Stock Data	
Share Price:	17.6p
Market Cap:	£17.3m
Shares in issue:	98.47m
52 week high/low:	52.0p – 18.2p

Company Profile	
Sector:	Biotechnology
Ticker:	MTPH
Exchanges:	AIM, Nasdaq[1]

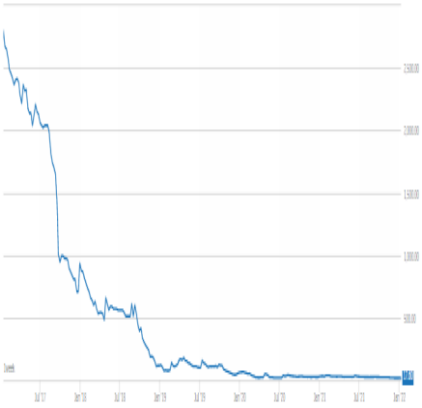
[1]Note: Ratio 1 ADS : 5 Ord. Shares

Activities

Midatech Pharma plc ('Midatech', 'MTPH', 'the Group') is a developer of therapeutic platform technologies and also focuses on the Research and Development ('R&D') of medicines for the treatment of rare cancers and other lethal diseases through in-house as well as partnered programmes while seeking to license its technologies.

www.midatechpharma.com/

5-year share price performance chart



Source: LSE

Past performance is not an indication of future performance.

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Midatech Pharma plc

Midatech has announced an extension of the Q-Sphera R&D Collaboration ('the Collaboration') that was originally detailed on 21 July 2020, while also disclosing that the previously unnamed party is, in fact, Janssen Pharmaceutica NV ('Janssen'), the Belgium-based pharmaceutical arm of the world's largest and most broadly-based healthcare company, Johnson & Johnson (NYSE: JNJ).

Today's news follows Midatech's 17 June 2021 announcement that it had successfully encapsulated a proprietary Janssen experimental large molecule medicine while preserving its functional integrity. Considering no other commercial or academic organisation has been able to deliver any such experimental medicine over extended periods using methods capable of commercial scaling, Janssen's decision to extend the Collaboration clearly reflects very positively on the potential of Q-Sphera's technology in the delivery of active pharmaceutical ingredients ('API') via long acting injectables. Midatech will now focus on maximising drug loading and optimising *in vitro* duration of release while utilising the technology. While this is the next of what is likely to become many more development steps requiring successful completion before a commercial opportunity presents itself, it is worth reflecting on the fact that the global monoclonal antibody ('mAb') market was valued at a giant US$154bn in 2020. Recognising that beyond Janssen there are large number of candidates, both on market and under development, that could benefit from this advance in technology, satisfying not only the need for sustained release but also local/targeted delivery, translation of biologics as long-acting formulations offers potential for blockbuster opportunities. From these, Midatech could generate not only substantial fees/extended royalties, but also build significantly on its the reputation for innovation.

Modified release mAb programme – Q-Sphera long-acting depot injection

One of the focuses of Midatech's March 2020 strategic review, was to expand the commercial/partnering opportunities presented by its three proprietary technologies, each of which is capable of optimising therapeutic opportunity. In particular it recognised that Q-Sphera might offer a global industry beset by ageing drug portfolios, the opportunity to extend the life time of their products. The technology's proprietary 3-D printing techniques encapsulate drugs in polymer-based bioresorbable microspheres, which may be injected to form depots in the body and release it in measured doses over predictable, sustained periods from one week to several months.

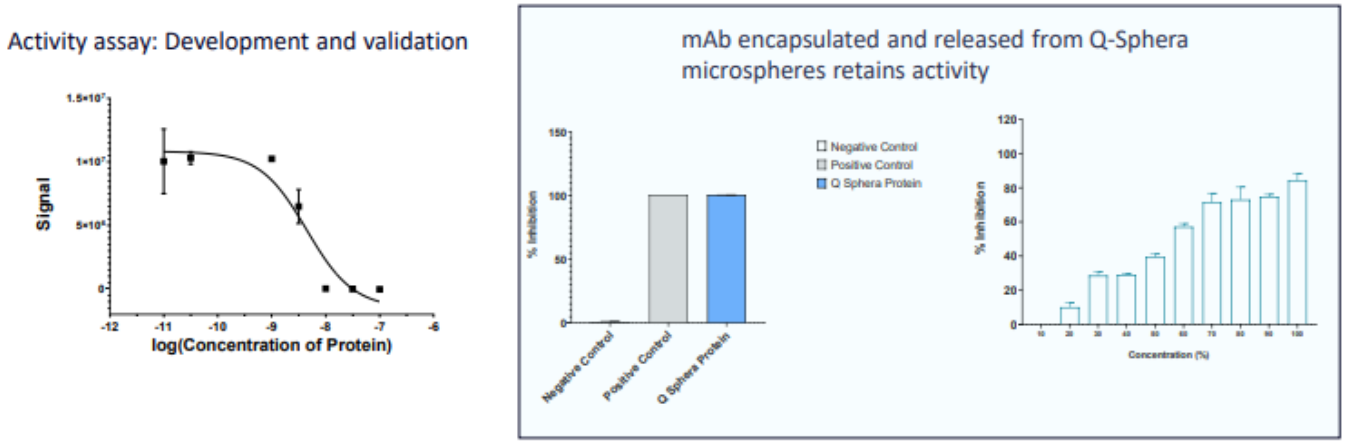
Given its ambition to fully exploit the capabilities and unique nature of the Q-Sphera Platform, management chose to target its technology at new and innovative applications. One such application included the encapsulation of biologics, in particular mAbs, for controlled release. Large molecules present a significant challenge in terms of formulation into long-acting injectables, as their complex tertiary structures are delicate with great sensitivity to the environment and the stresses under which they are manufactured. Traditional process such as, for example, double emulsion, which requires the drug to be dissolved in aqueous solution, has been seen to be unsuitable and results in denaturing of the molecule. Consequently, there are presently no commercially approved long-acting formulations available.

Q-Sphera differentiates itself through a manufacturing process that is known to be relatively benign, avoiding exposure to potentially hostile conditions (heat, pressure etc.). The 'open honeycomb' structure that is its signature creates microspheres

without inaccessible points that could result in pockets of protein degradation. Having successfully formulated short-chain peptides in the past, this provides confidence that the technology is fundamentally compatible with such an opportunity. The continuing challenge, however, remains that of achieving ever greater molecular scale, needing to be several-times larger than that already demonstrated while also supporting significantly greater inherent complexity. Should this be reliably achieved, however, it could result in what might be described as a 'game changing' outcome for the life sciences industry in general and Midatech in particular.

With many therapeutic proteins, the aim is to bind with a specific target to demonstrate that the antigen can be correctly folded and retain its functionality. Midatech accordingly used its expertise in analytical methods to develop an *in vitro* activity assay that measures the ability of an exemplar therapeutic monoclonal antibody (MTD220) to specifically combine with a carbonate antigen in order to demonstrate it is correctly folded and remains functional (i.e., not denatured). Data in the left-hand chart (below) from a Midatech presentation of June 2021, indicates that the assay is sensitive to increasing concentrations of the exemplar mAb as the luminescence signal decreases. The central bar chart shows that mAb encapsulated and released from Q-Sphera in an *in vitro* dissolution model is representative of how microspheres release drug in the body, demonstrating full activity is retained in the same way as the positive control (i.e., exemplar mAb not encapsulated in Q-Sphera). The chart to the right also indicates the linear relationship between protein concentration and assay inhibition. Follow-on development steps include further optimisation of drug loading and dissolution profile, before establishing potential application across multiple high-value mAb therapeutics that might be translated to scalable and commercially viable products.

Analytical Methods Demonstrate mAb Assays Preserving their Functionality



Source: Midatech, Investor Presentation of 17 June 2021

Potential 'Game Changer'

As noted, success in translating biologics as long-acting formulations is considered a potential 'game changer' for the life sciences sector. For Midatech, it is clear that there are a large number of candidates both on market and under development that could benefit from application of such an advance in technology, opening up opportunity not only for sustained release but also local and targeted delivery.

To put this into context of potential scale, Midatech constructed a table detailing the top-10 mAbs by global sales in 2020 which totalled US$75 billion, or almost half of the total global market which has been valued at c.US$154 billion. Opportunities include improved protein stability, reduced elimination and longer durations between doses, leading to greater compliance and better performance for patients, as well as reduced healthcare costs for the payer. Options for local delivery of high concentrations provide potential for reduced toxicities and side effects that are common with systemic delivery of mAbs, as well as reducing the total volume of costly drug required (resulting in a significant reduction in cost of goods) as well as potentially extending the life time of drugs that otherwise might be set to fall off-patent.

Midatech of course is not alone in seeking to extend the half-life of mAbs and has identified other players with similar objectives. Significantly, however, the bio-delivery and biodistribution of medicines using Q-Sphera offers a number of additional attributes,

not just in increasing stability, but also ensuring it can be effected in a commercially viable way in that it is both robust and repeatable on acceptable scale. There are other technologies being developed across a biotech industry that targets increased stability of proteins by, amongst other things, seeking to apply AI/machine learning as well as changes to formulation. Mostly, however, these have very lengthy development routes, compared with Q-Sphera whose concept has become well understood. Midatech has also completed extensive diligence with a wide sweep of academic papers, etc. to establish that no other party has been able to undertake such a process on a commercial scale without excessive wastage that makes it wholly uneconomic.

Global mAbs Market – Top Ten by Revenue in 2020

#	Brand	Generic	Company	Global sales 2020 ($Bn)	Current administration
1	Humira®	adalimumab	AbbVie	19.8	Injection every 2 weeks
2	Keytruda®	pembrolizumab	Merck	14.4	Injection every 3 weeks
3	Stelara®	ustekinumab	Johnson & Johnson	7.7	Injection, 4 weeks, every 12 weeks
4	Opdivo®	nivolumab	Bristol Myers Squibb	7.0	Injection every 4 weeks
5	Avastin®	bevacizumab	Hoffman La Roche	5.0	Injection every 2 or 3 weeks
6	Ocrevus®	ocrelizumab	Hoffman La Roche	4.4	Injection, 2 weeks, every 6 months
7	Rituxan®	rituximab	Hoffman La Roche	4.3	Infusion, 4 or 24 weeks
8	Darzalex®	daratumumab	Johnson & Johnson	4.2	Injection weekly, then 3 weekly, then 4 weekly
9	Soliris®	eculiumab	Alexion	4.1	Infusion, weekly then every 2 weeks
10	Cosentyx®	secukinumab	Novartis	4.0	Injection every 4 weeks
				74.9	
	Total mAb market 2020			154	

Source: Midatech, Investor Presentation of 17 June 2021

Following this success and recognition of the potential scale of the opportunity it is now presented with, Midatech's Board allocated part of the £10m (gross) new funds raised in the equity placing of 29 June 2021 to, amongst other things, develop additional mAb formulations to proof-of-concept ('PoC') stage using its Q-Sphera technology. That said, being taken only to PoC is a relatively economic process to undertake, even if buying the API itself is more expensive than for small molecules. Notwithstanding this, costings are expected to amount only to consumables (and allocated laboratory time) before seeking partners to fund development through the clinical process. Investors anticipate further updates on both this and progress with the Collaboration during 2022.

Proprietary technologies capable of optimising therapeutic opportunity

Midatech's three proprietary technology platforms (Q-Sphera™, MidaSolve™ and MidaCore™) are protected through 36 patent families including 120 granted patents and an additional 70 applications). They offer a rapid development facility capable of optimising therapeutic opportunity through a number of different routes. Each has its own unique mechanism and, having been validated through human use in the clinic, provides additional capability and insight that adds to and complements the collaborator's existing research facilities.

With multi-billion-dollar market caps, tens of thousands of employees and giant R&D budgets, Big Pharma has huge resources at its disposal. Their businesses might stretch across proprietary products, pharmaceutical services and active ingredients to global generics. Operating in a highly competitive environment, however, the problem they each recognise, is that ageing therapeutic portfolios require improved formulation in order to extend existing patent protection, improve patient outcome and/or to differentiate their offer within a crowded marketplace. They therefore seek innovative technologies, such as those developed by Midatech, that permit creation of new combinations as well as exploring new delivery mechanisms to improve patient comfort, convenience and efficacy.

TPI retains its valuation for Midatech, targeting a share price of 99p/share

Today's news reminds investors of the potential that Midatech's unique technologies offer. Janssen's extension of its Q-Sphera technology R&D Collaboration presents an important medium-term opportunity for the Group to collect both milestone payments and a long-term stream of royalties; it also builds on the Group's reputation for successful innovation. TPI last updated its valuation for Midatech following the two significant news announcements released in June 2021, while also factoring in continuing progress across its development pipeline. Not surprisingly, an exceptional level of international interest was expressed in the Group's release of 17 June 2021, which detailed breakthrough data indicating protein loading up to 15% w/w while retaining functional integrity throughout encapsulation and release, as demonstrated in an *in vitro* antigen binding assay. Given that the industry eagerly seeks long-acting formulations for monoclonal antibodies in a market which the top 10 drugs account for c.US$75 billion in annual sales, TPI apportioned a prudent value to this early-stage discovery, albeit recognising that this might be expected to multiply as soon as a senior development partner has been formally identified. Later that same month, Midatech raised £10m new equity funding, which the Board considers now provides it with a runway out to Q1 2023. The result was for TPI to increase its sum-of-parts valuation across the Group's different internal and external programmes to £97.5 million (compared to £65.7m previously in analysis published on 10 September 2020), although factoring in the increased number of shares in issue reduced TPI's target price to 99p/share (compared to 104.2p previously). This valuation remains in place following today's news.

Please note that TPI's valuation is based on financial modelling and there is no guarantee that such a valuation will ever be realised, therefore please do not base investment decisions on this valuation alone.

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