ExpreS2ion Biotech Holding

Sponsored Research Initiating Coverage

24 June 2021

Rising to the COVID-19 challenge

ExpreS2ion Biotech is a contract research organization, which has been founded over 10 years ago. The company specializes in the production of complex proteins using its proprietary protein expression platform. More recently, the company has been focusing on the development of its pipeline, which includes several vaccine and therapeutic candidates. Out of this group, we regard the ABNCoV2 project (COVID-19 vaccine), carrying the highest near-term potential. Its partner, Bavarian Nordic, plans to start Phase III trial later this year, pending funding. We expect an upward potential rerating of SEK 50 per share, should the vaccine successfully go through clinical development and receive regulatory approval. We initiate coverage of ExpreS2ion Biotech with a Buy rating, target price SEK 60 per share.

COVID-19 vaccine project carries the highest near-term potential

Despite the rapid success of a number of COVID-19 vaccines, there is a need for improved vaccines that offer strong immunogenicity as well as ease of clinical administration, stability and adaptiveness of platform. Given impressive pre-clinical results, as well as solid interim Phase I safety data, we believe ABNCoV2 has a significant opportunity to succeed through the rest of clinical development.

Promising breast cancer project

Amongst other projects, the company is working on an early stage breast cancer therapeutic vaccine. ExpreS2ion Biotech owns this project outright and has full control of its development, though eventually we would anticipate the company to out-license the project to a partner with more resources. We estimate that if the candidate reaches Phase III, the breast cancer vaccine could be worth around SEK 4bn (or close to $500m).

SEKm	2019	2020	2021e	2022e	2023e
Revenues	14	15	15	145	107
EBITDA	(16)	(29)	(32)	94	58
EBIT	(19)	(32)	(36)	90	54
EPS	(1.21)	(1.16)	(0.98)	2.42	1.46
EPS adj	(1.21)	(1.16)	(0.98)	2.42	1.46
DPS	-	-	-	-	-
EV/EBITDA	-	-	-	9.2	14.1
EV/EBIT	-	-	-	9.6	15.1
P/E adj	-	-	-	14.8	24.5
P/B	-	3.18	10.04	5.98	4.81
ROE (%)	-	-	-	50.6	21.8
Div yield (%)	-	-	-	-	-
Net debt	(4)	(104)	(114)	(186)	(230)

Source: Pareto

Buy
Hold
Sell

Target price (SEK)	**60**
Share price (SEK)	36

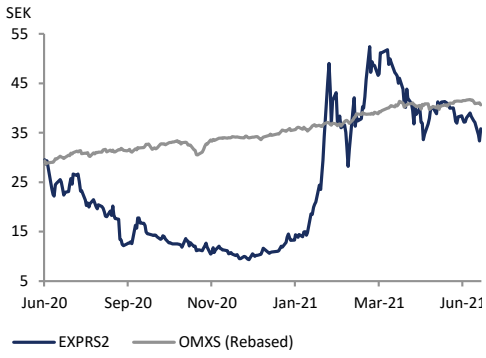
Forecast changes

%	2021e	2022e	2023e
Revenues	NM	NM	NM
EBITDA	NM	NM	NM
EBIT adj	NM	NM	NM
EPS reported	NM	NM	NM
EPS adj	NM	NM	NM

Source: Pareto

Ticker	EXPRS2.ST, EXPRS2 SS
Sector	Healthcare
Shares fully diluted (m)	27.6
Market cap (SEKm)	988
Net debt (SEKm)	-114
Minority interests (SEKm)	0
Enterprise value 21e (SEKm)	938
Free float (%)	83

Performance



Source: Factset

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Table of Contents

Investment case

ExpreS^{2}ion Biotech was started as a contract research organisation with the intent to commercialize its ExpreS2 protein expression platform. The driver for this was the increasing demand for production of complex proteins used for biological drugs and vaccines. The company's clients use ExpreS2 to create complex proteins (which are often active ingredients in drugs) using genetically modified cells. Since the launch of the platform over 10 years ago, the company has been able to produce more than 300 different proteins, working with more than 100 clients and partners while posting a success rate of 90% on its projects. We attribute the success of the insect-based protein expression platform due to a number of advantages including generating consistently high yields as well as being significantly less costly and time-consuming than some other protein expression platforms. Included in the platform is the HighMan-S2™ cell line, which has been engineered to provide unique glycosylation (attachment of sugar groups called glycans) by attaching mannose (type of a sugar) to the protein the cell line expresses. This allows clients to create custom "tailor-made" proteins.

Another attractive asset includes the joint venture, AdaptVac, in which ExpreS^{2}ion holds a significant share (34%). The key proprietary technology owned by AdaptVac is the capsid Virus Like Particle (cVLP) universal display technology that allows development of therapeutic and prophylactic vaccines. AdaptVac plays a key role in several projects that ExpreS^{2}ion itself is involved in.

While service revenue from the platform has been central for most of ExpreS^{2}ion Biotech's history, the new strategy includes a greater focus on building its own pipeline of drug candidates. This shift presents new upside opportunities far and beyond what the current financials show.

ExpreS^{2}ion pipeline overview

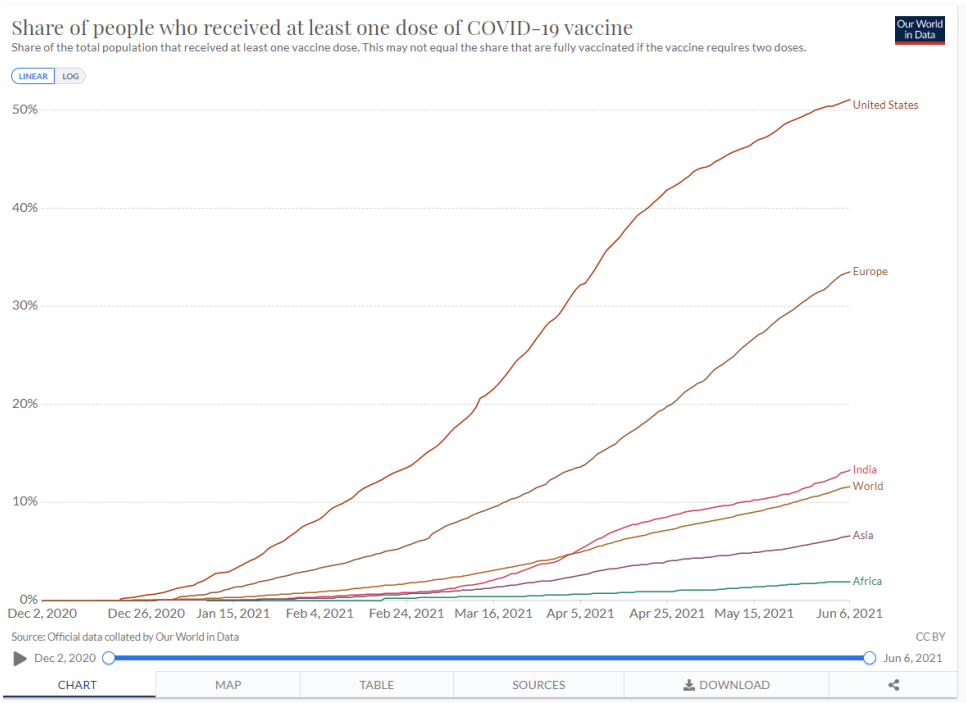
Source: Company data

The biggest near-term opportunity is the ABNCoV2 project. The focus of the project is to develop a second generation COVID-19 vaccine, characterized by strong immunogenicity, ease of clinical administration, stability, and

adaptiveness of platform. In a collaboration involving several parties, ExpreS^{2}ion produces SARS-CoV-2 antigens, puts it into VLP and conducts various optimisation efforts. GMP handling is being carried out by AGC Biologics, which is tasked with some of the production work (cGMP processing of the material to used clinically). Bavarian Nordic is responsible for further development and commercialization. A clinical Phase I/II study (COUGH-1), which was initiated in March 2021, is under way. On April 12th, the company reported positive interim safety data as the vaccine has been very well tolerated in the first 18 healthy volunteers dosed (total = 42) so far. The full study duration is about 7 months (last dosing is in May/June); headline results are expected in July 2021. Final reporting of the data is expected in October. In addition, Bavarian plans a clinical Phase II study that is expected to be initiated in June with initial immunogenicity data in August 2021.

As with most other vaccine developers, Bavarian plans to run the Phase III study in parallel, aiming for initiation sometime in H2 2021. Given the fast-moving vaccine competitive landscape, we believe that ABNCoV2 would be used as a booster to currently approved vaccines. Having said that, many developing countries are still not as far along in terms of vaccination as the developed world. In fact, outside US and Europe, less than 15% of people have not even gotten one dose of a COVID-19 vaccine. Despite first-mover advantage that some early breakthroughs have enjoyed, we believe there remains a high need for additional vaccines, as there is room for improvement over existing options.

Vaccination efforts around the world



Source: Our World in Data

We have seen exciting preclinical results already and believe ABNCoV2 could have a significant place in the market. Points of differentiation include encouraging stability that could potentially offer storage and handling even at room temperatures. This would be a major competitive advantage over the mRNA vaccines. Another advantage could be a single shot potential with long-lasting protection. Only the J&J vaccine is currently administered with a single dose but offers a mediocre efficacy of only 66%. A final promise is that ABNCoV2 could be perfectly suited for potential mutated variants of COVID-19, evidenced

by broad neutralizing responses seen in partner's, Bavarian Nordic, preclinical data in non-human primates.

Given the fast development timeline, we expect a royalty stream already in 2022, modelling SEK 129m (total company 2022e revenues SEK 145m), though as the project is further de-risked, our estimate would rise up to SEK 322m of 2022 royalties from this project alone. On the other hand, we do expect the royalty stream to decrease after 2022 (-30% per year), as the demand for COVID-19 vaccines is likely to subside somewhat. We currently value this project at SEK 34.17 per share, which includes both royalty stream and 34% ownership of AdaptVac, which is entitled to even a greater share of the royalty stream. Should the project reach market we expect an additional value of SEK 50 per share from this project alone.

ExpreS^{2}ion's pipeline includes other assets as well, one of the most interesting of which is ES2B-C001. This project is the company's potential answer to the HER2+ breast cancers. It's also the one project where ExpreS^{2}ion has full control and as a consequence the area of the largest investment. This programme is still in the preclinical stages, with preclinical proof of concept data expected later this year. However, it was observed that a strong antibody response (antibodies produced against HER2) was elicited by vaccination of genetically modified mice (grafted with mammary cells) with HER2-VLP and prevented tumour growth. A solution that causes the body to produce its own anti-tumor antibodies would go a long way in addressing many issues with trastuzumab (leading HER2+ treatment), which posted over $7bn of peak sales (sold as Herceptin) before the patent cliff.

Aside from the ABNCoV2 project, the breast cancer project provides the most significant near to midterm catalysts, in our view. While this project is very early stage and likely still 8-9 years away from the market, the de-risking of the asset along the way should offer a significant share price boost for the company. We currently model only a 3% LOA (Likelihood of Approval), given the current state. As the project moves along and reaches Phase I (2023e), for example, we see an estimated SEK 11 per share upward valuation increase. We currently value this project at SEK 10.97 per share. In reality, however, we do not believe ExpreS^{2}ion would be able to fund the program until completion. Instead, a likely scenario would be to out-license the project to a partner with more resources. We estimate that if ES2B-C001 reaches Phase III, the project should be worth around SEK 4bn (or close to $500m).

In addition to the two projects mentioned above we include the influenza, as well as the malaria projects in our valuation. Both of these out-licensed projects have a smaller market potential and are a number of years away before commercialization, hence a less significant contribution to our valuation. Nevertheless, having the strong partners on board and consistent external funding (i.e. from EU and other organizations) give us a level of confidence of a relatively good probability of these projects becoming successful.

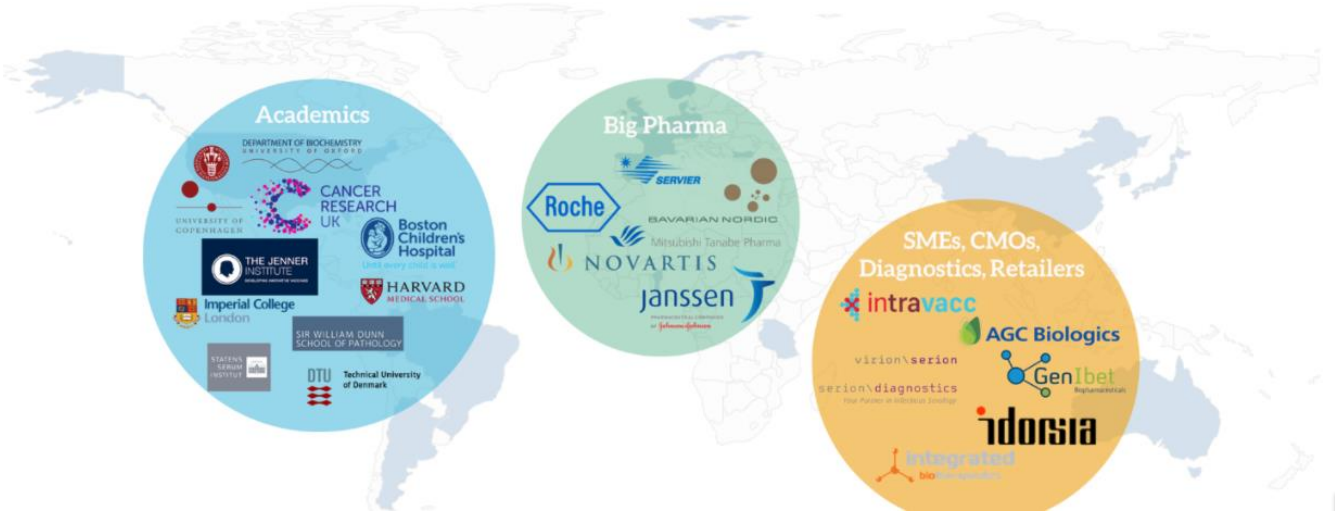
We value ExpreS2ion Biotech using a Sum of the Parts (SOP) approach, in which we combine individual project NPV results discussed in the respective sections of this report. Our calculation of the valuation analysis leads us to a rounded target price of SEK 60 per share. We initiate coverage of ExpreS2ion Biotech with a Buy rating.

ExpreS2 platform

ExpreS^{2}ion Biotech was created out of the vision of the founders to commercialize its ExpreS2 platform as the demand for production of complex proteins used for biological drugs and vaccines continued to increase. This took place through a spin-off of ExpreS^{2}ion Biotech from the pharmaceutical company, Affitech, that occurred in 2010.

The out-licensing of the ExpreS2 platform still constitutes the source of current revenue for the company. Revenue streams include potential future royalties, current license fees, and milestone payments, all of which we break down in detail in this report. In addition to licensing its platform, ExpreS^{2}ion also sells test kits and reagents for application as research tools or diagnostics. Customers and partners include pharmaceutical companies, such as Roche, as well as research institutions, such as Imperial College London. The company is working with about 10 clients (as of FY 2020 report publish date). Since its launch over 10 years ago, the company has been able to produce 300 different proteins, working with more than 100 clients and partners while posting a success rate of 90% of its projects.

Examples of current and previous partners as well as clients



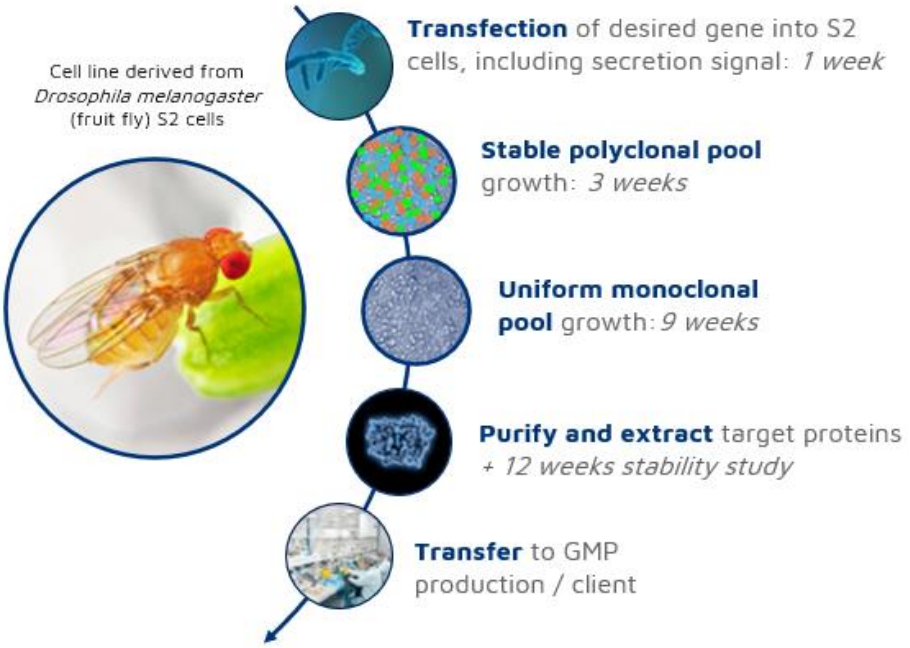
Source: Company data

ExpreS2 platform in a nutshell

Recombinant proteins (use DNA from multiple sources) are utilized in vaccines and biopharmaceutical products developed by the pharma and biotech industry, often as active ingredients in drugs. The production of proteins is done using protein expression platforms, which include a variety of cell types, such as bacterial, insect or mammalian. The important factors that play in determining the approach to use are yields, stability, speed and the ability to even express the protein.

ExpreS2 platform uses the insect approach of protein expression and is based on *Drosophila melanogaster* (fruit fly) S2 cells. The way this works is that the platform combines these S2 cells with patented expression vectors (promotes cell's internal protein production machinery), adapted culture agents and reagents which stimulate cell growth. The speed of the platform is very good with delivery times of around 3-6 months.

ExpreS2 platform



Source: Company data

The advantages of ExpreS2 are several. It provide a non-viral approach to protein and vaccine production, which avoids inherent risks and related costs to working with live viruses and viral vectors. Compared to some other methods, the process is significantly less costly and time-consuming. The latter is an extremely important factor, considering variables such as time-to-market and patent expiry for the clients. This makes the platform particularly valuable for the development of diagnostics and vaccines in epidemic or pandemic situations where speed is of the essence. In fact, the company has out-licensed its ExpreS2 technology in a COVID-19 vaccine project which is likely to enter Phase III trials later this year, which we discuss later. Also, the platform is able to generate homogeneous manufacturing batches, another critical requirement in pharmaceutical development. S2 cells are very genetically stable as cell culture profile/size distribution stays the same over a month of perfusion as does the protein output in terms of quantity and quality.

While the mechanism has been established in the 70's by Prof. Imogene Schneider, the company enjoys the patent life of the S2 vector system patent until 2032 (US), while patents on glyco-engineered S2 cells are until 2040.

GlycoX-S2

The GlycoX-S2 brand is Expres^{2}ion's solution in providing "tailor-made" proteins, which are particularly needed in immunotherapy and vaccine production. The company has been offering this to clients since October 2019, as the first product, HighMan-S2, was launched. The cell line has been engineered to provide unique glycosylation (attachment of sugar groups called glycans) by attaching mannose (type of a sugar) to the protein the cell line expresses. In real life, many pathogens (including the viral protein that causes COVID-19) are indeed glycosylated. It has been theorized that this mechanism allows additional defence against recognition by the immune system, further enhancing the ability of the pathogen to spread. ExpreS^{2}ion is currently using CRISPR/Cas9 gene editing technology (under license from ERS Genomics) to establish the cell lines (HighMan-S2). We believe the continued innovation seen in the GlycoX-S2 brand is responsible for

significant revenue growth in the last year (~10%). We expect further innovation in the coming years to the platform as the company enhances its expertise in the protein expression business.

Current platform revenue sources

The service revenue generated with the ExpreS2 platform can be broken down into three types of agreements. The MTA (Material Transfer Agreement), which usually lasts six months, grants the client to use the ExpreS2 platform purchasing the materials needed to use the platform. This type of collaboration is popular with COVID-19 as the company has five MTAs related to the transfer of its SARS-CoV-2 material for various COVID-19 diagnostic and research support purposes.

Second, RLA (Research License Agreement) gives the client the right to conduct basic research, based on cells contained in the platform. The revenue consists of the materials purchased as well as an annual license fee. Major RLAs (allowed for disclosure) are currently with Hoffman-La Roche, Imperial College London and Francis Crick Institute.

Finally, the CLA (Commercial License Agreement) gives the client the right to conduct clinical development of vaccines and other biopharmaceuticals using the ExpreS2 platform and to further commercialize the product. In return, the client pays for materials, development milestones and ultimately a sales-based royalty (low single-digit) if the product reaches the market. Major CLAs are currently running with University of Copenhagen, and the Jenner Institute of the University of Oxford.

In total, the revenue development from the platform service business has been strong (2020: 10% growth). However, the absolute figure of SEK 15.263m (FY 2020) is rather modest, in our view, when comparing to the potential from the company's pipeline. In terms of profitability, the company has posted 2020 operating profit of SEK -28.754m, though a large part of expenses investment in the pipeline business, including primarily the COVID-19 project in 2020. Indeed, the gross margin has been relatively high, posting at 60% in 2020. Looking just at the service business, we believe the ExpreS2 platform service business is around breakeven to the bottom-line.

AdaptVac

ExpreS^{2}ion holds a significant share (34%) in a joint venture called AdaptVac, formed in 2017. The remaining share is held by NextGen Vaccines, a spin out the Department of Immunology and Microbiology, the University of Copenhagen, led by Professor Ali Salanti. The key proprietary technology owned by AdaptVac is the capsid Virus Like Particle (cVLP) universal display technology that allows development of therapeutic and prophylactic vaccines. AdaptVac has a global exclusive license for this technology. Originally, this was a 50/50 venture but ExpreS2ion's stake was reduced to 34% during inlicensing of the breast cancer program.

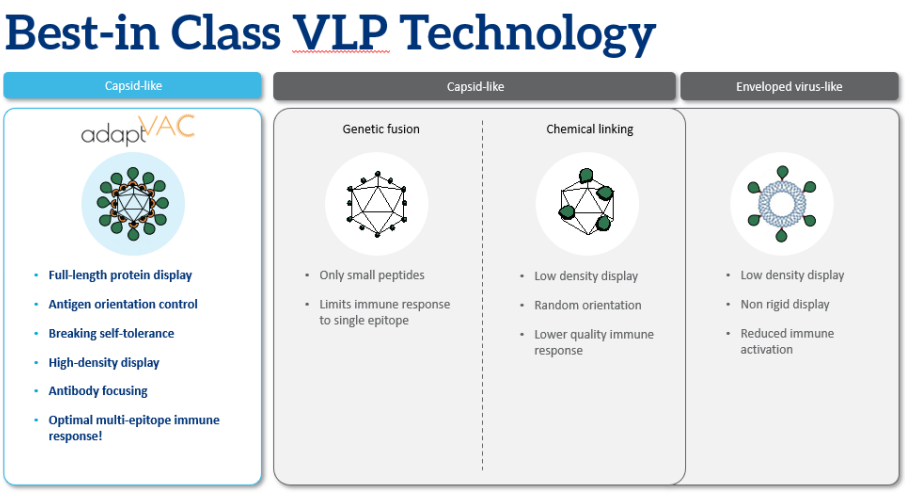
cVLP platform

VLP structure, used for vaccine development, is central to the AdaptVac's technology. VLPs, as the name suggests are similar to viruses, with the key difference being that they have no viral genetic material and are therefore non-infectious. The fact that VLPs cannot replicate yields is an important safety element which does not exist for vaccines that are based on attenuated viruses. While VLPs can be naturally occurring, one can also synthesize these through individual expression of viral structure proteins. Then these self-assemble into a virus like structure.

The VLP technology is not brand new but a validated one as VLP vaccines have been already commercially validated. For example, both Cervarix (Hepatitis B) and Gardasil (HPV) are successful FDA approved vaccines, that posted 2020 sales of $178m and $3.9bn, respectively. In fact, not only do these vaccines apply a VLP system, the antigens are also produced in insect cells.

AdaptVac' system carries high immunogenic potential which stems from several factors. There is a high-density display on its surface with 180 attachment sites. In addition, the exceptionally strong attachments can hold entire complex proteins. This is not the case with some other VLP approaches. which can only support fragments (single epitopes). Finally, AdaptVac features directional attachment compared to random orientation in other systems.

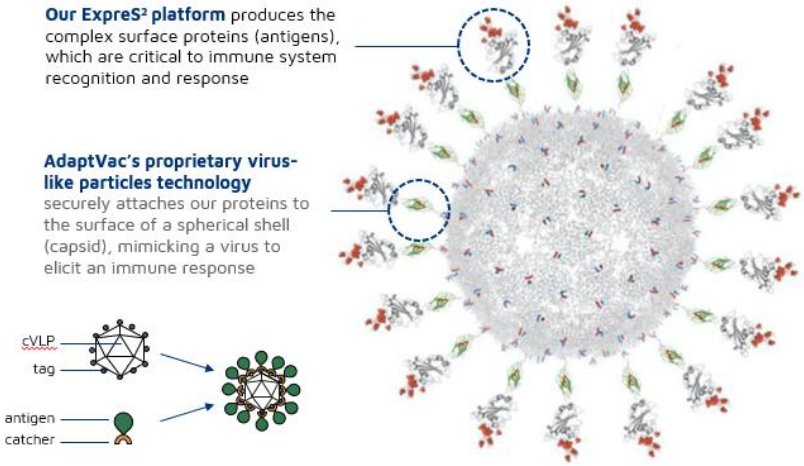
Advantages of AdaptVac's cVLP



Source: Company data

The creation of a VLP vaccine results from a combination of the VLP structure to a protein, nucleic acid, peptide or a small molecule. The selection of the antigen (molecular structure present on the outside of a pathogen) is based on a specific indication (SARS-CoV-2 spike protein for COVID-19, for example). The antigen is attached either by fusing it genetically to the VLP, by using chemical crosslinker, by using non-covalent binding methods, or isopeptide binding reactions based on Tag/Catcher pairs. The last method is what AdaptVac uses, which stems from the discovery by researchers at the University of Copenhagen. The discovery showed that this method is ideal for generating highly efficacious vaccines. The success of this approach is due to a favourable optimization of the number, density and direction of proteins displayed on the surface of the VLP.

Tag/Catcher binding method of AdaptVac cVLP



Source: Company data

AdaptVac is a joint venture and a separate entity with costs (rather small) and profit allocated proportionally to parties' ownership (ExpreS^{2}ion Biotech and NextGen Vaccines). The current projects include the COVID-19 vaccine, which is the most advanced, breast cancer vaccine and pandemic preparedness. ExpreS2ion Biotech is directly involved with the first two though economics these differ. ExpreS^{2}ion has a much greater control of the breast cancer project holding an exclusive global license. Both of these projects will be discussed in detail following this section.

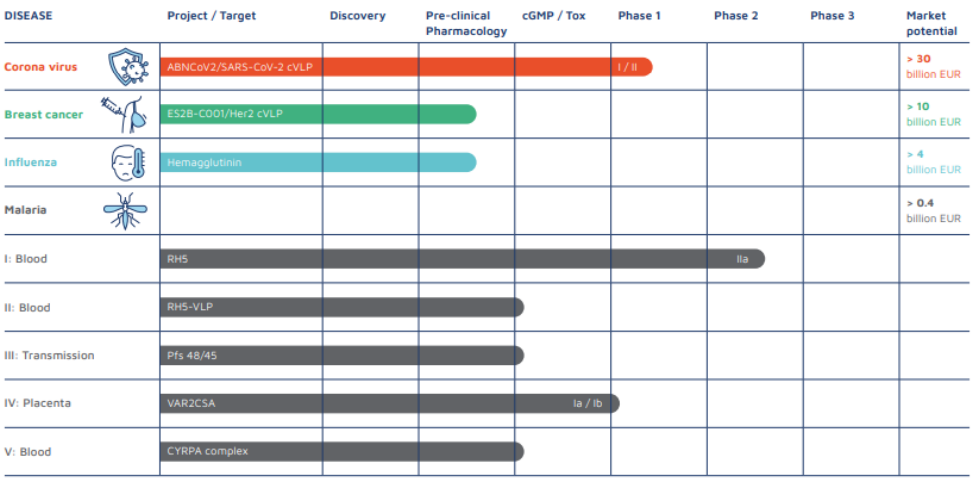
Pipeline

While service revenue has been central for most of the company's history, the new strategy for ExpreS^{2}ion Biotech includes a greater focus on building its own pipeline of drug candidates. This shift presents new upside opportunities far and beyond the service-based platform business.

At the same time, there is a greater need for investment as the company seeks to conduct its own research, preclinical and early clinical development before seeking out-licensing opportunities. However, the company has been successful in attracting funds with, SEK 131m raised in October 2020. There is a potential for up to an additional SEK 85m (bringing the total to SEK 216m) raised through follow-on warrant subscriptions in March 2021 (SEK 39m raised with 97.6% subscription rate) and September 2021 (up to SEK 45m). The latter, deemed TO5 warrants, have an exercise period from September 6 to September 20, 2021. The strike price would correspond to 70% of VWAP of the share price between August 23 and September 3, though the maximum strike would be SEK 25 per share.

The new funds would be used primarily for investing in the pipeline. Below is an overview of the major projects and at which development stage they currently are.

ExpreS2ion pipeline overview



Source: Company data

All of the projects except for the breast cancer vaccine are out-licensed. This means that there are limited costs to be further incurred by ExpreS^{2}ion. The company collaborates with partners, and does incur some development costs, on several of these projects, though a portion of this is funded by grants. These arrangements limit upside opportunities significantly as the company is subject to relatively small license fees and royalties, should the projects become successful. On the other hand, the breast cancer project is likely the one that presents the greatest upside opportunity as the company is entitled to 100% of the potential revenues. This, of course, involves a significant R&D burden since the company is responsible for clinical development. We do, however, believe that the project would be partnered should early stage development prove successful.

For the majority of this report, we discuss each of the projects in more detail, analysing respective markets and arrive at a current value of each project.

ABNCoV2 project

COVID-19 in a nutshell

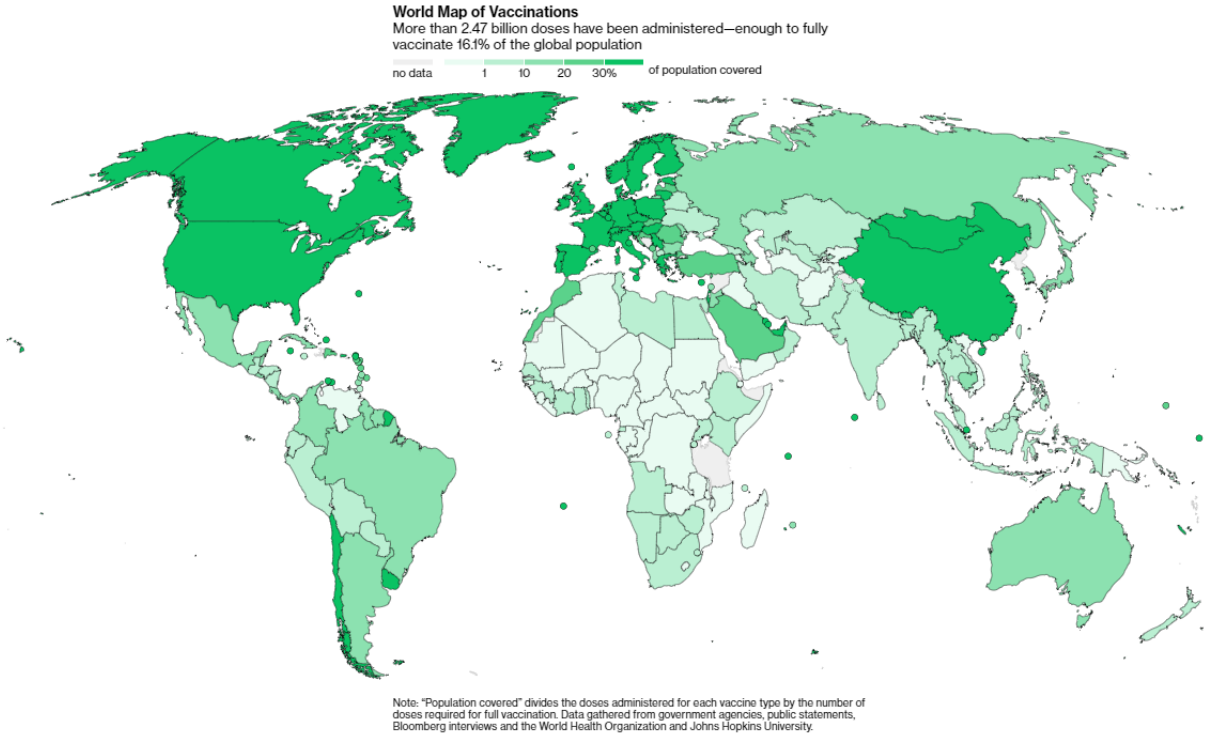
COVID-19 is caused by the SARS-CoV-2 virus, which stands for "severe acute respiratory syndrome coronavirus 2" and was first detected in the Chinese province of Hubei between the end of 2019 and January 2020. It is part of the coronavirus family, which is actually not new and includes illnesses such as severe acute respiratory syndrome (SARS) and Middle East respiratory syndrome (MERS), and even the common cold, according to the Mayo Clinic. However, SARS-CoV-2 is a novel virus, responsible for the COVID-19 disease, and rapidly reached a pandemic spread. Less than 50 days passed between China's cancellation of the Lunar New Year events to the WHO statement, officially declaring the spread of the SARS-CoV-2 pandemic.

The interesting thing about COVID-19 is that the severity of its symptoms can range from very mild to severe. These may appear two to 14 days after exposure and can include: cough, fever, tiredness, shortness of breath or difficulty breathing, muscle aches, chills, etc. Other complications include acute respiratory distress syndrome, kidney failure, cytokine release syndrome. Nevertheless, data from the EU/European Economic Area show that around 20–30% of diagnosed COVID-19 cases are hospitalised, and only 2% of those have severe illnesses. Some people can experience worsening symptoms, such as pneumonia after a week. One way to differentiate the early symptoms between COVID-19 and the common flu is through the sequence of symptoms. In COVID-19, fever usually comes first, followed by a cough and muscle pain. For influenza, in contrast, it is common to develop a cough first and fever later, according to "Frontiers in Public Health".

To combat the pandemic, many countries followed two approaches. The first was that the population was asked (or ordered) to reduce time spent outside and avoid contact with other people, in order to obstruct the virus' spread. Second the pharmaceutical industry and research facilities began research into developing more effective medicines and treatments. Most importantly, however, a race for an effective vaccine was launched around the world. Despite not having any direct precedent in the modern history of medicine, one year later, 15 vaccines were officially approved and are currently being administered to a wide share of the world's population. This is remarkable given typical the long development timeline (10-15 years) for vaccines.

As of June 16th, there have been nearly 2.5bn doses administered across 180 countries, according to Bloomberg. Currently 19 countries have administered enough shots to cover at least 40% of vaccinations, which also includes US.

World map of COVID-19 vaccinations



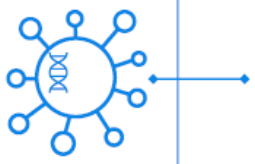
Source: Pareto Securities Research, Bloomberg

While a lot of progress has been made, still only 16.1% of the global population has been fully vaccinated. Furthermore, regions with highest incomes are getting vaccinated more than 30 times faster than those with the lowest. This has been recently showcased in India, where despite a very strong pharma industry, the spread of COVID-19 has not abated. As a result of the mixed results around the world, current estimates point to another year of vaccinations at current pace needed to achieve a high level of global immunity, followed by boosters.

COVID-19 vaccine landscape

To combat the new pandemic, there are a number of treatments as well as vaccines. We shall focus on the latter, as this is the area that ABNCoV2 project is looking to enter. Looking at the vaccines in general, one can subdivide different products based on the mechanism of action. Traditionally, vaccines used are either a whole-virus or a subunit approach. These relied on an entire inactivated virus or certain parts of the virus to cause immune response. Lately, a genetic approach has made a breakthrough. In this approach, the vaccine carries genetic instructions (mRNA) for the protein, to which the immune system would respond. The following graphic outlines the differences between the major types of vaccines and some examples.

Types of vaccines

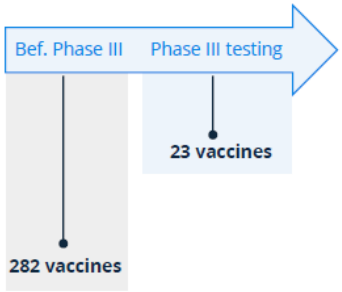


Whole-virus approach 	The vaccine is based on the entire disease-carrying virus, containing either an attenuated or inactivated virus, or some of its proteins.	Example from other diseases: **Influenza** Exemplary COVID-19 vaccines based on this approach: **Oxford/AstraZeneca**
Subunit approach 	The vaccine is based only on very specific parts of the virus that the immune system has to recognize to hinder the virus' reproduction. The vaccine contains only these parts.	Example from other diseases: **Hepatitis B** Exemplary COVID-19 vaccines based on this approach: **Anhui Zhifei**
Genetic approach 	The vaccine is based on a section of the genetic material of specific proteins. The vaccine contains the genetic instructions (mRNA) for the protein against which the immune system has to respond	Example from other diseases: **Human papillomavirus** Exemplary COVID-19 vaccines based on this approach: **Pfizer/BioNTech**

Source: Pharma Intelligence, Pareto Securities Research, Statista

Currently, there are at least 15 different vaccines against COVID-19 in use. Early success has gone clearly to mRNA vaccines (Pfizer/BioNTech and Moderna), as several have been developed at record speed, while posting supreme efficacy. However, there are major issues with these. For one, mRNA vaccines require specialized storage facilities with sub-zero temperatures, and are still seen as a major challenge in supply chain. Secondly, one dose appears not to be enough, as individuals have been receiving two doses and possibly will have to receive further booster shoots. Finally, mRNA vaccines are relatively expensive and at current prices are not realistic solutions for many countries around the world. We observe that certain vaccines have been reserved for specific regions.

COVID-19 vaccines in various countries, as of May 31st, 2021



Vaccines currently in use → 15 vaccines

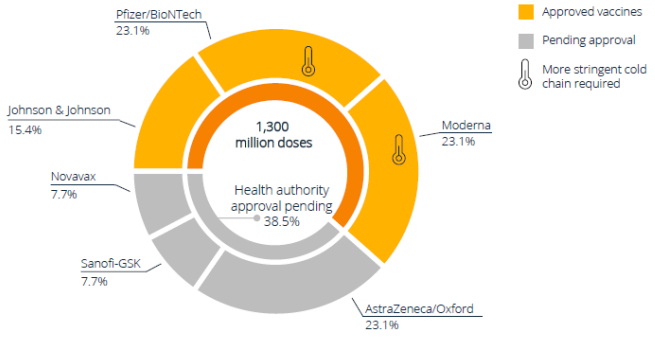
Manufacturer	Country of origin	Used internationally (min. one country outside country of origin)
Pfizer/BioNTech	U.S./Germany	✓
AstraZeneca/Oxford	UK	✓
Gamelaya Research Inst. (Sputnik V)	Russia	✓
Moderna	U.S.	✓
Johnson & Johnson	U.S.	✓
Anhui Zhifei	China	✓
Sinopharm	China	✓
Sinovac	China	✓
CanSino	China	✓
Wuhan/Sinopharm	China	✗
Vector institute (EpiVacCorona)	Russia	✗
Bharat	India	✗
Shenzhen Knagtai Biological products	China	✗
Instituto Finlay de Vacunas	Cuba	✗

Source: London School of Hygiene & Tropical Medicine, WHO, Pareto Securities Research

Order levels have varied across the world as well. While countries like India do not have vaccines to cover its population, many regions, particularly in the Western world, have ordered ample quantities of the vaccines. For example, the US, EU, and the UK have secured, on average, more than 4 COVID-19 vaccine doses per citizen. Some of the reasons for such a large ordered amount is the uncertainty around the overall vaccines' supply chain, the many ongoing

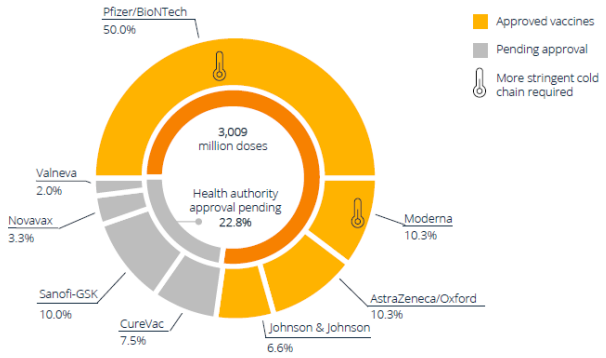
approval processes, and the spreading of SARS-CoV-2 variants. We note that some of these orders have been for vaccines that are still pending approval. As of May 31st, 0.8 billion orders (out of 1.3 billion) in the US consist of vaccines already approved by the national authorities. In the EU, roughly 77% of orders (out of 3 billion) are for currently approved vaccines. We see that the order appetite for vaccines in the Western world has remained high.

Doses of COVID-19 vaccine ordered and pre-ordered by the United States, as of May 31, 2021



Source: Unicef, Statista

Doses of COVID-19 vaccine ordered and pre-ordered by the European Union, as of May 31, 2021

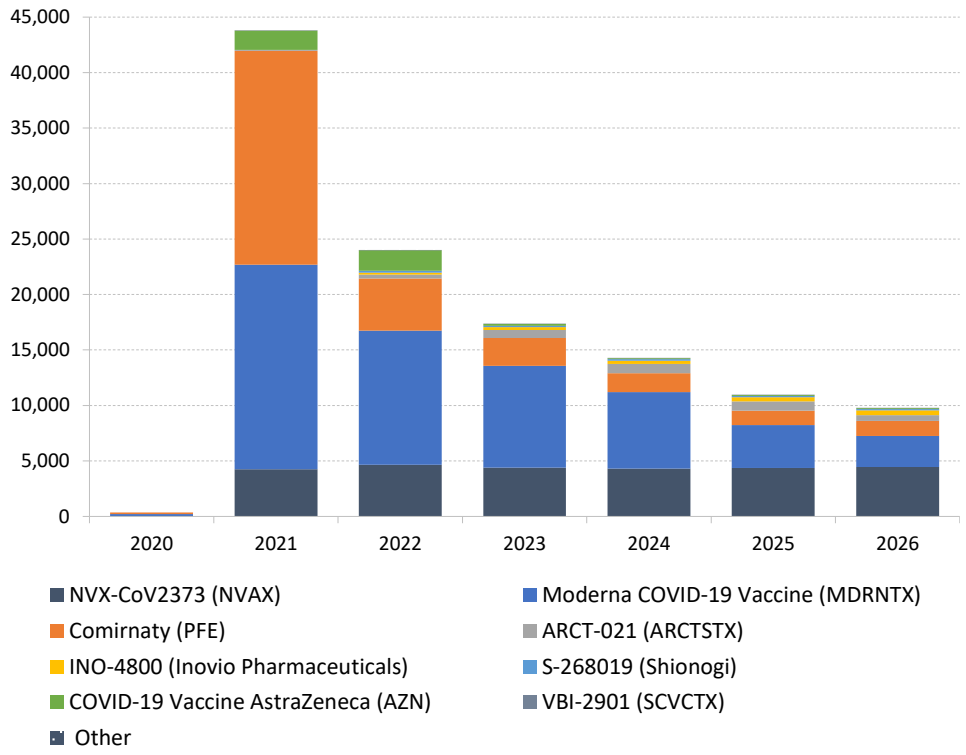


Source: European 21 Commission, Unicef, Statista

There are still many vaccines in clinical development for COVID-19, with around 23 in Phase III, and nearly 300 in early stages. The continued development of newer vaccines makes sense to us. While there are 15 available vaccines already, room for improvement still remains. We believe ExpreS^{2}ion's project within the Bavarian Nordic exclusive license has a good chance to address some of these issues, which we explore shortly.

Looking at major players, the clear vaccine leaders at the time are the mRNA variants led by Pfizer/BioNTech and Moderna. Pfizer/BioNTech's has booked $15b of sales for Comirnaty in Q4 '20, which comprises 780m doses (average price around $19 per dose). However, the company has mentioned it could deliver about 2bn by the end of 2021. Current consensus Comirnaty sales figure for 2021 is nearly $19bn. In 2022, though, the vaccine should see its sales at only 25% of this peak, according to Evaluate Pharma. Moderna is expected to see slightly less sales in 2021 (just over $18bn) than BioNTech, but less steep of a drop off, with 2022 sales making up 65% of this peak. On the other hand, sales estimates for Astrazeneca's vaccine are currently only $2bn in 2021 and $3bn in 2022. While this vaccine is the most popular by volume, it's sold at a much lower price than the mRNA vaccines.

COVID-19 vaccine competitor estimates ($m)



Note: 2021 and onwards consensus estimates per Evaluate Pharma
Source: Pareto Securities Research, Evaluate Pharma

ABNCoV2 in detail (same headline as on page 12)

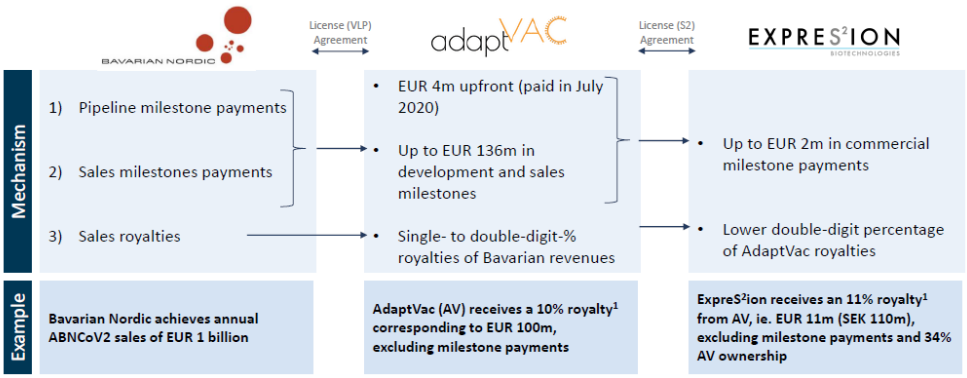
ExpreS^{2}ion's COVID-19 project is called ABNCoV2. The focus of the project is to bring a second generation COVID-19 vaccine. What that means is that the vaccine has strong immunogenicity, ease of clinical administration, good drug product handling, and adaptiveness of platform. Partly sponsored through a Horizon 2020 EU grant award to the PREVENT-nCoV consortium (also includes Leiden University Medical Center (LUMC), Institute for Tropical Medicine (ITM) at University of Tübingen, and Radboud University Medical Center (RUMC)), ExpreS^{2}ion and its joint venture partner AdaptVac have made significant progress in the development of a unique capsid virus-like particle (cVLP) COVID-19 vaccine. Between the two partners, the roles are clearly defined; ExpreS^{2}ion produces SARS-CoV-2 antigens, while AdaptVac holds the VLP technology. The third partner is Bavarian Nordic (entered in July 2020), who is responsible for further development and commercialization and would receive the lion's share of the proceeds should the vaccine become successful. In terms of the production of the vaccine technology, this can readily scale to commercial quantities as the partners are already working with AGC Biologics for the manufacture and scale-up of the vaccine.

The thesis behind the ABNCoV2 project is that the cVLP structure provides additional immunogenicity of the vaccine compared to those being injected without being attached to this structure. This thinking has been supported by vaccines already on the market. Other CLP (capsid-like particle) based vaccines have shown to be safe and highly immunogenic in humans. For example, the marketed Human Papillomavirus vaccine induces potent and durable antibody responses otherwise only seen after vaccination with live-attenuated viral

vaccines. The increased immunogenicity seems to also reflect a higher proportion of neutralizing antibodies in the total pool of vaccine-induced antibodies.

The economics of the ABNCoV2 project is regulated under the two license agreements between AdaptVac and Bavarian Nordic (covering the VLP technology) and ExpreS^{2}ion and AdaptVac (covering the ExpreS2 technology), respectively, as well as the shareholder agreement that stipulates ExpreS^{2}ion's 34% ownership of AdaptVac. Bavarian Nordic would record any sales and at the same time incur further development costs. An upfront payment of €4m was already paid to AdaptVac, which stands to receive up to €136m further in development and sales milestones. ExpresS2ion receives up to €2m of commercial milestone payments from AdaptVac. The largest benefit, however, should be the potential for royalties. AdaptVac stands to receive single- to double digit royalties of Bavarian revenues, some of which would trickle down to ExpreS^{2}ion. As a hypothetical example, on sales of €1bn, ExpreS^{2}ion would receive roughly €11m, assuming 11% of the 10% royalty that AdaptVac receives. It's important to note that ExpreS^{2}ion owns 34% of AdaptVac, and therefore is ultimately entitled to this share of proceeds that AdaptVac retains.

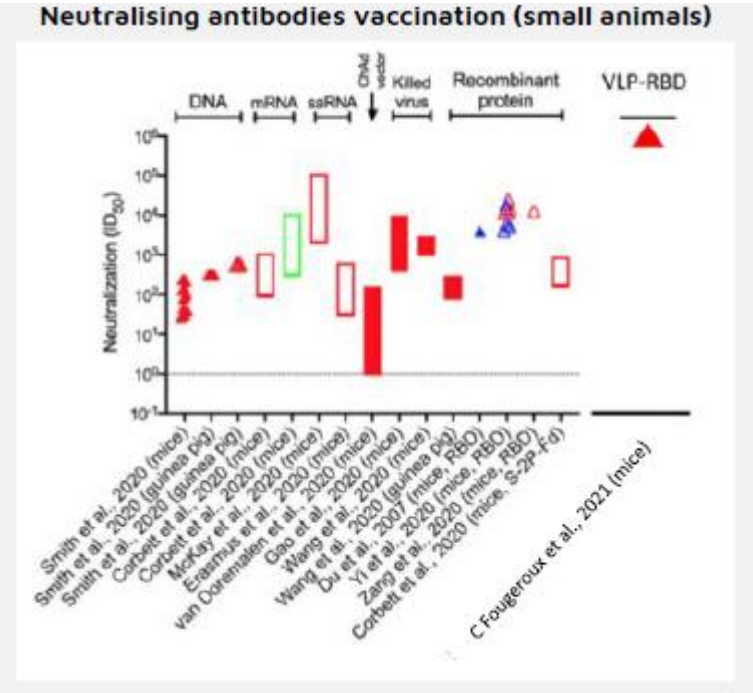
Economics of the ABNCoV2 project



Source: Example based on guidance from the Company

ABNCoV2 has shown impressive data so far, though human trials have just begun. ABNCoV2 preclinical data from a study carried out by University of Copenhagen and Leiden University was announced in June 2020 and published in Nature Comm. January 12, 2021. In this animal (mice) proof-of-concept (in vivo) study, boosted immunogenicity of the vaccine candidate was documented as the ExpreS2-system achieved robust expression of the SARS-CoV-2 Spike Receptor Binding Domain protein. The animal data showed a huge increase in immunogenicity and virus neutralization compared to a sub-unit vaccine control. The immune response was many hundred-fold higher itself from the antigen-coated cVLP compared to that of the antigen without display on the cVLP. Furthermore, the mice's ability to neutralize the virus is at least at par compared to published animal data from other COVID-19 vaccines. It's important to note that high-level antigen-specific antibody responses were measured after even a single vaccination.

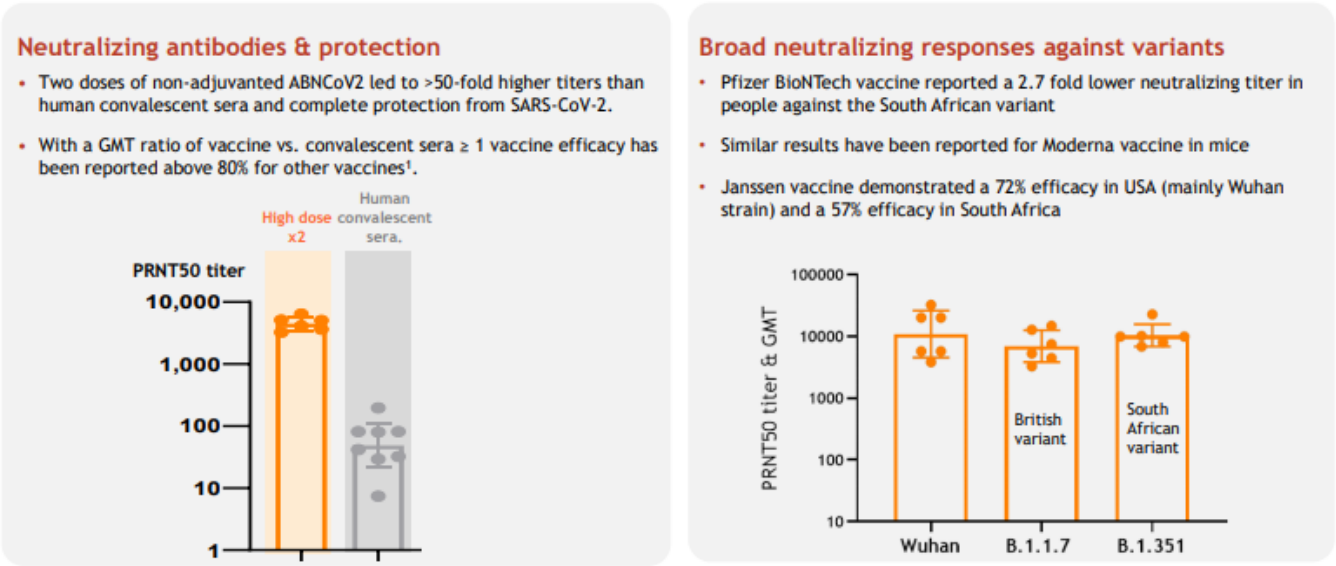
Potentially effective neutralization for VLP



Source: John P. Moore, P. J. Review. Journal of Virology. 2020. DOI: 10.1128/JVI.01083-20

Earlier this year, Bavarian Nordic reported additional preclinical data in non-human primates' studies. The results showed that two doses of non-adjuvanted ABNCoV2 led to >50-fold higher titers of neutralizing antibodies against the wild-type (Wuhan) virus when compared to titers measured in convalescent human samples. Furthermore, a neutralization test of samples from the study has now confirmed similarly high levels of neutralizing antibodies against the British and South African SARS-CoV2 variants (Khoury et al.). Follow-up data from the study, which investigated different dosing regimens of the vaccine with and without adjuvant, confirm the initial findings. It was established that a single administration of low and high doses with adjuvant, but also the high dose without adjuvant induced SARS-CoV-2 neutralizing antibodies at comparable levels to those measured in convalescent human samples. At the same time, a second administration of non-adjuvanted ABNCoV2 led to >50-fold higher titers. Finally, virus load was significantly reduced in all vaccinated groups, compared to nonvaccinated controls, and no virus could be detected at any timepoint in the majority of the subjects vaccinated with two high doses of ABNCoV2.

ABNCoVn2 preclinical findings in non-human primates



Source: Earle et al. MedRxiv, March 2021

It's interesting to note that some of the marketed vaccines have had mixed efficacy relating to the new strains of COVID-19. Pfizer-BioNTech data shows that there's nearly a threefold lower neutralizing titer against the South African variant. Looking at Janssen (J&J), the efficacy was 74%, though this primarily reflected the Wuhan strain. Looking at the South African strain, on the other hand, only a 57% efficacy in South Africa was recorded. The reason could be related to lower neutralizing titer. ABNCoV2, which generates high neutralizing titers, could provide a lasting and broader protection against the various variants.

Following encouraging preclinical results, the first clinical Phase I/II study (COUGH-1) was initiated in March 2021. The goal of the study is to test the safety and possible side effects of the ABNCoV2 vaccine in healthy subjects and to study if an immune response is generated after ABNCoV2 administration. To sponsor this study, part of a recent capital raise (by Bavarian) of DKK 1.1bn has been assigned, totalling roughly SEK 270m.

The study is based at Radboud University Medical Center (Nijmegen, Netherlands), where 42 volunteers are to be divided over 7 groups. There will be several different doses (6mcg, 12mcg, 25mcg, 50mcg, 70mcg) of the ABNCoV2 vaccine without adjuvant compared to the ABNCoV2 vaccine with adjuvant (MF59). On April 12th, the company reported positive interim safety data as the vaccine has been very well tolerated in the first 18 healthy volunteers dosed so far. The second part of the study should include 200 patients, which have already been treated with another vaccine or displaying antibodies. We note that ABNCoV2 will be studied as a booster to currently approved vaccines. The full study duration is about 7 months (last dosing is in May/June); however, headline results are expected in July 2021. Final reporting of the data is expected in October.

In addition, Bavarian plans a clinical Phase II study that is expected to be initiated in June with initial immunogenicity data in August 2021. The study would be run in both Germany and Netherlands. According to the study design, one group (n=100) will be seronegative (i.e. not previously vaccinated or infected) and will be receiving primary vaccination regime of two vaccinations four weeks apart. Second group would include seropositive subjects which would receive a single booster of ABNCoV2. Study should shed more light on the safety given a larger patient set.

As with most other vaccine developers, Bavarian plans to run the Phase III study in parallel, aiming for initiation sometime in H2 2021. The Phase III study would be much larger and would require significant funding, likely several hundred million dollars. As a result, further funding is needed to be raised to allow the full development of the program. We are optimistic as Bavarian seems fully committed to bring the vaccine candidate to the market. In fact, the company is looking for a variety of sources, including governmental agencies.

We believe that encouraging stability could potentially offer storage and handling even at room temperatures. This would be a major competitive advantage over the mRNA vaccines. BioNTech/Pfizer vaccine has to be stored at -70 degrees Celsius. On the other hand, ABNCoV2 has proven to endure storage at room temperature for 3 months and no changes were detected even after shorter incubation at 49 degrees Celsius. Another advantage could be a single shot potential with long-lasting protection. Only the J&J vaccine is currently administered with a single dose but offers a mediocre efficacy of only 66%. A final promise is that ABNCoV2 could be perfectly suited for potential mutated variants of COVID-19. Nevertheless, the upcoming clinical trials should provide a clearer answer to whether any of these would ultimately prove true.

Modelling assumptions

According to Arizton Advisory & Intelligence, the market for COVID-19 vaccines is projected to grow to $35 billion in 2021 and by another 6% the year after. However, Asia and Pacific is likely to be the major proportion of this figure (58%) due to the implementation of large-scale immunization programs being initiated by various countries, especially in China and India. In terms of the total global population, it appears that at least 70% of the population needs to be vaccinated to reach the herd immunity threshold, translating into 11 billion doses (assuming a 2 dose requirement), according to Duke University Global Health Innovation Centre.

The price of the vaccine ranges all over the spectrum. On the high end, the US government announced a $2 billion deal in July 2020 with Pfizer/BioNTech to purchase 100 million doses at $19.50 per dose. However, the total cost is $39, assuming 2 doses needed for a single patient. On the other hand, AstraZeneca has been charging around $3 per dose, though this vaccine has had some safety issues. Despite this, AstraZeneca has seen the most doses ordered so far as the low price point allows for many developing countries to procure this product.

COVID-19: vaccines in use as of May 31, 2021, by ordered quantities worldwide

Vaccine	Doses ordered**	Efficacy	Type of vaccine	Administration method	Production sites	Required temperature for maximum shelf life	Price per dose
AstraZeneca/Oxford	>3,000 million	70%		2 injections	Germany, Netherlands, Belgium, India	+2/8°C	3 USD
Pfizer/BioNTech	2,500 million	95%		2 injections	United States, Germany, Belgium	-70°C	17 USD
Moderna	1,500 million	90%		2 injections	United States, Switzerland	-20°C	17 USD
Johnson & Johnson	1,000 million	66%		1 injection	United States, Europe	+2/8°C	9 USD
Sputnik V	800 million	91%		2 injections	Russia	+2/8°C	<5 USD
Sinovac	368 million	n.a.		2 injections	China	+2/8°C	<20 USD
CanSino	39 million	n.a.		1 injection	China	+2/8°C	30 USD
Bharat	39 million	n.a.		2 injections	India	+2/8°C	<5 USD
Sinopharm	n.a.	79%		2 injections	China	+2/8°C	70 USD
Wuhan/Sinopharm	n.a.	n.a.		2 injections	China	+2/8°C	n.a.
Vector Institute	n.a.	n.a.		2 injections	Russia	+2/8°C	n.a.

Whole virus | Genetic (mRNA) | Subunit

Source: UNICEF, Statista, Pareto Securities Research

In a recent (April 2021) report by IQVIA, a total $157 billion on COVID-19 vaccines through 2025 is to be spent across the world. This figure translates to around $28.5 per patient, including booster shots to follow initial vaccinations every two years. Vaccine spending is expected to be highest in 2021 at $54 billion with massive vaccination campaigns underway around the world. It is expected to decrease after that, falling eventually to $11 billion in 2025. This translates to roughly a 30% decline per year between 2021 and 2025.

In our model, we assume global target population of 5.5bn needed to achieve herd immunity. We model in price per dose of roughly $7, adjusting for a lower price needed to be offered in order to generate sales in various parts in the developing world. By 2022, we expect the market for COVID-19 to be around $38.5bn. For ABNCoV2, we model-in market penetration of 10% (550m doses), arriving at peak sales estimate of $3.850bn. We expect very fast ramp-up, seen in other COVID-19 vaccines, though sales subsequently fall by 30% annually. We forecast IP life until 2036 at this point in time.

In terms of the costs, the project is fully out licensed. Aside from a small 5% OPEX (as % of the royalty stream), we assume no further expenses for this project.

To analyse the probability of success of this project, we use a recent study published in Biostatistics. (Wong, et. al. "Estimation of clinical trial success rates and related parameters." Biostatistics 20(2): April 2019). For a vaccine, the chances are relatively high, as success probability through clinical development is around 33%. Given that we have already seen interim positive safety data from the Phase I/II study, we have slightly bumped up the success rate, arriving at a 40% LOA. We note that further upside for additional de-risking of the asset could be as soon as July 2021, when the company releases its headline results of the study.

The economics of this project have been relatively clear and have been explained in detail previously. The two value drivers are the direct intermediate payments to ExpreS^{2}ion, as well as a 34% ownership stake of AdaptVac, which receives the lion share of payments from the commercial partner Bavarian Nordic.

We estimate the value of direct payments from ABNCoV2 to ExpreS^{2}ion at around SEK 241m or SEK 7.33 per share. The greater value creation, however, is likely to come from AdaptVac. Despite only a 34% share, we arrive at a SEK 883m NPV or SEK 26.84 per share. Altogether, this project accounts for over half of the current value of ExpreS^{2}ion Biotech, according to our estimates.

NPV of ABNCoV2 royalties and milestones

(in SEKm, escept peak sales)			2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
Peak Sales	$ 3,850														
Unadj. Revenue			-	32,209	22,546	15,782	11,048	7,733	5,413	3,789	2,653	1,857	1,300	910	637
					-30%	-30%	-30%	-30%	-30%	-30%	-30%	-30%	-30%	-30%	-30%
Royalty	1%														
LOA	40%														
Adjusted revenue			-	129	90	63	44	31	22	15	11	7	5	4	3
Cost of goods sold			-	6	5	3	2	2	1	1	1	0	0	0	0
R&D expense			-	-	-	-	-	-	-	-	-	-	-	-	-
S&M expense			-	-	-	-	-	-	-	-	-	-	-	-	-
G&A expense			-	-	-	-	-	-	-	-	-	-	-	-	-
Operating profit			-	123	86	60	42	29	21	14	10	7	5	3	2
Taxes	21%		-	25	18	12	9	6	4	3	2	1	1	1	1
NOPAT			-	98	68	48	33	23	16	11	8	6	4	3	2
Free cash flow			-	98	68	48	33	23	16	11	8	6	4	3	2
Present value of FCF	10%		-	85	54	34	22	14	9	6	4	2	1	1	1
Commercial Royalty			8	-	-	-	-	-	-	-	-	-	-	-	-
Net present value		**241**	**8**	**85**	**54**	**34**	**22**	**14**	**9**	**6**	**4**	**2**	**1**	**1**	**1**
per share		**7.33**													

Note: Forecast period extends through to 2041
Source: Pareto Securities Research

NPV of AdaptVac

(in SEKm, escept peak sales)			2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
Peak Sales	$ 3,850														
Unadj. Revenue			-	32,209	22,546	15,782	11,048	7,733	5,413	3,789	2,653	1,857	1,300	910	637
					-30%	-30%	-30%	-30%	-30%	-30%	-30%	-30%	-30%	-30%	-30%
Royalty	10%														
LOA	40%														
Adjusted revenue			-	1,293	905	633	443	310	217	152	106	75	52	37	26
Cost of goods sold			-	142	100	70	49	34	24	17	12	8	6	4	3
R&D expense			-	-	-	-	-	-	-	-	-	-	-	-	-
S&M expense			-	-	-	-	-	-	-	-	-	-	-	-	-
G&A expense			-	26	18	13	9	6	4	3	2	1	1	1	1
Operating profit			-	1,125	787	551	386	270	189	132	93	65	45	32	22
Taxes	21%		-	232	162	114	79	56	39	27	19	13	9	7	5
NOPAT			-	893	625	438	306	214	150	105	74	51	36	25	18
Free cash flow			-	893	625	438	306	214	150	105	74	51	36	25	18
Present value of FCF	10%		-	774	493	313	199	127	81	51	33	21	13	8	5
Milestones			5	457	-	-	-	-	-	-	-	-	-	-	-
Net present value		**2,596**	**5**	**1,231**	**493**	**313**	**199**	**127**	**81**	**51**	**33**	**21**	**13**	**8**	**5**
EXPR2 Share	34%														
AdaptVac value to ExpreSion		**883**													
per share		**26.84**													

Note: Forecast period extends through to 2041
Source: Pareto Securities Research

As reminder, current total NPV of this project to ExpreS^{2}ion (SEK 34.17 per share) incorporates a 40% LOA. Should ABNCoV2 prove its safety and efficacy in clinical development and receive approval, the value of this project should jump to around SEK 85 per share, an upside potential of over SEK 50, that could materialize in just a year, assuming no major delays.

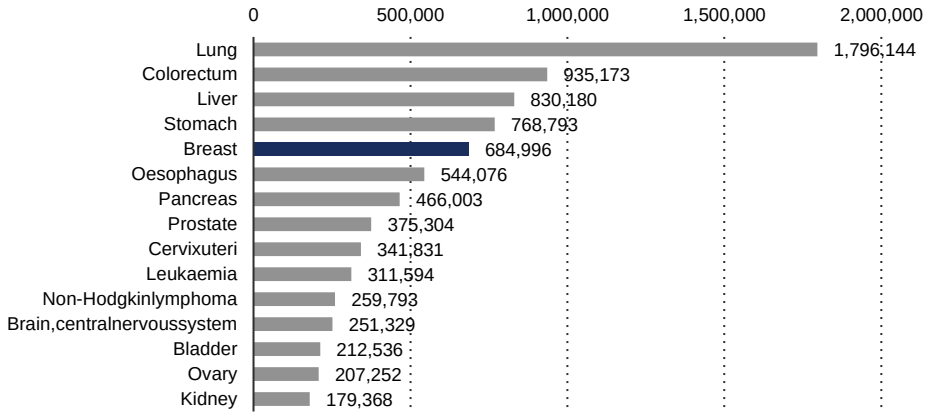
ES2B-C001

Breast Cancer in short

Breast cancer is a type of cancer that originates from breast tissue, usually beginning with a lump, dimpling of the skin or other abnormalities of the breast. The appearance of a lump is the first sign for 8 out of 10 diagnoses. We note less than 20% of lumps are actually cancerous as most of these are not related to breast cancer at all. Malignant tumours, however, are a major problem and can trigger metastasis, spreading beyond the initial location, usually into bone, lung, liver or even brain. At this point, the cancer is labelled Stage IV and often leads to death.

Breast cancer is more common in developed countries, though worldwide there have been 2.3 million new cases and 685,000 deaths in 2020. It ranks in the top 5, despite the fact the few men are affected by breast cancer.

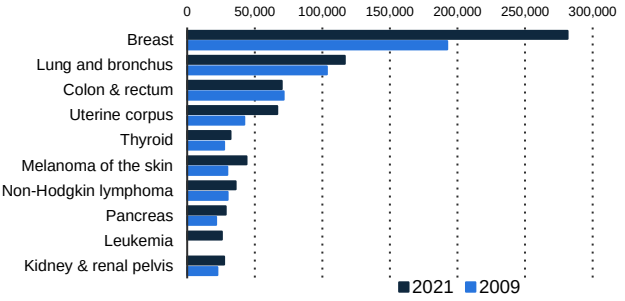
Number of cancer deaths worldwide in 2020, by major type of cancer



Source: WHO, Statista, Pareto Securities Research

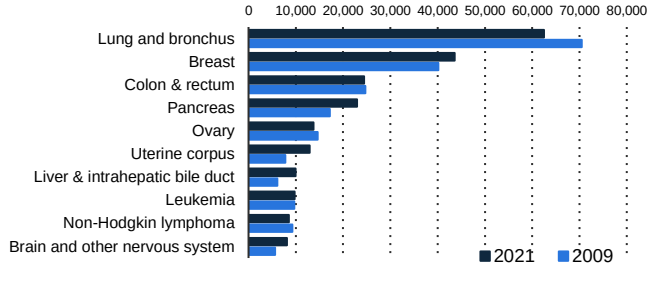
Breast cancer is much more common (more than 100 times) in women than in men. In fact, it is the leading causes of cancer for women, accounting for 25% of the cases. Nevertheless, prognosis has been getting better as of late. The five-year survival rates in England and the US are reaching 80-90%. As a result, while the number of new cases has significantly increased in the last decade, the number of deaths has fortunately decreased by a smaller growth factor. The important deciding factors of survival includes the extent of the disease, the sub-type of breast cancer (more than 18 in total) and patient's age.

Estimated number of new cancer cases among women in the U.S. in 2009 and 2021, by cancer type



Source: ACS, Statista, Pareto Securities Research

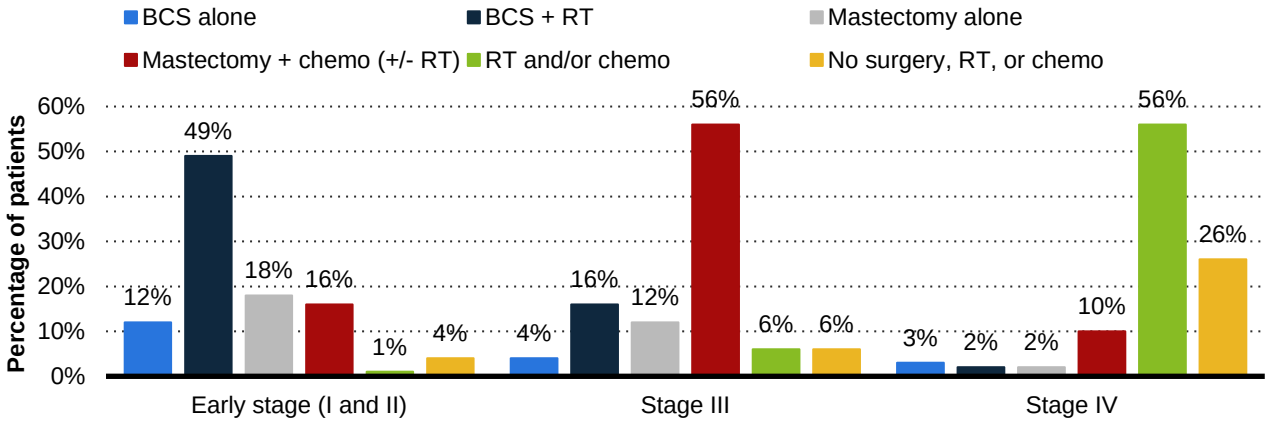
Estimated number of cancer deaths among women in the U.S. in 2009 and 2021, by cancer type



Source: ACS, Statista, Pareto Securities Research

Due to specific phases of the disease, treatment for breast cancer tends to vary depending on the stage of the disease. In the early stages, the most common treatment (nearly half of the patients) is breast reconstruction surgery and radiation therapy. At Stage III, mastectomy enters the treatment paradigm. The introduction of chemotherapy and immunotherapy usually begins at Stage IV. At this point the cancer has spread throughout the body, prompting the need for the body's immune system to join the fight against cancer.

Distribution of treatment types for female breast cancer in the U.S. in 2016, by stage



Note: BCS = breast conserving surgery, i.e., lumpectomy/partial mastectomy Chemo = chemotherapy and includes targeted therapy and immunotherapy.
RT= radiation therapy
Source: ACS, Statista, Pareto Securities Research

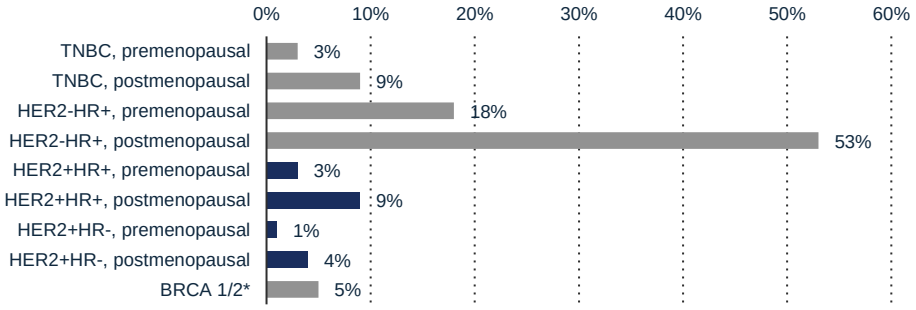
HER2+ breast cancers

Breast cancer is classified in a variety of ways, including grade (appearance), histopathology, stage (stage 0-4), and receptor status. The latter relates to receptors on the surface of breast cancer cells, which interact with particular hormones and growth factors that lead to cancer cell growth and poor prognosis. There are three major receptor types: estrogen receptors, progesterone receptors and Human epidermal growth factor receptor 2.

HER2, also known as ERBB2 and CD340, is a member of the human epidermal growth factor receptor family. This biomarker is an important target of breast cancer therapies for roughly 20% of breast cancer patients. The reason for this is that an amplification (over-expression) of HER2 plays an important role of

progression of aggressive forms of breast cancer and is strongly associated with increased reoccurrence. HER2 can be expressed in cancer cells up to 100 times more than in normal cells, leading to cell proliferation and opposing apoptosis (programmed cell death).

Percentage of U.S. patients with breast cancer that tested positive for selective biomarkers as of 2017

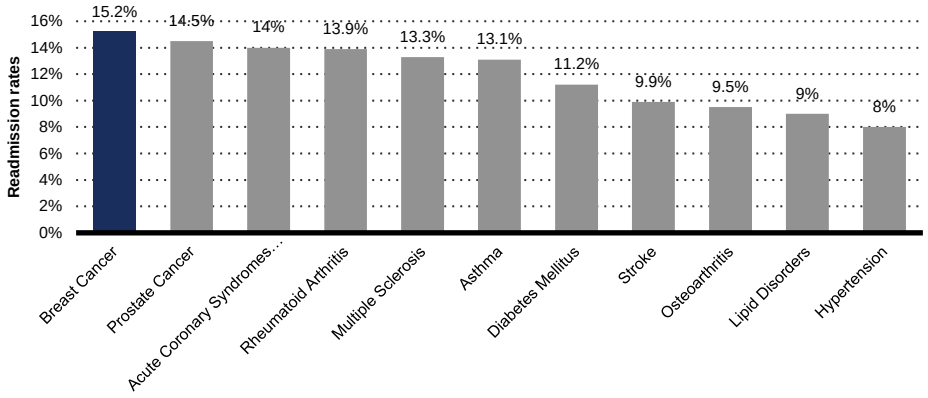


Source: IQVIA; Food and Drug Administration, Statista, Pareto Securities Research

Cancers that feature the HER2 amplification are called HER2+ cancers and include not only breast cancers (~20% of all breast cancers) but also gastric (7-34%) and salivary duct carcinomas (30%). The major medical therapy for the HER2+ cancers is monoclonal antibody trastuzumab, branded as Herceptin (developed by Roche), which recorded annual peak sales of over $7bn before its patents expired. This anticancer immunotherapy is typically given intravenously weekly or every 3 weeks over 12 months. Herceptin was approved back in 1998, though patents have expired and biosimilars have been approved since late 2017 (in EU) and late 2018 (US). The results of the original studies of trastuzumab showed that the drug improved overall survival in late-stage (metastatic) HER2+ breast cancer patients from 20.3 to 25.1 months. Trastuzumab works by attaching to the HER2 on the surface of breast cancer cells and blocking them from receiving growth signals. By blocking the signals, trastuzumab can slow or stop the growth of the breast cancer. Additionally, trastuzumab when binding HER2 acts as a flag for the immune system. The immune cells target the flagged cells and kill them. The drug is even more effective when combined with chemotherapy.

Trastuzumab is not without side effects and development of resistance, according to our research. Despite its great affinity for HER2 and ability to administer high doses (low toxicity), 20% of HER2 positive early stage breast cancer patients will not respond to trastuzumab (primary resistance), and 70% of patients with metastatic disease are resistant to treatment (secondary resistance). Resistance to the treatment develops rapidly, in the majority of patients within the first year and virtually in all patients over the long term. Not surprisingly, breast cancer tends to cause one of the highest acute-care readmission rates.

Rates of 30-day acute-care hospital readmission in the United States in 2018, by disease



Source: Pareto Securities Research, Statista

Furthermore, roughly 10% of people are unable to tolerate trastuzumab because of pre-existing heart problems. Finally, the need for many and frequent administrations results in laborious and expensive treatment. This also results in hypersensitive reactions, requiring other medications such as cortisol or antihistamines.

There have been further improvements in treating HER2+ cancers after approval of Herceptin. For example, Perjeta or pertuzumab (another monoclonal antibody) is used in combination with trastuzumab and docetaxel for the treatment. Pertuzumab was also developed by Roche and approved in 2012. In 2020, Perjeta has recorded the highest sales out of the HER2+ cancer drugs, recording over $4bn, though when Herceptin is combined with its biosimilars, trastuzumab still records more sales.

ES2B-C001/HER2-cVLP project

The ES2B-C001 project is the company's potential answer to the HER2+ cancers, with the potential to overcome drawbacks with existing therapies through internal antibody production. It's also the one project, where ExpreS^2ion has full control and as a consequence the area of the largest investment. Early in the year, the company was granted an exclusive global license to a novel ES2B-C001/HER2-cVLP breast cancer vaccine programme from AdaptVac. The company paid an upfront fee of DKK 2.5 million upon signing, followed by aggregated milestone-based payments of DKK 215 million during development until market approval, and a lower single-digit percentage royalty based on net sales to AdaptVac. However, as a consequence, ExpreS^2ion now owns 34% of AdaptVac (from 50%). Nevertheless, aside from the royalty payments, the company receives the full benefits should the project have further success.

The ES2B-C001/HER2-cVLP breast cancer vaccine programme is still in the preclinical stages, with preclinical proof of concept data expected later this year/beginning of next year. Given the disadvantages with the current treatments, a solution that causes the body to produce its own anti-tumor antibodies would go a long way in addressing the issues with trastuzumab. To date however, therapeutic efficacy of self-antigen-based vaccine remains disappointing due to its inability of overcoming immune-tolerogenic mechanisms.

In one study (Palladini, A. et al. Oncoimmunology. 2018), the researchers determined that the HER2-VLP vaccine shows promise in breaking HER2-self-

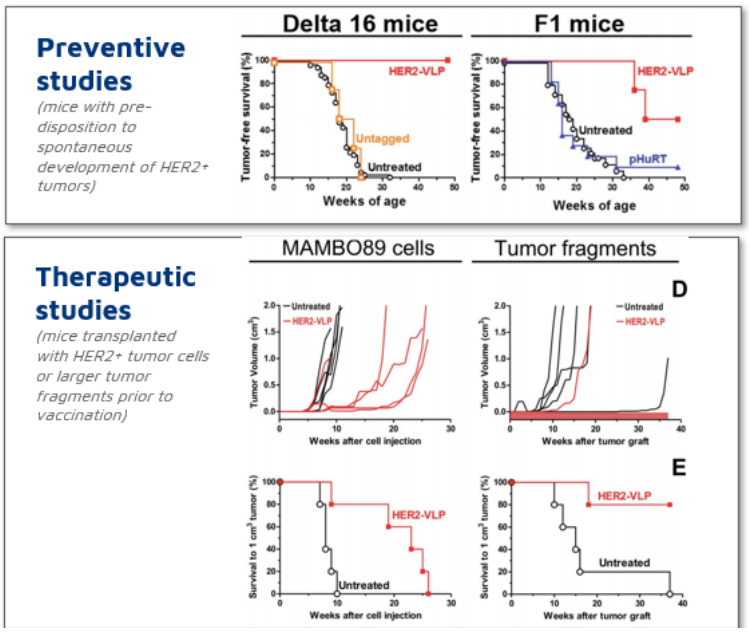
tolerance and targeting HER2 positive tumors in addition to being a new cost-effective modality for prevention and treatment of HER2-positive cancer. Surfaces of VLPs are highly immunogenic due to sharing key characteristics with live viruses. Furthermore, the multivalent display (on a VLP) of a self-antigen presents a highly effective means of overcoming B cell tolerance. What is also interesting is that recombinant expression of HER2 in Drosophila S2 insect cells has the potential advantage of improved antigen uptake by antigen-presenting calls (APCs) due to the addition of insect glycans.

In the study, it was observed that a strong antibody response (against HER2) was elicited by HER2-VLP vaccination in HER2-transgenic mice, which spontaneously develop HER2 positive tumors. In a preventive study, the vaccination totally hindered tumor growth. In a therapeutic study, the vaccination protected the mice for quite some time - some did not gain tumors at all.

Effect of a HER2-cVLP vaccine candidate on mice

- **Prevention of 50-100%** of spontaneous mammary carcinogenesis
- **Strong growth inhibition** in therapeutic studies (mice transplanted with tumor cells/fragments)

Preclinical *in vivo* studies are underway in collaboration with University of Bologna; data expected end of 2021



Note that this data was generated for AdaptVac's predecessor vaccine candidate (very similar to ES2B-C001)
Source: Palladini, A. et al. Oncoimmunology. 2018

ExpreS^{2}ion has recently (May 11th, 2021) selected its lead candidate ES2B-C001 from a pool of several optimized constructs. As mentioned earlier, the preclinical data is expected to come at the end of 2021/beginning of 2022, while GMP manufacturing should start next year. The company has signed a research collaboration agreement with University of Bologna for preclinical studies. Human studies (Phase I) that test safety and immunogenicity are planned to start in Q1 2023.

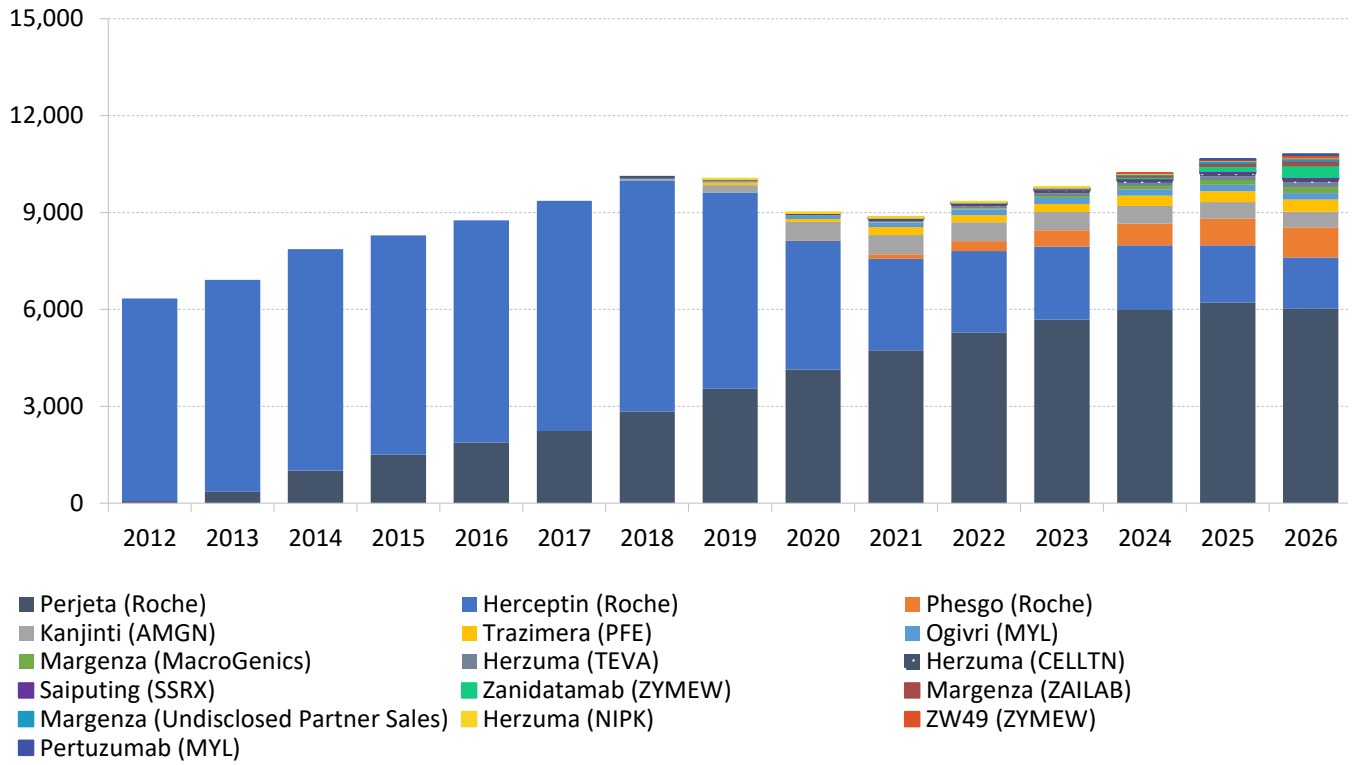
HER2+ market

When looking at the market potential of a HER2-VLP vaccine, it's more appropriate to look into all HER2 positive cancers that may benefit from HER2-targeted treatment. While the HER2+ market includes other cancers, this subcategory is more appropriate than just looking at the breast cancer market.

The HER2+ market is substantial and high growing. The global market for HER2 monoclonal antibodies was estimated at $12.8bn in 2020 and expected to grow to $22.3bn by 2027 (CAGR of 8.3%), according to Research and Markets. Despite Herceptin going generic, it is projected to record a CAGR of 8.7% and to reach $14.6bn by 2027.

Looking at the competitors, Herceptin has been the heavy weight in the HER2 mAbs space and has still posted the majority of sales in 2019. Nevertheless, Perjeta is quickly catching up, likely to significantly overtake Herceptin in 2021, due to Herceptin's generic erosion, as well as therapeutic considerations. There are a number of other entrants or potential entrants to the market, though current estimates are currently relatively low. Phesgo, also marketed by Roche, is a clear third, with sales estimated to approach $1bn by 2026.

Epidermal growth factor receptor ErbB-2 (HER2) antibody competitors ($m)



Note: 2021 and onwards consensus estimates per Evaluate Pharma
Source: Pareto Securities Research, Evaluate Pharma

Our modelling assumptions

In our model, we use the target market of 2nd line to 4th line (2L-4L)HER2+ metastatic breast cancer patients. This figure was estimated at 28,200 patients (Roche) for 2020 and includes US and EU5 markets. We assume it would take at least 9 years until the launch of the ExpreS^{2}ion's candidate, given the very early stage of the project. Modelling 5% annual growth rate of patients we arrive at a target patient population of approximately 46,000. We note that population size is relatively conservative and there is quite an upside from several sources. For one, if ES2B-C001 becomes approved for 1L, the target population could close to double. Furthermore, there is a possibility for additional cancer indications outside of breast cancer (similar to Herceptin), which would further open up the potential market even further. Finally, if there is an additional geographic region included (i.e. licensing deal with a Chinese or Japanese) partner, additional royalties could be expected. At this stage, however, we believe it's prudent to not include any of these possibilities in our current market estimate.

To determine possible price we looked at Roches' Phesgo, which is a combination of Herceptin and Perjeta. The price of this medication as of 2020 appears to be $151,000 for a 12-month course. We use this as a reference price for ExpreS^{2}ion's

candidate and also assume half of the cost in Europe. Incorporating a 5% growth rate we arrive at roughly $184,000 price assumption for ES2B-C001, which leads to a market potential of roughly €8.5bn. We further model in market penetration of 20%, leading to peak sales of this project of €1.7bn, though we do assume a 4-year ramp up. As with the COVID-19 project, we estimate IP life through to 2036, which could prove too conservative, should the company receive favourable exclusivity or further indications. Following patent expiration, we model in 20% decline of sales per year. This may not seem severe enough, given typical price erosion caused by generics. However, we believe the risk of this is much lower for ES2B-C001, due to the high complexity of the drug candidate.

The R&D costs for this project should be relatively significant. In fact, during the last capital raise, the company designated 58% of the proceeds for the development of the HER2 breast cancer vaccine. We model clinical development costs of $235m, $200m of which are to come from a Phase III trial. In reality, we do not expect the company to pay this much. Instead, the project would most likely be out licensed to a partner with larger resources before late stage clinical development. Nevertheless, we include these costs to arrive at a complete valuation of this project. We do also note that these costs are discounted by the probability of enrolment in each respective phase.

To get an idea of how much this project could fetch we show several recent relevant deals. For illustration purposes, should ES2B-C001 reach Phase III, we could expect the project to be worth around SEK 4bn (or close to $500m), as the asset becomes further de-risked.

Recent deals related to HER2+ therapeutics

Deal Summary	Case I	Case II	Case III	Case IV
Deal date	September 2020	July 2020	April 2019	November 2018
Licensor/seller	**Seattle Genetics**	**Radius Health**	**Puma Biotechnology**	**ZymeWorks**
Licensee/acquirer	**Merck**	**Menarini**	**Pierre Fabre**	**BeiGene**
Deal type	Licensing – WW (NA, EU excluded)	Licensing – WW (NA, EU excluded)	Licensing – Europe	Licensing – Asia, Australia, New Zealand excluding Japan.
Product	Tyrosine kinase inhibitor Tukysa	Oral SERD, a selective estrogen receptor degrader Elacestrant	EGFR inhibitor Nerlynx	HER2-targeted bispecific antibodies ZW25 and ZW49.
Indications	Breast Cancer HER2-positive	Advanced ER+/HER2- breast cancer	Early-stage hormone receptor positive HER2 patients	HER2+
Phase at deal	Approved	Phase 3	Approved	Phase I & IND
Deal value	**$275M**	**$350M**	**$430M for EU and $290M for China**	**$430M**
Upfront fee	$125M	$ 30M	$60M for EU $50M for China	$ 40M
Milestones	$150M ($85M in development commitment)	$320M	$345M for EU + $240M for China	$390M (2 mABs)
Royalties	10-15% (our estimate)	10-15% (our estimate)	10-15% (our estimate)	8-20% (our estimate)

Source: Company data

In any case, we do value the project as whole, incorporating both the total costs and total benefits. This is heavily discounted by the probability of success. At this moment we model a LOA (Likelihood of Approval) of only 3%, on the basis of the study mentioned in the previous section about the COVID-19 project. The low LOA stems from the fact that statistically cancer drugs carry the highest risk of development, with around 7% of ultimate approval from Phase I. ES2B-C001 is still a long way from being in Phase I, as preclinical proof-of concept animal studies are still outstanding. We therefore believe 3% of LOA is appropriate.

In terms of ultimate cash flow, ExpreS^{2}ion nearly benefits from full rewards should this project prove to be successful. Nevertheless, we do forecast COGS of

15% accounting for royalties to AdaptVac (lower single-digit percentage). After further 25% S&M and 15% G&A assumption we arrive at a peak operating margin of 45%. There are further milestone payments to AdaptVac, as we described above which need to pay at certain steps through the R&D process. We discount each milestone by probability of success for each respective phase.

We estimate the value from ES2B-C001 at around SEK 361m or SEK 10.97 per share. Prior to positive cash flow anticipated to come from 2030, we have SEK -26m impact to the NPV from LOA-adjusted R&D and other costs.

NPV of ES2B-C001

(in SEKm, escept peak sales)			2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044
Peak Sales	$ 1,691																
Unadj. Revenue			2,971	8,205	11,742	14,147	14,854	15,597	16,377	13,101	10,481	8,385	6,708	5,366	4,293	3,434	2,748
				176%	43%	20%	5%	5%	5%	-20%	-20%	-20%	-20%	-20%	-20%	-20%	-20%
LOA	3%																
Adjusted revenue			94	261	373	449	472	495	520	416	333	266	213	170	136	109	87
Cost of goods sold			14	39	56	67	71	74	78	62	50	40	32	26	20	16	13
R&D expense			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S&M expense			24	65	93	112	118	124	130	104	83	67	53	43	34	27	22
G&A expense			14	39	56	67	71	74	78	62	50	40	32	26	20	16	13
Operating profit			42	117	168	202	212	223	234	187	150	120	96	77	61	49	39
Taxes	21%		9	24	35	42	44	46	48	39	31	25	20	16	13	10	8
NOPAT			34	93	133	161	169	177	186	149	119	95	76	61	49	39	31
Free cash flow			34	93	133	161	169	177	186	149	119	95	76	61	49	39	31
Present value of FCF	10%		14	34	45	49	47	44	42	31	22	16	12	9	6	5	3
Payaway to AdaptVac			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Net present value		**361**	**14**	**34**	**45**	**49**	**47**	**44**	**42**	**31**	**22**	**16**	**12**	**9**	**6**	**5**	**3**
per share		**10.97**															

Note: Forecast period extends through to 2051
Source: Pareto Securities Research

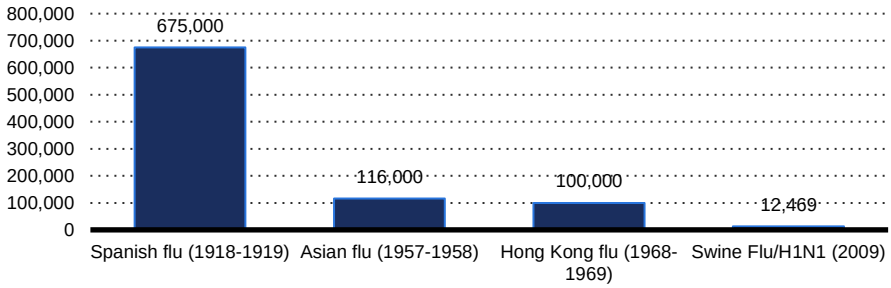
The biggest near-term upside for this project is progress through clinical development, especially considering current LOA at only 3%. That means that as the project becomes de-risked the NPV would increase. For example, successfully completing preclinical trials and entering Phase I (estimated in 2023) should provide roughly a SEK 11 per share upward valuation increase, according to our estimates.

Influenza project

Influenza

Influenza, commonly known as the flu, affects millions of people around the world. The WHO estimates that there are 1 billion cases every year. While the disease is self-limiting and rarely fatal, it can be deadly in high risk groups. One feature of influenza is that it can lead to progression to other serious conditions, especially to pneumonia. However, influenza itself can be devasting. In fact, there are 3-5 million severe cases annually, leading to 290,000 – 650,000 deaths around the world. This figure can be volatile, especially during pandemics of which there have been several since 1900. The biggest one, the Spanish flu, recorded 675,000 deaths just in the United States.

Estimated number of fatalities due to influenza pandemics in the United States



Source: CDC, Statista, Pareto Securities Research

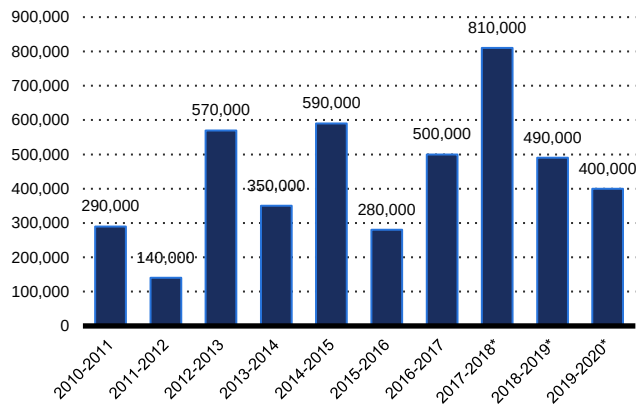
In the developed world, influenza has become more manageable over time and is no longer the leading cause of death. The death count per 100,000 was over 200 in 1900, but this has dropped to 12.3 in 2019. The medical advances over time have contributed to this improvement, while a number of other ailments have become more problematic. Nevertheless, influenza hospitalizations do present a significant burden on the medical system. Just in the US, several hundred thousand hospitalizations occur as a result of influenza. In bad flu seasons, this figure have been over half a million several times in the last decade. This has not just been a strain on patients but on the healthcare system itself.

Top 10 causes of death in the U.S. in 1900 and 2019 (per 100,000 population)

Cause of death	1900	2019
Pneumonia or influenza	202.2	12.3
Tuberculosis	194.4	-
Gastrointestinal infections	142.7	-
Heart disease	137.4	161.5
Cerebrovascular disease	106.9	-
Nephropathies	88.6	12.7
Accidents	72.3	49.3
Cancer	64.0	146.2
Senility	50.2	-
Diphtheria	40.3	-
Chronic lower respiratory disease	-	38.2
Stroke	-	37.0
Alzheimer's disease	-	29.8
Diabetes	-	21.6
Suicide	-	13.9

Source: The Atlantic, CDC, Pareto Securities Research

Number of influenza hospitalizations in the United States from 2010 to 2020



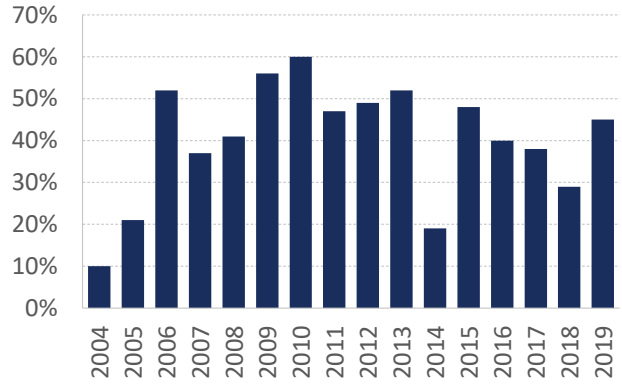
Source: CDC, Pareto Securities Research

Despite the long history and huge number of affected individuals (5–15% of the global population contracts influenza), there has not been an adequate solution to deal with this problem. The persistent inability to successfully eradicate this disease is explained by regular creation of unique influenza strains for which most humans have not developed protective antibodies. The evolution of influenza viruses happens through a so-called antigenic drift and antigenic shift. The former is especially common for the HA hemagglutinin protein (HA), in which just a few amino acid changes in the head region can constitute antigenic drift and lead to the phenomenon of seasonal influenza, requiring flu shots to be updated annually. The latter (antigenic shift) is a sudden, drastic change in an influenza virus's antigen, again usually in HA. Antigenic shift is what leads to pandemics. While these have been few and far in between, pandemics are difficult to predict and often tough to handle.

To combat influenza, regular vaccination is one top strategy. The WHO and US CDC recommend yearly vaccination for nearly all people over the age of six months, especially for those at high risk. The established flu vaccines, however, carry a rather suboptimal effectiveness and stand at only around 40%, meaning that 60% of those vaccinated are not sufficiently protected. According to a study by Cochrane Acute Respiratory Infections Group, 16% of unvaccinated adults get symptoms similar to the flu, while about 10% of vaccinated adults do. Vaccination decreased confirmed cases of influenza from about 2.4% to 1.1%. The antigenic shift is a major cause of this, but there are certain difficulties with real-world studies. For example, vaccines may be imperfectly matched, virus prevalence varies widely between years, and influenza is often confused with other influenza-like illnesses. Nevertheless, there is a clear need for a more effective vaccine, in order to further alleviate the influenza problem.

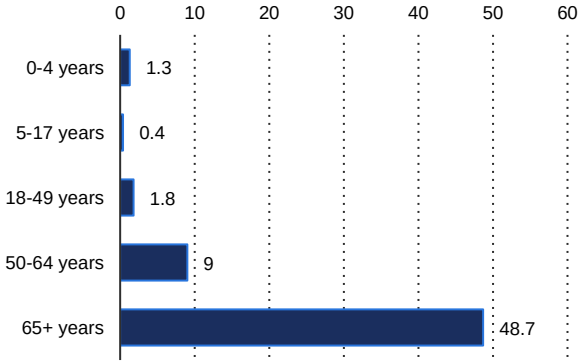
Influenza is usually not severe for younger populations. However, for elderly population the picture changes as the effect of the flu for this group is the most dire. According to the CDC, between 70% and 85% of all seasonal flu-related deaths occur in the elderly population (over 65). The number of hospitalizations is also relatively high, as between 50% and 70% of the total is represented by the elderly. While vaccine effectiveness is not very high in general, its effectiveness is particularly unclear for the elderly group according to several studies. This is unfortunate given this is the group most vulnerable to the flu.

US vaccine effectiveness by start year



Source: CDC, Pareto Securities Research

Influenza mortality rate during the 2018-2019 flu season in the United States, by age group



Source: CDC, Pareto Securities Research

There have also been some safety questions with influenza vaccines. For example, there have been fears of complications such as Guillain–Barré syndrome and increased narcolepsy following vaccinations. There has also been

some controversy regarding some preservatives used in certain vaccines such as thiomersal. Nevertheless, the authorities have rejected these concerns.

Despite their lack of effectiveness, influenza vaccines have been around since 1940s after the terrible fatal Spanish Flu during 1919-1921 prompted for immediate solutions. For a long time, hen's eggs were used to grow the inactivated virus. In 2012, however, the FDA approved flu vaccines made by growing virus in cell cultures and influenza vaccines made from recombinant proteins have been available. Aside from these types, plant-based influenza vaccines are in development.

INDIGO

ExpreS^{2}ion Biotech has a chance to contribute to an improved vaccine solution to deal with influenza through its participation in INDIGO. In addition to ExpreS^{2}ion, the INDIGO consortium (led by University of Amsterdam) consists of two Belgian partners, two French partners, two Dutch partners, one US partner, and six Indian partners. The EU-funded project involves public and private R&D organisations in the EU, India and United States for the development of two influenza vaccine concepts with the goal to achieve <10 % instead of 60% non-responders. Other goals include lower costs and better accessibility. The current budget is around €16m.

There are two concepts for this collaboration. The first concept combines a low dose of a commercial, inactivated, seasonal flu vaccine with a novel adjuvant, aiming to obtain proof-of-concept in phase I and IIa trials within 5 years.

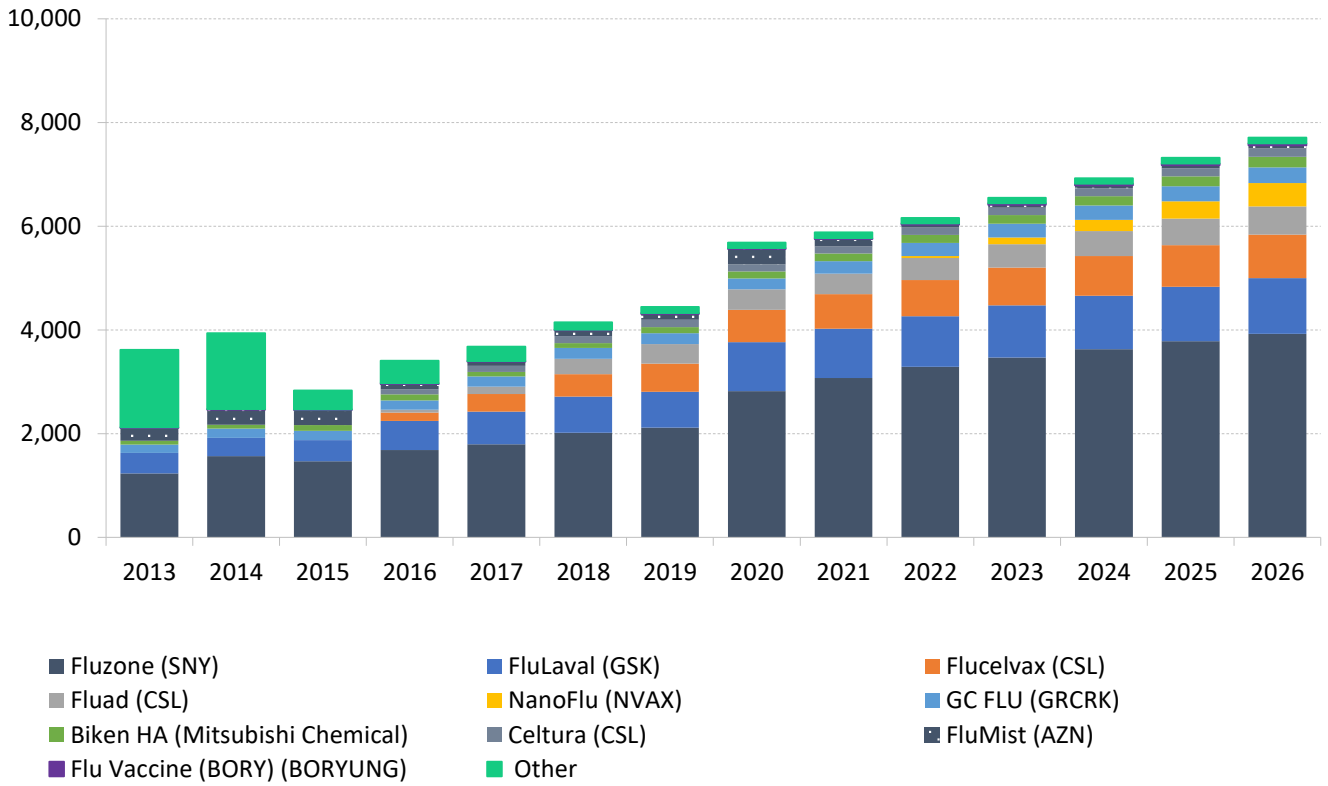
The second concept is based on three innovations including a recombinant viral hemagglutinin with increased immunogenicity, a potent adjuvant and needle-free delivery by intradermal patches. First, the contra-productive parts of HA would be removed to increase the immunogenicity of neutralizing epitopes. Second, the inclusion of the adjuvant (developed by LiteVax BV) further stimulates protective immunity and immunological memory. Lastly, the use of intradermal patches opens possibilities for self-administration, which could improve vaccine uptake in both developing as well as developed countries.

We believe the plans are realistic and there is a good probability to deliver next-generation flu vaccines, given EU support (€10m Horizon 2020 granted to INDIGO in March 2020) and 14 partners from around the world.

Competitive landscape

Looking at competitors, about half of all of the influenza vaccine sales in 2019 were attributed to Sanofi's Fluzone. This product has been a market leader for some time and expected to continue to remain the biggest selling influenza vaccine, with estimated nearly $4bn of sales by 2026. We believe our peak sales estimate for the INDIGO vaccine is relatively modest and could garner multiples of our expectations depending on its ultimate effectiveness and distribution.

Influenza vaccine competitor estimates ($m)

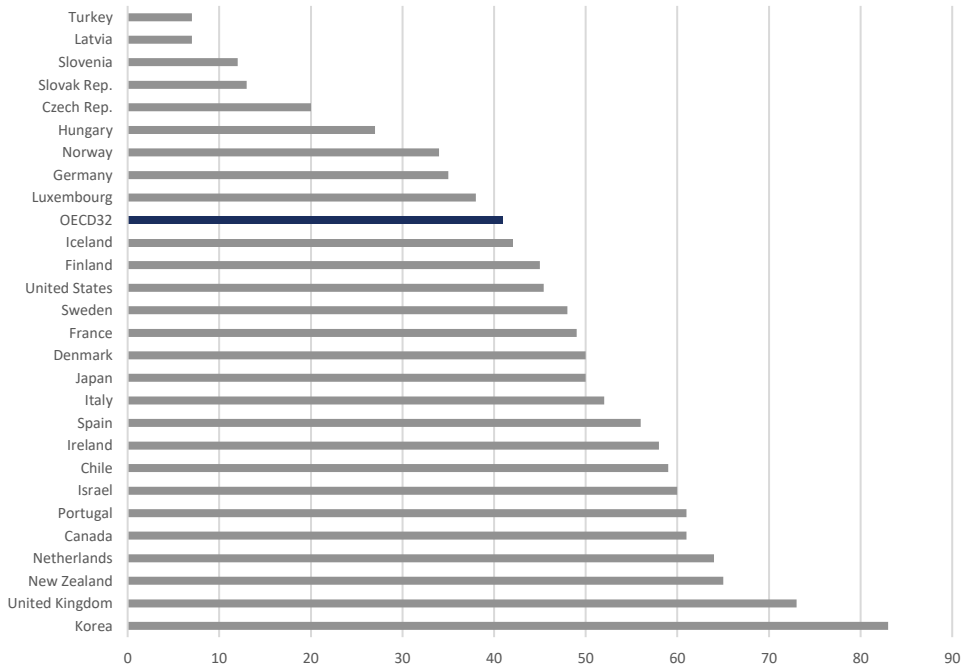


Note: 2021 and onwards consensus estimates per Evaluate Pharma
Source: Pareto Securities Research, Evaluate Pharma

Influenza vaccine market and our modelling assumptions

According to Fortune Business Insights, the global influenza vaccine market size was valued at $4.45 billion in 2019, and is projected to reach $7.6 billion by 2026, posting a CAGR of 6.9%. However, 95% of influenza doses were used in the Americas, Europe, and western Pacific, according to the American Council on Science and Health Comment Policy. In other parts of the world, the vaccination efforts have had mixed efforts. In the largest markets (US and Europe), the vaccination rate has hovered around 40%, though several countries are posting rates of up to 70%. In the developing world, however, the rates are lower. For example, in China and India the vaccination rate hovers at around 2%.

Vaccination coverage against influenza among the elderly in OECD countries as of 2017



Source: OECD, Pareto Securities Research

We believe the low effectiveness of current flu vaccines at least partly explains the low uptake of the flu vaccination. We expect some upside to the market as a whole, should a more effective and safer agent reach the market. This is especially true in the developing world, though further government initiatives would be needed to make this come true.

In our model, we assume a target market of nearly 400m patients, which includes the US, EU, Japan, and India regions. This figure is adjusted for current vaccination rates, which particularly in India are very low (~2%). Should vaccination efforts improve in these regions and across the world in general, we could see significant market growth acceleration.

The price of the influenza vaccine varies (depending on product and payor), but especially depending on the region, with the US posting prices of $14-$25, according to CDC. In Europe prices tend to be around $5-$15. In the developing world, such as India, we see even lower prices, down to $3, according to our research.

In our model, we assume the price per dose is roughly $20, also accounting for some inflation by the time a product candidate is launched. By the time of the launch, we expect the market to be at least $6.5bn, which could prove to be conservative given vaccination promotions by governments and global entities. For ExpreS^{2}ion, we model-in market penetration of 15%, arriving at peak sales estimates of $982m. Following the launch, we estimate a 7% growth until patent expiration (2036e), followed by a 5% annual decline. This could prove too conservative as influenza vaccines typically do not experience major patent cliffs as with other drugs. For example, FluLaval is expected to post 2% CAGR between 2020 and 2026, despite patent expiry in 2022, according to EvaluatePharma. Similar effects could be seen in other examples as well.

The economics of this project are not clear, but we note that there appear to be around 14 partners. For ExpreS^{2}ion, the responsibility appears to lie in the

utilization of its platform for antigen production. We model in approximately 5% royalty rate from total sales.

Aside from the recent COVID-19 pandemic, clinical development for vaccines tends to be long and costly. It's common for over 10 years from start to finish. The INDIGO project is still relatively early stage, though there are many partners involved. The vaccine candidate has already been selected. However, due the current COVID-19 pandemic, the initial development work has been deferred, though preclinical studies in animals are expected in mid-2021. We model in a launch date in 2030. Given the standard probabilities for drug candidates in the infectious vaccine area, we estimate a 27% LOA, assuming a 75% chance that a drug candidate gets into clinical development.

In terms of the costs, vaccine trials tend to be large and run for several hundred million dollars. Fortunately, the costs are likely to be split up between the numerous partners. We have also seen grants awarded. Therefore, we model in approximately $37 million cost over 10 years of the development for ExpreS^{2}ion. Since the EU appears to be funding the project through Phase IIa, the clinical development cost assumption lies entirely in the later stages, the vast majority coming from the Phase III trial, should the project reach this stage. We model a small 5% (of the royalty stream) OPEX cost, but otherwise we do not assume any further costs related to marketing or commercialization.

We estimate the value from INDIGO to ExpreS^{2}ion Biotech at around SEK 278m or SEK 8.46 per share. Prior to positive cash flow anticipated to come from 2030, we have SEK -5m impact to the NPV from LOA-adjusted R&D and other costs.

NPV of the influenza project

(in SEKm, escept peak sales)			2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044
Peak Sales	$ 982																
Unadj. Revenue			1,724	4,763	6,816	8,212	8,787	9,402	10,060	9,557	9,079	8,625	8,194	7,784	7,395	7,025	6,674
				176%	43%	20%	7%	7%	7%	-5%	-5%	-5%	-5%	-5%	-5%	-5%	-5%
Royalty	5%																
LOA	27%																
Adjusted revenue			23	65	93	112	119	128	137	130	123	117	111	106	101	96	91
Cost of goods sold			1	3	5	6	6	6	7	6	6	6	6	5	5	5	5
R&D expense			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S&M expense			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
G&A expense			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Operating profit			22	62	88	106	114	121	130	123	117	111	106	101	96	91	86
Taxes	21%		5	13	18	22	23	25	27	25	24	23	22	21	20	19	18
NOPAT			18	49	70	84	90	96	103	98	93	88	84	80	76	72	68
Free cash flow			18	49	70	84	90	96	103	98	93	88	84	80	76	72	68
Present value of FCF	10%		7	18	23	26	25	24	24	20	18	15	13	11	10	8	7
Net present value		**278**	**7**	**18**	**23**	**26**	**25**	**24**	**24**	**20**	**18**	**15**	**13**	**11**	**10**	**8**	**7**
per share		**8.46**															

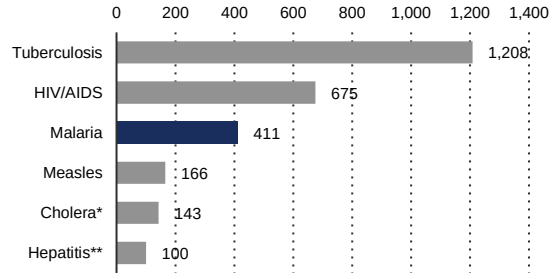
Note: Forecast period extends through to 2053
Source: Pareto Securities Research

Malaria projects

Malaria is a global issue

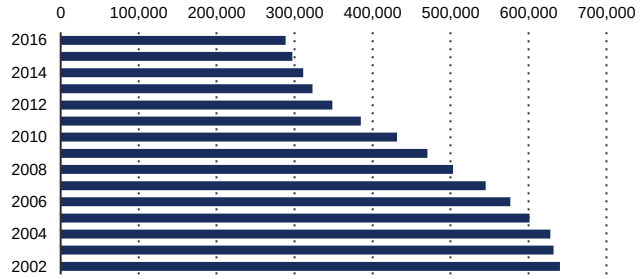
Malaria is a major global health issue that is largely relegated to the developing world, in particular to Sub-Saharan Africa, which carries more than 90% of the global disease burden. In theory, however, there are 3.2 billion people globally at risk of malaria infection. While there have been major advances in malaria control, there were still 229 million clinical estimated cases in 2019 (though there are reports of overdiagnosis in the preceding years), leading to around 411,000 deaths (WHO, World Malaria Report 2019). Out of these, 67% occurred in children under five years old, though fortunately the situation has been improving. Since 2002, the number of children who have died from malaria more than halved, though a significant casualty figure still remains.

Number of deaths caused by selected communicable diseases annually worldwide as of 2019 (in 1,000)



Source: WHO, Statista, Pareto Securities Research

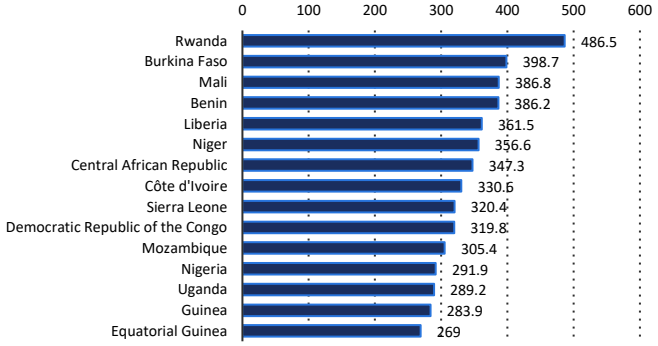
Number of deaths worldwide among children under five years due to malaria from 2000 to 2016



Source: UNICEF, WHO, Pareto Securities Research

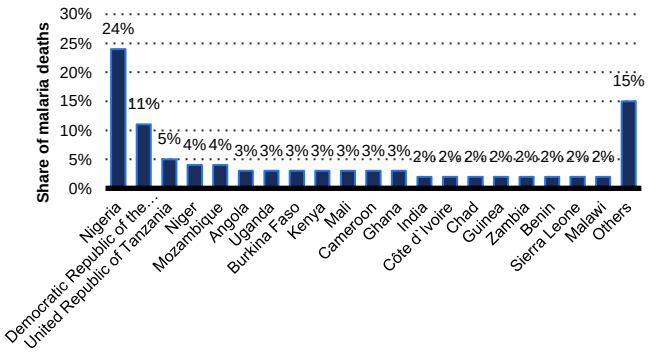
Malaria is not only a health burden but also a financial one to countries that are in greatest need. An older study (Greenwood, B. et al. "Malaria." The Lancet 2005) estimated a $12 billion cost to Africa every year. Furthermore, malaria has a heavy burden in some select countries, where it may be responsible for 30–50% of hospital admissions, up to 50% of outpatient visits, and up to 40% of public health spending. In terms of total figures, Nigeria is far away the leading country, accounting for nearly a quarter of malaria deaths in the world. This is partly due to the large population of the country as a number of small countries carry a much greater prevalence normalized by population size.

Leading 20 countries based on number of new malaria cases in 2018 (per 1,000 population at risk)



Source: WHO, Statista, Pareto Securities Research

Distribution of malaria deaths worldwide among leading countries with high malaria deaths in 2018



Source: WHO, Statista, Pareto Securities Research

Malaria in a nutshell and treatments

Malaria is classified as a mosquito-borne infectious disease. The parasites entered through the *Anopheles* mosquito lodges into liver cells where they multiply and grow, after which they move into red blood cells. Malaria symptoms usually begin ten to fifteen days after being bitten by an infected mosquito and include fever, tiredness, vomiting and headaches. However, in severe cases patients experience yellow skin, seizures, coma or death. There are further potential complications, especially the acute respiratory distress syndrome occurring in 5–25% of adults and up to 29% of pregnant women.

In terms of treatment, there are a number of medications such as mefloquine, doxycycline, or the combination of atovaquone/proguanil (Malarone) which is frequently used for prevention. However, the use of preventive drugs is usually reserved for travellers or pregnant women as their cost doesn't allow for continuous use for the broad population. Patients infected with malaria are treated with antimalarial medications. One of the most successful therapies is artemisinin, which is used as part of the artemisinin-combination therapy (with other antimalarials) and is about 90% effective when used to treat uncomplicated malaria. Severe and complicated malaria, however, presents a more difficult issue, where mortality rates are high (10% to 50%). These cases are usually treated in critical care units and involve artemisinin derivatives and quinine.

While there are a number of medications to treat malaria, the issue of drug resistance has begun to emerge. This affects all classes of drugs, except for artemisinin, which due to their cost are not used as widely. However, even this drug class is beginning to experience some drug resistance in Southeast Asia. Furthermore, there is a major problem with counterfeiting. In a 2012 study, one third of antimalarial medications in Southeast Asia and Sub-Saharan Africa failed chemical analysis, packaging analysis, or were falsified. There is a possibility of immunity against malaria, but this occurs only in response to years of repeated infection.

The need for a vaccine against malaria has remained unmet. While there is one that has been approved in 2015 (RTS,S or Mosquirix), its efficacy has been fairly low at around 36%, even after receiving three shots and a booster dose. For infants, the protection was even worse, only at 26% and no significant protection against severe malaria. The WHO aims to reach 90% global reduction of malaria by 2030. In order to reach this ambition, the organization considers an effective vaccine against malaria to have an efficacy goal of 75%. It's clear that the current treatments and the Mosquirix vaccine do not present a viable solution to reach the WHO's ambition. As a result, there is a great need for a safe, effective and durable malaria vaccine.

ExpreS2ion' Malaria I project

ExpreS^{2}ion Biotech is running a number of malaria projects, several of which are well into clinical development.

The most advanced of these is the so-called Malaria I blood stage (RH5-1) project. Here ExpreS^{2}ion serves as a collaboration partner with The Jenner Institute of the University of Oxford, that is developing the blood-stage Plasmodium falciparum malaria antigen RH5.1 using the ExpreS^{2}ion platform. The reason why RH5.1 was chosen as a target was because it is a part of a larger protein complex expressed by the malaria parasite during infection, helping it to invade red blood cells as a result causing this condition. The thinking behind the RH5.1 vaccine is to block red blood cell invasion and therefore the progression of the disease.

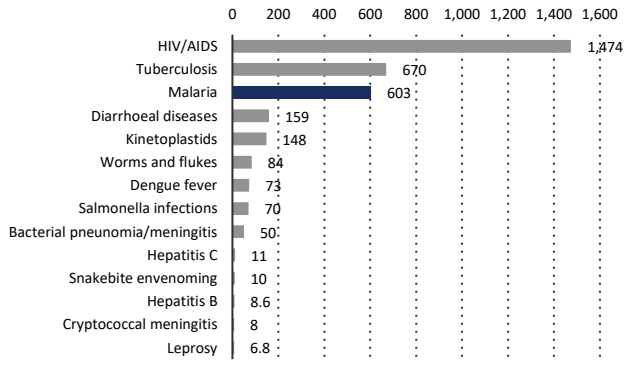
In terms of clinical development, the RH5.1/AS01B vaccine has been studied in the VAC063 study, a Phase I/IIa trial funded by Leidos Inc. as part of the

company's prime contract with the United States Agency for International Development (USAID) for the creation and testing of malaria vaccines. The reason for this vaccine candidate name (RH5.1/AS01B) is that the candidate is formulated in the AS01B adjuvant, a liposome-based vaccine adjuvant system, which is used to improve vaccine immunogenicity and efficacy.

VAC063 study results have recently (April 2021) been published in the journal *Med* (though positive results were already announced in October 2018). In this study, run by the University of Oxford, researchers assessed the safety, immunogenicity and efficacy of the vaccine candidate. The trial included 67 vaccinated healthy UK volunteers. The primary efficacy endpoint of the trial was to establish whether the RH5.1/AS01B vaccine could demonstrate a reduced parasite multiplication rate (PMR) in vaccinated subjects compared to infectivity controls in a blood-stage controlled human malaria infection (CHMI) model. In conclusion, the RH5.1/AS01B vaccine was seen as safe, well tolerated, and immunogenic in healthy adults. Furthermore, a significantly reduced blood-stage parasite growth rate was observed in vaccines following controlled human malaria infection, seen as a defining milestone for the blood-stage malaria vaccine field.

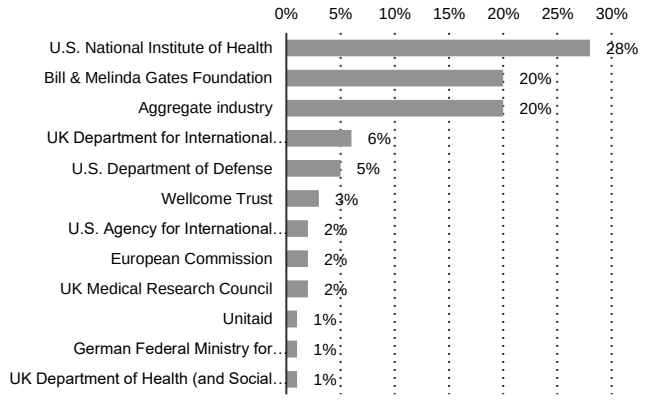
There is support from international consortiums involved, namely OptiMalVax (members: University of Oxford, Sorbonne University and James Cook University in Australia), funded by a €20m EUR grant. There is also the MultiViVax consortium (includes University of Oxford and the University of Edinburgh), funded by a €5.7m grant. We would like to highlight that in general malaria research receives substantial funding around the world. In 2019, there were $603m allocated to R&D for malaria, third-most of all conditions. Only HIV/AIDS and tuberculosis has received more. In terms of sources of funds, the US National Institute of Health and Bill & Melinda Gates Foundation supplied nearly half of the total funds in 2019 for malaria.

Donated funds for research and development by disease in 2019 (in million U.S. dollars)



Source: Policy Cures, Statista, Pareto Securities Research

Percentage of select major funders for malaria research and development worldwide in 2019



Source: Policy Cures, Statista, Pareto Securities Research

ExpreS2ion' Malaria IV project

Another clinical-stage malaria project is the so-called Malaria IV Placenta born (VAR2CSA), named after the antigen with the same name. Like all of the other malaria projects, a partnership was started this time in 2013 as part of an international consortium PlacMalVac.

Here the aim is to develop a vaccine against placental malaria. The thinking is that some women have acquired immunity against malaria during childhood, but nevertheless become susceptible to malaria again during their first pregnancies. As a result, this has become a major problem in Sub-Saharan Africa with estimates of roughly 20,000 maternal and 200,000 infant deaths annually. Positive Phase Ia data for this project was already communicated in January 2019. The next step is to launch an additional Phase Ia clinical trial in Africa, which is planned to take place during 2021.

We note that while there are multiple partnerships, mainly through academic institutions, the source of antigens cannot be changed without invalidating clinical data. Therefore, we are comfortable that ExpreS2ion should not have any IP issues and the protein antigen would continue to be manufactured using its platform.

ExpreS^{2}ion' other malaria projects

The company has several other preclinical malaria projects namely:

- **Malaria II – Blood stage (RH5-2).** This a second generation to the company's most advanced project (RH5-1). The improvement here is the engineering of the antigen to retain regions important for red blood cell recognition, which are targeted by neutralising antibodies. Furthermore, this protein will be displayed on the surface of a hepatitis B derived virus-like particle (VLP) in order to maximise the induction of high titre antibodies
- **Malaria III – Transmission (Pfs48/45).** Here, the goal is to develop a transmission-blocking vaccine to prevent the transfer to mosquitos feeding on persons infected with malaria. This should help to hinder further spread of the disease. It's important to note that this transmission-blocking vaccine does not give direct protection from the disease, but it would stop the disease from spreading and could therefore lead to eradication of malaria. Similar to the Malaria I project, Jenner Institute at the University of Oxford leads this project, with ExpreS^{2}ion as a member.
- **Malaria V - Blood-stage (PfRipr complex).** Lastly, this potential next generation malaria vaccine is developed to target a recently discovered molecular 'key' that the deadly malaria parasite uses to enter human blood cells. This 'key' is a complex of three parasite proteins called Rh5, CyRPA and Ripr, where the three proteins work together to unlock and enter the cell and could prove to be a promising target for vaccine development.

Malaria vaccine market and our modelling assumptions

According to Market Insight Reports, the global malaria vaccines market size is forecast to reach $134.9m by 2026, growing at a CAGR of 33.2% during 2019-2026. We do note that this ultra-high growth rate is partly due to a low base rate, as there is no effective vaccine on the market.

One key competitor for ExpreS^{2}ion is another vaccine (R21/Matrix-M) also developed by Oxford, which is further along in clinical development. In April 2021, the results of the Phase II trial (n=450 children) were announced that the vaccine has posted a 77% efficacy rate, which surpasses the WHO's goal. Furthermore, the vaccine appears to be well-tolerated, only producing minor side effects like fever. A Phase III trial is planned with 4,800 children across four African countries. In terms of production capacity, Oxford has entered into partnership with the Serum Institute of India to produce 200 million doses annually of the vaccine, each costing an estimated $3, for a total of $600m. The vaccine should be available for 30 million children born in at-risk regions in Africa, along with the rest of the world.

As of today, R21/Matrix-M appears to be a front runner, however, there are other candidates being researched. One is the PfSPZ vaccine, developed by Sanaria using radiation-attenuated sporozoites to elicit an immune response. Clinical trials have been promising, with trials taking place in Africa, Europe, and the US, protecting over 80% of volunteers. One drawback though is the ultimate feasibility of large-scale production and delivery in Africa since the vaccine must be stored in liquid nitrogen. Nevertheless, Phase III trial is in the works.

Looking at the global antimalarial drugs market, Allied Market Research expects the figure to be €1bn by 2026 registering a CAGR of 4.6%. We view this as a good benchmark growth rate to use for our projections. We assume an order similar to R21/Matrix-M, though to grow 4.6% CAGR to roughly 300 million doses, assuming $3 per dose. In our model, we estimate $900m market potential at the time of launch, assumed in 2029. We model in 25% market penetration given many projects the company is involved in for this indication, arriving at peak sales of $225m. Following the launch, we estimate a 5% growth until patent expiration (2040e), followed by a 5% annual decline. As with the influenza project, the economics of the malaria collaborations are not clear. We model in approximately 5% royalty rate from the total sales.

In terms of the costs, clinical development is likely to be split up between various partners and partially funded by EU. Furthermore, the clinical trials are taking place in Africa, where trial costs are likely significantly lower. Therefore, we model in approximately $10.9 million cost over 10 years of the development for ExpreS2ion, discounted by probability of enrolment into various phases. Given the standard probabilities for drug candidates in infectious vaccine areas and some progress in clinical development for several projects we estimate a 42% LOA.

We model a small 5% (of the royalty stream) OPEX cost but otherwise, we do not assume any further costs related to marketing or commercialization since the projects are out-licensing.

We estimate the value from the malaria projects to ExpreS^{2}ion Biotech at around SEK 124m or SEK 3.78 per share. Prior to positive cash flow anticipated to come from 2030, we have SEK -6m impact to the NPV from LOA-adjusted R&D and other costs.

NPV of malaria projects

(in SEKm, escept peak sales)			2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044
Peak Sales	$ 225																
Unadj. Revenue			1,092	1,562	1,882	1,976	2,075	2,179	2,288	2,402	2,523	2,649	2,781	2,642	2,510	2,384	2,265
			176%	43%	20%	5%	5%	5%	5%	5%	5%	5%	5%	-5%	-5%	-5%	-5%
Royalty	5%																
LOA	42%																
Adjusted revenue			23	33	40	42	44	46	49	51	54	56	59	56	53	51	48
Cost of goods sold			1	2	2	2	2	2	2	3	3	3	3	3	3	3	2
R&D expense			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S&M expense			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
G&A expense			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Operating profit			22	32	38	40	42	44	46	48	51	53	56	53	51	48	46
Taxes	21%		5	6	8	8	9	9	10	10	10	11	12	11	10	10	9
NOPAT			17	25	30	32	33	35	37	39	40	42	45	42	40	38	36
Free cash flow			17	25	30	32	33	35	37	39	40	42	45	42	40	38	36
Present value of FCF	10%		7	9	10	10	9	9	8	8	8	7	7	6	5	4	4
Net present value		**124**	**7**	**9**	**10**	**10**	**9**	**9**	**8**	**8**	**8**	**7**	**7**	**6**	**5**	**4**	**4**
per share		**3.78**															

Note: Forecast period extends through to 2053
Source: Pareto Securities Research

Financials

ExpreS^{2}ion Biotech's financials resemble that of an early-stage biotech. For 2021, we expect revenues to come entirely from the service business, as has been the case in the last few years. In 2022, however, we forecast a significant increase to the top-line coming from royalties to be potentially received from the COVID-19 project. We assume a decline of total revenues post-2022, as the royalty stream from this project is likely to decrease, according to our forecast in the earlier section. The other major projects are not likely to generate revenues until the late 2020s, early 2030s. We have outlined our forecast for each project in the appropriate sections above.

Summary of our estimates for the key financial metrics

SEK mm	2021	2022	2023	2024	2025
Adjusted net revenue	**SEK 15**	**SEK 145**	**SEK 107**	**SEK 81**	**SEK 63**
% growth					
Cost of goods sold	6	13	11	10	10
% of revenue	*40%*	*9%*	*10%*	*13%*	*15%*
Gross margin	**SEK 9**	**SEK 132**	**SEK 96**	**SEK 71**	**SEK 53**
% margin	***60%***	***91%***	***90%***	***87%***	***85%***
Operating profit	**SEK (36)**	**SEK 90**	**SEK 54**	**SEK 31**	**SEK 11**
% margin	***(240%)***	***62%***	***51%***	***39%***	***18%***
Taxes	(7)	18	11	6	2
% tax rate	*21%*	*21%*	*21%*	*21%*	*21%*
NOPAT	**SEK (29)**	**SEK 71**	**SEK 43**	**SEK 25**	**SEK 9**
% margin	***(191%)***	***49%***	***40%***	***31%***	***14%***
(-) Capex	(3)	(3)	(3)	(3)	(3)
(+) D&A	4	4	4	4	4
(-/+) change in NWC	0	0	0	0	0
Free cash flow	**SEK (28)**	**SEK 72**	**SEK 44**	**SEK 26**	**SEK 10**

Source: Pareto Securities Research

One of the most important financial items for an early stage biotech is its cash position and the burn rate. After a recent (October 2020) capital raise, the company's cash balance stood at ~SEK 83m after the end of Q1 2021 plus another ~SEK 39m from a more recent T04 warrant exercise. We expect the company to burn roughly SEK 28m in 2021, though given the rather significant Q1 '21 cash burn, we could see the 2021 higher, should this trend continue through the year.

Looking at the financial liabilities, the company has a very minor exposure, as one would expect. Currently, there is a SEK 1.9m amount attributed to liabilities to credit institutions.

Another dynamic item to keep in mind is the shares outstanding count and the dilution from the remaining warrants. As of Q1 2021, this figure stood at 27,608,301. However, after the recent warrant exercise, the share count stands at 29,383,191. The company still has all of the T05 warrants outstanding that would be exercised between September 6, 2021 and September 20, 2021. In addition, there are further warrants from incentive programs, namely T02 and T06. Taking the dilution from all of the warrants into account, we arrive at a share account of 32.88m and a pro forma cash balance of SEK 212m.

Dilution from the warrants

Type	Number of Warrants	Factor	Number of Shares	Conversion Price	Cash to Company
T02	680,100	1.00	680,100	5	3,271,281
T04	5,324,670	0.33	1,774,890	22	39,047,580
T05	5,455,297	0.33	1,818,432	25	45,460,808
T06	1,000,000	1.00	1,000,000	17	17,000,000
			5,273,422		**104,779,669**
Q1 2021			27,608,301		106,832,000
ProForma Balance			**32,881,723**		**211,611,669**

Source: Pareto Securities Research

Valuation

We value ExpreS2ion Biotech using a Sum of the Parts (SOP) approach, a common valuation approach for biotech companies. In this method, we combine individual project NPV results discussed in the respective sections of this report. The cash flows from each project are discounted using WACC of 10%.

The near term COVID-19 project contributes to more than half of our valuation as ABNCOV2 and the AdaptVac equity stake result in combined 57% of the company value. The relative quick potential cash flows as well as large market potential justify the relatively high NPV, despite the project being out-licensed to Bavarian Nordic. The breast cancer project (ES2B-C001) carries second highest value contribution of 18%. However, the LOA modelled is currently 3%, which allows for significant value generation should the asset progress successfully through clinical development. The 100% ownership of this asset by ExpreS2ion drives the very high value generation potential, relative to other projects. All in all, we value all the projects, at close to SEK 53.6 per share.

Another item in our valuation, cash, provides another 11% of the value. This figure is adjusted after considering the exercise of warrants, discussed in the previous section. Consequently, we have adjusted the shares outstanding to 32.88m.

Our calculation of the valuation analysis leads us to a rounded target price of SEK 60 per share. We initiate coverage of ExpreS2ion Biotech with a Buy rating.

SOP Valuation

Sum of the Parts Valuation	NPV (SEK m)	Per Share (SEK)	% of Total Fair Value
ABNCoV2 (Royalties)	241	7.33	12%
ES2B-C001	361	10.97	18%
Influenza	278	8.46	14%
Malaria	124	3.78	6%
Unallocated	-126	-3.82	-6%
AdaptVac Equity Stake	883	26.84	45%
Total	**1,762**	**53.57**	**89%**
Debt	-2	-0.06	0%
Cash & CE (Pro Forma for Dilution)	212	6.44	11%
Shares outstanding (Pro Forma for Dilution)	32.88		
Fair Value	**1,971**	**60**	100%

Source: Pareto Securities Research

Key risks

Currently no marketed pharmaceuticals

Historically, the company's business model relied on milestone payments and royalties from approved pharmaceuticals that have been developed with the ExpreS2 platform. So far there have not been any pharmaceuticals that have gained market approval. Therefore, current revenues have been limited and there is a substantial risk that this continues, especially if the COVID-19 vaccine project is not successful. We do not expect any current pipeline project to reach commercial stage until the late 2020s/early 2030s.

Clinical trials

Before a market launch, a drug candidate must be tested rigorously in a number of clinical trials, which carry a significant level of failure. Furthermore, there is a substantial possibility that preclinical findings do not correspond with the results that are obtained in clinical trials in humans. Finally, even if results from smaller clinical trials (Phase I) are favourable, there still remains a large probability that large trials do not confirm the previous results.

Collaboration partners

ExpreS^{2}ion relies heavily on collaborations. For most projects there are larger companies involved who steer the project and ultimately decide the path forward. For the COVID-19 project, ExpreS^{2}ion relies heavily on Bavarian Nordic and specifically its ability to raise enough funds to finance the Phase III trial. If the partner is unable or unwilling to find the financing, the outcome of the project would be jeopardized.

Competitive landscape

The value of each pipeline is based primarily on current beliefs of the various inputs of a respective market potential estimate. If and when the drug reaches the market, the environment could be very different. For example, competitors with larger resources could launch effective products and severely threaten the market potential for ExpreS^{2}ion's products and decrease the value of the company.

Financial risks

ExpreS^{2}ion Biotech is currently loss making and requires periodic capital raises to fund its operations. Although we expect a much brighter outlook (positive net income and cash flow) in the near-term, project delays (i.e. COVID-19 vaccine) or cancellations would likely create a need to further raise capital in the near-term.

Legal risks

ExpreS^{2}ion Biotech generally tries to avoid legal risk. However, there is a possibility of being held accountable should any incidents occur during clinical trials, even if these are carried out by an external party. As the company operates in the pharmaceutical industry, there are always product liability risks, especially concerning any safety issues related to a drug.

Management

ExpreS^{2}ion Biotech has six members of the management team.

Management

Bent U. Frandsen (Chief Executive Officer)

- Employed since 2016, appointed CEO in 2019. On the board of AdaptVac ApS in 2017
- More than 27 years of professional experience in management, finance, and business development positions in multinational companies
- This includes more than 24 years life science experience at public listed companies: Lundbeck, ALK-Abelló, Coloplast, and private companies: NsGene, CMC Biologics, and Amphidex
- Experienced in licensing, services, M&A, and new cash deals in excess of €200 million, and has furthermore been in charge of successfully closing numerous collaboration agreements pertaining to research and development of both new chemical entities and biologicals
- MSc in Finance and Strategic Planning from Copenhagen Business School, Denmark.

Keith Alexander (Chief Financial Officer)

- Employed since October 2020
- Over 20 years of professional experience in investment markets, investor communications, corporate strategy, and business development from American and Danish banks
- Over his career, he has served in leadership, analytical and commercial functions at J.P. Morgan Securities and J.P. Morgan Asset Management in NYC, NY USA, Danske Bank Asset Management (formerly Danske Capital) in Kongens Lyngby, Denmark and Accenture (formerly Andersen Consulting) in Chicago, IL, US
- Contributed to raising over €1 billion for equity and bond portfolios, evaluated large M&A transactions, structured and valued cross-border joint ventures, advised investors managing over $8 trillion in assets, and analyzed financial services companies as a member of the #1 ranked All-American Equity Research Team in 2010 at J.P. Morgan Securities
- MBA from The Wharton School of the University of Pennsylvania, and a B.Sc. in Industrial Management, with a minor in Biological Sciences, from Purdue University

Dr. Max M. Søgaard (Vice President of Research & Development and Technology)

- Has been employed by the company since 2013 and was appointed Vice President in 2020
- Has 20 years of scientific research and process development experience, having served the last eight years at ExpreS^{2}ion in roles ranging from Senior Scientist (Downstream) to Vice President, and prior to that 12 years of academic research focused on structural biology and molecular biophysics with an emphasis on infectious disease applications
- Heads internal R&D in order to extend ExpreS^{2}ion's unique capabilities and know-how in applying ExpreS2 technology for customers and the company's own vaccine development
- PhD in Biochemistry from University College London, UK, and a MSc in Molecular Biology from Aarhus University, Denmark

Mette Thorn (Vice President of Preclinical Development)

- Employed by the company since February of 2021
- Has 20 years of preclinical development and management experience in vaccine development within cancer and infectious diseases, amongst other fields
- Has extensive research science experience from Biotech and Pharma, including from roles with Astion Pharma, the SSI, Symphogen, Novo Nordisk, Bioneer, Biocare, and CBio
- In all of her roles she has been instrumental in progressing preclinical pipeline assets from early stage research into clinical development phase
- PhD in Immunology and a MSc in Chemical Engineering from the Technical University of Denmar

Lars J. Petersen (Medical Director, Oncology)

- Has been employed by the company since February of 2021
- More than 20 years of professional clinical drug development experience, primarily within advanced biologics in oncology and immunology
- Served as Medical Director at Genmab and Abbott, and has been a consultant for numerous companies globally, including serving as consultant Chief Medical Officer with Cytovac, ROS Therapeutics, and 2A Pharma
- Had a long academic career as Clinical Professor (chair) in functional cancer imaging at the University of Aalborg, Denmark, published more than 165 peer-reviewed publications, and presented more than 100 lectures at international meetings

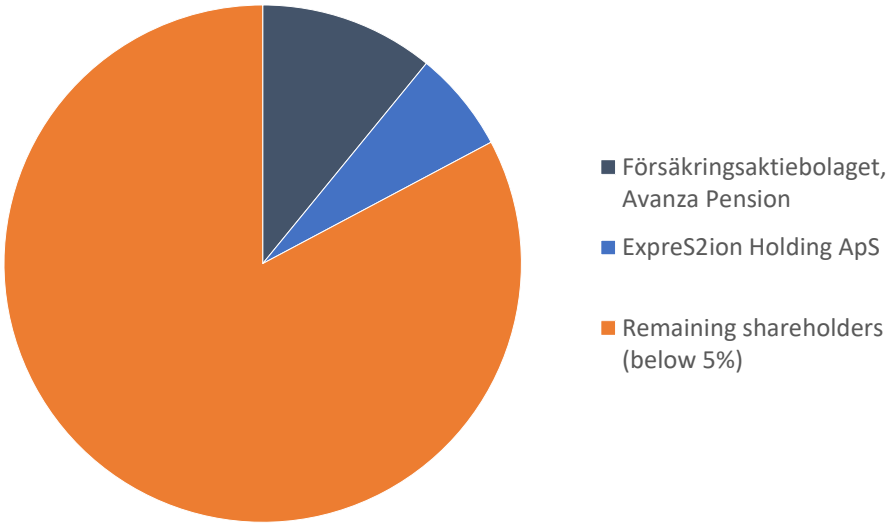
Eske Rygaard-Hjalsted (Vice President Business Development)

- Employed by the company since May 2021
- More than 25 years track record in business development and working with sales and marketing across diagnostics, biotech, medtech, and bioinformatics in companies that include DAKO/Agilent A/S, FOSS Analytical A/S, and other international companies
- Worked out of Silicon Valley, California for four years as a Business Development/Strategic Marketing Consultant
- Tenure in the last five years at Intomics A/S, a consecutive Børsen Gazelle Winner during 2017-19, where he was VP Sales, Marketing and Business Development
- MSc in Molecular Biology from The Technical University of Denmark (DTU)

Shareholders

ExpreS^{2}ion has a single class of shareholders. As of March 31, 2021, the number of shares outstanding is 27,608,301. Shareholders who hold over 5% of shares total roughly 17%. The largest shareholder is Försäkringsaktiebolaget, Avanza Pension holding around 11% of the total shares. Just over 6% are held by three ways founders: Martin Roland Jensen (Chairman), Charlotte Dyring (co-founder) and Wian de Jongh (co-founder).

Expre2ion shareholder base (as of March 31, 2021)



Note that ExpreS2ion Holding ApS was dissolved in March though that was not yet reflected in the Euroclear data
Source: Pareto Securities Research, company data from Euroclear

On March 26, 2021, ExpreS2ion Holding ApS (Danish CVR-number 32773052) was formally dissolved. The company was created in 2010 by the co-founders as a way to pool their shares in the company. Following Dr. Wian de Jongh's departure in early 2021 to become CEO of AdaptVac ApS, ExpreS2ion's joint venture with NextGen Vaccines ApS, it was decided that the co-founders would dissolve the vehicle.

After Q1 2021 close, further shares have been added to the total base. On April 28th, 97.6% of the TO4 warrants were exercised which corresponded to 1,774,890 shares. Therefore, current shares outstanding is 29,383,191, according to our calculation.

PROFIT & LOSS (fiscal year) (SEKm)	2016	2017	2018	2019	2020	2021e	2022e	2023e
Revenues	**5**	**10**	**9**	**14**	**15**	**15**	**145**	**107**
EBITDA	**(8)**	**(9)**	**(16)**	**(16)**	**(29)**	**(32)**	**94**	**58**
Depreciation & amortisation	(1)	(2)	(3)	(3)	(3)	(4)	(4)	(4)
EBIT	**(9)**	**(11)**	**(18)**	**(19)**	**(32)**	**(36)**	**90**	**54**
Net interest	(0)	(0)	(1)	(1)	(4)	(0)	(0)	(0)
Other financial items	-	-	-	-	-	-	-	-
Profit before taxes	**(9)**	**(12)**	**(19)**	**(20)**	**(35)**	**(36)**	**90**	**54**
Taxes	1	2	2	2	3	7	(18)	(11)
Minority interest	-	-	-	-	-	-	-	-
Net profit	**(9)**	**(10)**	**(17)**	**(17)**	**(32)**	**(29)**	**71**	**43**
EPS reported	(0.63)	(0.73)	(1.35)	(1.21)	(1.16)	(0.98)	2.42	1.46
EPS adjusted	**(0.63)**	**(0.73)**	**(1.35)**	**(1.21)**	**(1.16)**	**(0.98)**	**2.42**	**1.46**
DPS	-	-	-	-	-	-	-	-

BALANCE SHEET (SEKm)	2016	2017	2018	2019	2020	2021e	2022e	2023e
Tangible non current assets	1	1	1	1	1	1	1	0
Other non-current assets	12	11	9	7	5	4	4	3
Other current assets	6	5	5	5	6	5	5	5
Cash & equivalents	6	2	6	5	107	116	189	232
Total assets	**25**	**17**	**21**	**19**	**119**	**127**	**198**	**241**
Total equity	13	7	8	(1)	95	105	176	219
Interest-bearing non-current debt	6	6	7	1	2	2	2	2
Interest-bearing current debt	-	-	-	-	-	-	-	-
Other Debt	6	4	6	18	22	20	20	20
Total liabilites & equity	**25**	**17**	**21**	**19**	**119**	**127**	**198**	**241**

CASH FLOW (SEKm)	2016	2017	2018	2019	2020	2021e	2022e	2023e
Cash earnings		(8)	(13)	(12)	(17)	(28)	75	47
Change in working capital		(0)	0	(1)	(2)	2	-	-
Cash flow from investments	(1)	(0)	(1)	(1)	(1)	(3)	(3)	(3)
Cash flow from financing	15	4	19	13	123	39	-	-
Net cash flow		(5)	5	(1)	101	10	72	44

CAPITALIZATION & VALUATION (SEKm)	2016	2017	2018	2019	2020	2021e	2022e	2023e
Share price (SEK end)	**6.7**	**9.6**	**5.9**	**3.59**	**10.9**	**35.8**	**35.8**	**35.8**
Number of shares end period	14	13	12	14	28	29	29	29
Net interest bearing debt	(0)	5	1	(4)	(104)	(114)	(186)	(230)
Enterprise value	**90**	**133**	**74**	**47**	**196**	**938**	**866**	**822**
EV/Sales	19.3	13.6	8.4	3.4	12.9	-	6.0	7.7
EV/EBITDA	**-**	**-**	**-**	**-**	**-**	**-**	**9.2**	**14.1**
EV/EBIT	-	-	-	-	-	-	9.6	15.1
P/E reported	-	-	-	-	-	-	14.8	24.5
P/E adjusted	**-**	**-**	**-**	**-**	**-**	**-**	**14.8**	**24.5**
P/B	7.0	19.1	8.8	-	3.2	10.0	6.0	4.8

FINANCIAL ANALYSIS & CREDIT METRICS	2016	2017	2018	2019	2020	2021e	2022e	2023e
ROE adjusted (%)		-	-	-	-	-	50.6	21.8
Dividend yield (%)	-	-	-	-	-	-	-	-
EBITDA margin (%)	-	-	-	-	-	-	64.6	54.6
EBIT margin (%)	-	-	-	-	-	-	61.9	50.9
NIBD/EBITDA	0.05	(0.53)	(0.05)	0.25	3.63	3.57	(1.99)	(3.94)
EBITDA/Net interest	-	-	-	-	-	-	-	-

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Appendix A

Disclosure requirements in accordance with Commission Delegated Regulation (EU) 2016/958 and the FINRA Rule 2241

The below list shows companies where Pareto Securities AS - together with affiliated companies and/or persons – owns a net long position of the shares exceeding 0,5 % of the total issued share capital in any company where a recommendation has been produced or distributed by Pareto Securities AS.

Companies	No. of shares	Holdings in %	Companies	No. of shares	Holdings in %
ArcticZymes Technologies	598,575	1.24%	SpareBank 1Ringerike Hadı	100,000	0.64%
Bonheur	241,145	0.57%	Sparebank 1SM N	1,875,442	1.44%
DOF	2,366,346	0.75%	Sparebank 1SR-Bank	1,850,014	0.72%
Pareto Bank	16,235,830	23.38%	SpareBank 1Østfold Akersl	1,205,116	9.73%
Quantafuel	1,119,887	0.89%	SpareBank 1Østlandet	3,825,292	3.60%
Sandnes Sparebank	126,013	0.55%	Sparebanken M øre	305,239	3.09%
Selvaag Bolig	3,087,135	3.29%	Sparebanken Sør	433,744	2.77%
SpareBank 1BV	1,771,308	2.81%	Sparebanken Vest	6,805,073	6.34%
Sparebank 1Nord-Norge	4,125,317	4.11%			

Pareto Securities AS may hold financial instruments in companies where a recommendation has been produced or distributed by Pareto Securities AS in connection with rendering investment services, including Market Making.

Please find below an overview of material interests in shares held by employees in Pareto Securities AS, in companies where arecommendation has been produced or distributed by Pareto Securities AS. "By material interest" means holdings exceeding a value of NOK 50 000.

Company	Analyst holdings*	Total holdings	Company	Analyst holdings*	Total holdings	Company	Analyst holdings*	Total holdings
AF Gruppen	0	1,825	Fjordkraft Holding	0	12,855	Pareto Bank	0	2,412,220
Aker ASA	500	2,405	Flex LNG	0	3,532	Pexip Holding	0	62,433
Aker BP	0	23,471	Frontline	0	78,708	PGS	0	11,676
Aker Carbon Capture	0	122,771	Gjensidige Forsikring	0	7,723	Protector Forsikring	0	12,000
Aker Offshore Wind	0	168,028	Golden Ocean Group	0	1,433	Quantafuel	0	1,119,887
Aker Solutions	0	3,678	Grieg Seafood	0	9,453	REC Silicon	0	36,816
American Shipping Co.	0	13,300	Hafnia Ltd.	0	10,000	SalM ar	0	2,129
Aprila Bank ASA	0	22,675	Huddly	0	970,444	Sandnes Sparebank	0	126,013
Archer	0	30,170	Hunter Group ASA	0	308,500	Scatec	0	20,412
ArcticZymes Technologies	0	598,575	HydrogenPro	0	37,552	Selvaag Bolig	0	52,050
Atlantic Sapphire	0	13,610	ice Group ASA	0	200,000	Skitude	0	12,695
Austevoll Seafood	0	29,235	Kalera	0	53,027	Sparebank 1Nord-Norge	0	3,350
Avance Gas	0	3,362	Kitron	0	13,386	Sparebank 1SM N	0	12,740
B2Holding AS	0	14,075	Komplett Bank	0	99,300	Sparebank 1SR-Bank	0	8,505
BASF	270	270	Kongsberg Gruppen	0	36,023	SpareBank 1Østfold Akershus	0	1,252
Belships	0	9,950	KWS	75	75	SpareBank 1Østlandet	0	8,621
Bonheur	0	32,275	Lerøy Seafood Group	0	40,378	Sparebanken Sør	0	16,435
Borregaard ASA	0	650	M ercell	0	23,038	Sparebanken Vest	0	16,735
Bouvet	0	2,940	M owi	0	4,661	Sparebanken Øst	0	1,500
BRAbank	0	74,607	M PC Container Ships	0	32,487	Stolt-Nielsen	0	1,817
BW Energy	0	55,050	Nordic Semiconductor	0	5,491	Storebrand	0	25,178
BW Offshore	0	16,076	Noreco	0	790	Subsea 7	0	9,226
Cloudberry Clean Energy	0	50,000	Norsk Hydro	0	111,219	Telenor	0	9,782
DNB	0	30,055	Norske Skog	0	98,225	Vow	0	8,681
DNO	0	151,978	NTS	0	2,272	Wallenius Wilhemsen	0	56,050
DOF	0	2,366,346	Ocean Yield	0	104,370	XXL	0	17,823
Elkem	0	35,426	OHT	0	6,650	Yara	0	14,508
Entra	0	9,977	Okeanis Eco Tankers	0	22,000	Zaptec	0	4,000
Equinor	0	2,900	Orkla	0	19,852			
Europris	0	11,414	Panoro Energy	0	34,904			

This overview is updated monthly (last updated 15.06.2021).

*Analyst holdings refers to positions held by the Pareto Securities AS analyst covering the company.

Appendix B

Disclosure requirements in accordance with Article 6(1)(c)(iii) of Commission Delegated Regulation (EU) 2016/958

Overview over issuers of financial instruments where Pareto Securities AS have prepared or distributed investment recommendation, where Paret Securities AS have been lead manager/co-lead manager or have rendered publicly known not immaterial investment banking services over the previous 12 months:

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2G Energy	EcoOnline	Kraft Bank	Saga Robotics
Advanzia Bank S.A.	ELOP	LakersHolding AS	Salmon Evolution
Africa Energy Corp Corp	Endur ASA	Maha Energy	Scorpio Bulkers
Aker ASA	Energean Israel Finance Ltd.	Malorama Holding AS	Seafire AB
Aker Clean Hydrogen	Enviv AS (Bookis)	Meltwater	SFL Corporation Ltd
Aker Horizons	Fertiberia S.A.R.L.	Mercell	SGL TransGroup International
AkershusEnergi	Fjordkraft Holding	Mintra Group	Siccar Point Energy
Akva Group	Flexistore AS	Modex AS	Skitude
Alussa Energy Acquisition Corp (Freyr)	Genel Energy	MPC Container Ships	Smart Wires Inc.
American Tanker, Inc.	Gjensidige Forsikring	Mutares SE & Co. KGaA	Strandline Resources Limited
Arctic Fish	Golden Ocean Group	Müller Medien GmbH (United Vertica	Talos Energy Inc
ArendalsFossekompani	Goliath Offshore	Navigator Holdings Ltd.	Tise AS
Attensi	Halodi Robotics AS	Navios	Trønderenergi AS
Belships	Heimdall Power	Next Biometrics Group	Vegfinans AS
BioInvent	HKN Energy Ltd	Nordic Halibut	Viking ACQ1 AS, SPAC
Biomega Group AS	Hofseth BioCare	Norlandia Health & Care Group AS	Vow
Boreal Holding AS	House of Control	Norse Atlantic	Watercircles Forsikring
Borr Drilling Limited	Huddly	Norske Skog	West Coast Salmon
Brooge Energy Limited	HydrogenPro	Norwegian Block Exchange	Wheel.me
Bulk Infrastructure Holding	Ice Group Scandinavia Holdings AS	OHT	Ørn Software (View Software,
BWEnergy	Idavang A/S	Panoro Energy	
BWLPG	Instabank ASA	Pelagia Holding AS	
CentralNic Group PLC	Kalera	PetroNor E&P	
Circa Group	Keppel FELS Limited	PetroTal	
Cloudberry Clean Energy	Kistos plc.	Proximar Seafood	
CrayoNano AS	Klaveness Combination Carriers ASA	Pryme	
DigiPlex	KLP	Quantafuel	

This overview is updated monthly (this overview is for the period 3105.2020 – 3105.2021).

Appendix C

Disclosure requirements in accordance with Article 6(3) of Commission Delegated Regulation (EU) 2016/958

Distribution of recommendations

Recommendation	**% distribution**
Buy	67%
Hold	30%
Sell	3%

Distribution of recommendations (transactions*)

Recommendation	**% distribution**
Buy	95%
Hold	5%
Sell	0%

* Companies under coverage with which Pareto Securities Group has on-going or completed public investment banking services in the previous 12 months.

This overview is updated monthly (last updated 15.06.2021).

Appendix D

This section applies to research reports prepared by Pareto Securities AB.

Disclosure of positions in financial instruments
The beneficial holding of the Pareto Group is 1 % or more of the total share capital of the following companies included in Pareto Securities AB's research coverage universe: None

The Pareto Group has material holdings of other financial instruments than shares issued by the following companies included in Pareto Securities AB's research coverage universe: None

Disclosure of assignments and mandates
Overview over issuers of financial instruments where Pareto Securities AB has prepared or distributed investment recommendation, where Pareto Securities AB has been lead manager or co-lead manager or has rendered publicly known not immaterial investment banking services over the previous twelve months:

24SevenOffice Scandinavia AB	Climeon AB	Isofol Medical AB	Surgical Science
Azelio	Egetis Therapeutics	LMK Group	Swedencare AB
Bionvent	Implantica	Media & Games Invest plc.	Vicore Pharma
Biovica International	Green Landscaping Group AB	Re:NewCell	VNV Global
Cibus Nordic Real Estate AB			

Members of the Pareto Group provide market making or other liquidity providing services to the following companies included in Pareto Securities AB's research coverage universe:

Africa Energy Corp.	Logistri Fastighets AB	Minesto	ShaMaran Petroleum
ByggPartner i Dalarna Holding	Magnolia Bostad	Saltängen Property Invest	Surgical Science
Cibus Nordic Real Estate	Media & Games Invest plc.	SciBase Holding	Tethys Oil
Isofol Medical	Mentice AB	Sedana Medical	Vostok Emerging Finance

Members of the Pareto Group have entered into agreements concerning the inclusion of the company in question in Pareto Securities AB's research coverage universe with the following companies: None
Member of the Pareto Group is providing Business Management services to the following companies:

Bosjö Fastigheter AB	Bråviken Logistik	Halmslätten	Mälaråsen
Bonäsudden	Delarka	Logistri	Sydsvenska Hem

Members of the Pareto Group have entered into agreements concerning the inclusion of the company in question in Pareto Securities AB's research coverage universe with the following companies: None
This overview is updated monthly (last updated 15.06.2021).

Appendix E

Disclosure requirements in accordance with Article 6(1)(c)(i) of Commission Delegated Regulation (EU) 2016/958

Designated Sponsor
Pareto Securities acts as a designated sponsor for the following companies, including the provision of bid and ask offers. Therefore, we regularly possess shares of the company in our proprietary trading books. Pareto Securities receives a commission from the company for the provision of the designated sponsor services.

2G Energy *	GFT Technologies *	Merkur Bank	SMT Scharf AG *
Biotest *	Gigaset *	MLP *	Surteco Group *
CORESTATE Capital Holding S.A.	Heidelberg Pharma *	mutares	Syzygy AG *
Daldrup & Söhne	Intershop Communications AG	OVB Holding AG	TAKKT AG
Demire	Leifheit	Procredit Holding *	Viscom *
Epigenomics AG*	Logwin *	PSI SOFTWARE AG *	
Gesco *	Manz AG *	PWO *	
Gerry Weber	MAX Automation SE	S&T AG *	

* The designated sponsor services include a contractually agreed provision of research services.

Appendix F

Disclosure requirements in accordance with Article 6(1)(c)(iv) of Commission Delegated Regulation (EU) 2016/958

Sponsored Research
Pareto Securities has entered into an agreement with these companies about the preparation of research reports and– in return - receives compensation.

Adler Modemaerkte	Dermapharm Holding SE	Intershop Communications AG	mutares
Baywa	Expres2ion Biotechnologies	Leifheit	OHB SE
BB Biotech	Gerry Weber	MAX Automation SE	OVB Holding AG
Daldrup & Söhne	Hypoport AG	Merkur Bank	Siegfried Holding AG

This overview is updated monthly (last updated 15.06.2021).