2033E	78	25%	20	0.040
Net cash at YE2020E					12	100%	12	0.024
Fair value					**1,371**		**297**	**0.609**
Current share price (A$)								0.135
Upside								351%

Source: goetzpartners Research estimates. Warning Note: Forecasts are not a reliable indicator of future results or performance. The return may increase or decrease as a result of currency fluctuations.

Anti-tumour impact of efti combinations

Demonstrated synergy with both immunotherapies and chemotherapy

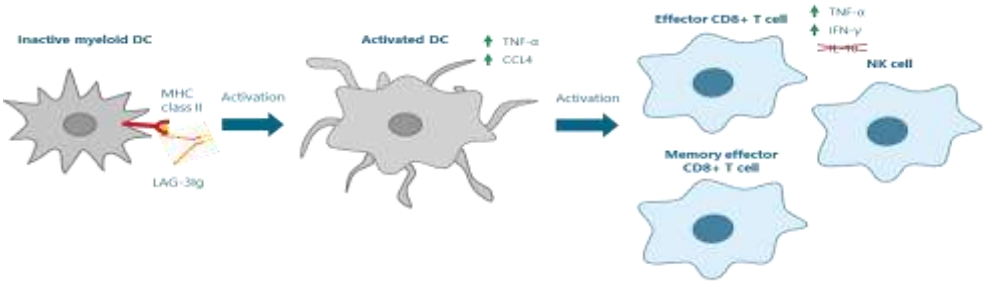
Its unique mechanism of action ("MoA") as an activator of APCs and good tolerability make efti a strong candidate for combination with existing cancer therapies including immunotherapies, such as immune checkpoint inhibitors ("ICIs") and other established therapies like chemo. The drug has already shown evidence of synergy with PD-1 inhibitors in lung cancer. Early TACTI-002 trial data suggests ability to boost PD-1 efficacy with ORRs of >50% comparable to those so far only achieved with much harsher PD-1 / chemo combinations. With positive responses also in HNSCC and the trial moving into its extension phase, efti shows promise of providing a much sought after means of safely and effectively extending the benefits of PD-1-based therapies to a broader patient population. While the recent reported AIPAC trial combining efti with chemo in mBC failed to achieve the dramatic results anticipated, the trial did yield clear signs of efficacy in substantial patient subpopulations amounting to potentially >50% of the patient population and could perhaps have even broader impact with chemo if the treatment regimen used in the AIPAC trial were modified.

Unique MoA opens anti-tumour immune throttle

Potent activation mechanism makes Efti ideal for 'releasing the throttle' on the immune system

Eftilagimod alpha (IMP321) is a potent activator of the immune system, inducing activation of both arms of the immune system (innate and adaptive). As a soluble recombinant version of the naturally occurring LAG-3 protein, Efti binds preferentially to MHC class II proteins present on the surface of myeloid dendritic cells ("DCs"), a subset of APCs. Upon binding to these MHC class II proteins, the DCs become activated, expressing pro-inflammatory cytokines, such as tumour necrosis factor alpha (TNF-α). This cytokine, among others, leads to the activation of fully differentiated effector and memory effector CD8+ T cells along with natural killer ("NK") cells, expressing TNF-α and interferon gamma (IFN-γ). By secreting these cytokines, NKs activate other parts of the adaptive immune system. This unique immune activation makes efti an ideal candidate for combination with other I-O therapies like anti-PD-1 / PD-L1 as well as established anti-cancer treatments such as chemotherapy.

FIGURE 5: MoA of Eftilagimod alpha ("Efti") in activating antigen presenting cells ("APCs")



Source: Company data, Brignone et al. (2007) *J Immunol*

While anti-PD-1 / PD-L1 ICIs, such as Keytruda and Opdivo, have been shown to have substantial impact and can significantly extend survival compared to previous therapies, dramatic sustained benefits are restricted to limited patient populations in a select number of cancers. As a result, there is a massive effort by drug developers to identify ICI combinations with other drugs that can extend these benefits to more patients in more cancers. In the past two years, 1287 new combination trials testing 222 targets with PD-L1 were opened (Cancer Research, 2019). Where ICIs effectively release the brake from the immune system, there is clear rationale for adding a drug like efti, which can potentially open the throttle.

Enhancing chemotherapy-induced immune system activation

Although primarily cytotoxic in nature, therapies such as chemo and radiotherapy have also been shown to have a potentially substantial immune component. The debris and cellular signals released during cell death resulting from these agents is known to promote anti-tumour immune responses, which can be amplified by immune-modulators such as anti-PD-1 / PD-1 antibodies. Approved first-line treatment of metastatic non-squamous NSCLC in 2017, the combination of Keytruda with pemetrexed and carboplatin extends ORR to around 50% compared to 10% - 20% in patients receiving Keytruda alone. Similar effects might be expected with efti-chemo combinations.

Tolerable safety profile: The key to a good combo

Good safety and tolerability will be key to the successful use of combination therapies. As such, the apparent good tolerability of efti seen in trials to date make it an excellent candidate.

Efti-IO benefit in lung and head & neck cancers

The Two ACTive Immunotherapies-002 (TACTI-002) phase II trial has already shown the potential of combining efti with the anti-PD-1 drug pembrolizumab (Keytruda) in NSCLC and HNSCC. Limited by patient to patient differences in PD-1 expression, responses to anti-PD-1 / PD-L1 therapies is limited to 10% - 20% of patients (Hayashi & Nakagawa, 2019). While responses in NSCLC can be boosted to c.50% including low PD-1 expressing patients by the combination with doublet chemotherapy, this clearly comes with the acute and long-term effects of these toxic and potentially mutagenic chemicals.

Efti-pembro combo in trial for potential first line treatment for NSCLC

Conducted in collaboration with Merck & Co. Inc, the TACTI-002 study aims to investigate the combination of efti and pembro; potentially avoiding the need for toxic chemotherapy. Involving up to 109 patients, the study is taking place in up to 13 study centres in US, Europe and Australia and is split into three different parts based on indication and line of treatment: part A is for the first line treatment of NSCLC, part B for the second line treatment of NSCLC who have been refractory to previous PD-1 / PD-L1 treatment and part C for second line treatment of HNSCC (FIGURE 6). Patients in the trial will undergo a combination phase consisting of 18 cycles of treatment for 54 weeks and then a monotherapy phase lasting 51 weeks. If there are more responses than threshold in patients during stage 1 for each indication, additional patients can be recruited in stage 2 under the Simon's 2-stage design of this trial.

FIGURE 6: Three-part phase II TACTI-002 trial testing a combination of Efti and Pembrolizumab

Source: Company data

Promise from interim TACTI-002 trial data

Improved ORR in 1L NSCLC patients, regardless of PD-L1 expression levels

Positive interim results from stage 1 of the TACTI-002 trial have been reported for parts A and C, with a tolerable safety profile observed across all three parts.

FIGURE 7: Interim results in 1L NSCLC patients

Tumour response	% (N=17)
Complete response	0.0
Partial response	52.9
Stable disease	29.4
Progressive disease	17.7
Objective response rate	52.9
Disease control rate	82.4

Source: Company data

In the treatment of 1L NSCLC (part A), the ORR from this combination treatment appears to be sustained with an ORR of 53% when last reported in April 2020. This included two late responders, who responded at 8 and 11 months after treatment respectively. With late responses unusual in pembrolizumab monotherapy, this may hold promise for those patients with tumours refractory to anti-PD-1 treatment alone. With over half of the patients still under treatment at 8+ months, the median PFS has not yet been reached. As a PD-L1 all comer trial, the potential of this combination across a broad range of NSCLC patients can be observed, and so far, tumour responses continue to be reported across all three expression level groups (<1%, 1% - 49% and > or equal to 50%), with 4 of the 9 responses being in patients with PD-L1 expression below 50%. This result is impressive compared to pembrolizumab monotherapy, where about 20% of patients respond unless pre-selected for high PD-L1 expression levels.

Sustained response rates in 2L HNSCC patients

Results in second line HNSCC have also been encouraging. Also including a late responder at 8 months, this early data shows twice the response rate normally associated with pembro monotherapy. Including patients with a range of PD-L1 expression levels, median PFS has yet to be reached and the response dependence on high and low PD-1 expression has yet to be broken down.

FIGURE 8: Interim results in 2L HSNCC patients

Tumour response	% (N=18)
Complete response	0.0
Partial response	33.3
Stable disease	16.6
Progressive disease	39.9
Not evaluable	11.1
Not yet evaluated	5.6
Objective response rate	33.3
Disease control rate	50.0

Source: Company data

Good safety and tolerability across all study groups

In all parts, the safety was assessed for the 63 patients enrolled before data cut-off. These patients have received a median of 6 efti injections and a median of 5 pembrolizumab injections. So far, no new safety signals have been observed, displaying promising tolerance to this drug combination. Although 38.1% of patients displayed 1 treatment emergent adverse event ("TEAE") grade 3 or above, 7.9% were deduced to be drug related and all the 5 fatal TEAEs were concluded as unrelated to both drugs in the study.

FIGURE 9: Adverse events across all patients enrolled (N=63) from all parts (A-C)

Adverse event	Any grade (%)	Grade 3 (%)	Grade 4 (%)
Cough	15.7	-	-
Asthenia	20.6	-	-
Decreased appetite	17.5	-	-
Dyspnoe	17.5	4.8	1.6
Fatigue	15.9	1.6	-
Diarrhoea	14.3	1.6	-
Upper respiratory tract infection	12.7	-	-
Constipation	11.1	1.6	-
Nausea	11.1	-	-

Source: Company data

Other immunotherapy combinations explored

Efti is also involved two other trials in combination with other immunotherapies. One is the INSIGHT-004 trial, as part of a new clinical collab and supply agreement with Merck KGaA and Pfizer. A combination of efti with avelumab (another anti-PD-L1) in patients with advanced solid malignancies is the focus of the trial, with enrolment completed in the past few weeks, initial results are expected in Q2 2020E. The first cohort demonstrated no new safety signals or dose limiting toxicities.

Cytlimic, another partner, is evaluating a combination immunotherapy of HSP70 derived peptide, a GPC3 derived peptide, efti and Hiltonol in patients with advanced or metastatic solid cancer. In initial results from the phase I trial, approximately 70% of patients showed immune response to each peptide.

The involvement of efti in four clinical trials using combination therapies is key for expanding the use into many indications and exploiting the full potential of the drug.

Efti-chemo potential in breast cancer

While the study did not achieve the hoped-for results for regulatory approval, data from the AIPAC mBC trial does indicate the potential for efti-chemo combination in a number of substantial patient subpopulations.

Largest trial to date

Immutep's largest trial to date the Active immunotherapy PAClitaxel ("AIPAC") trial, is a phase IIb trial in patients with late stage HR+ / HER2- metastatic breast cancer ("MBC") taking place in Europe. The trial has two arms, patients in arm 1 are treated with paclitaxel + efti for six months followed by efti monotherapy, whilst patients in arm 2 are treated with paclitaxel + placebo for 6 months followed by placebo monotherapy.

While not reaching the significance required to warrant hoped for regulatory approval, data released in March 2020 indicated a positive trend in PFS. At 6 months 63% of patients receiving chemo + efti were progression-free, compared to 54% with chemo + placebo. ORR in the efti group was 48.3% compared to 38.4% in placebo group. Importantly, the combination was overall safe and well tolerated.

Significant benefits observed in some subgroups

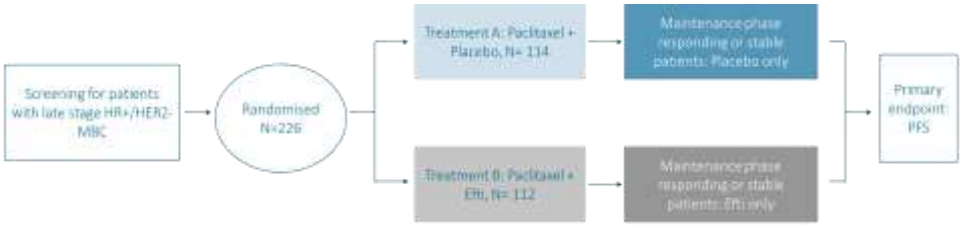
Analysis of some subgroups showed that patients with a low monocyte count at baseline received a significant benefit from efti as seen in FIGURE 11 with the PFS extended by nearly two months. Similar results were observed in patients with aggressive, more immunogenic luminal B type. Identification of these subgroups could potentially fuel further investigation and highlight patients who would gain a substantial clinical benefit from this combo. Interestingly, it also signals that fast-growing tumour types, such as NSCLC, may be a better target for APC activators like efti.

FIGURE 11: Median PFS readings from subgroups identified in interim results of AIPAC trial

	Median progression free survival estimate (months)	
Subgroup	Chemo + Efti	Chemo + Placebo
Low monocytes at baseline (<0.25 x 10^9/L)	BICR: 7.29	BICR: 5.45
	Investigator: 7.46	Investigator: 5.16
Luminal B type	BICR: 7.29	BICR: 5.45
	Investigator: 7.20	Investigator: 5.55

Source: Company data

FIGURE 10: Structure of the AIPAC phase IIb trial

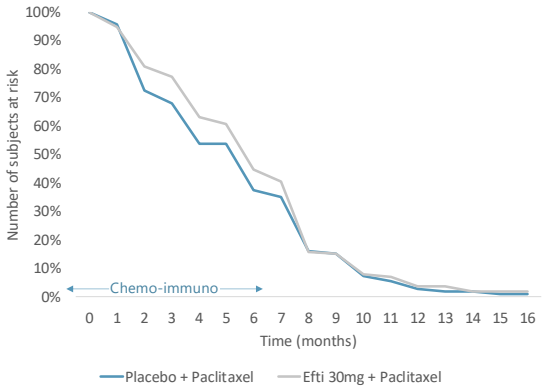


Source: Company data

Effects on PFS observed only when in direct combination with chemotherapy

Analysis of the data also suggested that the effect on the total patient could perhaps be boosted by adjusting the treatment regimen. The study protocol required that patients only received paclitaxel for the first seven months of efti treatment. From the data, it was evident that the efti appeared a benefit over placebo during the first seven months, but this benefit disappeared thereafter (FIGURE 12). This might suggest that retaining or extending the duration of chemotherapy could provide a boost to efti therapy and should be considered in future trials. The enhancing effect of chemo might also suggest that the presence of a 'co-inflammatory' stimulus could enhance the impact of efti on solid tumours. This may be key in shaping future trials not only in mBC but also in other indications such as NSCLC, where an efti / chemo combo seems an obvious next step. It may also aid in the choice of other combinations with inflammatory effects, such as radiotherapy.

FIGURE 12: AIPAC BICR trial data indicates potential efti-paclitaxel synergy



PFS estimates – primary analysis Blinded independent investigator read (BICR)	Paclitaxel + Efti N=114	Paclitaxel + Placebo N=112
Median (months)	7.29	7.29
Mean (months)	7.12	6.64
% progression free at 6 months	**63%**	**54%**

Source: Company data

Firm basis for efti development in breast cancer; endorsed by Chinese partner

Although the AIPAC trial did not achieve the hoped-for significance, the data does provide a strong basis for further development and should form the basis of a future Phase 3 trial in mBC, in our view. Such optimism appears to be shared by Immutep's Chinese partner EOC Pharma. Having fully considered the AIPAC data, EOC, who have exclusive rights to efti in China, has determined to pursue the development of efti in mBC. A dose escalating Phase I with 12 patients receiving 6mg or 30mg doses of efti is due to complete by YE CY2020E. Immutep will receive defined milestones and royalties from EOC as the products moves through development and into the market.

Efti revenue model

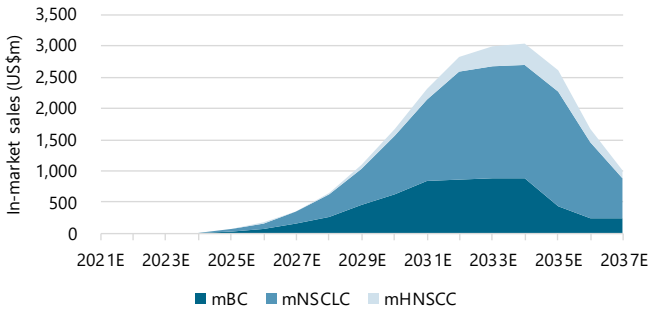
We estimate that if successfully marketed by a major partner efti could generate upwards of $3bn in sales in Europe and the US. Our key assumptions and in-market sales forecasts for efti are shown FIGURE 13 and FIGURE 14. We model a global licensing deal worth $1bn, of which we include only $600m in our forecasts, including a $50m upfront payment, $125m in regulatory milestones and $425m in sales-based milestones. We further assume that Immutep receives tiered royalties on sales, rising progressively from 15% for the first $250m to 25% for sales over $2bn, yielding a blended royalty rate of up to 21.5% (FIGURE 15).

FIGURE 13: Efti in-market sales forecasts - summary

Indication	First launch	Peak penetration		Peak sales ($m)
		US	Europe	
mBC	2024E	15%	10%	889
mNSCLC	2025E	10%	6.5%	1,826
mHNSCC	2026E	12%	8%	326
Portfolio				3,041

Source: goetzpartners Research estimates. Warning Note: Forecasts are not a reliable indicator of future results or performance. The return may increase or decrease as a result of currency fluctuations.

FIGURE 14: Efti in-market sales forecasts



Source: goetzpartners Research estimates. Warning Note: Forecasts are not a reliable indicator of future results or performance. The return may increase or decrease as a result of currency fluctuations.

Efti is protected by a series of separate patents that cover combinations with chemotherapy and immune as well as manufacturing. We believe that these together with the data exclusivity for innovative biologics of 8 and 12 years in the EU and USA respectively should provide protection from the introduction of biosimilars into the mid-2030s.

FIGURE 15: Eftilagimod alpha sales model

Dec YE	2020E	2021E	2022E	2023E	2024E	2025E	2026E	2027E	2028E	2029E	2030E	2031E	2032E	2033E	2034E	2035E
Global eftilagimod sales ($m)		-	-	-	12	66	173	358	656	1,099	1,666	2,309	2,816	2,984	3,025	2,598
mBC sales		-	-	-	12	40	83	166	272	453	624	841	858	873	889	445
mNSCLC sales		-	-	-	-	26	84	176	351	581	937	1,298	1,724	1,799	1,812	1,826
mHNSCC sales		-	-	-	-	-	5	16	33	65	105	170	235	311	324	326
Global licensing deal																
Royalties to Immutep ($m)		-	-	-	2	10	26	56	107	196	318	472	599	641	651	544
Blended royalty rate		0.0%	0.0%	0.0%	15.0%	15.0%	15.0%	15.6%	16.2%	17.8%	19.1%	20.5%	21.3%	21.5%	21.5%	21.0%
Royalties to Immutep (A$m, into P&L)		**-**	**-**	**-**	**2**	**13**	**35**	**75**	**143**	**262**	**426**	**633**	**803**	**859**	**873**	**729**
Upfront ($m, amortised over 10 years)	**-**	**-**	50.0													
Share of upfront recognised in P&L (A$m)	-	-	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7				
Milestones (A$m, into P&L)	**-**	**-**	**-**	**33.5**	**-**	**134.0**	**100.5**	**-**	**134.0**	**-**	**-**	**-**	**334.9**	**-**	**-**	**-**
Regulatory milestones ($m)				25.0		75.0	25.0									
Sales-based milestones ($m)						25.0	50.0		100.0				250.0			

Source: goetzpartners Research estimates. Warning Note: Forecasts are not a reliable indicator of future results or performance. The return may increase or decrease as a result of currency fluctuations.

Pharma out-licensed programmes

Novartis - LAG525 releasing anti-tumour T-cell suppression

Antagonism of the LAG-3 suppressor function is the focus of a large number of players with BMS's relatimab currently in Phase III (FIGURE 16). Originally licensed to CoStim Pharmaceuticals Inc, the Immutep product IMP701 is currently under development by Novartis who acquired CoStim in 2014. Now named LAG525, Novartis has the drug in five separate clinical trials in over 1000 patients. These include: phase II in combination with another immunotherapy for solid tumours and blood cancer, phase II in combination with chemotherapy for triple negative breast cancer ("TNBC"), phase II in combination with immunotherapy and a small molecule drug for melanoma, phase II in combination with immunotherapy for solid tumours and finally a phase I trial combining chemotherapy and a small molecule with IMP701 for TNBC

FIGURE 16: Landscape overview of LAG-3 antagonist therapeutics

Company	Programme	Preclinical	Phase I	Phase II	Phase III	Total trials	Patients on trials
BMS	Relatlimab		7	23	2	32	9,693
NOVARTIS	LAG525 (IMP701)		1	4		5	1,104
B.I.	BI754111		4	1		5	849
Merck & Co. Inc.	MK4280		2	1		3	940
Macrogenics	MGD013		1	1		2	1,105
Symphogen A/S	SYM022		2			2	132
H-L Roche	RG6139		1			1	200
Regeneron	REGN3767		1			1	589
Innovent	IBI110		1			1	268
Xencor	XmAb-22841		1			1	242
Tesaro	TSR-033		1			1	200
F-Star	FS-118		1			1	51
Incyte	INCAGN02385		1			1	40

Source: Company data

These studies are expected to generate data and associated milestone payments to Immutep during 2020E and beyond. With a launch expected in 2025E, we anticipate that revenues from LAG525 could reach $4bn generating peak royalties of over $250 (>AUD$340m) (FIGURE 17)

FIGURE 17: LAG525 sales model

Dec YE	2025E	2026E	2027E	2028E	2029E	2030E	2031E	2032E	2033E	2034E	2035E	2036E	2037E
LAG525 global sales to Novartis ($m)	**200**	**500**	**1,100**	**2,000**	**3,000**	**3,400**	**3,900**	**3,920**	**4,000**	**3,800**	**3,200**	**2,800**	**2,400**
growth		150%	120%	82%	50%	13%	15%	1%	2%	(5%)	(16%)	(13%)	(14%)
Royalties to Immutep ($m)	10	25	56	110	180	212	252	254	260	244	196	166	138
Blended royalty rate	5.0%	5.0%	5.1%	5.5%	6.0%	6.2%	6.5%	6.5%	6.5%	6.4%	6.1%	5.9%	5.8%
IMM financial year	FY24/25	FY25/26	FY26/27	FY27/28	FY28/29	FY29/30	FY30/31	FY31/32	FY32/33	FY33/34	FY34/35	FY35/36	FY36/37
Royalties to Immutep (JunYE) ($m)	5	18	41	83	145	196	232	253	257	252	220	181	152
Royalties to Immutep P&L (A$m)	**7**	**23**	**54**	**111**	**194**	**263**	**311**	**339**	**344**	**338**	**295**	**242**	**204**

Source: goetzpartners Research estimates. Warning Note: Forecasts are not a reliable indicator of future results or performance. The return may increase or decrease as a result of currency fluctuations.

GSK – GSK'781 depleting auto-immune T-Cells

Autoimmune disease results from the attack of cell and tissues by the patients' own immune system. Targeting LAG-3 and depleting the activated T-cells driving the aberrant immune response, IMP731 is designed to suppress autoimmune disease. With exclusive global rights, GSK is currently running and funding two trials. These include a phase II trial in ulcerative colitis and a phase I trial in healthy Japanese and Caucasian patients. A phase I trial in patients with psoriasis has already been completed. In September 2019, upon dosing of the first patient in the ulcerative colitis trial, a £4m milestone payment was granted to Immutep. Future development of this drug could yield further milestones for Immutep, with a potential total of £64m including upfront payments, royalties, and milestones (FIGURE 18).

FIGURE 18: GSK2831781 sales model in UC

Dec YE	2026E	2027E	2028E	2029E	2030E	2031E	2032E	2033E	2034E	2035E	2036E	2037E
UC prevalence in the US (k)	972	982	992	1,002	1,012	1,022	1,032	1,043	1,053	1,064	1,074	1,085
growth (%)	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%
Penetration	0.1%	0.4%	1.0%	1.8%	3.0%	4.0%	4.8%	5.0%	4.5%	4.0%	3.5%	3.0%
Annual US price ($)	24,691	24,938	25,188	25,439	25,694	25,951	26,210	26,472	26,737	27,004	27,275	27,547
growth (%)	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%
GSK2831781 US sales in UC	**24**	**98**	**250**	**446**	**780**	**1,061**	**1,285**	**1,380**	**1,267**	**1,149**	**1,025**	**897**
UC prevalence in Europe (k)	2,251	2,274	2,297	2,320	2,343	2,366	2,390	2,414	2,438	2,462	2,487	2,512
growth (%)	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%
Penetration	0.0%	0.1%	0.3%	0.6%	1.0%	1.5%	2.0%	2.4%	2.5%	2.3%	2.0%	1.8%
as % of peak penetration	1%	5%	12%	23%	40%	60%	80%	95%	100%	90%	80%	70%
Annual European price ($)	15,471	15,471	15,471	15,471	15,471	15,471	15,471	15,471	15,471	15,471	15,471	15,471
GSK2831781 EU sales in UC	**9**	**44**	**107**	**202**	**362**	**549**	**740**	**887**	**943**	**857**	**770**	**680**
GSK2831781 global sales to GSK ($m)	**33**	**142**	**356**	**648**	**1,142**	**1,610**	**2,025**	**2,267**	**2,210**	**2,006**	**1,795**	**1,577**
growth		334%	151%	82%	76%	41%	26%	12%	(3%)	(9%)	(11%)	(12%)
Royalties to Immutep ($m)	2	7	18	34	65	99	132	154	149	131	114	96
Blended royalty rate	5.0%	5.0%	5.0%	5.2%	5.7%	6.1%	6.5%	6.8%	6.7%	6.5%	6.3%	6.1%
IMM financial year	FY25/26	FY26/27	FY27/28	FY28/29	FY29/30	FY30/31	FY31/32	FY32/33	FY33/34	FY34/35	FY35/36	FY36/37
Royalties to Immutep (JunYE) ($m)		4	12	26	49	82	116	143	151	140	122	105
Royalties to Immutep P&L (A$m)		**6**	**17**	**35**	**66**	**110**	**155**	**192**	**203**	**187**	**164**	**140**

Source goetzpartners Research estimates. Warning Note: Forecasts are not a reliable indicator of future results or performance. The return may increase or decrease as a result of currency fluctuations.

Preclinical Programmes

IMP761 is an antibody against LAG-3, designed to target auto-reactive memory T cells with potential to be used in the treatment of autoimmune diseases. Recently, significant progress has been made in cell line development, with a stable CHO cell line established which can produce high product yields of the drug. Immutep are now working on preparations for the GMP compliance development phase for clinical testing to begin.

Financial models

FIGURE 19: Immutep profit and loss model

Profit & Loss Statement	2018A	2019A	2020E	2021E	2022E	2023E	2024E	2025E	2026E
Jun YE (A$k except EPS)	30-Jun-18	30-Jun-19	30-Jun-20	30-Jun-21	30-Jun-22	30-Jun-23	30-Jun-24	30-Jun-25	30-Jun-26
Revenue	**7,353**	**7,490**	**13,047**	**10,400**	**22,046**	**44,782**	**27,338**	**170,311**	**202,280**
growth	74%	2%	74%	(20%)	112%	103%	(39%)	523%	19%
License income	2,630	140	7,600	4,019	17,624	40,192	22,532	168,114	196,374
% sales	36%	2%	58%	39%	80%	90%	82%	99%	97%
growth			5337%	(47%)	339%	128%	(44%)	646%	17%
Other income	4,723	7,350	5,447	6,381	4,422	4,590	4,807	2,197	5,906
% sales	64%	98%	42%	61%	20%	10%	18%	1%	3%
growth	12%	56%	(26%)	17%	(31%)	4%	5%	(54%)	169%
R&D and intellectual property	(9,990)	*(16,591)*	(19,500)	(13,368)	(13,886)	(14,553)	(6,389)	(17,971)	(29,278)
% sales	136%	222%	149%	129%	63%	32%	23%	11%	14%
growth	33%	66%	18%	(31%)	4%	5%	(56%)	181%	63%
Corporate administrative expenses	(7,242)	(6,366)	(6,493)	(6,623)	(6,756)	(6,955)	(4,702)	(8,850)	(11,467)
% sales	98%	85%	50%	64%	31%	16%	17%	5%	6%
growth	67%	(12%)	2%	2%	2%	3%	(32%)	88%	30%
D&A expenses	(1,809)	*(1,880)*	(1,699)	(1,597)	(1,461)	(1,363)	(1,320)	(1,247)	(1,297)
% sales	25%	25%	13%	15%	7%	3%	5%	1%	1%
growth	6%	4%	(10%)	(6%)	(9%)	(7%)	(3%)	(6%)	4%
Other external expenses	(1,057)	(1,958)	(1,146)	(1,318)	(1,516)	(4,908)	(2,005)	(2,306)	17,678
% sales	14%	26%	9%	13%	7%	11%	7%	1%	(9%)
growth	41%	85%	(41%)	15%	15%	224%	(59%)	15%	(867%)
Total costs & operating expenses	**(20,098)**	**(26,795)**	**(28,839)**	**(22,907)**	**(23,619)**	**(27,779)**	**(14,416)**	**(30,374)**	**(24,363)**
EBIT	**(12,744)**	**(19,305)**	**(15,792)**	**(12,507)**	**(1,573)**	**17,003**	**12,922**	**139,938**	**177,917**
Interest expenses	-		-	-	-	-	-	-	-
Profit/Loss before tax	**(12,744)**	**(19,305)**	**(15,792)**	**(12,507)**	**(1,573)**	**17,003**	**12,922**	**139,938**	**177,917**
growth	26%	51%	(18%)	(21%)	(87%)	(1181%)	(24%)	983%	27%
% sales	(173%)	(258%)	(121%)	(120%)	(7%)	38%	47%	82%	88%
Income tax	(2)	-	-	-	-	-	(1,292)	(27,988)	(53,375)
Tax rate	0%	0%	0%	0%	0%	0%	10%	20%	30%
Net income/loss	**(12,746)**	**(19,305)**	**(15,792)**	**(12,507)**	**(1,573)**	**17,003**	**11,630**	**111,950**	**124,542**
EPS calculation									
Earnings per Share (Basic)	**(0.005)**	**(0.006)**	**(0.003)**	**(0.003)**	**(0.000)**	**0.004**	**0.002**	**0.023**	**0.026**
growth	18%	23%	(44%)	(23%)	(87%)	(1181%)	(32%)	863%	11%
Underlying EPS (Basic)	**(0.006)**	**(0.008)**	**(0.004)**	**(0.004)**	**(0.001)**	**0.004**	**0.002**	**0.023**	**0.021**
Earnings per Share (Diluted)	**(0.005)**	**(0.006)**	**(0.003)**	**(0.003)**	**(0.000)**	**0.004**	**0.002**	**0.023**	**0.026**
growth	18%	23%	(44%)	(23%)	(87%)	(1181%)	(32%)	863%	11%
Underlying EPS (Diluted)	**(0.006)**	**(0.008)**	**(0.004)**	**(0.004)**	**(0.001)**	**0.004**	**0.002**	**0.023**	**0.021**
Number of Shares (basic)	2,624,714	3,225,576	4,702,827	4,837,122	4,837,122	4,837,122	4,837,122	4,837,122	4,837,122
Number of Shares (diluted)	2,624,714	3,225,576	4,702,827	4,837,122	4,837,122	4,837,122	4,837,122	4,837,122	4,837,122

Source: Company data, goetzpartners Research estimates. Warning Note: Past performance and forecasts are not a reliable indicator of future results or performance. The return may increase or decrease as a result of currency fluctuations.

FIGURE 20: Immutep balance sheet model

Balance Sheet	2018A	2019A	2020E	2021E	2022E	2023E	2024E	2025E	2026E
Jun YE (A$k)	30-Jun-18	30-Jun-19	30-Jun-20	30-Jun-21	30-Jun-22	30-Jun-23	30-Jun-24	30-Jun-25	30-Jun-26
ASSETS									
CURRENT ASSETS	**28,643**	**23,542**	**30,862**	**19,809**	**19,319**	**27,204**	**32,965**	**137,814**	**238,115**
Cash and cash equivalents	23,476	16,568	23,601	12,402	11,764	19,499	25,106	129,797	229,938
GST receivable	171	268	273	279	284	290	296	301	308
Grant and other receivables	3,261	4,926	5,173	5,276	5,382	5,489	5,599	5,711	5,825
Other current assets	1,736	1,780	1,815	1,852	1,889	1,926	1,965	2,004	2,044
FIXED ASSETS	**18,356**	**17,000**	**15,995**	**14,650**	**13,679**	**13,266**	**12,552**	**13,073**	**12,859**
Tangible assets, net	26	53	79	107	138	173	210	251	297
Plant & Equipment	11	25	53	79	110	144	181	221	266
Computer	15	16	14	15	15	16	16	16	17
Furniture and fittings	0	12	13	13	13	13	14	14	14
Goodwill	110	110	110	110	110	110	110	110	110
Intangible assets, net	18,219	16,837	15,805	14,433	13,431	12,983	12,232	12,712	12,452
Patents	-	-	-	-	-	-	-	-	-
Intellectual property	18,219	16,837	15,805	14,433	13,431	12,983	12,232	12,712	12,452
TOTAL ASSETS	**46,999**	**40,541**	**46,856**	**34,459**	**32,998**	**40,470**	**45,517**	**150,887**	**250,974**
LIABILITIES									
CURRENT LIABILITIES	**3,853**	**5,299**	**5,405**	**5,513**	**12,322**	**12,434**	**12,549**	**12,666**	**12,785**
Trade payables	1,615	2,557	2,608	2,661	2,714	2,768	2,823	2,880	2,938
Borrowings	-	-	-	-	-	-	-	-	-
Current tax payable	-	-	-	-	-	-	-	-	-
Employee benefits	190	239	243	248	253	258	263	269	274
Other payables	2,048	2,503	2,553	2,604	2,656	2,709	2,764	2,819	2,875
Deferred revenue	-	-	-	-	6,699	6,699	6,699	6,699	6,699
NON-CURRENT LIABILITIES	**9,623**	**10,855**	**12,002**	**13,322**	**8,140**	**21**	**(4,671)**	**(9,063)**	**(33,439)**
Convertible note liability	6,646	7,643	8,789	10,107	11,624	13,367	15,372	17,678	-
Warrant liability	2,945	3,164	3,164	3,164	3,164	-	-	-	-
Employee benefits	32	48	49	50	51	52	53	54	55
Deferred tax liability	-	-	-	-	-	-	-	-	-
Deferred revenue, less of current portion	-	-	-	-	(6,699)	(13,397)	(20,096)	(26,795)	(33,493)
TOTAL LIABILITIES	**13,477**	**16,154**	**17,407**	**18,835**	**20,462**	**12,456**	**7,878**	**3,603**	**(20,653)**
EQUITY									
SHAREHOLDERS EQUITY	**33,522**	**24,388**	**29,449**	**15,624**	**12,536**	**28,014**	**37,639**	**147,284**	**271,627**
Contributed equity	213,233	221,092	241,945	240,627	239,111	237,586	235,581	233,275	233,077
Reserves	64,874	65,534	65,534	65,534	65,534	65,534	65,534	65,534	65,534
Accumulated losses	(244,585)	(262,238)	(278,030)	(290,537)	(292,109)	(275,106)	(263,476)	(151,526)	(26,984)
TOTAL LIABILITIES & SHAREHOLDERS' EQUITY	**46,999**	**40,541**	**46,856**	**34,459**	**32,998**	**40,470**	**45,517**	**150,887**	**250,974**
GEARING									
Gross debt	**9,591**	**10,807**	**11,954**	**13,272**	**14,788**	**13,367**	**15,372**	**17,678**	**-**
Total ST debt	-	-	-	-	-	-	-	-	-
Total LT debt	9,591	10,807	11,954	13,272	14,788	13,367	15,372	17,678	-
Cash and cash equivalents plus investments	**23,476**	**16,568**	**23,601**	**12,402**	**11,764**	**19,499**	**25,106**	**129,797**	**229,938**
Net debt/(cash)	**(13,884)**	**(5,761)**	**(11,647)**	**870**	**3,024**	**(6,132)**	**(9,734)**	**(112,119)**	**(229,938)**

Source: Company data, goetzpartners Research estimates. Warning Note: Past performance and forecasts are not a reliable indicator of future results or performance. The return may increase or decrease as a result of currency fluctuations.

FIGURE 21: Immutep cash flow model

Cash Flow Statement	2018A	2019A	2020E	2021E	2022E	2023E	2024E	2025E	2026E
Jun YE (A$k)	30-Jun-18	30-Jun-19	30-Jun-20	30-Jun-21	30-Jun-22	30-Jun-23	30-Jun-24	30-Jun-25	30-Jun-26
OPERATING CASH FLOW									
Payments to suppliers and employees	(13,572)	(19,553)	(27,320)	(21,346)	(22,194)	(33,153)	(19,833)	(35,865)	(29,805)
License income	2,630	140	7,600	4,019	17,624	40,192	22,532	168,114	196,374
Interest received	127	411	405	413	422	430	439	447	456
Tax received / paid	(2)	-	-	-	-	-	(1,292)	(27,988)	(53,375)
Miscellaneous income	1,004	1,047	-	-	-	-	-	-	-
Grant income	2,036	2,670	5,042	5,968	4,000	4,160	4,368	1,750	5,450
NET CASH USED IN OPERATING ACTIVITIES	**(7,777)**	**(15,286)**	**(14,273)**	**(10,946)**	**(148)**	**11,629**	**6,213**	**106,459**	**119,100**
CASH FLOW FROM INVESTING									
Payments for held-to-maturity investments	-	-	-	-	-	-	-	-	-
Proceeds from held-to-maturity investments	-	-	-	-	-	-	-	-	-
Payments for P&E and intangibles	(12)	(41)	(695)	(252)	(490)	(949)	(606)	(1,768)	(1,083)
Proceeds from disposal of P&E	-	-	-	-	-	-	-	-	-
Acquisitions, net of cash acquired	-	-	-	-	-	-	-	-	-
Net cash provided by investing activities	**(12)**	**(41)**	**(695)**	**(252)**	**(490)**	**(949)**	**(606)**	**(1,768)**	**(1,083)**
CASH FLOW FROM FINANCING									
Proceeds from issue of shares / options / warrants	19,724	8,786	22,000	-	-	-	-	-	-
Proceeds from borrowings	-	-	-	-	-	-	-	-	-
Repayment of borrowings	-	-	-	-	-	(2,945)	-	-	(17,876)
Transaction costs	(1,319)	(773)	-	-	-	-	-	-	-
Net cash provided by financing activities	**18,405**	**8,013**	**22,000**	**-**	**-**	**(2,945)**	**-**	**-**	**(17,876)**
Net change in cash and cash equivalents	10,616	(7,315)	7,033	(11,198)	(638)	7,735	5,607	104,691	100,141
Effect of exchange rate on cash and cash equivalents	623	408	-	-	-	-	-	-	-
Cash and cash equivalents, beginning of period	12,237	23,476	16,568	23,601	12,402	11,764	19,499	25,106	129,797
Cash and cash equivalents, end of period	**23,476**	**16,568**	**23,601**	**12,402**	**11,764**	**19,499**	**25,106**	**129,797**	**229,938**
Cash generation/(burn)	**(7,789)**	**(15,328)**	**(14,967)**	**(11,198)**	**(638)**	**10,680**	**5,607**	**104,691**	**118,017**

Source: Company data, goetzpartners Research estimates. Warning Note: Past performance and forecasts are not a reliable indicator of future results or performance. The return may increase or decrease as a result of currency fluctuations.

List of Figures

COMPANY DESCRIPTION

Immutep (known as Prima BioMed until November 2017) is an Australian clinical-stage biotechnology company that develops immunotherapies for cancer and autoimmune diseases. Immutep is the global leader in the understanding of and in developing therapeutics that modulate Lymphocyte Activation Gene-3 ("LAG-3"). LAG-3 was discovered in 1990 at the Institut Gustave Roussy by Dr Frédéric Triebel, Immutep's Chief Scientific Officer and Chief Medical Officer. The company has three assets in clinical and one asset in preclinical development. The lead product candidate is eftilagimod alpha ("efti"), a first-in-class antigen presenting cell ("APC") activator being investigated in combination with chemotherapy or immune therapy for advanced breast cancer and melanoma. Immutep is dual-listed on the Australian Stock Exchange ("IMM") and on the NASDAQ Global Market ("IMMP") in the US (American Depository Receipts), and has operations in Europe, Australia, and the US. The company has licensing deals with Novartis, GSK and EOC (China only), and clinical trial collaboration and supply agreements with Merck & Co. and Merck KGaA / Pfizer, the latter for lead asset efti.

SCENARIOS

Base Case - GP Investment Case
Immutep generates further clinical data on efti and secures an outliciensing deal over the next 12-18 months.

Bluesky Scenario
N/A

Downside risk
Company is unable to generate further positive data on efti and fails to achieve licensing deal.

Peer Group Analysis

SWOT

Strengths: Leader in the understanding of LAG-3; broadest LAG-3 focused pipeline; validation from large pharma partners (Novartis, GSK, Merck & Co.); funded for >12 months.

Weaknesses: One single asset (eftilagimod alpha) accounts for the lion share of value; efti has not demonstrated convincing efficacy in monotherapy settings; efti is protected mainly by use and formulation patents, as the composition of matter patent has already expired.

Opportunities: LAG-3 could become the third pillar in immune checkpoint therapy and efti is the most advanced LAG-3 focused asset; efti could be the first immuno-oncology drug to be approved for metastatic breast cancer; oncology drugs addressing high unmet needs often enjoy shorter development and approval timelines than therapeutics in other disease areas; significant M&A activity in the immuno-oncology space.

Threats: EMA and FDA raise the hurdles for immunotherapy drugs.

INDUSTRY EXPECTATIONS

Immutep is developing immunotherapies for cancer, with a focus on the immune checkpoint LAG-3. The immune checkpoint inhibitor ("ICI") class has experienced rapid adoption since the launch of BMS's Yervoy (ipilimumab) in 2011, owing to their ability to elicit durable responses in 20 - 50% of patients for up to 10 years. The global ICI market was worth $16.8bn in 2018 and is expected to nearly triple by 2022E, driven largely by expanding use of existing therapies both in approved and new indications. The race is on to develop novel compounds with complementary mechanisms of action for combination therapy able to augment response rate without increasing toxicity, which, if successful, are expected to enjoy rapid uptake.

Important Disclosures: Non-Independent Research

Analyst Certification

I, Dr. Chris Redhead, hereby certify that the views regarding the companies and their securities expressed in this research report are accurate and are truly held. I have not received and will not receive direct or indirect compensation in exchange for expressing specific recommendations or views in this research report.

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- (GLAXOSMITHKLINE PLC (GSK LN))
- (INCYTE CORP (INCY US))
- (INNOVENT BIOLOGICS, INC. (1801 HK))
- (MACROGENICS INC. (MGNX US))
- (MERCK & CO., INC. (MRK US))
- (MERCK KGAA (MRK GR))
- (NOVARTIS AG (NOVN SW))
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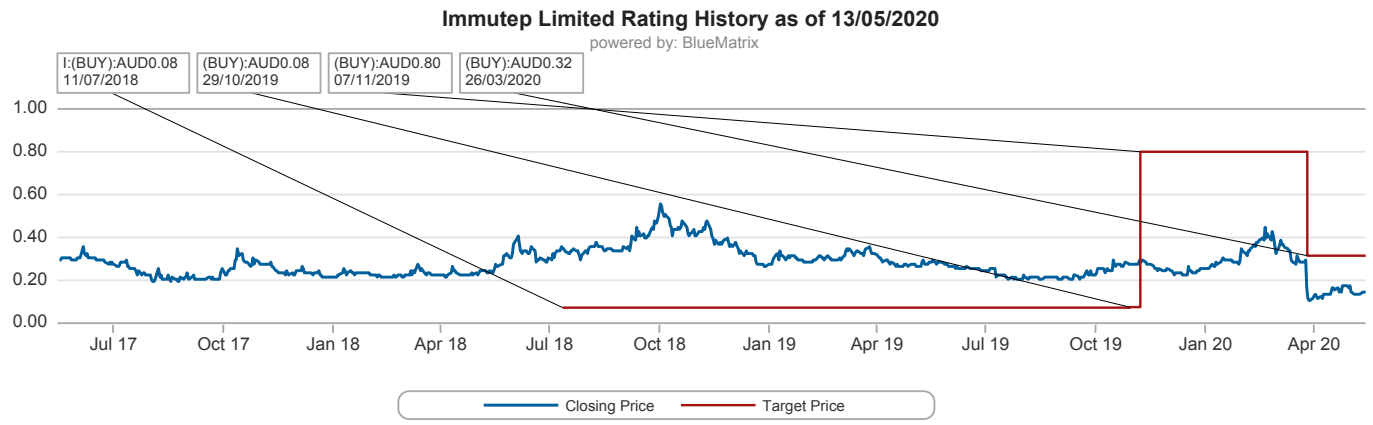

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goetzpartners securities Limited
The Stanley Building, 7 Pancras Square, London, N1C 4AG, England, UK.

Tel: +44 (0)203 859 7725

www.goetzpartnerssecurities.com