

# Abzena

Fund-raising

## Fund-raising could drive transformational growth

Pharma & biotech

Abzena recently announced a placing of £25m gross (issuing 75.8m new shares at 33p) to expand its service offering, capacity and capabilities. Importantly, we expect this fund-raising to take Abzena to profitability, which will be a significant milestone for the company. We have increased our valuation to £132m (vs £105m), primarily due to the increase in forecast service revenues, improved gross margin and cash position.

Year end	Revenue (£m)	PBT* (£m)	EPS* (p)	DPS (p)	P/E (x)	Yield (%)
03/15	5.7	(4.7)	(5.89)	0.0	N/A	N/A
03/16	9.9	(7.5)	(6.00)	0.0	N/A	N/A
03/17e	19.1	(9.1)	(6.17)	0.0	N/A	N/A
03/18e	29.7	(10.1)	(4.52)	0.0	N/A	N/A

Note: \*PBT and EPS are normalised, excluding amortisation of acquired intangibles, exceptional items and share-based payments.

## Building on strong progress since IPO in 2014...

Abzena has made strong progress since its IPO in 2014. It has built its service offering and geographic footprint both through investment and two acquisitions in the US. Alongside this, it has grown its Abzena *inside* portfolio to 12 (in clinical development) and has recently announced another significant licensing deal for its novel site-specific ThioBridge technology.

## ...with significant fund-raising to reach profitability

Abzena has announced a £25m (£23.9m net) fund-raising through a placing of 75.8m shares at a price of 33p each. The funds will be used to expand its services, capabilities and capacity. Specifically, it has indicated that it will use the funds to upgrade and grow its US-based biomanufacturing facilities and capabilities, invest in its existing biology, chemistry and biomanufacturing services in the UK and US, and invest in its sales and business development functions. In essence, this fund-raising, according to the company, should enable Abzena to fund its targeted services business revenue growth plans of 40% (CAGR) over the next three years and improve gross margins to 50%, which should move it towards profitability in a shorter time frame.

## Valuation: Increased to £132m, or 62p per share

We have raised our rNPV to £132m (vs £105m) primarily due to the increase in forecast service revenues, improved gross margin and increase in cash. This has been slightly tempered as we have also increased the percentage of group admin costs relating to the service business to 90% (vs 70%). We have also rolled the model forward by three months and incorporated the estimated FY17 cash position of £4.1m and included the £23.9m net fund-raising cash. We maintain our assumptions around the Abzena *inside* clinical pipeline at this stage. We believe Abzena is well positioned following its fund-raising to grow its integrated service offering and, as its Abzena *inside* products move through the clinic and onto the market, we expect upside to our current estimates.

3 May 2017

**Price** **33.50p**

**Market cap** **£72m**

\$1.28£

Net cash (£m) at 30 September 2016 (pro forma adjusted for equity raise) 33.3

Shares in issue 213.6m

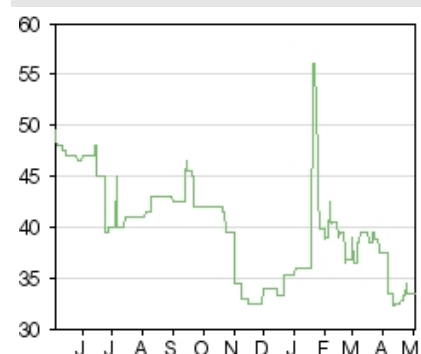
Free float 39%

Code ABZA

Primary exchange AIM

Secondary exchange N/A

### Share price performance



% 1m 3m 12m

Abs (10.7) (14.1) (32.3)

Rel (local) (11.1) (16.5) (42.0)

52-week high/low 56.0p 32.2p

### Business description

Abzena is a UK group that offers a range of services and technologies for biopharmaceutical development including immunogenicity tests, protein engineering, bioconjugation, polymer/synthetic chemistry, biomanufacturing and ADC chemistry.

### Next events

Further Abzena *inside* products into the clinic 2017

Roche update SDP051 2017

Phase III GS-5745 futility analysis in gastric cancer H217

### Analyst

Dr Linda Pomeroy +44 (0)20 3077 5738

[healthcare@edisongroup.com](mailto:healthcare@edisongroup.com)

[Edison profile page](#)

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## Investment summary

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### Company description: A growing, integrated business model

Abzena provides biological research services aimed at creating more effective and safer biological products. The group initially evolved through the combination of three key businesses: PolyTherics, Antitope and Warwick Effect Polymers. More recently, it has also acquired PacificGMP (contract, development and manufacturing) and TCRS (specialist contract chemistry and bioconjugation). This enables Abzena to offer a more comprehensive and integrated offering. Abzena listed on AIM in July 2014 (raising £20m) and in 2015, from a secondary placement, raised £20m net of expenses from the sale of 35m new shares at 60p. The group is primarily based on the Babraham Research Campus in Cambridge (UK) and, following two acquisitions in 2015, has operations in San Diego (PacificGMP) and Philadelphia (TCRS). The company employs c 200 staff.

### Valuation: Raised to £132m

We have reviewed our rNPV model and updated it to reflect the change in our financial forecasts for the services business following the recent net fund-raising of £23.9m. We have raised our rNPV to £132m (vs £105m) primarily due to the increase in forecast service revenues and improved gross margin. This has been slightly tempered as we have also increased the percentage of group admin costs relating to the service business to 90% (vs 70%). Finally, we have rolled the model forward by three months and incorporated the estimated FY17 cash position of £4.1m, and included the £23.9m net fund-raising cash.

### Financials: Forecast profitability in FY20

Following the net fund-raising of £23.9m (75.8m shares at a price of 33p each) to expand its services, capabilities and capacity, we now forecast a cash runway to profitability in FY20. As the fund-raising was after the FY17 March year end, we do not expect any impact on our FY17 forecasts. We now forecast revenue of £29.7m, £41.2m and £55.2m in FY18, FY19 and FY20 respectively (services business CAGR from FY17 to FY20 of 40%) and for the services business gross margin to improve to 50% in FY20, from 39% expected in FY17. Alongside this increase in revenue, we expect an increase in costs and now forecast £4.0m in FY18, £4.2m in FY19 and £4.4m in FY20 of R&D costs and £19.5m in FY18, £19.8m in FY19 and £23.0m in FY20 of SG&A costs. Finally, we expect capex to increase in FY18 and FY19 as a result of investment into increasing its capacity.

### Sensitivities: Low-risk business model

With stable and growing revenues from its services business and a licensed portfolio of drugs that does not require investment to develop, Abzena operates a relatively low-risk business model. However, the biological services industry is highly competitive and will require Abzena to continually invest in enhancing its technologies and offering to the sector, which may require development and/or purchasing further assets. Having acquired two manufacturing businesses at the end of 2015 to expand its offering, it is integrating and embedding the broader offering, which is not without risk. While potential future royalty revenues on sales of products developed using Abzena's technologies appear to offer pure upside, the development of these candidates is not within Abzena's control. Advancing these candidates into late-stage clinical studies will require significant investment and/or a larger partner, so success of part of the pipeline will depend on the ability of Abzena's licensees to secure the finance and/or partner. This does not include Gilead, Roche, two undisclosed major pharmas and private companies Opsona and Vascular Pharmaceuticals (large pharma investment). Finally, it should also be noted that Abzena's revenues and costs are predominantly in US\$ and therefore could be affected by exchange rate movements.

## Promise of a transformational growth plan

Abzena recently announced a £25m (£23.9m net) fund-raising through a placing of 75.8m shares at a price of 33p each. It indicated that the funds will be used to expand its services, capabilities and capacity. Specifically, it has indicated that it will use the funds to upgrade and grow its US-based biomanufacturing facilities and capabilities, invest in its existing biology, chemistry and biomanufacturing services in the UK and US, and invest in its sales and business development functions. In essence, this fund-raising, according to the company, should enable it to deliver a transformational growth plan including:

- revenue growth of 40% (CAGR) over the next three years;
- improved gross margins of 50%; and
- a move to profitability.

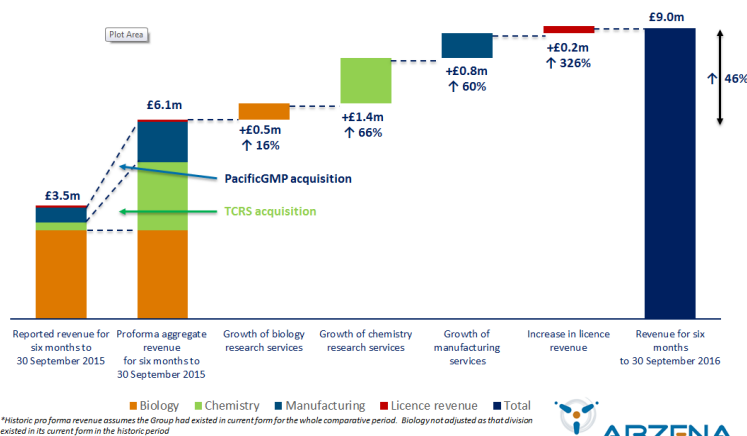
Abzena's services business (pre fund-raising) accounted for 97% of group revenues (£8.7m H117). Approximately 84% of the services revenue to H117 was derived from repeat customers, yet the customer base remains relatively broad with the top 10 customers accounting for ~47% of total revenues. Geographically, these revenues in FY16 were broadly split between North America (67%) and Europe (21% not including UK, 6% in the UK).

The growth Abzena has experienced has, according to the company, led it to the point where it is capacity constrained and therefore requires further investment to enable it to grow further. For example, its capacity was already assigned through to 2018, its number of repeat customers had doubled and there was an increase in the number of manufacturing programmes that were enacted alongside Abzena *inside* contracts. Alongside this, the company had limited GMP chemistry (ADC) manufacturing capability which, if put in place, could provide the ability to attract high-value, follow-on projects.

We expect Abzena to invest the proceeds primarily across the three areas of the service business, and forecast capex of £11m in manufacturing, £3m in chemistry and £3m in biology. We expect the majority of this investment to be in FY18. We expect the new facilities to be completed by Q1 FY19.

We believe Abzena is well-positioned to achieve its growth plans. It has already indicated that demand exceeds its current capacity and it has previously demonstrated its ability to capture an opportunity and deliver following two acquisitions in 2015 (PacificGMP and TCRS). Exhibit 1 outlines how it has grown since the acquisitions.

**Exhibit 1: Growth to date**

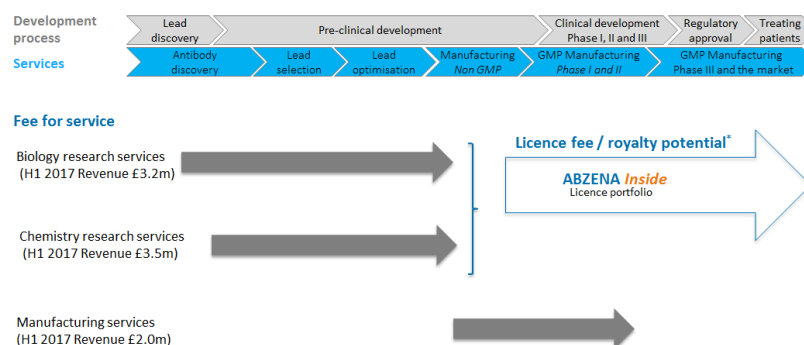


Source: Abzena presentation

At the time of the acquisitions the strategic plan was to capture greater value from providing an integrated, broader service offering, both in terms of capability and stage in the development process. This has started to prove fruitful and with the fund-raising we expect Abzena to build on this by increasing its cross-group utilisation and attracting a diverse and international customer base including major pharmaceutical companies and public and private biotech companies.

Exhibit 2 illustrates Abzena's operations, the two aspects of its business model and where it is able to capture value across the development process.

#### Exhibit 2: Capturing value across the development process

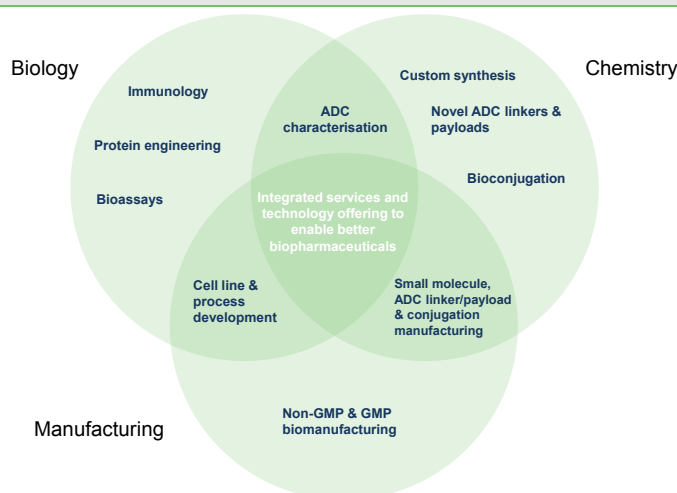


Source: Abzena presentation

While the fund-raising is important for the expansion and growth of its service business and ultimately transitioning the company to profitability, there remains a second aspect to its investment case: its expanding clinical pipeline of antibodies, being developed and fully funded by global partners, which were derived using Abzena's protein engineering technology, termed *Abzena inside* products. The *Abzena inside* portfolio has grown to 12 (in clinical development) and it has recently announced another significant licensing deal for its novel site-specific ThioBridge technology.

## Service areas that could deliver profitability

Abzena combines three distinct but complementary areas in biology, chemistry and manufacturing to enable better biopharmaceuticals. It is the integration of these areas that underpins Abzena's business model.

**Exhibit 3: Integrated business model**


Source: Abzena presentation

## Biology services

The Biology division provides immunology, protein engineering, protein production bioassay and bioanalysis services (divisional forecasts outlined below in Exhibit 4, with hyperlinks to detailed overviews of the specific technologies and services).

**Exhibit 4: Biology division service and technology offerings and forecasts**

Technology offering	Products	Details	Revenues				
			H117	FY17e	FY18e	FY19e	FY20e
Immunogenicity assessment	<a href="#">EpiScreen/iTope &amp; TCED</a>	Accurate, sensitive and rapid ex vivo and in silico (computer) testing for the risk of anti-drug antibodies (ADAs) to therapeutic antibodies/proteins; and identification of immunogenic sequences that cause unwanted immune response (which can then be 'fixed' by Abzena's Composite Human Antibody or Composite Protein technologies).	2.4	4.6	5.6	6.2	7.1
Protein engineering*	<a href="#">Composite Human Antibody/Composite Proteins**</a>	Creation of fully humanised antibodies and deimmunised proteins to reduce the risk of immune responses (immunogenic sequences removed/critical sequences retained). Fully integrated offering with cell line development and bioconjugation as appropriate.	0.8	1.8	2.6	2.8	4

Source: Abzena and Edison Investment Research. Note: \*Can lead to cell line development and then GMP manufacturing services.  
\*\*Longer-term licensing potential.

## Chemistry services

The Chemistry division provides custom synthesis of antibody drug conjugate (ADC) linkers, payloads and conjugation services (divisional forecasts outlined below in Exhibit 5, with hyperlinks to detailed overviews of the specific technologies and services).

**Exhibit 5: Chemistry division service and technology offerings and forecasts**

Technology offering	Products	Details	Revenues				
			H117	FY17e	FY18e	FY19e	FY20e
Bioconjugation – ADCs*	<a href="#">ThioBridge</a>	Site-specific conjugation of chemotherapy drugs to antibodies and antibody fragments, creating more stable and homogeneous ADCs using the ThioBridge linker. Range of cytotoxic payloads available.	3.5	6.4	8.9	10.7	11.9
Specialist contract chemistry and bioconjugation	<a href="#">Produce, analyse and manufacture antibody drug conjugates</a>	Specialist contract chemistry and bioconjugation company based near Philadelphia, US with expertise in producing and analysing ADCs.					

Source: Edison Investment Research. Note: \*Longer-term licensing potential.

## Manufacturing services

The Manufacturing division provides cell line development, process and manufacturing capability to GMP standard for Phase I and II clinical trials (divisional forecasts outlined below in Exhibit 6, with hyperlinks to detailed overviews of the specific technologies and services).

**Exhibit 6: Manufacturing division service and technology offerings and forecasts**

Technology offering	Products	Details	Revenues				
			H117	FY17e	FY18e	FY19e	FY20e
Contract manufacturing biopharmaceutical products	<a href="#">Contract, development and manufacturing</a>	San Diego-based CDMO (contract, development and manufacturing organisation) focused on developing/GMP manufacturing biopharmaceutical products (eg monoclonal antibodies) for use in Phase I and II clinical trials.	1.4	4.7	10.6	18.0	26.0
Cell line development*	<a href="#">Composite CHO</a>	Development of stable and highly expressing mammalian cell lines, suitable for commercial production (for clinical trials) of proteins and antibodies by the licensee (or CMO). Suitable for Abzena-engineered products or biosimilars.	0.6	1.0	1.2	1.5	2.0

Source: Edison Investment Research. Note: \*Can lead on to GMP manufacturing services.

## Abzena *inside* – the risk-free potential upside

Abzena has potential additional upside to its service business growth from its Abzena *inside* products. This licensed portfolio of antibodies was developed using its Composite Human Antibody (CHA) or ThioBridge (antibody drug conjugates) technology (outlined above). This portfolio offers the prospect of small royalties (~1%) on sales (CHA) and potentially higher royalties (up to 5%) on its ADC products (ThioBridge). This provides risk-free upside as Abzena benefits if the product successfully reaches the market; however, it assumes none of the R&D or partnering risks and is not restricted by indication as its '*inside*' is applied across a broad range of indications.

To date, 12 antibody candidates (up from five at the time of Abzena's IPO in July 2014), developed using Abzena's humanising technology (CHA), have been disclosed as in active clinical development with customers currently conducting Phase I, II and III studies. Alongside this have been two significant licensing ThioBridge deals for two separate biotech companies to develop up to three and 10 products (to include ThioBridge as the linker in the resulting products) respectively. For a more detailed overview of these deals, please see our previous [update note](#). An overview of the disclosed Abzena *inside* pipeline is outlined below.

## Example of value provided from its integrated business model

Abzena's most recent ThioBridge deal announcement indicated that it had signed a significant licensing agreement with a San Diego-based biopharmaceutical company for its novel, site-specific ThioBridge technology and a master services agreement to use its chemistry services. The licensing deal includes the use of ThioBridge in up to 10 ADCs across a wide range of indications. According to the company, the value of the agreement has the potential to reach more than \$300m in development/commercial milestones if the partner successfully develops the ADC products. Alongside this, Abzena would also receive royalties on sales of any approved products that incorporate the ThioBridge technology.

**Exhibit 7: Valuation assumptions by product**

	Product - Partner	Status	Peak sales (\$m)	Probability of success	Launch date	Estimated royalty rate
1	GS5745 - Gilead Sciences	Phase III	2,500	50%	2019	1%
2	OPN-305 - Opsona Therapeutics	Phase II	750	35%	2020	1%
3	VPI-2690B - Vascular Pharmaceuticals	Phase II	1,000	35%	2021	1%
4	NKT120 - NKT Therapeutics	Phase Ib	250	25%	2021	1%
5	SDP051 - Adheron Therapeutics	Phase II	1,000	25%	2023	1%
6	TBI 304H - Therapure Innovations	Phase I	1,000	15%	2021	1%
7	US major pharma partner	Phase II	1,000	35%	2022	1%
8	US Pharma	Phase I	750	15%	2022	1%
9	US Biotech	Phase I	750	15%	2022	1%
10	US Biotech	Phase I	750	15%	2023	1%
11	Private US Biotech	Phase I	750	15%	2023	1%
12	US biotech company	Phase I	750	5%	2025	1%
13	Halozyne ADC Product 1	Pre-clinical	500	5%	2026	3%
14	Halozyne ADC Product 2	Pre-clinical	500	5%	2027	3%
15	Halozyne ADC Product 3	Pre-clinical	500	5%	2028	3%
16	US Biotech ADC Product 1 and 2	Pre-clinical	1,000	5%	2025	3%
17	US Biotech ADC Product 3 and 4	Pre-clinical	1,000	5%	2026	3%
18	US Biotech ADC Product 5 and 6	Pre-clinical	1,000	5%	2027	3%
19	US Biotech ADC Product 7 and 8	Pre-clinical	1,000	5%	2028	3%
20	US Biotech ADC Product 9 and 10	Pre-clinical	1,000	5%	2029	3%

Source: Edison Investment Research

## Sensitivities

With stable and growing revenues from its services business and a licensed portfolio of drugs that does not require R&D spend, Abzena operates a relatively low-risk business model. However, the biological services industry is highly competitive and will require Abzena to continually invest in enhancing its technologies and offering to the sector. This may include the need to acquire new assets/companies, which adds an element of execution risk, but with shrewd selection of targets this should only help strengthen Abzena's position and therefore the investment case. Although the potential future revenue streams from royalties on sales of products developed using Abzena's technologies appear to offer pure upside, the development of these candidates is not within Abzena's control. With the exception of Gilead, Roche, two undisclosed major pharmas and private companies Opsona and Vascular Pharmaceuticals (a large pharma investment), a number of candidates are being developed by relatively small private companies that may struggle to secure the finance required to develop their products in a timely and effective manner. Advancing these candidates into late-stage clinical studies will require significant investment and/or a larger partner, so success will depend on the ability of Abzena's smaller licensees to secure the finance/partner. Finally, it should also be noted that Abzena's revenues and costs are predominantly in US\$ and therefore could be affected by exchange rate movements.

## Valuation

We have reviewed our rNPV model and updated it to reflect the change in our financial forecasts for the services business following the recent net fund-raising of £23.9m. We have raised our rNPV to £132m (vs £105m) primarily due to the increase in forecast service revenues and improved gross margin. This has been slightly tempered as we have also increased the percentage of group admin costs relating to the service business to 90% (vs 70%). Finally, we have rolled the model forward by three months and incorporated the estimated FY17 cash position of £4.1m and included the £23.9m net fund-raising cash. We maintain our assumptions around the Abzena *inside* clinical pipeline at this stage.



We believe Abzena is well positioned following its fund-raising to grow its integrated service offering and, as its Abzena *inside* products move through the clinic and onto the market, we expect upside to our current estimates. Our valuation model and key assumptions are summarised in Exhibit 8.

**Exhibit 8: Abzena valuation model and key assumptions**

	rNPV (£m)	rNPV per share (p)	Key assumptions
Services business	43.8	20.5	3-phase DCF: 2017-2020 (40% CAGR growth), 2021-2025 (2-5% growth), 2% TV on 2025 FCF (steady-state); 10% WACC; 12-15% effective tax rate; 60% COGS FY18 decreasing to 50% in FY20; 90% of Group admin expense.
Licensed biological product royalties	60.2	28.2	Risk-adjusted royalties (1-5%) on partner's product sales; 12.5% WACC; 12% effective tax rate; 50% of Group R&D expense (risk-adjusted); no milestones included.
Portfolio sub-total	104	49	
Cash (FY17e + fund-raising)	28.0	13.1	FY17e + net fund-raising.
Overall valuation	132.1	62	213.6m shares outstanding (basic).

Source: Edison investment Research

While we maintain our valuation approach for Abzena, which indicates significant upside to its current market cap of £72m, it is worth considering it against a set of its peers now that there is clarity around its route to profitability. Defining Abzena's peer group is difficult because, while there are a number of companies that touch on various aspects of Abzena's offering, there is not a true like-for-like operation. For example, if we consider the competition in terms of breadth of offering, then Lonza and Catalent are potentially significant competitors. Horizon Discovery could be a good peer comparator as it offers services while having a longer-term potential income stream. Equally, a company such as Abcam, a service provider, could be considered. There are also smaller players that compete with one aspect of Abzena's business, for example Selexis in cell line development services and ImmunoGen for ADC technology. An overview of the possible competitor universe is shown in Exhibit 9. Lonza, Catalent and Abcam are profitable, whereas Horizon Discovery ImmunoGen and Seattle Genetics are currently loss making.

**Exhibit 9: Competitor overview**

Company	Description
Lonza	Broad commercial manufacturing capability (small-scale quantities to full commercial production), clinical development services (consumables, tests) and bioscience solutions.
Catalent	Suite of proprietary technology platforms and integrated business model. Divisions include biological development & manufacturing, biosimilar development & manufacturing and bioconjugates.
Abcam	Range of products sold including primary and secondary antibodies, biochemicals, proteins, peptides, lysates, immunoassays and other kits.
Horizon Discovery	Gene editing platform services and technology incorporated in customers' final products.
ImmunoGen	Developing ADC technologies. Establishes deals for its technologies with pharmaceutical companies.
Seattle Genetics	Focused on developing and commercialising antibody-based therapies for the treatment of cancer. One marketed product alongside a product pipeline.
Selexis	Facilitates rapid, stable and cost effective bioproduction of virtually any recombinant protein. Leader in mammalian cell line generation. Technology incorporated in customers final products.

Source: Edison Investment Research

We have looked at the publicly traded companies and EV/Sales multiples (Exhibit 10). If we apply the average EV/Sales ratio to Abzena (having removed the three much higher outliers, Abcam, Horizon Discovery and Seattle Genetics), it would imply an EV of £53m.

**Exhibit 10: Publicly traded comparators**

Company	Market cap (m)	EV (m)	EV/Sales (x)
Lonza*	CHF11,063	CHF12,649	2.68
Catalent*	US\$3,496	US\$5,265	2.68
Abcam*	£1,688	£1,611	7.39**
Horizon Discovery	£200	£187	7.61**
ImmunoGen	US\$349	US\$189	2.92
Seattle Genetics	US\$9,503	US\$8,914	20.5**
Average			7.3
Average (outliers removed**)			2.76

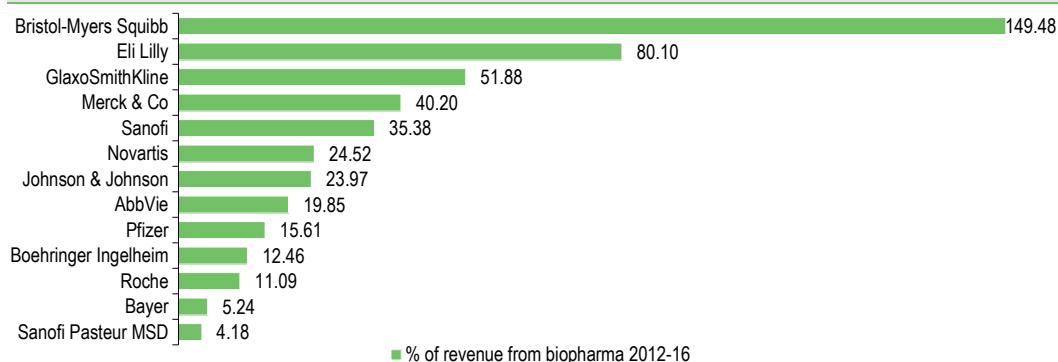
Source: Edison Investment Research. Note: \*Profitable companies. \*\*Outliers.



## A sector with growing interest and potential

Abzena is offering a service in an area that is large and growing rapidly. According to a 2014 McKinsey report, biopharmaceuticals were generating global revenues of \$163bn, which was 20% of the pharma market in 2014. P&S Market Research has indicated that the biopharma market is expected to grow at c 10% pa to 2019 and the R&D outsourcing market at >23%, projected to reach \$11.4bn by 2020. The potential in these markets is underpinned by the increase in the number of large pharmaceutical companies shifting their presence to biopharma and when we consider recent M&A activity in the biologics field (see Exhibits 11 and 12).

### Exhibit 11: Increasing shift to biopharma



Source: EvaluatePharma and Edison Investment Research

### Exhibit 12: Recent M&A activity in biologics sector

Date of acquisition	Company	Acquired company	Deal value (\$m)
27/01/2017	IBA Molecular	Mallinckrodt's Nuclear Imaging Business	690
20/12/2016	Astellas Pharma	Ganymed Pharmaceuticals	1,402
29/11/2016	Celldex Therapeutics	Kolltan Pharmaceuticals	235
24/11/2016	Novartis	Selexys Pharmaceuticals	665
30/09/2016	Acorda Therapeutics	Biotie Therapies	363
30/09/2016	Celgene	EngMab	3,100
28/09/2016	Pfizer	Medivation	14,000
05/08/2016	Mylan	Meda	7,200
05/07/2016	Bristol-Myers Squibb	Cormorant Pharmaceuticals	520
03/06/2016	Shire	Baxalta	6,546
01/06/2016	AbbVie	Stemcentrx	9,800
31/05/2016	OSE Immunotherapeutics	Effimune	34
09/05/2016	VBI Vaccines	VBI Vaccines (pre SciVac Therapeutics)	92
26/01/2016	3SBio	Shanghai CP Guojian Pharmaceutical	214
22/01/2016	Shire	Dyax	6,546

Source: EvaluatePharma and Edison Investment Research

While it is clear that there is significant interest in the biopharma area, it is difficult to quantify how this translates into appropriate potential for Abzena. However, we note the company's strong progress since its IPO in 2014. It has built its service offering and geographic footprint through investment and through two acquisitions in the US. Alongside this, it has grown its Abzena *inside* portfolio to 12 (in clinical development) and has recently announced another significant licensing deal for its novel site-specific ThioBridge technology.

## Financials

Following the recent announcement of Abzena's £23.9m net fund-raising (75.8m shares at a price of 33p each) to expand its services, capabilities and capacity, we have reviewed our forecasts. As the fund-raising was after the FY17 March year end, we do not expect any impact on our FY17

forecasts, but have reviewed our FY18 estimates onwards to incorporate the full impact of the fund-raising and expansion plans.

We expect Abzena to use the funds to upgrade and grow its US-based biomanufacturing facilities and capabilities, invest in its existing biology, chemistry and biomanufacturing services in the UK and US and invest in its sales and business development functions. The company has indicated that the funds will be invested in the following areas:

- £11m: manufacturing.
- £3m: chemistry.
- £3m: biology.
- £2m: working capital.
- £6m: gross corporate expenses.

As a result of this investment, we now forecast a cash runway to profitability in FY20 and an increase in sales from the services business and improved margin. Exhibit 13 outlines our previous and current forecasts. We now forecast revenue of £29.7m, £41.2m and £55.2m in FY18, FY19 and FY20 respectively (services business CAGR from FY17 to FY20 of 40%) and for the services business gross margin to improve to 50% in FY20, from 39% expected in FY17. We expect growth in each area of the services business (biology, chemistry and manufacturing), but that the most significant and steepest growth will be in the manufacturing division in FY18 following the investment. Alongside this increase in revenue, we expect an increase in costs and now forecast £4.0m in FY18, £4.2m in FY19 and £4.4m in FY20 of R&D costs and £19.5m in FY18, £19.8m in FY19 and £23.0m in FY20 of SG&A costs. Finally, we expect capex to increase in FY18 and FY19 as a result of investment into increasing its capacity and forecast £11m of capex in FY18, £3m in FY19 and £2m in FY20. We have maintained our revenue forecasts from licences at this time, but note that as the services business grows there could be upside with further Abzena *inside* product agreements coming to fruition.

Importantly, our forecasts indicate that Abzena will be EBITDA positive (£0.1m) in FY19 and become profitable in FY20 (£3.1m PBT).

**Exhibit 13: Change in service business revenue forecasts**


	2017e	2018e		2019e		2020e	
	Current	Previous	Current	Previous	Current	Previous	Current
Immunology	4.6	5.6	5.6	5.9	6.2	6.1	7.1
Protein Engineering	1.8	2.6	2.6	2.7	2.8	2.7	4.0
Chemistry	6.4	7.0	8.9	8.3	10.7	9.1	11.9
Cell Line Development	0.9	1.8	1.2	1.9	1.5	2.0	2.0
Biomanufacturing	4.7	7.2	10.6	8.3	18.0	9.0	26.0
<b>Total Service Revenue</b>	<b>18.5</b>	<b>24.3</b>	<b>28.9</b>	<b>27.1</b>	<b>39.3</b>	<b>28.9</b>	<b>51.1</b>

Source: Edison Investment Research

**Exhibit 14: Financial summary**

	£'000s	2014	2015	2016	2017e	2018e	2019e	2020e
Year end 31 March		IFRS	IFRS	IFRS	IFRS	IFRS	IFRS	IFRS
<b>PROFIT &amp; LOSS</b>								
Revenue		5,261	5,667	9,854	19,076	29,667	41,125	55,044
of which: Biology		3,128	4,158	5,299	6,423	8,237	9,061	11,132
Manufacturing		419	594	2,096	5,658	11,789	19,570	27,991
Chemistry		165	657	2,174	6,395	8,892	10,670	11,943
Total Service revenues		3,712	5,409	9,569	18,476	28,917	39,301	51,066
Licenses/milestones/royalties		1,549	258	285	600	750	1,824	3,978
Cost of Sales		(1,697)	(2,532)	(5,319)	(11,233)	(17,350)	(20,829)	(25,533)
Gross Profit		3,564	3,135	4,535	7,842	12,317	20,296	29,511
R&D expenses		(2,601)	(2,989)	(4,216)	(3,794)	(3,984)	(4,183)	(4,392)
SG&A expenses		(4,787)	(5,634)	(9,047)	(14,023)	(19,492)	(19,784)	(22,950)
EBITDA		(3,116)	(4,510)	(6,972)	(7,893)	(7,208)	113	5,945
Operating Profit (before GW and except)		(3,394)	(4,795)	(7,773)	(9,144)	(10,093)	(2,664)	3,123
Intangible Amortisation		(304)	(504)	(588)	(731)	(666)	(607)	(554)
Depreciation		(278)	(285)	(801)	(1,251)	(2,885)	(2,777)	(2,822)
Exceptionals		(426)	0	(2,542)	0	0	0	0
Operating Profit		(4,124)	(5,299)	(10,903)	(9,875)	(10,759)	(3,272)	2,569
Other		0	0	0	0	0	0	0
Net Interest		27	79	244	50	2	34	22
Profit Before Tax (norm)		(3,367)	(4,716)	(7,529)	(9,095)	(10,091)	(2,631)	3,145
Profit Before Tax (reported)		(4,097)	(5,220)	(10,659)	(9,825)	(10,757)	(3,238)	2,591
Tax		548	498	961	590	430	389	486
Profit After Tax (norm)		(2,819)	(4,218)	(6,568)	(8,505)	(9,661)	(2,242)	3,631
Profit After Tax (reported)		(3,549)	(4,722)	(9,698)	(9,236)	(10,327)	(2,849)	3,077
Average Number of Shares Outstanding (m)		1.4	71.6	109.4	137.8	213.6	213.6	213.6
EPS - normalised (p)		N/A	(5.89)	(6.00)	(6.17)	(4.52)	(1.05)	1.70
EPS - reported (p)		N/A	(6.59)	(8.86)	(6.70)	(4.83)	(1.33)	1.44
Dividend per share (p)		0.0	0.0	0.0	0.0	0.0	0.0	0.0
<b>BALANCE SHEET</b>								
Fixed Assets		10,139	10,432	27,347	28,230	35,694	35,324	33,964
Intangible Assets		9,446	8,942	23,177	22,461	21,809	21,217	20,678
Tangible Assets		693	1,490	4,170	5,769	13,885	14,108	13,286
Other		0	0	0	0	0	0	0
Current Assets		5,856	20,924	22,108	11,540	17,810	15,495	20,100
Stocks		295	817	1,379	1,379	1,379	1,379	1,379
Debtors		2,263	3,161	5,436	5,436	5,436	5,436	5,436
Cash		2,757	15,799	13,724	4,135	10,565	8,291	12,799
Other		541	1,147	1,569	590	430	389	486
Current Liabilities		(1,278)	(2,354)	(5,850)	(5,850)	(5,850)	(5,850)	(5,850)
Creditors		(1,160)	(2,354)	(5,488)	(5,488)	(5,488)	(5,488)	(5,488)
Short term borrowings		0	0	0	0	0	0	0
Short term leases		0	0	0	0	0	0	0
Other		(118)	0	(362)	(362)	(362)	(362)	(362)
Long Term Liabilities		(1,183)	(1,153)	(2,549)	(2,549)	(2,549)	(2,549)	(2,549)
Long term borrowings		0	0	0	0	0	0	0
Long term leases		0	0	0	0	0	0	0
Other long term liabilities		(1,183)	(1,153)	(2,549)	(2,549)	(2,549)	(2,549)	(2,549)
Net Assets		13,534	27,849	41,056	31,370	45,105	42,420	45,665
<b>CASH FLOW</b>								
Operating Cash Flow		(4,328)	(4,859)	(10,870)	(7,774)	(7,086)	238	6,073
Net Interest		0	0	0	0	0	0	0
Tax		251	(133)	371	961	590	430	389
Capex		(264)	(1,082)	(2,047)	(2,864)	(11,015)	(3,015)	(2,015)
Acquisitions/disposals		(6,133)	0	(9,357)	0	0	0	0
Financing		10,670	19,037	20,013	0	23,900	0	0
Dividends		0	0	0	0	0	0	0
Other		(6)	79	(185)	89	41	73	61
Net Cash Flow		190	13,042	(2,075)	(9,589)	6,430	(2,274)	4,508
Opening net debt/(cash)		(2,754)	(2,757)	(15,799)	(13,724)	(4,135)	(10,565)	(8,291)
HP finance leases initiated		0	0	0	0	0	0	0
Other		(187)	0	0	0	0	0	0
Closing net debt/(cash)		(2,757)	(15,799)	(13,724)	(4,135)	(10,565)	(8,291)	(12,799)

Source: Abzena accounts, Edison investment Research

Contact details	Revenue by geography (FY16)
Babraham Research Campus Babraham Cambridge CB22 3AT UK +44 (0)1223 903 498 www.abzena.com	
Management team	
<b>CEO: John Burt</b> Joined PolyTherics in November 2010, initially as chief business officer then becoming CEO in May 2011. Following the acquisition of Antitope and creation of Abzena, John is CEO of the group. Co-founder and CEO of Thiakis (2004-08, when Thiakis was acquired by Wyeth). Previous roles include finance, technology licensing and business and corporate development responsibilities at Vanguard Medica, GlaxoSmithKline and Imperial Innovations.	<b>CFO: Julian Smith</b> Joined PolyTherics as CFO in September 2013, now CFO for the group. Julian was chief financial and operations officer at Imperial Innovations (2006-13). Prior to Imperial Innovations, he was CFO of RadioScape and group financial controller of Mobile Systems International.
<b>President, US: John Manzello</b> Joined Abzena in October 2016 after serving as president of San Diego's Promosome, where he joined the company as president and CEO in April 2007. John expanded the business development, IP portfolio and strategic alliances for the company's suite of synthetic biology technologies. Before joining Promosome, he held business and commercial development roles at Althea Technologies, Cohesive Technologies, Genzyme Transgenics (GTC) and GTC's CRO/CMO subsidiary Primedica.	<b>Chief Business Officer: Sven Lee</b> Before joining Abzena, Sven was director of global sales and business development for the cell therapy technologies business unit of Terumo BCT. Before Terumo, he was VP of global business development at Catalent Biologics, responsible for the team's preclinical through Phase I/II GMP manufacturing business. He also launched the SMART Tag antibody drug conjugation platform. Before Catalent, Sven spent five years as director of business development with Crucell (Johnson & Johnson) and 10 years with Biogen.
<b>Senior VP Scientific Operations: Campbell Bunce, PhD</b> Campbell has over 19 years' experience working in the biotech and diagnostics sectors, occupying senior management positions with Piramed Pharma (director, development programmes), Immune Targeting Systems (R&D director) and Oxford Immunotec (GM, immunology products). He has extensive experience in developing novel biologics and vaccines for cancer, inflammatory and infectious diseases, leading them through development and regulatory processes.	<b>Senior VP of Technical Operations: Jim Mills, PhD</b> Jim joined Abzena's executive team in March 2015 as VP of technical operations. He was previously CEO of Cantab Biopharmaceuticals, having originally joined the company in 1997 as part of the process development group. Jim has a background in protein production and GMP manufacturing, having obtained his PhD in microbial physiology and biochemistry from the University of Leicester.
Principal shareholders	(%)
Invesco Asset Management	25.8
Woodford Investment Management LLP	23.0
Touchstone Innovations	16.9
City Financial	4.2
Hargreave Hale	4.2
Companies named in this report	
Seattle Genetics (SGEN), ImmunoGen (IMGN), Roche (ROG), Gilead Sciences (GILD), Opsona Therapeutics, Vascular Pharmaceuticals, NKT Therapeutics, Adheron Therapeutics, Therapure Innovations, Lonza, Catalent, Abcam, Horizon Pharma, Halozyme	

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