Breast cancer on stage

Cash burn lower than expected in Q4

ExpreS²ion Biotechnologies maintained cash burn at a low level in the fourth quarter of last year. Year-end cash position amounted to SEK 58m after a quarterly cash burn of SEK 20m compared to our burn-rate estimate of SEK 25m.

Management expects cash to have a runway into 2025, which imply a further decline in cash burn from an already low level. Assuming a strict cost control it is our opinion that cash runway will take the company into 2025 by a small margin, including preparations of a future clinical trial.

Breast cancer vaccine status

ES2B-C001 is the company's most advanced proprietary program. It is a protein-based vaccine candidate for prevention and cure of HER2 positive breast cancer, an aggressive form of breast cancer making up around 20 percent of all breast cancer cases.

The ES2B-C001 program was put on hold last year due to financing restrictions but is now progressing towards a clinical study in 2025. Currently the program is investigating safety in non-human primates, and we expect a conclusion in first half of this year.

Funding of vaccine study in humans

Looking into 2024 we expect that the progress of ES2B-C001 to be the guiding star for the share price. The Q4 report did provide additional information over earlier reports as to the timeline of the program. We assume that a clinical trial application can be filed in the second half of this year with a potential study start in 2025.

One of the caveats is the funding of the study which we believe will be costly compared to a phase 1 study of a traditional small molecule drug candidate, partly because of vaccine manufacturing costs. A share issue in 2024 may be avoided by teaming up with a partner and sharing the costs of a phase 1 study.

Fair value raised after AstraZeneca acquisition

A major asset in ExpreS²ion Bio is its 34 percent stake in AdaptVac, a Danish-based technology platform and vaccine developer. The platform is based on the formulation of proteins vaccine on capsid virus-like particles (cVLP). One of the market leaders in VLP-based vaccine development, Icosavax, was recently acquired by AstraZeneca for USD 838m, an impressive sum of money.

Pending further information on the financing of ExpreS²ion's planned clinical program we expect the share price to be volatile. On the back of the AstraZeneca acquisition and imminent ES2B-C001 animal data, we raise our fair value to SEK 3,0 (2,2).

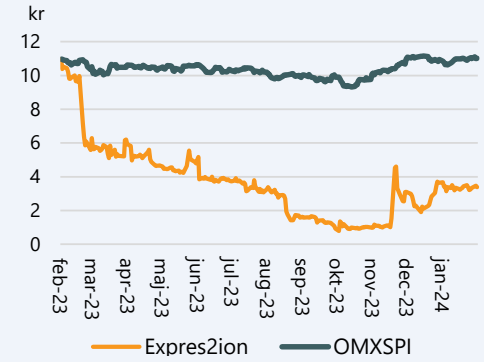
ExpreS²ion Biotech

Date	15 februari 2024
Analyst	Sten Westerberg

Facts

Industry	Vaccine Development
Chairman of the Board	Martin Roland Jensen
CEO	Bent U. Frandsen
Year of Listing	2016
Stock List	First North Growth Market
Ticker	EXPRS2
Share price	SEK 3,5
No. of shares, mln.	51,4
Market cap, SEKm	180
Cash, SEKm	58
Fair value	3,0 kronor
Next report	2024-05-16

Share price development last year



Source: Refinitiv

Forecasts & Key ratios, SEKm

	2023	2024p	2025p	2026p
Revenues	9	11	32	27
R&D expenses	-51	-30	-50	-30
Net income	-96	-56	-54	-30
Earnings per share	-1,5 kr	-1,1 kr	-1,1 kr	-0,6 kr
Revenue growth	43%	22%	195%	-16%
Cash	58	62	8	-22
New share issue	58	60	0	0

Source: Company, Analysguiden forecasts

Focus on breast cancer project

ExpreS²ion Biotechnologies is developing ES2B-C001, a vaccine candidate for HER2 positive (Human Epidermal Growth Factor Receptor 2) breast cancer. It is getting closer to initiation of human testing but needs at first to be backed up by further preclinical safety data, regulatory approval of human testing and financing.

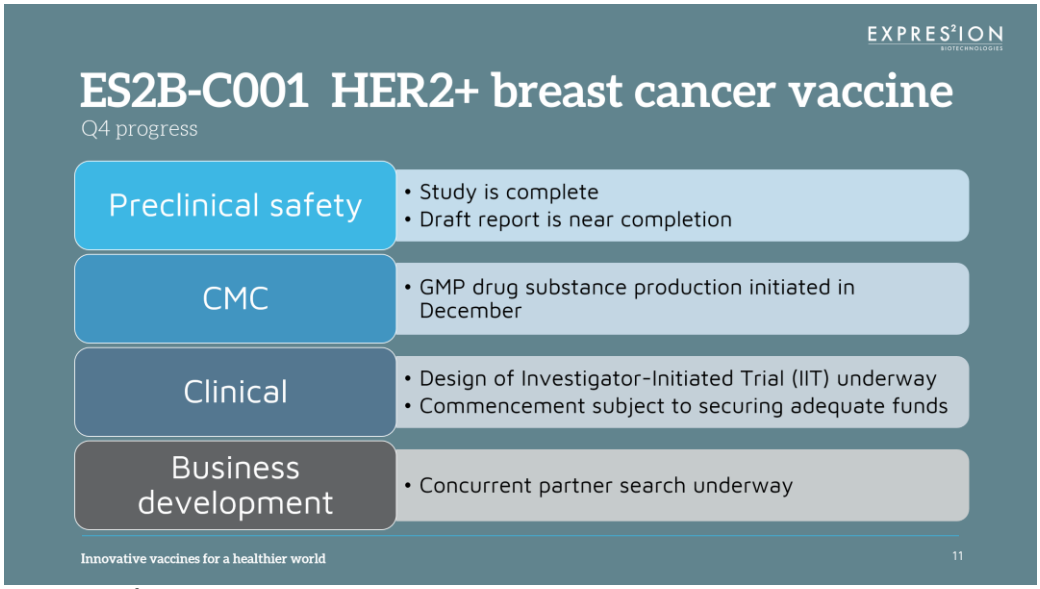
ES2B-C001 has shown solid preclinical data in a transgenic mice model, both as a preventive and therapeutic agent, which is a highly innovative profile. In December 2021, the Company reported topline preclinical results in mice models, demonstrating proof-of-concept also in HER2-transgenic preventive as well as therapeutic models. Later in 2022 the company decided to initiate a preclinical program also in non-human primates (NHP), first as preliminary safety studies, later followed by the GLP safety studies required for a Clinical Trial Application (CTA).

In the Q4 report it is announced that a draft of the preclinical NHP study is near completion. A positive read-out from the NHP testing will be a milestone in the development and support a submission of a clinical trial application (CTA) during the second half of this year. The program has seen delays over the last years. In the 2023 prospectus, it was announced that the preclinical data would be published towards the end of 2023.

Start of clinical test possible in 2025

Assuming a positive readout of the animal program it will be possible to start a First-In-Human study in 2025, which is subject to further financing by the company. According to the Q4 report the company has initiated Good Manufacturing Production (GMP) of the drug substance, i.e., production of both the antigen (the full length of a domain of the HER2 protein) and the virus like particle (VLP).

Status of the ES2B-C001 program



Source: ExpreS²ion investor presentation

Next step in the production chain is to formulate the drug substances as a drug product, which includes the filling of vials with the ready-made vaccine. These investments should be substantial and may raise doubt about the possible cash runway in 2025.

According to the investor presentation after the Q4 report, management aims for an investigator-initiated clinical trial, which is a more expensive form of study compared to an academic study collaboration, while a less expensive form compared to a clinical CRO-driven trial. Investigator-led studies are the conventional type of study in the pharmaceutical industry and will have to be fully sponsored by the company. In our mind, there are two principal scenarios to raise funding for a small phase 1 study:

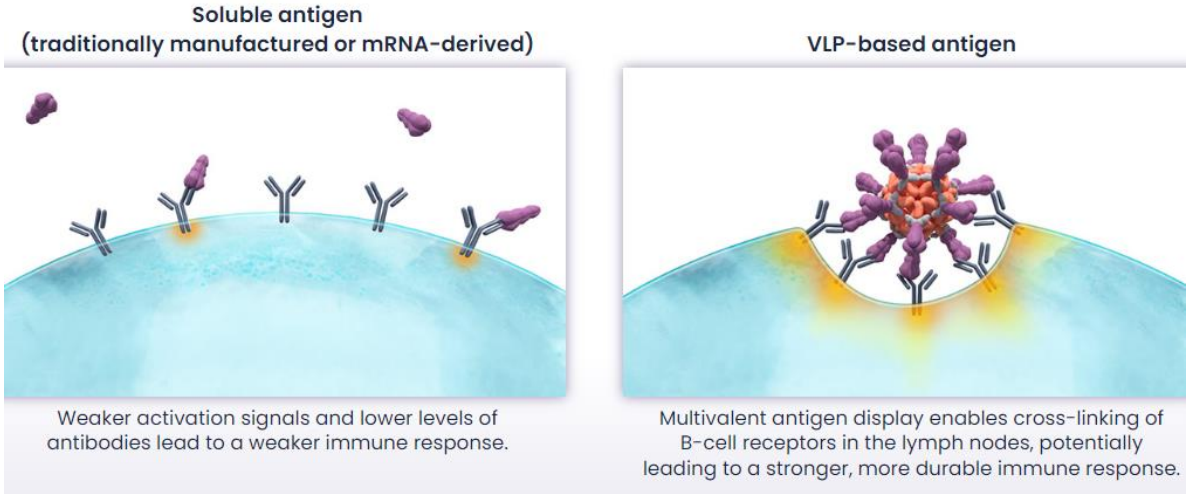
- A highly dilutive new share issue of at least SEK 50-60m,
- Signing of a partnership which could entail a splitting of costs for the trial.

In the current financing environment, it is possible that management is opting for the latter alternative, but this may result in further delays of the program, which was initially meant to start in 2022. Our conclusion is that we should not expect a CTA in the first half of this year, partly because a CTA also will have to include the GM vaccine product, which is yet to manufacture. A clinical ready vaccine candidate manufacturing will entail a milestone of SEK 3,5m to AdaptVac, the inventor of the product, and another SEK 3,5m on initiation of the phase 1 study.

AstraZeneca acquisition of VLP vaccine

In December AstraZeneca announced the acquisition of the US-based vaccine developer Icosavax, which is considered a market leader in the field of virus-like particle mounted vaccine development. Icosavax' most advanced project, IVX-A12, is ready to start phase 3 study in the prevention of infections of the respiratory syncytial virus (RSV) and human metapneumovirus (hMPV). The antigen protein of the vaccine is mounted on a virus-like particle (VLP) scaffold, much like the scaffold of AdaptVac.

Icosavax platform compared to traditional platform



Source: Icosavax home page

AstraZeneca pays upfront USD 838m for Icosavax, of which we estimate that the phase 3 program makes up at least 85 percent. Another approx. USD 300m are contingent on future milestones of the Icosavax pipeline.

We judge the AstraZeneca acquisition primarily as a way of boosting its position in the RSV market, where AstraZeneca has lost substantial market shares to newer products. But the acquisition clearly signals a belief in the VLP technology, which is an important vote of confidence in a vaccine industry otherwise focused on mRNA-based technology.

In a press statement AstraZeneca points out that the VLP technology is a proven technology with multiple products on the market, including vaccines for human papillomavirus and hepatitis B. So far, this technology has been limited to a smaller number of proteins which naturally fold into the VLPs, while the Icosavax protein VLP platform builds this success with the intention to create a more differentiated response.

Icosavax's VLP platform technology is designed to enable multivalent, particle-based display of complex viral antigens, which it believes will induce durable virus protection. The AstraZeneca acquisition supports the notion that the VLP technology may induce a stronger and more durable immune response versus traditional soluble antigens as well as mRNA-based approaches.

Potential Bavarian payment in 2024

According to the Q3 report from Bavarian Nordic it expects to pay a final milestone to AdaptVac of DKK 74m (EUR 10m), which has been booked as a deferred consideration on the balance sheet. We believe this payment may be due after publication of the final results from the phase 3 trial in US and Denmark. ExpreS²ion states in its Q3 report that this payment is expected to be due in 2024.

After the payment no further liabilities should remain on behalf of Bavarian Nordic to AdaptVac. In total AdaptVac will then have received approx. DKK 107m from Bavarian Nordic, including the initial DKK 33m downpayment in 2020.

It is not clear to us how AdaptVac will dispose of the 2024 payment. We find it likely that a part of the EUR 10m payment will be reinvested in operations, just as the lion share of the first payment of DKK 33m. At that time shareholders received a dividend payment of DKK 1m in 2021.

In our model we expect the Board of Directors of AdaptVac to move forward with a dividend payout in 2025 corresponding to 60 percent of the Bavarian payment. Since ExpreS²ion Biotechnologies holds a 34 percent share of AdaptVac this would correspond to around SEK 22m, assuming no negative tax consequences in AdaptVac or ExpreS²ion.

We are not aware of a dividend policy adopted by the board of directors in AdaptVac why this assumption is a speculation based on the pronounced intention of ExpreS²ion's management. Judging by the dividend paid in 2021 our current assumption may be generous. The

main shareholder of AdaptVac, NextGen Vaccines, holds 66 percent of the stock and may want to reinvest more in the operations.

However, given that most of the 2020 payment was reinvested in AdaptVac and that its operations were running at a burn rate of DKK 6 m in 2022 we expect that a 2025 dividend payment may be handled differently.

AdaptVac is controlled by NextGen Vaccines ApS, which holds 66 percent of the shares. NextGen was founded by the inventors of the proprietary capsid Virus-Like Particle (cVLP) platform technology, a spin-off from the University of Copenhagen in 2017. ExpreS²ion holds the remaining 34 percent.

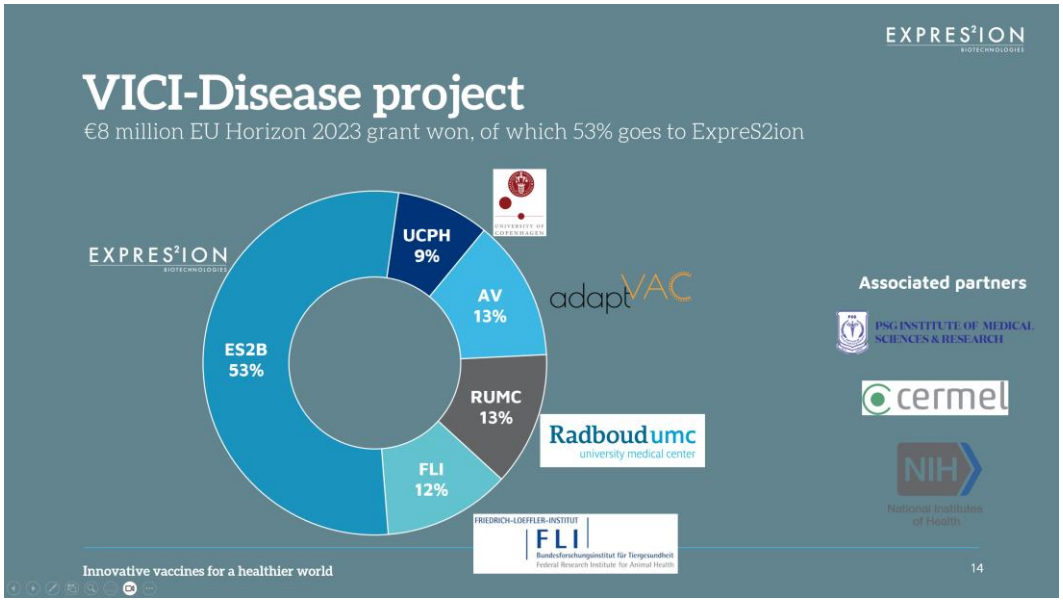
New program adds value to portfolio

In December ExpreS²ion announced that it will be part of a new consortium, the VICI-Disease consortium, with the aim to develop a vaccine against viruses with pandemic or endemic potential, starting with the Nipah virus. This virus causes severe infections such as acute respiratory infection and fatal encephalitis in humans primarily in tropical regions. Mortality rate is estimated at 40% to 75%.

The virus is transmitted to humans from animals (such as bats or pigs), or contaminated foods and can also be transmitted directly from human to human. Fruit bats of the *Pteropodidae* family are the natural host of Nipah virus. There is no treatment or vaccine available for either people or animals.

Horizon Europe is granting 8 million EUR, approximately 90 million SEK, to the consortium, of which 53% is direct contribution for ExpreS²ion's part of the project costs. The aim is to obtain clinical proof-of-concept of a Nipah virus (NiV) vaccine candidate within four years.

Several vaccine institutions in VICI collaboration



Source: ExpreS²ion Biotechnologies

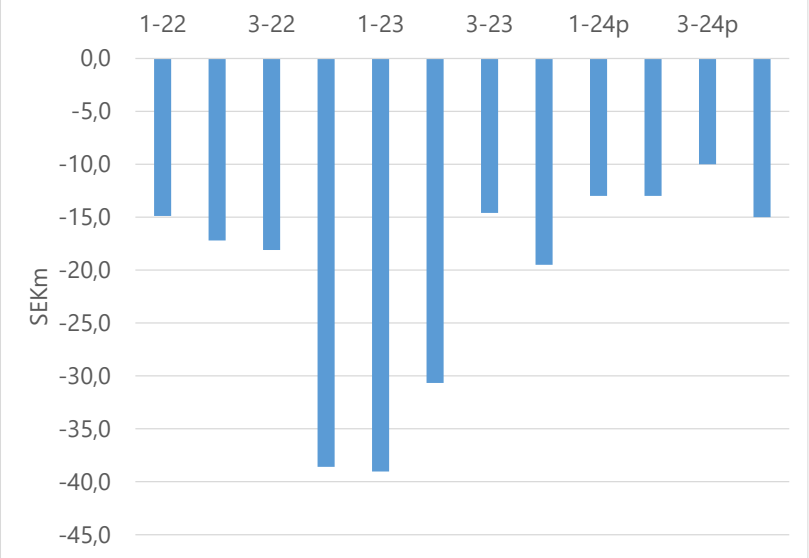
We expect the grants to be accounted for in the Other operating income line over the course of the four-year period. We have assigned a commercial value of SEK 20m of this early-stage program for the company.

Financial discussion and valuation

We are raising our fair value of ExpreS²ion Biotechnologies to SEK 3,0 up SEK 0,8 from the previous report. Our main scenario is that the company will have to raise new capital during this year before the cash position of SEK 57m is consumed by early 2025. A SEK 60m issue at SEK 2,1 would increase the number of shares by 55 percent to 80 mln shares. This allows us to raise the likelihood of approval (LOA) for ES2B-C001 to six percent by 2030 taking the project value to SEK 0,8. We expect a licensing deal in 2026 with an initial downpayment of EUR 15m.

Our scenario may be turned upside down by a partnership ahead of the initiation of the phase 1 trial. Speaking in favor of such a development is the benefit of teaming up with a partner with previous experience in clinical trials, complementing the development and biological skills of the ExpreS²ion management team. However, a deal with a preclinical asset may prove expensive, leaving ExpreS²ion with less upside than if management decides to pursue phase 1 on their own.

Cash burn in SEKm, outcome and forecast



Source: ExpreS²ion Biotechnologies, Analysguiden forecasts

In our Sum-of-the Parts we also take a more generous view of the commercial value of Adaptvac's proprietary VLP platform as reflected by the AstraZeneca acquisition of Icosavax. The value of the company, excluding a 2025 dividend, is raised to EUR 27m from a previous cautious valuation at EUR 10m, still with a conservative angle considering the lack of information on its projects and business development.

We also remain cautious of the scope for a VLP technology platform as long as the mRNA programs have not yet proven to have an inferior immunogenic longevity. The Covid-19 pandemic proved the mRNA companies to have a greater flexibility and speed in addressing new mutations of the virus, a competitive advantage which may also prove relevant for oncology vaccines. Still, we believe that the longevity data being rolled out from ABNCoV2 program, together with robust immune responses, allows for alternatives to the mRNA platform, especially in genetically more stable diseases.

Sum-of-The-Parts valuation of ExpreS²ion Biotech

	Project value (MSEK)	Value / share (SEK)	Peak sales (MEUR)	LOA*	WACC	Share of NPV	Comments
ES2B-C001	68	0,8	2 525	6%	15%	100%	Preclinical program
Adaptvac holding	92	1,1		100%	12%	34%	Minority owner
Platform	41	0,5	0,6	100%	10%	100%	cash flow based
Malaria project	30	0,4	175	10%		6%	of consortium
Indigo (influenza)	17	0,2	952	3%		6%	of consortium
Nipha program	20	0,2	100	3%		53%	of consortium
Administration	-20	-0,2					
Sum	248	3,0		*diluted no. of shares incl TO9, mln*		*82,0*	
**) Likelihood of approval*				*current number of shares, mln*		*51,4*	

Forecasts by Analysguiden

Assumptions of risk adjusted NPV calculation

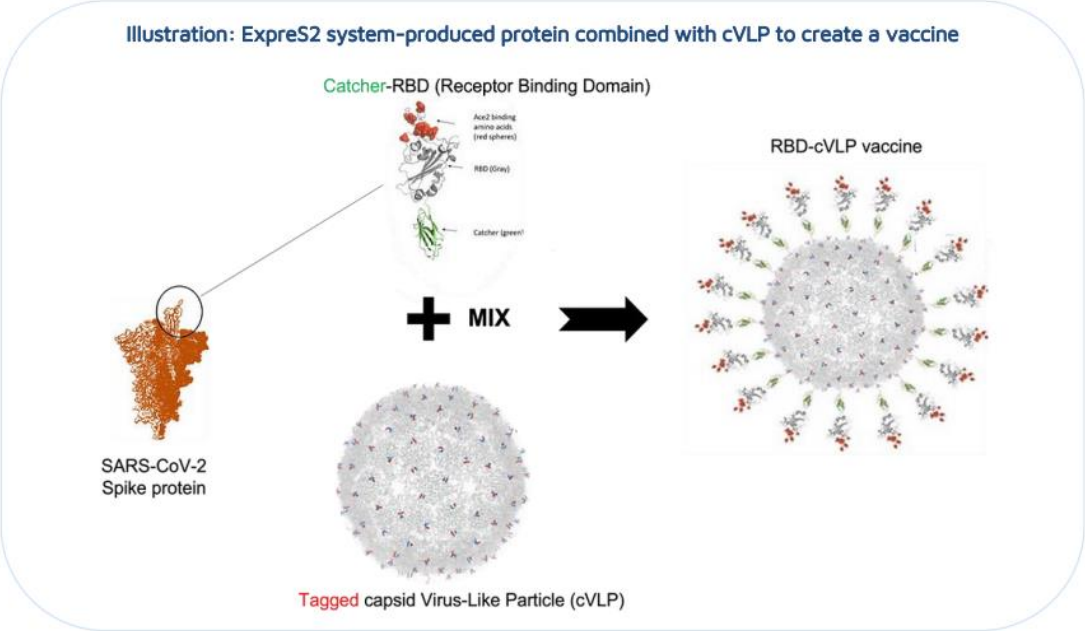
SEKm, ExpreS2ion Bio		2022	2023	2024p	2025p	2026p	2027p	2028p	2029p	2030p
Operating revenue		6	9	7	14	132	8	323	9	754
ABNCoV-2					*22*					
ES2B-C001					*-15*	*125*	*0*	*314*	*0*	*745*
platform/services		*6*	*7*	*7*	*7*	*7*	*8*	*8*	*9*	*9*
EBIT		-127	-106	-60	-57	61	-34	320,1	6,0	
Cash		111	58	58	1					
AdaptVac		2022	2023	2024p	2025p	2026p	2027p	2028p	2029p	2030p
Net income				10	0	5	75	0	0	
Milestones, ERUm				*10*	*0*	*5*	*75*			
Risk adjustment				*1,0*	*1,0*	*1,0*	*1,0*	*1,0*	*1,0*	
Risk-adjusted NPV (SEKm)				64,3	-2,4	19,5	254,3	-1,2	5,0	
WACC	12%									
NPV, AdaptaVac (EURm)	29,1									
Likelihood of approval	100%									
ExpreS2ion share, SEK	1,1									
ES2B-C001 (SEKm)		2022	2023	2024p	2025p	2026p	2027p	2028p	2029p	2030p
Costs, preclinical / clinical		-70	-60	-44	-54	-50	0	0	0	0
milestones to Adaptvac				*-3,5*	*-3,5*	*0*	*-14*	*0*	*0*	*-285*
Sales, EURm									0	473
Total milestones, licensing	365					15	0	50	0	100
Royalty	*12%*									*57*
Expres2ion revenues, SEKm		-70	-60	-44	-54	165	0	550	0	1724
Risk-adjusted				*0,80*	*0,28*	*0,28*	*0,13*	*0,07*	*0,07*	*0,06*
Risk adjusted revenues, NPV (SEKm)				0	-15	35	0	22	0	46
WACC	15%									
NPV, SEKm	68									
Likelihood of approval	68									
Diluted value/share, SEK	0,9									

Analysguiden forecasts and assumptions

Appendices - Summary of the technology

We classify the joint AdaptVac and ExpreS²ion platforms as a combined protein subunit antigen vaccine platform. Protein expression is provided by ExpreS²ion's EXPRES2 technology, coupled with a capsid Virus Like Particle (cVLP) of the AdaptVac platform. In the case of ABNCoV2, which has completed a phase 3 study, the capsid-like particle is coated with 60-80 particles of the recombinant RBD protein fragment. Researchers showed in a Nature article that RBD proteins glued to the CLP had a 3-4-fold higher immunogenicity compared to soluble RBD proteins injected without being mounted to the capsid-like particle, a strong rationale for the technology behind the ABNCoV2 cVLP vaccine.

Schematic figure of cVLP expression and construct



Source: Company presentation

Vaccine candidate in development

The breast cancer vaccine candidate ES2B-C001 is ExpreS²ion Biotechnologies in-house proprietary program which is progressing toward a clinical trial. It was licensed from AdaptVac based on an option agreement signed in 2020. In May 2022 ExpreS²ion Biotechnologies announced positive preclinical proof-of-concept results for this HER2-breast cancer vaccine candidate from a therapeutic study in HER2-transgenic mice. In the study, all transgenic mice vaccinated with ES2BC001 formulated in an adjuvant were metastasis-free, while all control mice had lung nodules. Furthermore, 73% of mice vaccinated with ES2B-C001 without adjuvant were metastasis-free.

Later ExpreS²ion initiated animal studies on non-human primates which are soon to be completed. This program has been slow in progression and still has some way to go before entering a first in human clinical trial. In 2020 it was expected that the program would be ready

for a CTA, Clinical Trial Application, in the first half of 2022. This CTA has for several reasons been pushed into 2024.

In 2020 the program was developed by AdaptVac and called AV001. In the option deal which ExpreS²ion signed with AdaptVac in February 2020 described AV001, later to be ES2B-C001, as having shown proof-of-concept in animal testing on mice in an article published 2018 by researchers at the University of Bologna. However, this study was based on a non-proprietary tag catcher method and had to be redone with a proprietary tag catcher system developed by AdaptVac.

There are currently other vaccine candidates being developed for HER2 positive breast cancer in clinical trials. The list of preclinical programs is long and include candidates based on mRNA vaccine platforms. What may be the selling point of ES2B-C001 is the claim to both a preventive and therapeutic effect. ES2B-C001 is developed as a therapeutical vaccine for patients with HER2 positive breast cancer, having progressed after initial treatment with the standard anti-HER2 therapy Avastin (trastuzumab). In published research ES2B-C001 has demonstrated a strong tumor-growth inhibiting effect in a mice model and when blood serum from vaccinated mice was applied to cultures of HER2-positive human breast cancer tumors. ES2B-C001 has also shown successful results in HER2-transgenic preventive as well as therapeutic tumor mice models, where ES2B-C001 demonstrated effective inhibition of tumor development compared to control groups.

According to the published prospect, two weeks after the inoculation of tumor cells, the first vaccine administrations were given. ES2B-C001 formulated in an adjuvant was found to totally block tumor development, whereas the control group progressively expanded with lung metastases and subcutaneously growing local tumors. Additionally, ES2B-C001 without adjuvant was found to inhibit, but not prevent, tumor development.

Competitive landscape in HER2+ breast cancer

About 15-20 percent of all breast cancers are HER2+, which makes any new treatment a potential blockbuster. We note that there are several ongoing vaccine studies on HER2+ breast cancer. Clinicaltrails.gov lists nineteen ongoing clinical trials when screening its data base. One of these is a 598-patient phase 3 trial, FLAMINGO-01, sponsored by Texas-based Greenwich Lifesciences, which is now recruiting. This study includes patients with HLA-A positive disease which may be a broader population than strictly HER2 positive. The study is expected to post its first results in 2026.

A number of earlier studies are also in different clinical phases with patients suffering from HER2 positive breast cancer. A sample is shown in the table below.

Study Title	Study Phase	Stage of Disease	Study Population	Tumor Type	Study Treatment	NCT Number
A Phase II Study of Concurrent WOKVAC Vaccination with Neoadjuvant Chemotherapy and HER2-Targeted Monoclonal Antibody Therapy	Phase II	I, II, III	Patients with HER2+ breast cancer, regardless of hormone receptor status, who are planning to receive neoadjuvant cytotoxic chemotherapy and HER2-targeted monoclonal antibody therapy prior to planned surgery.	Breast	Vaccine + chemo+HER2-targeted monoclonal antibody	NCT04329065
A Phase II Study to Evaluate the Efficacy and Safety of an Adjuvant Therapeutic Cancer Vaccine (AST-301, pNGVL3-hICD) in Patients with HER2 Low Breast Cancer (Cornerstone-001)	Phase II	I, II, III	Patients with histologically or cytologically confirmed HER2 low expression (1+ or 2+) and hormone receptor-negative (both ER- & PR-) breast cancer who have completed neoadjuvant systemic chemotherapy and have residual disease.	Breast	Vaccine	NCT05163223
A Phase I Dose Escalation Trial of Alpha-tocopheryloxyacetic Acid (α-TEA) in Patients with Treatment Refractory HER2+ Metastatic Breast Cancer	Phase I	IV	Stage IV HER2+ breast cancer who have been treated with definitive therapy and received maintenance HER2-targeted monoclonal antibody therapy; and currently have measurable disease not considered curable by conventional therapies.	Breast	Vitamin E derivative + HER2 targeted monoclonal antibody	NCT04120246
Phase I trial of intravenous administration of TAEK VAC-HerBy vaccine alone and in combination with HER2 antibodies in patients with advanced cancer (Stage 2 only)	Phase I	II, III, IV	Patients with HER2+ breast or gastric/gastroesophageal junction cancer who have locally advanced metastatic tumors	Breast and gastric/gastroesophageal junction	Vaccine + chemo+HER2-targeted monoclonal antibody	NCT04246671

Source: Cancer Vaccine Institute, University of Washington

We also note that in the second line setting of females with metastatic relapsing breast cancer after failing first line treatment with generic trastuzumab, AstraZeneca/Daiichi scored a recent success with its phase 3 program Enhertu. In the 557-patient study, those taking Enhertu survived for 23.9 months, as compared with 16.8 months for those who received standard chemotherapy. This is considered a positive result in a difficult to treat patient setting and Enhertu is expected to change the current standard-of-care in second-line HER2+ breast cancer.

Potential launch of ES2B-C001 in 2030

We currently see a potential for ES2B-C001 to reach the market in 2030 after a 2-year phase 3 trial. We have assigned the program a 6 percent chance of reaching the market, including an 80 percent likelihood of CTA approval. Our valuation of the program at SEK 70 million is below the investment so far carried out. We estimate that including the last capital raise of SEK 55 million, the company has invested close to SEK 100 million in ES2B-C001.

Cooperation with Oxford University

Malaria is a major public health problem in developing countries. It is a mosquito-borne disease and places a particularly high burden on children in the African Region. There were around 240 million cases of malaria and 627,000 deaths worldwide in 2020, mostly children.

For 20 years the University of Oxford has been carrying out extensive research in this field and has several programs ongoing. In October this year the WHO recommended the R21/Matrix-M vaccine, which

has been sponsored by University of Oxford in collaboration with the Serum Institute of India and Novavax. Novavax is the proprietary owner of the Matrix-M adjuvant and will market the vaccine in non-endemic countries. The vaccine is expected to be launched by the Serum Institute and Novavax next year.

This is the second malaria vaccine to be approved and recommended by WHO after RTS,S/AS01 (Mosquirix, GlaxoSmithKline), which was developed in the late 80's and received a WHO recommendation only in 2021. Both vaccines have shown to be safe and effective in preventing malaria in children and, when implemented broadly, are expected to have a high public health impact.

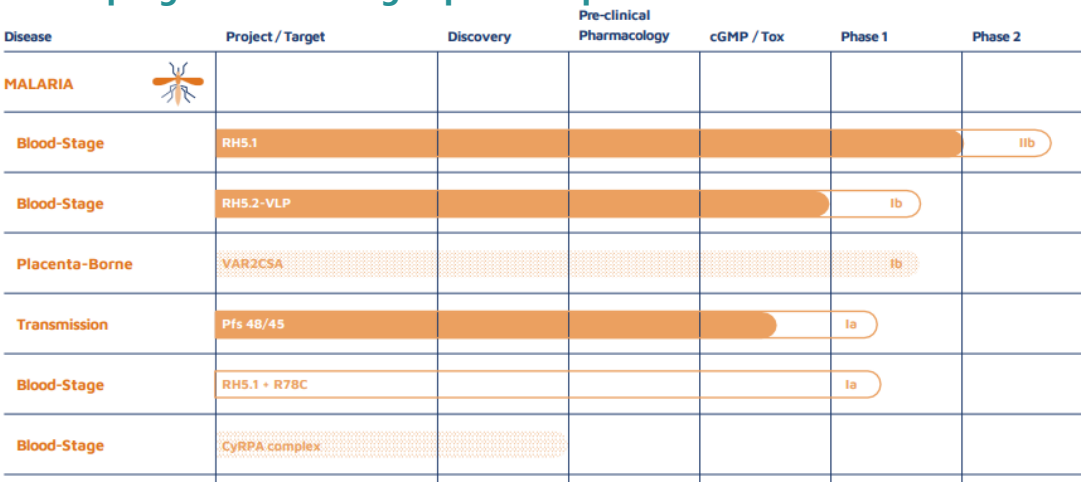
The R21/M vaccine shows a reduction of symptomatic cases of malaria by 75% during the 12 months following a 3-dose series. Mosquirix is believed to be less efficient in the region of 50 percent. In a phase 3 trial, Mosquirix efficacy was 56% in children aged 5–17 months.

Last year UNICEF paid up to USD 170 million to access eighteen million doses of Mosquirix over a three-year period, corresponding to a price per dose of 9,4 USD. We estimate that Mosquirix is selling at around EUR 75m annually. Low unit prices are likely to remain but the launch of the second more efficient vaccine should expand the market. ExpreS²ion refers to a Data Bridge study projecting an EUR 1,8 bn malaria market by 2029, which should assume the entry of more efficient vaccines.

ExpreS²ion vaccine will have to prove higher efficacy

ExpreS²ion is currently involved in four different clinical studies sponsored by University of Oxford. All these studies have progressed to a clinical phase or are currently preparing to recruit. A cooperation with the world leader in malaria research and development is an asset for ExpreS²ion. However, to enter this vaccine market, a new vaccine will have to prove higher immunogenicity than the two marketed products.

Oxford programs involving ExpreS²ion proteins

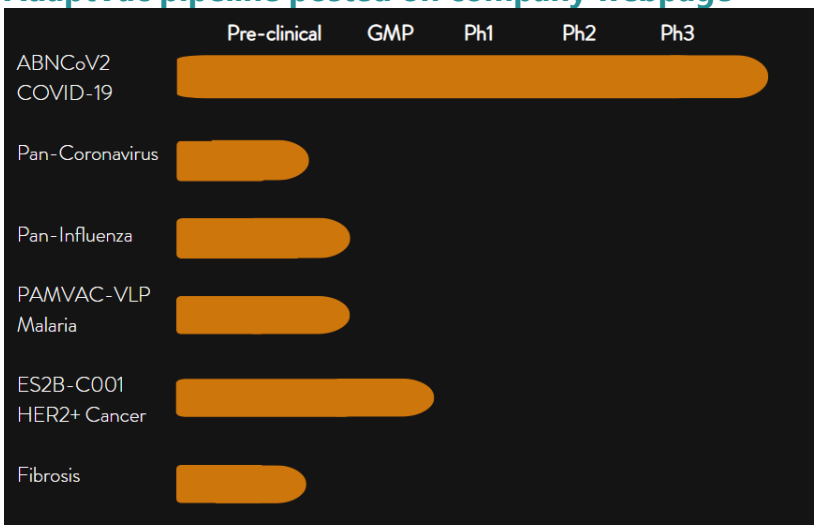


Source: ExpreS²ion Biotechnologies (participation in VAR2CSA and CyRPA discontinued)

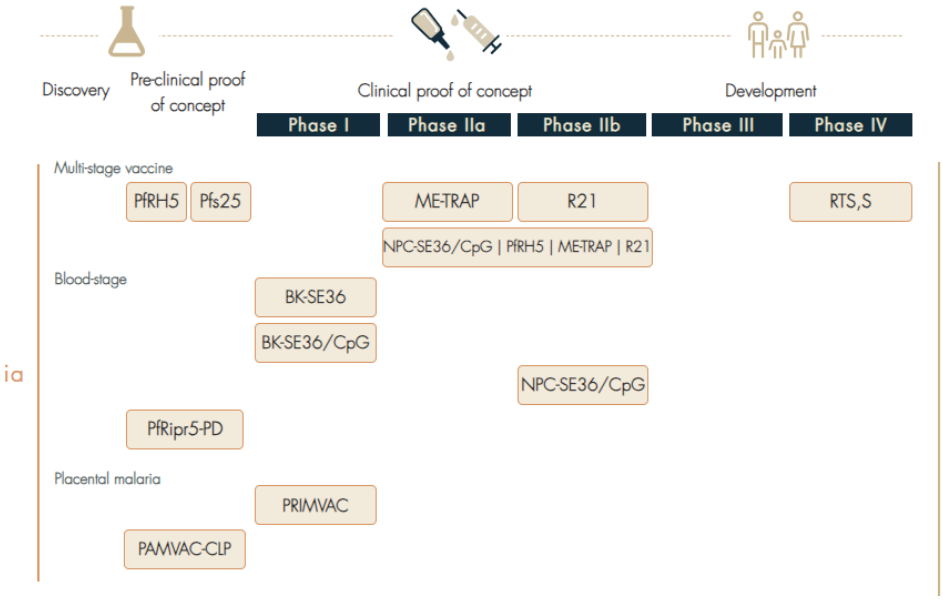
According to clinicaltrials.gov University of Oxford is currently sponsoring thirty-five ongoing trials in malaria vaccination. Four of these trials involve ExpreS²ion as a subcontractor of the RH5 expression protein. The most advanced is VAC091 (NCT05790889) which will

involve 360-460 participants in Burkina Faso and report results late in next year. At this point in time, we find it difficult to assess the possibility for this row of programs to reach success, but serving as a subcontractor to University of Oxford is a meriting feature. We view the continuous efforts of University of Oxford in this field as a second or third wave of new Oxford malaria cures. However, in absence of a commercial agreement between University of Oxford and the involved parties, such as ExpreS²ion Biotechnologies, we remain cautious on the value of these programs.

AdaptVac pipeline posted on company webpage



Malaria portfolio of the European Vaccine Initiative



Source: European Vaccine Initiative

A second factor behind a cautious approach to the value of AdaptVac is the lack of external validations other than from Bavarian Nordic. There is a number of different virus-like particle (VLP) vaccine platforms, both involving capsids or other scaffolds. The VLP technology was first described in animal models in 2007. Since then, VLPs are considered as promising nanotools for the development of subunit vaccines due to high immunogenicity and safety. The proprietary knowledge of AdaptVac is based on a method of displaying the

isopeptide (spike protein) on the surface of the VLP, a method which we believe has distinctive features over similar generic techniques, such as the SpyTag/Catcher system.

The most advance program in AdaptVac after ABNCoV2 is PAMVAC-VLP (also PAMVAC-CLP). This program is a malaria vaccine candidate sponsored and coordinated by the European Vaccine Initiative (EVI) in collaboration with the Oxford University.

The PAMVAC program is still in a phase of preclinical proof-of-concept. The basis of the project was invented by University of Copenhagen and later transferred to AdaptVac. A randomized phase 1 clinical trial was conducted in Germany and Benin in 2015-17. It was published in 2019[1] and the authors concluded that a follow-up trial in in women before first pregnancies in an endemic area was to come next. Since then, the program has not advanced to a new clinical trial.

The parties received financing of EUR 10m by the European Union in 2022 which is expected to last until 2027. The PAMVAC-VLP program is a placenta-borne concept as opposed to the RH.5 blood stage programs of ExpreS²ion. In the ExpreS²ion Q3 report it was announced that the company is discontinuing collaboration in the placenta-borne malaria program after the decision of University of Copenhagen to contract a different manufacturer of the expressed protein.

[1] *Clinical Infectious Diseases*, Volume 69, Issue 9, 1 November 2019, Pages 1509–151

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