EDISON

Oxford BioMedica

Corporate update

Golden age for LentiVector as Axovant signs deal

Pharma & biotech

Oxford BioMedica (OXB) has signed an out-licensing deal with Axovant for its Parkinson's disease (PD) gene therapy AXO-Lenti-PD (previously OXB-102) worth up to $842.5m. Axovant plans to accelerate it rapidly into the clinic, with a Phase I/II dose escalation study in advanced PD patients to be initiated by year end. In addition to OXB's numerous other partnerships, notably the recently signed Bioverativ deal and the ongoing collaboration with Novartis on its launched CAR-T Kymriah, this deal demonstrates OXB's continuing world-leading status in lentiviral technology. We now include the Axovant deal in our model and value OXB at £614m.

Year end	Revenue (£m)	PBT* (£m)	EPS* (p)	DPS (p)	P/E (x)	Yield (%)
12/16	27.8	(20.0)	(29.35)	0.0	N/A	N/A
12/17	37.6	(11.5)	(14.14)	0.0	N/A	N/A
12/18e	72.6	4.5	9.88	0.0	92.5	N/A
12/19e	82.9	7.7	14.81	0.0	61.7	N/A

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

Commercial revenue opportunity significant

The out-licensing deal for OXB's AXO-Lenti-PD (previously OXB-102) adds to a growing and diversified revenue base. The deal includes $30m upfront ($5m as a prepayment for manufacturing-related activities), $55m in development milestones and $757.5m in commercial milestones in addition to tiered royalties of 7-10%. AXO-Lenti-PD is a re-engineered version of OXB's gene therapy ProSavin, which was tested in a Phase I/II open-label study in 15 patients and demonstrated statistically significant improvements in motor behaviour. AXO-Lenti-PD has been engineered to increase dopamine production compared with ProSavin, which could lead to a more efficacious gene therapy product.

Lentiviral expertise continues to be recognised

OXB's experience in providing commercial-grade LentiVector for Novartis's Kymriah has validated both its technology and its manufacturing capabilities. This expertise continues to attract partners, as evidenced by the recent announcement of the Bioverativ collaboration to develop gene therapies for haemophilia patients (>$100m in milestones plus royalties). These partnerships and others continue to grow OXB's revenues, driven in the near term by escalating sales of Kymriah. Furthermore, key inflection points from partnered assets OTL-101 (Orchard Therapeutics, BLA submission in H218) and CMB305 (Immune Design, Phase III clinical trial in synovial sarcoma initiation) could provide further inflection points.

Valuation: £614m or £9.35/share

Our increased valuation of OXB is £614m (£9.35/share) vs £513m previously. We now include the Axovant out-licensing deal in our valuation, but all other assumptions remain unchanged. We include the deals with Novartis, Bioverativ, Immune Design, Orchard Therapeutics and Sanofi, and OXB's non-partnered assets OXB-201, OXB-202 (corneal graft rejection) and OXB-302 (cancer) in our valuation.

8 June 2018

Price	**913.5p**
Market cap	**£600m**

Net debt (£m) at end December 2017 (excluding March 2018 £20.5m gross capital-raise and $30m Axovant upfront)	22.5
Shares in issue	65.7m
Free float	79%
Code	OXB
Primary exchange	LSE
Secondary exchange	N/A

Share price performance

%	1m	3m	12m
Abs	25.8	24.0	190.4
Rel (local)	18.9	17.3	181.1
52-week high/low		15.0p	5.0p

Business description

Oxford BioMedica's (OXB) LentiVector technology underpins the company's strategy. OXB generates significant revenue from partners that utilise its technology, notably Novartis, Bioverativ, Orchard Therapeutics and Immune Design. OXB is in partnering discussions about internally developed assets. OXB-102 will start a Phase II shortly.

Next events

EU DLBCL/pALL Kymriah approval	H218
OTL-101 BLA submitted	H218
CMB305 Phase III initiated	H218

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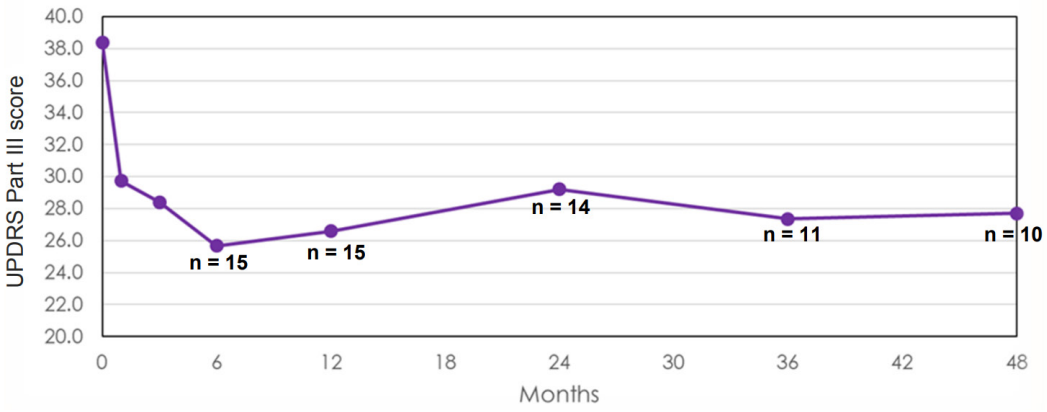
Edison profile page

AXO-Lenti-PD: Sector primed for next-gen ProSavin

AXO-Lenti-PD is a lentiviral-based gene therapy, which aims to programme non-dopaminergic cells in the brain to produce dopamine that will correct levels that have declined due to Parkinson's disease. Dopamine plays a critical role in movement and co-ordination and a reduction in its levels leads to the characteristic and progressive features of PD: tremor, slowness of movement and rigidity.

AXO-Lenti-PD is based on OXB's first-generation gene therapy for PD patients, ProSavin (OXB-101). ProSavin was tested in an open-label Phase I/II trial, with most recent data published in 2014, which studied the long-term safety and tolerability of ProSavin. The trial tested 15 patients at three dose levels (low dose, $1{\cdot}9 \times 10^7$ transducing units [TU]; mid-dose, $4{\cdot}0 \times 10^7$ TU; high dose 1×10^8 TU). No serious adverse events were reported, with drug-related adverse events typically mild in nature, most commonly increased on-medication dyskinesias and on-off phenomena. A common measure of Parkinson's patients is a comprehensive multi-question assessment of a patient's motor and non-motor symptoms called the Unified Parkinson's Disease Rating Scale (UPDRS). The scale is divided into multiple parts, a key component of which is part III, where a clinician evaluates a patient's motor abilities (eg speech, hand movements, tremor at rest) with scoring from 0 to 4, where a score of 0 is normal and 4 signifies severe problems. Improvements in UPDRS-III after taking ProSavin were tracked over 48 months and can be seen in Exhibit 1.

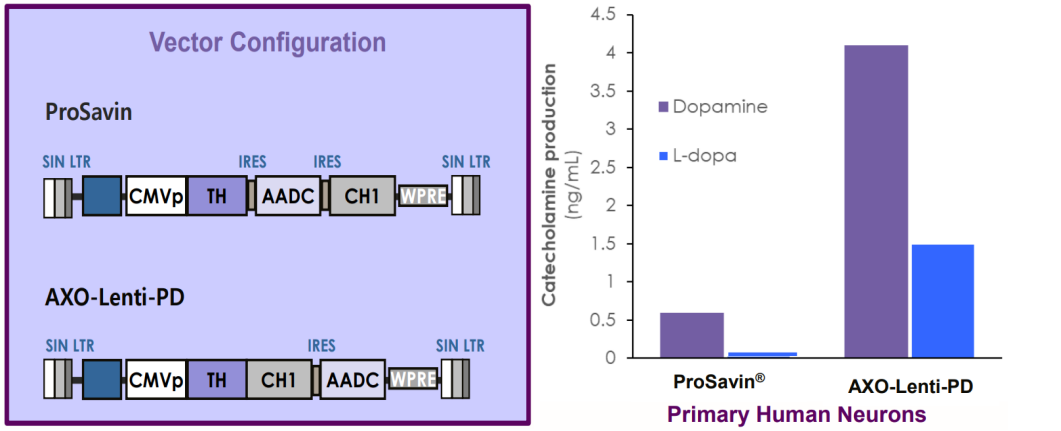
Exhibit 1: Mean UPDRS-III (OFF) score over time



Source: Oxford BioMedica

While ProSavin demonstrated improvements in motor behaviour and a safe profile, further clinical trials were not undertaken, primarily because of funding limitations and a lower efficacy than could be achieved with standard, commercially available oral therapies (eg L-DOPA, a precursor of dopamine that can cross the blood-brain barrier). AXO-Lenti-PD (previously OXB-102) aims to address these shortfalls in efficacy by redesigning the genetic payload of the vector. Both ProSavin and AXO-Lenti-PD contain the same genes, but the specific ordering and stoichiometry of gene expression has been altered (Exhibit 2) to improve both dopamine and L-DOPA production levels. A core property of lentiviral vectors is their high gene capacity, which enables three genes to be inserted that express three critical enzymes (tyrosine hydroxylase [TH], cyclohydrolase 1 [CH1] and aromatic L-amino acid decarboxylase [AADC]) needed for dopamine synthesis.

Exhibit 2: Differences between ProSavin and AXO-Lenti-PD



Source: Oxford BioMedica

Axovant plans to initiate a Phase I/II trial by year end for advanced-stage Parkinson's patients. This will consist of two parts. In the first part (A), patients will be tested across three dose levels with the lowest dose tested being the previous highest dose (1×10^8 TU) from the ProSavin trial. Once a dose has been selected, Part B of the study will be initiated. Additional patients will be enrolled into either the treatment arm or a sham arm (imitation surgical procedure). All patients will receive LentiVector via a one-time MRI-guided stereotactic delivery to the brain striatum. Endpoints have not yet been defined, but improvements in UPDRS scores and reduction of oral L-DOPA use are likely to be key.

We note that US-based gene therapy company, Voyager Therapeutics, has an AAV-based PD gene therapy in Phase I/II trials (VY-AADC). However, unlike AXO-Lenti-PD, which directly produces dopamine, VY-AADC has to be taken with oral L-DOPA, which is then converted into dopamine by the inserted enzymes. Clinical efficacy results have been mixed, but at the more optimal dosing of 900µl per putamen, encouraging efficacy data have been announced.

Valuation: £614m or £9.35/share

Our increased valuation of OXB is £614m (£9.35/share) vs £513m previously. We have updated our valuation to include the Axovant out-licensing deal, and moved forward our anticipated launch of AXO-Lenti-PD (previously OXB-102) in the US and EU to 2022 from 2024. We assume Axovant will aim to move it through the clinic rapidly and aim to launch the therapy on the back of Phase II data with an accelerated approval. However, we note that insufficient data or failure to achieve an accelerated approval could cause these timelines to slip significantly. We retain our previous assumptions for PD in relation to incidence, peak penetration and price as described in our recently published outlook report. We forecast peak sales of $1.96bn across the US and EU. Axovant has announced that OXB will receive tiered royalties based on net annual sales, with 7% on net sales up to $1bn, 8% between $1bn and $2.5bn, 9% between $2.5bn, and 10% over $4bn. As such, we currently assume that a peak royalty rate of 8% is achieved. We assume that OXB receives the majority of development milestones ($50m of the total $55m announced) and a significant proportion of the commercial milestones over its lifetime ($500m of total $757.5m announced). We note that AXO-Lenti-PD has yet to be tested in humans and, while it builds on a positive data package from ProSavin, it could fail to reach the market as a result of limited efficacy or unforeseen safety concerns. We currently assume a 20% chance of success for AXO-Lenti-PD. We note that Axovant also now owns the rights to ProSavin. However, no development plans have been discussed.

All of our other product assumptions and deal metrics remain unchanged; however, we assume increased costs particularly in relation to administrative expenses as the company rapidly expands to continue to meet increasing demand for its lentiviral technology. We have updated the exchange rates and note that OXB recently consolidated its shares in issue by a factor of 50. The company now has 65,701,066 shares in issue. For extensive details of our valuation, please see our recently published outlook note, Validation achieved, growth expected.

Exhibit 3: Financial summary

£'000s	2016	2017	2018e	2019e
Year end 31 December	IFRS	IFRS	IFRS	IFRS
PROFIT & LOSS				
Revenue	27,776	37,590	72,549	82,867
Cost of Sales	(11,835)	(18,442)	(27,788)	(31,069)
Gross Profit	15,941	19,148	44,761	51,797
R&D	(24,299)	(21,611)	(24,657)	(26,601)
Administrative expenses	(5,957)	(7,276)	(11,278)	(12,969)
Other operating income	3,002	4,071	0	0
EBITDA	(7,638)	(1,293)	13,981	18,990
Depreciation	(3,340)	(4,113)	(5,135)	(6,748)
Operating profit (before amort. and except).	(10,978)	(5,406)	8,846	12,242
Amortisation	(335)	(262)	(20)	(16)
Exceptionals	0	0	0	1
Operating profit	(11,313)	(5,668)	8,826	12,227
Net Interest	(8,994)	(6,093)	(4,353)	(4,510)
Other	0	0	0	1
Profit Before Tax (norm)	(19,972)	(11,499)	4,493	7,732
Profit Before Tax (reported)	(20,307)	(11,761)	4,473	7,717
Tax	3,666	2,744	2,000	2,000
Profit After Tax (norm)	(16,306)	(8,755)	6,493	9,732
Profit After Tax (reported)	(16,641)	(9,017)	6,473	9,717
Average Number of Shares Outstanding (m)	56	62	66	66
EPS - normalised (p)	(29.35)	(14.14)	9.88	14.81
EPS - reported (p)	(29.95)	(14.56)	9.85	14.79
Dividend per share (p)	0.00	0.00	0.00	0.00
Gross Margin (%)	57.4%	50.9%	61.7%	62.5%
EBITDA Margin (%)	(27.5%)	(3.4%)	19.3%	22.9%
Operating Margin (before GW and except) (%)	(39.5%)	(14.4%)	12.2%	14.8%
BALANCE SHEET				
Fixed Assets	29,501	28,421	37,266	48,003
Intangible Assets	657	2,954	2,954	2,954
Intangible Assets	1,330	97	77	62
Tangible Assets	27,514	25,370	34,235	44,987
Current Assets	27,441	36,981	57,956	59,649
Stocks	2,202	3,332	3,807	4,256
Debtors	6,904	17,088	23,852	27,244
Cash	15,335	14,329	28,810	26,662
Other	3,000	2,232	1,488	1,488
Current Liabilities	(9,316)	(21,762)	(24,492)	(25,840)
Creditors	(6,003)	(8,690)	(11,420)	(12,768)
Provisions	0	0	0	0
Deferred income	(3,313)	(13,072)	(13,072)	(13,072)
Long Term Liabilities	(35,011)	(37,494)	(38,811)	(40,176)
Long term borrowings	(34,389)	(36,864)	(38,181)	(39,546)
Other long term liabilities	(622)	(630)	(630)	(630)
Net Assets	12,615	6,146	31,919	41,636
CASH FLOW				
Operating Cash Flow	(5,979)	(1,551)	9,472	16,497
Net Interest	(3,258)	(10,800)	(3,074)	(3,183)
Tax	4,131	4,530	2,744	2,000
Capex	(6,458)	(1,969)	(14,000)	(17,500)
Acquisitions/disposals	0	0	0	0
Financing	17,497	385	19,300	0
Dividends	0	0	0	0
Other	47	8,399	38	38
Net Cash Flow	5,980	(1,006)	14,481	(2,148)
Opening net debt/(cash)	17,900	19,054	22,535	9,371
HP finance leases initiated	0	0	0	0
Other	(7,134)	(2,475)	(1,317)	(1,364)
Closing net debt/(cash)	19,054	22,535	9,371	12,884

Source: Company accounts, Edison Investment Research

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