AVACTA GROUP LTD

UPDATE II: PART III

24.06.2020

Ticker:	**AVCT.L**
Price (p):	**139.0**
Shares in issue (m):	**248.8**
Market cap. (£m):	**345.8**

Introduction

This note is the third and final instalment of our Update Note (2) on Avacta Group. All notes viewable here:

https://aimchaos.com/

We published our original Investment Thesis on Avacta Group ('Avacta') on 1 March 2020. The core to our thesis was the Company's work in the area of cancer therapeutics – in immuno-oncology, chemotherapy and ultimately, a combination of them both. We detailed how that by some point next year, the Company will have completed, at the minimum, a Phase I human trial for its pre|CISION platform (targeted chemotherapy), and potentially a similar trial for an immunotherapy based on its Affimer platform. The Investment Thesis proposed that if either of those platforms were successful in their first respectively trials, Avacta would rapidly achieve a billion-pound valuation. If *both* were successful, and then combined into a novel 'Affimer-drug conjugate' platform which was *itself* successful in human trials (we suggested results from such a trial would be available by end 2022), then a *multi*-billion-pound valuation would be quickly realised.

Over the past three and a half months, the coronavirus pandemic has materially affected Avacta's business strategy. As we have detailed in previous notes, the Company is using its Affimer technology to develop various types of antigen tests for COVID-19. So far, it has announced that it is developing a point-of-care ('POC') lateral flow test ('LFT') that will give a result within ten minutes; and a rapid test designed for processing in mass spectrometers ('BAMS test'). The first LFT prototype has now been developed and is currently undergoing optimisation work in the lab; whilst the BAMS prototype is already being evaluated and optimised using live patient samples in the hospital setting. Avacta has stated that it is already in discussions with manufacturers and government in advance of commercialisation of both products.

In May, the Company stated that there is also the potential to use the Affimer reagents that are being incorporated into the aforementioned tests, in a neutralising therapy for SARS-CoV-2 (the virus that causes the coronavirus disease – which is itself known as 'COVID-19'). Neutralising therapies can be used either to treat already infected patients, by limiting disease progression; or as a prophylactic, providing temporary passive immunity to those most at risk of exposure to the virus, such as healthcare workers.

As a result of these three workstreams that are each focussed on assisting in the war against the coronavirus pandemic, Avacta stepped into the limelight of the UK public markets. From a price of 21.75p at end March, the Company shares hit an intraday high of 215p on 27 May. In the wake of this ~900% rise, Avacta determined to raise a further £25m in new equity. The order book was multiple times oversubscribed: management ultimately took £48m which, in addition to the £8.8m raised in early April, gives the Company sufficient cash to operate a significantly accelerated and expanded programme for its Therapeutics division, as well as to launch multiple products (including the COVID-19 tests) within its Diagnostics division.

In short, Avacta's fortunes have been transformed over the past three months. We stated in our original Investment Thesis our belief that the Company could ultimately achieve a multi-billion-pound valuation within three years. We now propose that, as a result of both its very near-term, potentially gargantuan revenues that

could be generated from COVID-19 test sales, and its rapidly accelerated cancer therapeutics programme, that target could be achieved in 2021.

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This is the final instalment of our three-part Update Note on Avacta. We first set out our valuation analysis for the Company. We then provide our updated Investment Thesis. To summarise, we believe that there are four key value inflection points for Avacta that could potentially all occur before end 2021:

i) Multi-hundred-million-pound sales of the COVID-19 antigen tests

ii) Successful Phase I trial for the first pre|CISION pro-chemotherapy

iii) Successful Phase I trial for the first Affimer-based therapeutic

iv) Successful Phase I trial for the first TMAC drug conjugate

If just one of those inflection points were to occur, we feel that Avacta could very quickly achieve a billion-pound valuation. If two or three of them were to occur, we feel that a multi-billion-pound valuation would very quickly be realised. Were *all four* inflection points to be met, we believe that the sky would be the limit for Avacta.

Valuation Analysis: Diagnostics Division

Early stage biotech and pharma companies are notoriously difficult to value, as a result of their idiosyncratic products under development. We have opted to use a blend of intrinsic and relative valuation analysis methodologies in order to calculate fair values for Avacta's assets, operations and partnerships, which we then use to derive a sum-of-the-parts valuation for the Company as a whole. We provide a current base case valuation, as well as various upside valuation scenarios.

Our valuation analysis on Avacta is entirely independent and has not received any guidance from management. Please see our full disclosure at the end of this note.

Overview

Since we published our original Investment Thesis on 1 March 2020, the Diagnostics division's position – and value – has improved drastically. Firstly of course, it is now developing at least two types of COVID-19 antigen test. These have the potential to generate very near-term revenue on a scale that would be entirely transformational for Avacta. Moreover, the success of Affimer reagents in COVID-19 tests should drive increased interest in the Diagnostics division's wider product and service offerings.

Secondly, the division has completed its first four proprietary diagnostic assays, which are now available for potential licensees to evaluate for clinical assay development. A further two are nearing completion of development. These ready-made "off-the-shelf" assays should enable a much faster route to commercial license deals, as potential partners would not be required to commission Avacta to carry out the evaluation process for the desired assay first. In short, the proprietary assays should supercharge the division's revenue growth.

Finally, the Diagnostics division has received a £10m cash injection, courtesy of the £48m equity raise earlier this month. This will enable it to expand and accelerate all workstreams within the division, as well as bolster its senior management team.

Non-COVID-19 products and services

In its 2019 Financial Results presentation (p.21), Avacta highlighted the global market sizes for its six most developed in-house Affimer diagnostic tests.[1] It estimated that in 6-7 years, these markets alone would be valued at circa $18.5 billion (or ~£15bn). Were its licensee customers to secure just 1% of these global markets using Affimer-based diagnostics, that would amount to revenue of ~£150m. At a royalty rate of 5% to 10%, that would amount to annual royalties to Avacta of £7.5m to £15m.

The Company already has 29 customer evaluations at varying stages ongoing with diagnostics partners, including four out of the top ten global diagnostics businesses. As we detailed in our original Investment Thesis (p.4), these could range in deal value to Avacta (including both licensing fees and royalties) from several hundred thousand pounds per annum (as we believe to be the case with the division's first licensee customer, New England Biolabs) to as much as £1m pa.

In our original Investment Thesis, we suggested the following:

AIM peer Bioventix is an ideal publicly listed comparable for Avacta's Diagnostics division. Bioventix manufactures and supplies high affinity sheep monoclonal antibodies for use in diagnostic applications such as clinical blood testing. In short, it does exactly what Avacta's Diagnostics division does, but with antibodies.

Bioventix's current market capitalisation is £221m. In FY 2019, it posted a profit-before-tax ('PBT') of £7.0m, on revenue of £9.3m. Its gross margin was 90.6%, and its PBT margin, 75.0%.

[1] https://avacta.com/wp-content/uploads/2020/05/Avacta-Group-plc-Prelim-Results-Shareholder-Meeting-2020.pdf

The shares trade on a trailing price-sales ratio ('PSR') of 23.7x, and a trailing price-earnings ratio ('PER') of 37.9x. Using consensus market forecasts, the shares trade on a 2020 PSR of 21.8x, and a 2020 PER of 34.1x.

Given that Avacta's Diagnostics division is lossmaking at present, only Bioventix's PSR metrics are relevant.

In FY 2019, the combined revenue and order book for the Diagnostics division amounted to £1.33m. This was an increase of 160% year-on-year ('YoY'), from £0.51m in 2018.

If this growth were maintained, the division's revenue and order book at end 2020 would be £3.45m. Conservatively assuming that revenue and order book growth rate in FY 2020 were to decelerate by half – to 80% YoY growth – the division would be still be generating circa £2.4m in sales.

On Bioventix's forward PSR ratio, Avacta's Diagnostics division would be valued at **£52.4m**.

However, the in-house assays could rapidly accelerate the Diagnostics division's revenue growth. If each were to secure a 0.5% market share over the next three years, it could result in additional revenue to Avacta of circa £5m.

Moreover, within that period, the 29 currently ongoing evaluations with customers will all likely be concluded. If we assume that 15 of them result in licensing deals at £0.3m pa, that would result in a further £4.5m pa in very high margin revenue for Avacta.

In summary, through a combination of paid-for evaluations (conversions of ongoing, and securing of new); the licensing out of the recently established in-house reagents portfolio; and the provision of bespoke Affimer binders in easy, 'turn-key' projects – we believe that within three years, the Diagnostics division could be generating at least £10m in annual revenue.

Exhibit 1: valuation ranges for the Diagnostics division (non-COVID-19)	**Forecast revenue (£m)**	**Valuation (£m)**	**Valuation (pps)**
Base case valuation (end 2020)	2.4	52.4	21.1
3-year bull case scenario	10.0	218.4	87.8

Partnership with Medusa19 offers further upside

We examine Avacta's direct-to-consumer ('DTC') distribution agreement with Medusa19 Ltd ('Medusa') in detail on p.8 of our Update Note, 23.05.2020. At present, it appears that Medusa is solely focussed on marketing and selling Avacta's COVID-19 lateral flow test ('LFT'). However, in the RNS (20.05.2020) detailing the partnership, both parties referenced Medusa being the DTC distributor of "*other consumer diagnostic tests that Avacta develops in the future*".

This is highly significant: evidently Avacta intends to develop not just a range of diagnostic assays available for licensing, but in fact a portfolio of diagnostic devices that will be sold directly to consumers. The DTC market for medical devices is nascent but, as we referenced in our 23.05.2020 Update Note, could be set for explosive growth in the wake of the coronavirus pandemic. Via Medusa as its DTC distributor, revenues for Avacta's Diagnostics division could dwarf even our above quoted 3-year bull case scenario.

COVID-19 lateral flow test

In two of our previous notes, we have extensively detailed the urgent global need for a point-of-care test for COVID-19 that provides a relatively accurate result within minutes. We have proposed that were such a test available, there could quite easily be global demand for several billion units per annum (see pp.3-4 of the first instalment of this Update Note, 23.05.2020). This view is supported by industry participants themselves: in an online panel discussion last week that included Avacta's Head of Diagnostics, David Wilson, as well as two members of Cytiva's senior management, it was suggested that as many as 23 million tests *per week* would be required for "lower and middle income countries" alone over the next 12 months.

It is extremely difficult to derive a fair value for Avacta's LFT at this point in time, given the number of variables that exist. That is why neither the Company nor any of its brokers have yet provided detailed forecasts to the market.

The limited information that has been relayed in Company presentations to date is:

- Wholesale price: $15 per unit
- Retail price: $30 per unit
- Cost of manufacture: $1 to $2 per unit

Using these figures as a guide, and making several of our own assumptions, we have constructed a discounted cash flow ('DCF') model that demonstrates only one year of sales of LFTs, commencing at the start of September (although we think that sales could commence in early August). We are modelling only one year of sales to account for the uncertainty around the virus – notably regarding its continued virulence and efforts in vaccine development.

For the sake of simplicity, in our modelling we use an average price of £10 for all units sold, and a cost of manufacture of £1 per unit.

For all aspects of distribution – including sales and marketing, logistics and delivery, and customer support and post-market surveillance – we assume a cost of £5 per unit.

Finally, we assume an average 25% profit pay-away to commercial partners.

This results in a pre-tax profit per unit to Avacta of £3.

We assume a build-up in monthly sales as follows:

Exhibit 2: monthly sales of LFTs

Month	Unit sales (m)	Month	Unit sales (m)
September '20	5	March '21	50
October '20	10	April '21	50
November '20	20	May '21	50
December '20	30	June '21	50
January '21	40	July '21	50
February '21	50	August '21	50

The cumulative total amounts to 445 million tests sold over the 12-month period.

The key variables in our view are:

- Probability of successful development, approval, and commercialisation
- Speed at which a vaccine is successfully developed and administered wholesale
- Probability of the virus 'dying out' or herd immunity being achieved

In our first instalment of this Update Note (23.05.2020) (p.4), we detailed why we see a very low probability of failure in Avacta successfully commercialising its LFT from this point in time. As we stated: "*The technical risk of developing the reagent has been overcome; and so great is the pan-global need of a POC antigen test that we believe regulatory approval will be fast-tracked.*"

Our view has not changed. However, for the sake of remaining conservative, we have opted to apply a 50% execution risk within our modelling. Once CE Marking has been received, this will be reduced to 20%; and once revenues from the first 5 million units have been received, it will be removed.

There are over 150 vaccinations under development for COVID-19 worldwide with now over a dozen in human trials. Of these, the US Department of Health and Human Services has singled out five leading vaccines, namely those being developed by: Moderna; a consortium of Oxford University and AstraZeneca; Johnson & Johnson; Merck; and Pfizer.

The Oxford consortium's vaccine is presently the most advanced: data is expected from its currently ongoing Phase II/III trial as early as mid-August. If it is positive, mass distribution would begin as early as October. Were any of the other four developers successful in their trials, mass distribution of their vaccines would begin anytime from January to April 2021.

It is difficult to estimate the probability of a successful vaccination being developed. The timeframes at which programmes are being fast-tracked is wholly unprecedented in the history of vaccinations. For example: in its original estimation of the probability of success of its Phase II/III trial, the Oxford consortium stated 80%. However, on 23 May, as it was becoming apparent that the virus was waning rapidly in the UK (where the Oxford vaccine is being trialled), Oxford stated that there was a 50% chance that the test would yield no result at all. This effectively reduces the chances of its vaccination being rolled out in the UK in October to 40%.

It is also extremely challenging to predict how rapid it will be to achieve wholesale population vaccination on a global scale. AstraZeneca, a partner of the Oxford consortium, has so far put in place manufacturing capacity (a combination of in-house and via partnerships) to produce two billion doses per annum. Pre-clinical data for the consortium's vaccine suggests that patients will require a booster jab, and that immunity will last for approximately one year. With its current manufacturing capacity, the Oxford consortium could only inoculate one billion people, or ~13% of the world's population.

With regards to the probability of the virus 'dying out', the data being reported from across the globe are too conflicting to arrive at any concrete conclusions. Many nations have proved extremely effective at shutting down the virus through a range of lockdown and social distancing measures. Conversely, reported new cases on a global basis continue to increase (the daily average over the past five days is 160k), as many poorer nations cannot afford to enforce such measures.[2] On the subject of herd immunity, wholesale population testing is still not being implemented on a scale large enough to determine whether herd immunity has been achieved. There is also conflicting evidence concerning whether antibodies actually provide a robust immunity to a second infection, and for how long.[3]

[2] Using an average from the following three sources:
https://covid19.who.int/?gclid=EAIaIQobChMIgseVgcrW6QIVEWHmCh0t3gHHEAAYASAAEgJgQPD_BwE;
https://www.worldometers.info/coronavirus/;
https://ourworldindata.org/grapher/daily-cases-covid-19

[3] e.g. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7263513/;
https://www.scmp.com/news/china/science/article/3089476/there-may-be-no-immunity-against-covid-19-new-wuhan-study

We model a 50% discount into our DCF valuation for Avacta's LFT, to account for both the possibility of a vaccine being rapidly developed (and manufacturing facilities being rapidly scaled up), and for the virus simply fading away. We refer to these combined possibilities as 'market risk'.

We apply a nominal 10% discount rate to cash flows.

Exhibit 3: assumptions used in DCF model for LFT sales	
Average sales price per unit (£)	10
Cost of manufacture per unit (£)	1
Cost of sales and distribution per unit (£)	5
Profit share paid out (%)	25
Pre-tax profit per unit (£)	3
Corporation tax (%)	19
Discount rate applied (%)	10
Market risk (%)	50
Execution risk (pre-approval) (%)	50
Execution risk (post-approval, pre-sales) (%)	20

Exhibit 4: summary of DCF model for LFT sales	
Unlevered free cash flows over 12 months (£m)	1,081.4
Net present value ('NPV') of free cash flows over 12 months (£m)	999.7
Risked NPV, pre-approval (£m)	249.9
Risked NPV, post-approval (£m)	399.9
Risked NPV, post-first 5 million of unit sales (£m)	499.9
Avacta: shares in issue (m)	248.8
Risked NPV per share, pre-approval (p)	100.5
Risked NPV per share, post-approval (p)	160.7
Risked NPV per share, post-completion of first 5m unit sales (p)	200.9
Unrisked NPV per share, post-completion of first 5m unit sales (p)	401.8

We note that the only broker forecast in the market at present (Zeus Capital, 19.05.2020 Initiation Note) is significantly more bullish: Zeus suggests annual pre-tax profit to Avacta for LFT sales in *just the EU and US* of up to $1.6bn (or £1.3bn). Our own pre-tax profit to Avacta on *global* sales is £1.34bn.

We also believe there is *substantial* upside to our forecasts. For example, if we were to increase the average sales price (across both wholesale and retail channels) by 50%, to £15 per unit, our model calculates unlevered free cash flows over 12 months of £2.43bn, or 978p per share. If this seems excessively bullish, we remind readers of the price points that Avacta itself has initially indicated ($15 for wholesale, $30 for retail).

COVID-19 BAMS test

The partnership between Avacta and Adeptrix, announced to the market on 1 May, has moved extremely rapidly. The two companies are combining their respective proprietary technologies – namely Avacta's Affimers and Adeptrix's bead-assisted mass spectrometry ('BAMS') – to develop a rapid SARS-CoV-2 antigen test (for more detail see pp.10-11 of our Update Note, 23.05.2020).

Less than six weeks after the formation of the collaboration, Avacta announced that the partners had successfully developed a "*highly specific prototype test that detects the virus spike protein at clinically relevant concentrations*." The partners intend to carry out additional work, including testing Affimer reagents to other SARS-CoV-2 antigens such as the nucleocapsid protein, in order to further improve the specificity and sensitivity of the test.

In the 9 June update, Avacta also stated the pathway to commercialisation:

"*The next step… is to evaluate and optimise the BAMS assay using patient samples at laboratory sites in the UK and US which will be done imminently before moving to manufacturing, clinical validation to quantify the sensitivity and specificity and CE/FDA approval for professional use in the summer*."

In the same manner as we have done with Avacta's LFT, we have built a 13-month DCF model for sales of the BAMS test. Avacta has provided no commercial details to the market, other than the fact that it will receive a royalty on the sales of BAMS test kits by Adeptrix, and that a single mass spectrometer ('MS') will process up to 1,000 tests per day. Consequently, our financial forecasts are highly speculative.

We assume an average unit selling price of £10, and a royalty due to Avacta on gross sales of 20%.

We assume a build-up in monthly sales as follows:

Exhibit 5: monthly sales of BAMS tests			
Month	**Unit sales (m)**	**Month**	**Unit sales (m)**
		February '21	6
August '20	1	March '21	6
September '20	2	April '21	6
October '20	4	May '21	6
November '20	5	June '21	6
December '20	6	July '21	6
January '21	6	August '21	6

We assume first sales will commence in August, following CE Marking / FDA Approval in July. We have modelled for peak sales being reached in the fifth month (December) and then maintained until end August 2021 (for the same reasons as we have already stated regarding the LFT rollout).

The cumulative total amounts to 66 million tests sold over the 13-month period.

Our rollout modelling is based on each MS processing 800 tests per day, 25 days per month. At peak sales, we assume 300 MSs worldwide are being used to process Avacta's and Adeptrix's COVID-19 BAMS tests.

There is very limited data in the public domain on global numbers of MSs. However, as an important tool in numerous branches of medicine, they are commonplace in hospitals and laboratories across the world. Bearing in mind that there are over 1,200 hospitals in the UK and over 6,100 hospitals in the US alone, we believe that a peak sales assumption that is based on only 300 MSs processing COVID-19 BAMS tests is extremely conservative.

We assume a lower execution risk for the BAMS test, in comparison to the LFT. This is as a result of the BAMS test already having been developed into a 'highly specific prototype', as well as the fact that Adeptrix has used Affimers in other BAMS tests that it has successfully developed in the past.

Exhibit 6: assumptions used in DCF model for BAMS test sales	
Average sales price per unit (£)	10
Gross royalty due to Avacta (%)	20
Pre-tax profit per unit to Avacta (£)	2
Corporation tax (%)	19
Discount rate applied (%)	10
Market risk (%)	50
Execution risk (pre-approval) (%)	20
Execution risk (post-approval, pre-sales) (%)	10

Exhibit 7: summary of DCF model for BAMS test sales	
Unlevered free cash flows over 13 months (£m)	106.9
Net present value ('NPV') of free cash flows over 13 months (£m)	99.6
Risked NPV, pre-approval (£m)	39.9
Risked NPV, post-approval (£m)	44.8
Risked NPV, post-first 5 million of unit sales (£m)	49.8
Avacta: shares in issue (m)	248.8
Risked NPV per share, pre-approval (p)	16.0
Risked NPV per share, post-approval (p)	18.0
Risked NPV per share, post-completion of first 5m unit sales (p)	20.0
Unrisked NPV per share, post-completion of first 5m unit sales (p)	40.0

Again, in comparison to existing broker guidance in the market (being solely that of Zeus Capital, 19.05.2020), our forecast cash flows are very conservative. Zeus suggests annual (pre-tax) royalties to Avacta of $288m against our £132m. Zeus also states that "the installed base of MSs is estimated to be many 100,000s" and that therefore Avacta's royalty income could "easily multiply up".

Valuation Analysis: Therapeutics Division

Overview

The Therapeutics division has two core platforms: the Affimer platform and the pre|CISION platform. It is also developing a hybrid platform – "TMAC" – that incorporates the technologies of both Affimers and pre|CISION to develop powerful drug conjugates.

All three platforms are at pre-clinical stage – that is to say, no therapeutic developed through any of them has yet been tested in humans. This naturally entails a considerable degree of risk from here in successful development and commercialisation for each of them. Conversely, the very fact that they *are* platform technologies (as opposed to individual therapeutics that many junior biotech and pharma companies focus on developing) makes them potentially *extremely* valuable, owing to the multitude of therapeutics that they each could ultimately develop.

For example, if an Affimer-based monotherapy (a relatively simple therapeutic) were to be proved safe in Phase I human trials, this would enable the development of countless other therapies that are based on Affimer proteins – not just in the field of cancer treatment, but in therapies to treat autoimmune and inflammatory diseases, viruses, etc. We would argue that the efficacy of the monotherapy itself in the Phase I trial would in fact be of secondary importance: even if the therapeutic itself were to prove inferior to existing antibody-based products already on the market, the fact that the Affimers were safe and stable in man would be a tremendous value inflection point that would provide the confirmation required to fast-track multiple other Affimer-based therapies into clinic.

For this reason, we have opted to focus more on the value of the individual platforms, rather than on specific therapeutics being developed on each platform.

The Affimer platform

The Company has numerous Affimer-based therapeutics in pre-clinical development, some of which we cover extensively in our Investment Thesis (pp.7-10, 20-21). The publicly disclosed candidates are:

Exhibit 8: proprietary Affimer-based therapeutic pipeline
Immunotherapies
AVA004 (PD-L1 inhibitor – monotherapy)
AVA017 (LAG-3 inhibitor – monotherapy)
AVA021 (PD-L1 and LAG-3 inhibitor – bispecific therapy)
AVA027 (PD-L1 and TGF-β inhibitor – bispecific therapy)
Unnamed (PD-L1 and cytokine inhibitor – bispecific therapy)

As a result of the now saturated market, Avacta's two leading monotherapies – the PD-L1 inhibitor AVA004, and the LAG-3 inhibitor AVA017 – do not hold much commercial value as standalone assets. For that reason, we believe that neither will be brought to clinic as monotherapies. Instead, the Company will likely move straight into a Phase I trial for one of its Affimer-based bispecific immunotherapies, or possibly even for one of its TMAC drug conjugates.

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Although we have opted to value the Affimer technology as a *platform*, instead of ascribing values to each Affimer-based therapeutic under development, it is still worth noting the sort of valuations being attributed to antibody-based equivalent therapies.

The bispecific therapy AVA021 is Avacta's lead high-value drug on the Affimer(-only) platform. Bispecific immunotherapies are a newer subclass of drug, and consequently the competition in the space is, at least for the present, less intense. In 2018, the global market for immune checkpoint inhibitor therapies amounted to $17bn. 83% of that was attributable to antibody-based monotherapies that targeted PD-1 / PD-L1 checkpoints. [The leading monotherapy by global sales in 2018 was Merck's Keytruda, at $7.2bn.]

Bispecific immune checkpoint inhibitor therapies have proved to have a higher efficacy in animal models than immune checkpoint inhibitor *monotherapies*: consequently, assuming successful human trials, it would be reasonable to envisage that the more potent bispecific therapies will rapidly carve out for themselves a significant share of the market. Moreover, bispecific therapies could also substantially *expand* the immune checkpoint inhibitor global market. Firstly, the subclass of treatment could be used on cancer patients who have hot tumours but do not respond to simple monotherapy treatments. Secondly, it could be used on patients who have relapsed following monotherapy treatment.

The most advanced bispecific therapy under development is an antibody-based version of AVA021, owned by F-star Biotechnology. The therapy, named FS118, is in the final stages of completing its Phase I human trial. Although the commercial deal has now been cancelled, US pharmaceutical giant Merck had been willing to commit over €1bn in upfront and milestone payments to F-star for exclusive commercial rights over five of F-star's pre-clinical drugs, including its lead candidate, FS118.

Importantly, Avacta's AVA021 isn't far off on the development pathway than where FS118 was, when Merck and F-star entered into the pre-clinical €1bn deal. Furthermore, an Affimer-based bispecific therapy would enjoy several key advantages over an antibody-based one such as F-star's SS118 (notably greater ease of formatting and lower cost of manufacturing).

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A successful Phase I human trial will demonstrate the efficacy – and crucially, the safety profile – of the Affimer technology as a whole. We consider this to be a critical value inflection point for Avacta: it will validate its proprietary pipeline of Affimer-based therapeutics, as well as the technology's viability to existing and potential partners.

On this note, we would highlight Avacta's ongoing efforts in securing a partner to develop a neutralising Affimer ('NAf') therapy for COVID-19 (please see the second instalment of this Update Note for detailed analysis). Were the Company to prove successful in this endeavour, a Phase I human trial would very likely be carried out in H2 of this year. One partnership developing an neutralising therapy for COVID-19 (between Eli Lilly and AbCellera) commenced a Phase I trial at the start of June: results are expected by end June. As such, it is reasonable to assume that were Avacta to secure its own partner, it would have clinical data for its Affimer platform *before the end of this year*. Regardless of whether the NAf therapy itself is effective, securing safety data will act as the aforementioned critical value inflection point.

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Affimers are based on the naturally occurring human protein, stefin A: they constitute a 'protein scaffold' and are an alternative to antibodies (known as an 'antibody mimetic').

The Affimer platform is a therapeutic platform: it has the capacity to create a novel class of immuno-oncology, anti-inflammatory and many other types of therapeutic drugs that are based on Affimers, as opposed to the market standard, *antibodies*. As Affimers possess a number of key technical advantages over antibodies, the platform also has the capacity to *improve on* already existing antibody-based drugs. Given that antibodies currently dominate global drugs markets worth over $125bn – and forecast to exceed $200bn by 2023 – there is evidently

a colossal commercial opportunity for Avacta, if the Company can successfully prove the efficacy and safety profile of Affimer-based therapies in first-time-in-human trials.

The true commercial value of such a platform resides in the owner's – or licensee's – ability to operate freely in a market that is extraordinarily guarded by patents. An antibody mimetic platform can be used to recreate existing antibody-based drugs that are under patent, and then patent and commercialise the proprietary, non-antibody-based versions.

Big Parma has demonstrated that it is more than willing to pay Big Money for alternative protein scaffolds.

In June 2018, global pharmaceutical company Sanofi acquired Ablynx for ***a total equity value of €3.9 billion***, paid in cash. Ablynx owned an antibody mimetic platform, named Nanobody®, that – as with the Affimer technology – possesses a number of key advantages over standard antibodies. At the time, Ablynx was utilising its Nanobody platform to develop over 45 treatments, both in-house and via collaborations, for a broad range of therapeutic indications including across: haematology, inflammation, infectious disease, autoimmune disease, oncology and immuno-oncology. Its lead drug Caplacizumab, a treatment for a rare blood clotting disease, had passed its Phase III trial in late 2017. It has an estimated market opportunity of circa €800m. Caplacizumab gained FDA approval in the US in February 2019.

Within the Takeover Bid document was stated the reasons for the bid by Sanofi. We believe that it is highly relevant to understanding the blue-sky potential value of Avacta's Affimer platform technology, and so have copied it in, verbatim, below:

"*Sanofi and Ablynx had already entered into a collaboration to discover and develop certain multi-specific nanobodies against selected targets.*

Sanofi's R&D model and priorities are focussed on technology platforms such as Ablynx's Nanobody platform. Sanofi has particular interest in Ablynx's platform, since it has led to promising results within the framework of the collaboration agreement and it would provide Sanofi with an important strategic and competitive advantage in drug discovery.

The acquisition of Ablynx will enhance the Sanofi Group's strategy by contributing to sustaining leadership in rare diseases thanks to caplacizumab, Ablynx's most advanced product candidate.

Further, Ablynx's expertise will allow Sanofi to make great progress in the prevention and treatment of diseases Sanofi has been developing antibodies for.

Sanofi has a global footprint and a large R&D scale, which should allow Sanofi to accelerate the development and maximize the commercial potential of Ablynx's ongoing programmes, and to further leverage the platform with the introduction of new programmes.

The acquisition of Ablynx is expected to significantly broaden Sanofi's Specialty Care portfolio and its long-term R&D capabilities.

Thanks to its Nanobody platform and the quality of products currently in development, Ablynx constitutes a unique opportunity for Sanofi to accelerate its portfolio reshaping, sustain R&D innovation, and therefore enhance growth at Sanofi Group level."

Of course, Ablynx was several years ahead of Avacta with regard to platform development, at the time it was acquired. Avacta is yet to put its Affimer technology into a Phase I trial, whilst in contrast Ablynx had completed a Phase III trial for a drug that utilised its Nanobody technology. Nevertheless, it is clear from the above Takeover Bid statement why other pharma conglomerates might also wish to lay their hands on antibody mimetic technologies, such as the Affimer platform.

Indeed, at this juncture it is crucial to highlight another matter regarding the Sanofi-Ablynx takeover. Three weeks before Sanofi tabled its bid, in January 2018, Denmark's Novo Nordisk – another tier 1 multinational pharmaceutical company – had made a €2.6 billion offer for Ablynx, which was rejected. This demonstrates that there is at least one other player in Big Pharma that is on the look-out for an antibody mimetic platform. If we were to guess at other potential suitors, our first choice would be British-Swedish multinational pharmaceutical and biopharmaceutical company, AstraZeneca. It has significant equity holdings in two of Avacta's major

partners (namely Moderna and ADC) and has a major interest in both immuno-oncology and drug conjugates – two areas that Avacta's Affimer technology could significantly enhance.

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Besides Ablynx / Sanofi, we highlight three other companies that have developed alternative protein scaffolds, to be utilised in drug development. For the sake of brevity, we will not detail the mechanics of each platform, but recommend viewing p.26 of Avacta's February 2020 corporate presentation, which compares the key attributes of each platform against the Affimer technology.[4]

i) ***Molecular Partners*** (SIX listed, mkt cap: $505m)
The Swiss-based company is developing the DARPin platform, with its lead multi-specific candidate in Phase II trials.

ii) ***Bicycle Therapeutics*** (NASDAQ listed, mkt cap: $292m)
The company has used its eponymously named platform to develop various immuno-oncology ('IO') therapies. The first two – both being novel drug conjugates – are presently in Phase I trials.

iii) ***Pieris Pharmaceuticals*** (NASDAQ listed, mkt cap: $170m)
Pieris' proprietary platform is its Anticalin technology, which it is using to developing therapies focussed on two areas, namely IO and respiratory disease. In its IO division, its lead candidate is a bispecific compound that is currently in Phase I human trials.

Securing positive data in human trials is evidently a major value inflection point for developers of antibody mimetic platforms, with successful completion of each trial catalysing further step changes in value.

We suggest that Avacta's Affimer technology should currently be valued in line with the technology platforms of Bicycle and Pieris – as they likewise do not yet have positive data from human trials.

However, if and when positive data *is* attained, we believe that Avacta's Affimer platform should receive a premium valuation rating over competing antibody mimetics. Our rationale for this is that Affimers appear to be a best-in-class platform (see footnote 4, p.26). The Company is already set to receive potentially over half a billion dollars in milestone payments through three partnerships with industry heavyweights – critically, these partners entered into collaborations with Avacta despite Affimers having not yet been tested in man. The versatility of the Affimer platform is key: partners are using it in a broad array of therapeutics. LG Chem is developing Affimer-based drugs to treat autoimmune and inflammatory diseases; ADC Therapeutics is developing Affimer-based drug conjugates; Moderna, the global leader in cutting-edge mRNA, is developing an undisclosed therapeutic that involves Affimers (we assume instructing the immune system to self-generate Affimers); and Avacta's joint venture with Daewoong is developing the next generation of stem cell therapies that incorporate Affimer immune-modulators.

In short, the Affimer platform can be used in an immense scope of therapeutics. Consequently, we feel it appropriate to apply a 100% premium valuation rating to the peer group, once the platform has been proved safe in humans.

[4] https://avacta.com/wp-content/uploads/2020/02/Avacta-Group-February-2020.pdf

Exhibit 9: antibody mimetic platform valuations	**Enterprise value ('EV')**
Bicycle Therapeutics ($m)	195*
Pieris Pharmaceuticals ($m)	100**
Pre-human data average ($m)	**148**
Post-human data average (Molecular Partners) ($m)	**434*****
Avacta: shares in issue (m)	248.8
EV for Affimer platform, pre-human data (£m)	116.5
EV for Affimer platform, pre-human data (p)	46.8
EV for Affimer platform, post-human data (£m)	685.7
EV for Affimer platform, post-human data (p)	275.6

USD : GBP = 0.79
*Assuming $97m net cash.
**Assuming $70m net cash.
***Assuming $71m net cash.

Beyond that £686m target enterprise value for the Affimer platform (which, as we have already explained, could be achievable *this year*, were a NAf therapy for COVID-19 to progress into clinic), it is simple to see how the platform could be valued at many multiples of that in just a few short years. One need only consider the cash consideration of €3.9bn paid by Sanofi for Ablynx only two years ago – or the ~$125bn in global sales *per annum* of antibody-based drugs. Avacta has freedom to operate in developing alternative, Affimer-based therapies wherever there is already existing antibody-based IP. In essence, it has an almost *limitless market to target*.

…….

The pre\|CISION platform

Avacta's pre|CISION platform is, to our knowledge, unique. There are various forms of targeted therapy in the treatment of cancer, but none that work in the same manner as the pre|CISION platform.[5] As such, ascribing any accurate degree of value to the platform is exceedingly difficult. Avacta has targeted at least 11 off-patent (or soon-to-be-off-patent) chemotherapies, whose efficacy the pre|CISION technology can *materially* enhance.

Exhibit 10: proprietary pre|CISION-based therapeutic pipeline
Targeted chemotherapies
AVA6000 (pro-doxorubicin)
AVA3996 (pro-velcade)
Plus nine other pro-drugs

We will first present our valuation for pro-doxorubicin, calculated via DCF modelling and risk adjusted. This will enable us to then demonstrate the potential value of the pre|CISION platform as a whole.

The Company's strategy for its pre|CISION platform is to focus on off-patent (or soon-to-be-off-patent) chemotherapies. The platform can be used to essentially *reformulate* a well-established, proven drug that has been in widespread use for many years. [We do note however that the Company does not refer to the process as 'reformulation'.] Because of this, the regulatory process for taking the drug through clinic differs to that for a novel drug. A pre|CISION pro-chemotherapy would only be required to complete a Phase I human trial, followed by a Pivotal Phase II human trial (whilst a novel chemotherapy would be required to then move to a large scale Phase III trial that would include many hundreds, if not thousands, of patients likely spanning multiple countries). Given that the chemotherapy itself already works in man, the focus of the trials for the pre|CISION pro-drug being developed would therefore primarily be on the enhanced safety profile.

In short, the pro-drug would (theoretically) have a much higher probability of succeeding in Phases I and II trials and subsequently attaining regulatory approval, than would an entirely novel drug being brought to clinic. Accordingly, whilst the likelihood of approval ('LOA') for novel therapies from pre-clinical stage is ~10%, we assume that the LOA for a pre|CISION pro-chemotherapy will be 25%.[6]

We consider a successful completion of the first pre|CISION Phase I trial to be a major derisking event and increase our LOA from that point to 50%.

If the pre|CISION technology is effective in man, it could multiply the target market for each successfully reformulated chemotherapy, several times over. Firstly, those patients who would otherwise have been forced to cease cycles of conventional chemotherapy treatment, because they have reached the maximum tolerated dose ('MTD') – would no longer be required to: with the pre|CISION targeted version of the chemotherapy, they could endure multiple more (or alternatively, much more potent) chemotherapy cycles. Secondly, those patients who would otherwise not have been able to endure chemotherapy cycles at all, owing to age and / or underlying health conditions (which might entail that they could not endure the cardiotoxicity of conventional chemotherapy drugs), would now be able to do so.

Avacta's business model is centred upon licensing out its technology platforms with the ultimate aim of building out a major, diverse royalty portfolio. The model ensures that Avacta need not finance the much more expensive

[5] https://chemoth.com/targeted

[6] https://www.bio.org/sites/default/files/legacy/bioorg/docs/Clinical%20Development%20Success%20Rates%202006-2015%20-%20BIO,%20Biomedtracker,%20Amplion%202016.pdf

Phase II and III trials itself. Rather, it receives upfront and milestone payments as its therapeutics are advanced through the clinic by a partner, and subsequently royalty payments if a therapeutic is successfully commercialised.

For pro-doxorubicin, we have used the following assumptions in our DCF model:

Exhibit 11: assumptions used in DCF model for pro-doxorubicin	
Upfront and milestone payments, 2021 ($m)	50
Milestone payments, 2022 ($m)	150
Milestone payments, 2023 ($m)	150
Gross global sales, commencing 2024 ($m)	3,000*
Annual growth rate out to 2038 (assumed date of patent expiry) (%)	10
Gross royalty on sales due to Avacta (%)	5
Royalty due from Avacta to Tufts (%)	20
Net royalty on sales due to Avacta (%)	4
Corporation tax (%)	19
Discount rate applied (%)	15
Execution risk (pre-Phase I) (%)	75
Execution risk (post-successful Phase I) (%)	50

* *Generic* doxorubicin sales in 2025 are forecast to be $1.4bn, up from $1.0bn in 2019. Avacta has commissioned third party research that forecasted that *pro*-doxorubicin – just for three indications, and only in the US and EU – could achieve peak sales in 2020 of $1.5bn. Consequently, we feel that $3bn in *global* sales for pro-doxorubicin, for *all* indications, is a conservative assumption.

Exhibit 12: summary of DCF model for pro-doxorubicin	
Unlevered free cash flows, 2021-2038 (£m)	2,618.9
Net present value ('NPV') (£m)	622.2
Risked NPV, pre-Phase I (£m)	155.6
Risked NPV, post-successful Phase I (£m)	311.1
Avacta: shares in issue (m)	248.8
Risked NPV per share, pre-Phase I (p)	62.5
Risked NPV per share, post-successful Phase I (p)	125.0
Unrisked NPV per share, post-commencement of sales (p)	250.1

USD : GBP = 0.79

The global chemotherapy market is forecast to reach $57bn pa by 2024. Avacta has stated that its pre|CISION platform could be "*widely applied to a range of chemotherapies*" in this market.[7] Let us assume that in addition to doxorubicin, chemotherapies totalling 25% of that $57bn per annum sales figure could be reformulated using the pre|CISION platform. That amounts to $14.3bn in sales. We consider this assumption to be highly conservative: as we explain in detail on pp.11-13 of our Investment Thesis, the chemistry underlying the

[7] https://avacta.com/wp-content/uploads/2020/06/Placing-Presentation-June-2020-1.pdf - p.14

pre|CISION platform would not be altered (materially) for each pro-drug. Accordingly, if the first pro-chemotherapy to enter the clinic – pro-doxorubicin – is successfully reformulated, it stands to reason that the other ten chemotherapies in Avacta's pre|CISION pipeline have a high probability of also being successfully reformulated.

Data from Avacta's June presentation (p.14) supports our belief that only a 25% share of the total $57bn 2024 global chemotherapy market for the pre|CISION platform could be highly conservative. It suggests that just *one* of the 11 chemotherapies in Avacta's pipeline – paclitaxel – will have a global market by 2025 of $6.6bn. This is for the *generic* chemotherapy. As such, we feel confident in suggesting a target market by 2024 for Avacta's pipeline of pre|CISION targeted chemotherapies of *three times* the existing forecast (for the non-targeted versions) of $14.3bn.

For illustrative purposes, we have provided a DCF valuation for our suggested pro-chemotherapy target market ($42.9bn global sales, starting in 2024). We use the same assumptions set out in Exhibit 11, except that we do not include any upfront or milestone payments for these next 10 pro-chemotherapies.

Suffice to say, Avacta will of course not have fast-tracked all 11 of the pro-drugs within its pre|CISION pipeline through the clinic by 2024. However, the DCF model does assist in highlighting the scale of the opportunity for Avacta, if indeed the pre|CISION chemistry is as effective in humans as it has proved in animal studies.

Exhibit 13: illustrative long-term valuations pre|CISION platform	
Total addressable market ('TAM') in 2024 ($bn)	42.9
Unlevered free cash flows (post-tax, net royalties), 2024-2038 (£bn)	34.9
Net present value ('NPV') (£bn)	7.03
Risked NPV, pre-Phase I (£bn)	1.76
Risked NPV, post-successful Phase I (£bn)	3.51
Avacta: shares in issue (m)	248.8
Risked NPV per share, pre-Phase I (p)	706.1
Risked NPV per share, post-successful Phase I (p)	1,412.2
Unrisked NPV per share, post-commencement of sales (p)	2,824.4

USD : GBP = 0.79

The TMAC platform

Pre-clinical data for the TMAC platform has generated some astounding results, as we detail on p.22. However, the very fact that it is a novel class of cancer therapy renders it extremely difficult to estimate a TAM for it. As such we have not attempted to calculate a fair value for the platform.

Taking the first TMAC drug conjugate through clinic will be a higher risk, longer and more expensive endeavour than it will be for reformulating generic chemotherapies (each therapeutic is novel, and so would require Phases I through to III of human trials). Yet were the pre-clinical data to be replicated in man, we believe that the TMAC platform could ultimately dwarf the potential value of the standalone pre|CISION platform that we suggested in Exhibit 13.

Collaborations

It is challenging to ascribe accurate valuations to each of the four major collaborations that Avacta has entered into, owing to the lack of detail provided (that is invariably the reality of most collaborations in the pharma and biotech business). Upfront payments are not (usually) known; milestone payments could ultimately be spread out over as long as a decade; royalty terms are unknown, etc.

What we do know is that all four major partners are covering Avacta's R&D costs in the respective collaborations.

Furthermore, from the details provided about the first three collaborations (namely with Moderna, LG Chem and ADC Therapeutics), we can calculate that for each therapeutic target against which a partner selects and licenses an Affimer candidate, said partner will pay Avacta approximately $50m, split across upfront and milestone payments.

To our knowledge, the number of therapeutic targets that the collaborations are working on are as follows:

Moderna: 1 target (with options over an undisclosed number of further targets)
LG Chem: 3 targets (with options over 3 further targets)
ADC Therapeutics: 3 targets

We have constructed a DCF model to calculate a fair value for these upfront and milestone payments. We assume that these payments will come due over the next eight and half years, to end 2028.

Exhibit 14: assumptions used in DCF model for Therapeutics collaborations	
Upfront and milestone payments, 2021 ($m)	5
Upfront and milestone payments, 2022 ($m)	20
Upfront and milestone payments, 2023 ($m)	50
Upfront and milestone payments, 2024 ($m)	50
Upfront and milestone payments, 2025 ($m)	75
Upfront and milestone payments, 2026 ($m)	100
Upfront and milestone payments, 2027 ($m)	100
Upfront and milestone payments, 2028 ($m)	100
Total upfront and milestone payments, 2021-2028 ($m)	**500**
Corporation tax (%)	19
Discount rate applied (%)	15
Probability of successful collaborations (and receipt of full payments) (%)	33

N.B. we do not account for the R&D costs incurred by Avacta that each of the partners will be paying for, nor do we attribute any value to future royalties due to Avacta. The latter would potentially provide material upside over the longer term.

Exhibit 15: summary of DCF model for Therapeutics collaborations	
Unlevered free cash flows, 2021-2028 (£m)	320.0
Net present value ('NPV') (£m)	148.3
Risked NPV (£m)	49.4
Avacta: shares in issue (m)	248.8
Risked NPV per share (p)	19.9
Unrisked NPV per share (p)	59.6

USD : GBP = 0.79

Avacta's collaboration with its fourth major partner, Daewoong, follows the same operational format as those with Moderna, LG Chem and ADC Therapeutics. Daewoong has selected certain targets; Avacta will generate a range of Affimer proteins against those targets; Daewoong will then incorporate the Affimers into its own therapeutics, etc.

However, in *corporate* format, the collaboration differs from the others. Whilst Avacta's first three collaborations are based on licensing deals, Avacta and Daewoong have created a new joint venture company, named AffyXell (Avacta holds a 45% equity stake).

Although the JV is only at an embryonic stage, we note how other early stage biotech companies specialising in gene and/or cell therapies have attracted dizzying valuations in recent years:

- In October 2018, Allogene Therapeutics listed on NASDAQ at a post-new money valuation of $2.1bn, raising $324m in new equity in the process. Allogene is a biotech business pioneering the development of allogeneic cell therapies for cancer (similar to Daewoong's platform technology, Allogene's platform enables it to develop 'off-the-shelf' therapies). At the time of IPO, the company had one drug candidate in Phase I clinical trials, with the remainder at pre-clinical stages.

- In July last year, Japan's multinational pharmaceutical conglomerate, Takeda Pharmaceutical Co, acquired Belgium-based TiGenix for €520m. TiGenix has a proprietary allogeneic stem cell platform technology which it is utilising for the treatment of autoimmune and inflammatory diseases. At the time of the acquisition, it had three lead drugs: the first in a Pivotal Phase III trial, the second in a Phase II trial, and the third in Phase I.

- In August last year, Germany's Bayer (one of the world's largest pharmaceutical companies) acquired the remaining 59.2% equity that it did not already own in BlueRock Therapeutics for up to $600m in cash. The deal valued BlueRock at circa $1bn. BlueRock is a US-based biotechnology company focussed on developing engineered cell therapies in the fields of neurology, cardiology and immunology, using its proprietary stem cell platform.

- In September last year, NASDAQ-listed Vertex Pharmaceuticals acquired Semma Therapeutics for $950m in cash. Founded only five years previously in 2014, Semma has developed a breakthrough stem cell technology which it is initially using to generate a curative cell therapy for type 1 diabetes.

- In February this year, Massachusetts-based Beam Therapeutics raised $170m in new equity in its NASDAQ IPO, at a post-new money valuation of $844m. Having been founded in only 2017, Beam develops gene editing technologies for the treatment of diseases. The Company has 12 programmes in development – all of which are pre-clinical.

Both Avacta and Daewoong believe that a combination of their proprietary technologies could create the "*next generation of cell therapies*", superior to existing types of therapies in the marketplace.

We believe that AffyXell will shortly be seeking external funding in a Series A round, which will provide an exact valuation for Avacta's existing 45% stake. However, for now, based on the aforementioned relative valuations we have opted to apply a nominal valuation to AffyXell of $25m in its current state.

Exhibit 16: estimated current value of Avacta's 45% equity stake in AffyXell	
Estimated current value ($m)	25.0
Value of Avacta's 45% equity stake ($m)	11.3
Avacta: shares in issue (m)	248.8
Value of Avacta's 45% equity stake per share (p)	3.57

USD : GBP = 0.79

Valuation Analysis: Summary

Our base case valuation for Avacta in its *present state* is as follows:

Exhibit 17: current base case valuation for Avacta		
	£m	**Pence per share**
Diagnostics division		
Core business	52.4	21.1
COVID-19 LFT	249.9	100.5
COVID-19 BAMS test	39.9	16.0
Total	**342.2**	**137.5**
Therapeutics division		
Affimer platform	116.5	46.8
Pro-doxorubicin	155.6	62.5
Collaborations	49.4	19.9
AffyXell shareholding	8.9	3.6
Total	**330.4**	**132.8**
Net cash	50.0	20.1
Our current base case valuation:	**722.6**	**290.4**

From our range of analyses in the preceding pages, our readers can construct various upside scenarios for each asset and platform over the months and years ahead. In the (admittedly, unlikely!) scenario that all goes to plan over the next 18 months, our Company-wide analysis suggests the following possible valuation, by end 2021:

Exhibit 18: bull case valuation for Avacta, end 2021		
	£m	**Pence per share**
Diagnostics division		
Core business	52.4	21.1
COVID-19 LFT	1,081.4	434.6
COVID-19 BAMS test	106.9	43.0
Total	**1,240.7**	**498.7**
Therapeutics division		
Affimer platform	685.7	275.6
Pro-doxorubicin	311.1	125.0
pre|CISION platform*	1,756.8	706.1
Collaborations	49.4	19.9
AffyXell shareholding	8.9	3.6
Total	**2,811.9**	**1,130.2**
Net cash**	25.0	10.0
Our bull case valuation, end 2021:	**4,077.6**	**1,638.9**

*Comprising ten pre-clinical stage pro-drugs.
**Assuming £25m in operating expenditure over next 18 months; not including cash generated (which is valued elsewhere).

The Updated Investment Thesis for Avacta Group

It is depressing and frustrating that it has taken an event as dismal as a global pandemic that has killed almost half a million people worldwide, for the public market to perceive the potential value of Avacta's Affimer technology platform. Nevertheless, here we are: Avacta has been able to make the most of a terrible chapter in our history, to both improve its own standing and potentially to play a key role in battling the pandemic.

In previous notes, we have commented on how Avacta's efforts in developing both antigen tests and a potential neutralising therapy for COVID-19 have been (and could be even more so in the future) hugely beneficial to the Company. The successful development and commercialisation of an antigen test would provide:

- *An immediate, and potentially very substantial, revenue stream*
- *The opportunity to showcase the Affimer technology to the global diagnostics industry*

The successful development of a neutralising Affimer therapy for COVID-19 would provide:

- *An immediate, and potentially very substantial, upfront payment and subsequent royalty stream*
- *The opportunity to establish the Affimer platform as the go-to for developing future neutralising therapies*
- *A fast-track to validating the clinical safety and efficacy profile of the Affimer technology*
- *The opportunity to showcase the Affimer technology to the global therapeutics industry*

If Avacta' antigen tests were to sell in the hundreds of millions of units over the next year, the revenue generated would ensure that the Company would never have to return to the market for funding again. As we have detailed in the first instalment of this Update Note (23.05.2020), we believe that Avacta's COVID-19 tests will be first-in-class, and consequently that such a magnitude of orders is indeed a distinct possibility.

Perhaps most importantly, as the market's and media's interest in Avacta continues to grow as its COVID-19 related products move through their development stages, the Company's broader therapeutics pipeline is inadvertently being brought to the attention of the global investment community. We have demonstrated in the preceding pages how the pre|CISION platform alone could command a value in the multiple billions of pounds, were it to prove effective and safe in man. This data should be available within 12 months from now.

We have *not* however commented in detail on the TMAC platform. Management has recently stated that Avacta's "*TMACs hold great promise as a transformative therapy for cancer patients*." In recent presentations, the Company has revealed new pre-clinical data for its first two TMAC molecules that we did not cover in our original Investment Thesis. In the case of the second (as yet unnamed) TMAC drug, it achieved *complete regression* of the tumour in 60% of the animals in the study. Furthermore, those animals that enjoyed full regression were shown to be subsequently immune to that same type of cancer, if challenged again.

We retain our view that whilst the Diagnostics division – supercharged by its COVID-19 antigen tests under development – offers substantial immediate term upside for Avacta, the Therapeutics division remains the core long-term growth driver of the business. Before the end of next year, it appears probable that the Company will have generated in-human data for each of its two platform technologies. There is even an outside possibility of TMAC entering the clinic in the latter half of 2021, although we believe it more likely that this will occur in 2022.

In this note, we have analysed the various assets and operations of Avacta. ***We have set out our current base case valuation of £723m, or 290p per share*** – a 109% premium to the current share price of 139p.

Over the next 18 months, we see vast upside to this target price too. As we proposed in our Introduction, we believe that there are four key value inflection points for Avacta that could potentially all occur before end 2021:

i) Multi-hundred-million-pound sales of the COVID-19 antigen tests

ii) Successful Phase I trial for the first pre|CISION pro-chemotherapy

iii) Successful Phase I trial for the first Affimer-based therapeutic

iv) Successful Phase I trial for the first TMAC drug conjugate

If the first three of these value inflection points all materialise, we have detailed our rationale for how we see the Company building to a market capitalisation of over £4bn, or £16 per share, by end 2021.

If the first TMAC molecule is fast-tracked into Phase I trials next year then – as we stated in our Introduction – the sky really is the limit for Avacta. We have not attempted to attribute a valuation range to the TMAC platform in its current state, as there are very many variables to consider in its development from this point in time. For us, the pre-clinical data speaks for itself: the platform could prove revolutionary for cancer treatment. That is the key takeaway at this point. If the platform's clinical safety and efficacy profile is proved up in man, a multi-billion-pound valuation will shortly follow, in our view.

…….

At this juncture, we believe it is important to briefly note the risk profile of the investment case for Avacta.

The Company is at the cutting edge of cancer treatments; it is using its Affimer platform to challenge colossal and entrenched markets that are founded on antibodies; and it is leading the charge in developing the best antigen tests in the world to detect SARS-CoV-2. It should *always* be kept in mind that such ambitious workstreams carry a significant degree of risk.

Our base case target price of 290p per share is a sum of very heavily discounted valuations of each of Avacta's assets and operations. Even heavily discounted however, there is still significant downside risk to many of those individual valuations: the industry in which Avacta operates often witnesses the commercial hopes of an asset obliterated upon receipt of a poor lab or clinical result.

…….

Our own extensive research leads us to believe that even after its superb share price performance so far in 2020 – and the plethora of risks still involved in unlocking the immense monetary value that resides within the Company's broad asset base – Avacta remains significantly undervalued at 139p. We were extremely encouraged by the £48m equity raise at 120p, and notably by the participation of an exceptionally high calibre US investor. It is our hope that this transformational fundraise that brought major US investors onto the shareholder register will fast-track Avacta towards a NASDAQ listing: this event alone would potentially be another major value inflection point, given that US investors tend to attribute much loftier valuations to cutting-edge biotech businesses than does the UK investment community.

On a final note, we will touch on how we envisage the long-term future for Avacta unfolding, assuming it achieves our stated four key value inflection points over the next couple of years. We see two likely scenarios: firstly, a takeover by Big Pharma. Each of Avacta's three platform technologies could ultimately command a price tag over and above the €3.9bn that Sanofi paid for Ablynx and its Nanobody platform. Avacta's Diagnostics division – were it to be supercharged by major sales of its COVID-19 products over the next 12 months – could also quickly attract a suitor.

Alternatively, now that the Company has a sizeable cash pile and major US shareholders, we believe that there is very real potential for Avacta to establish itself as a mid-cap life sciences company in the next few years. The Affimer platform enables it to skirt around antibody-based IP and to operate in an almost endless list of areas of medicines; and the pre|CISION and TMAC platforms have provided it with a real chance of becoming a major name in the field of cancer therapeutics over the coming decade.

With regards to this second scenario, we were very interested to see the establishment of a dedicated DTC distribution partner – in the form of Medusa – for Avacta's Diagnostics division (see p.4). In our view, this is a measured move to establish a highly effective (and perhaps market-leading) sales channel for the Company – and not just for its COVID-19-related products, but for a wider portfolio of proprietary diagnostic products. In other words, it appears that management is actively seeking to establish Avacta as an integrated, self-sufficient and independent player in the global life sciences industry.

Disclosure

The author of this paper, Myles McNulty, is a private investor. He and his family hold 0.9% of the ordinary shares of Avacta Group.

This paper is non-independent research. It has not been prepared in accordance with legal requirements designed to promote the independence of investment research and is not subject to any prohibition on dealing ahead of the dissemination of the investment research.

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