YEAR-END REPORT

1 JANUARY - 31 DECEMBER 2022

Q4 2022

- The result for the quarter amounted to -8 021 kSEK (-6 450 kSEK)
- Cash flow for the quarter amounted to -6 642 kSEK (-7 291 kSEK)
- Cash and cash equivalents at the end of the quarter amounted to 22 951 kSEK (12 273 kSEK)

Summary Financial Highlights kSEK	Oct-Dec 2022	Oct-Dec 2021	Jan-Dec 2022	Jan-Dec 2021
Net revenue	0	0	0	0
Operating result	-8,067	-6,474	-28,955	-21,117
Result for the period	-8,021	-6,450	-28,788	-21,136
Balance sheet total	33,285	36,900	33,285	36,900
Cash flow for the period	-6,642	-7,291	10,678	-21,347
Cash and cash equivalents	22,951	12,273	22,951	12,273
Equity ratio %	88%	81%	88%	81%
Data per share **SEK**				
Number of shares at the end of the period	13,806,142	11,006,056	13,806,142	11,006,056
Result per share before and after dilution*	-0.58	-0.65	-2.09	-2.17
Cash flow per share	-0.48	-0.73	0.78	-2.19
Equity per share	2.12	2.70	2.12	2.70

** Dilution effects is not calculated when the result is negative*



Q4
Oct-Dec

Significant events

- On October 24, Ziccum announced proof of successful nebulization and drying of vaccine lipid nanoparticles (LNP) in its in-house mRNA project. This was carried out using LaminarPace, the company's ambient drying technology. LNP is the preferred drug delivery component in today's mRNA Covid-19 vaccines. The study resulted in a defined knowledge-space, defining the best operating conditions, and key read-out parameters were encapsulation efficiency, yield and particle size. The trials were repeated for confirmation.
- On December 8, it was announced that Ziccum has signed an agreement contracting the ICP Institute of Computational Physics at the Zurich University of Applied Sciences' School of Engineering (ZHAW) for the next phase of the project developing 3D modelling of LaminarPace. The project aims to accelerate industrial development of LaminarPace and will run over three years. The team at ZHAW is one of the most recognized internationally within industrial simulation and modelling.
- On December 14, Ziccum launched a new, expanded website. With a new brand platform, the expanded site aims to strengthen the company's dialogue with biopharmaceutical partners and prospects. It includes new technological, scientific and business content, and improved navigability.
- On December 16, it was announced that Ziccum has been awarded a contribution of 10 mSEK by Eurostars for a joint grant application with ZHAW. Eurostars is the largest international funding programme for SMEs wishing to collaborate on R&D projects, and is co-funded by the EU Horizon 2020 Framework Programme and EUREKA. Ziccum will receive payments of 5 mSEK from the national funding body Vinnova during the project, they are consented to cover up to 50% of a project's costs. The rest of the contribution will go into the project and reduce the total project cost for Ziccum. The three year long project (LaPaSim) starts February 1 2023, and is to apply 3D-modelling to Ziccum's ambient drying system for biopharmaceuticals, LaminarPace, resulting in a digital twin. International competition for the funding was intense, and the proposal was one of the highest-ranked applications.
- During the fourth quarter CEO Ann Gidner bought 45,000 shares in Ziccum.

Q1
Jan-March

Significant events

- On January 18, a Extraordinary General Meeting was held, in addition to approving the Board's proposal, it was decided to increase the limit on the number of shares and the size of the share capital in the Articles of Association, to enable the issue of the remaining 933 362 units in the private placement.
- On January 18, an additional 2 800 086 shares and 1 866 724 warrants were registered, and all shares and warrants in the private placement are thus registered.
- The last payments from the directed share issue were received by the company in January and February 2022, a total of 40 mSEK was added to the company after deduction of issue costs.
- On February 7, Ziccum announced that it has become a member of the United Nations Global Compact, the world's largest corporate sustainability initiative.
- On February 22, it was announced that the employment of the CEO Göran Conradson was terminated. The company's CFO, Frida Hjelmberg was appointed acting CEO.
- On March 3, the Board released an update on strategy, goals and priorities. The company's strategy for entering into commercial agreements with industrial players was defined, based on four key priority activities:

1. **Drive an active business development agenda** that proactively prepares for collaboration with existing and potential partners. This to offer the opportunity to evaluate specific projects in combination with Ziccum's technology, and to understand the requirements placed on the technology before a decision on a license agreement can be made.
2. **Generate laboratory data** that manifest and confirm the technology's capacity to dry different types of vaccines, so-called proof of concept.
3. **Develop the company's technology** to adapt its functionality, capacity and quality to the licensees' required specifications.
4. **Develop conceptual plans** for how Ziccum's drying technology can be adapted to the commercial scale and integrated into a commercial production environment.

With a new CEO, the Board's goal is to increase the pace of, above all, business development work – with the goal of entering into more industrial collaborations in order to evaluate LaminarPace and advance existing collaborations into negotiations on commercial terms and license agreements.

Q2
April-June
Significant events

- On April 25, a strategic sharpening was announced informing the market that Ziccum is now targeting three key vaccine platforms in its research and development work through 2022 and 2023 **–** driven by input from external collaborations and new internal technology capabilities.

1. Viral vector platform using Adenovirus - Four major Covid-19 vaccines already use adenovirus vaccine vectors as a platform. The platform enables efficient gene transduction and research is ongoing in a wide range of indications.

2. Subunit vaccine (adjuvanted) platform - This platform is also being used in major Covid-19 vaccine candidates. Instead of using the whole pathogen, protein-based adjuvant vaccines use a defined protein antigen from the pathogen which can be recognized by the body's immune system to provoke an immune response.

3. mRNA/LNP vaccine platform - Generating data on dry-formulated mRNA/LNP materials is a key strategic priority for Ziccum. Covid-19 has highlighted the efficacy of mRNA/LNP as a vaccine platform enormously.

- On April 27, Ziccum informed about the selected key targeted technology developments of the LaminarPace system, the fourth generation in development - some underway, and some recently completed:

1. New powder collector - A new sealed, contained collection unit is installed that enables the inhouse study of a wider range of test substances. The new unit increases safety, reduces humidity and enables quicker, more efficient collection of drier formulations.

2. New nitrogen usage - Ziccum has now introduced Nitrogen gas (N2) into the drying column to replace air. N2 is a highly efficient remover of moisture. The first nitrogen-based generation of LAPA is installed and has performed well in tests.

3. New nebulizer - The LAPA system's nebulizer feature is a key component in optimizing the system's capacity, reproducibility and reliability.

4. New membrane - Intensive work is currently underway in optimizing the membrane for future GMP compatibility – examining its porosity, mounting and materials for industrial setting.

- On May 6, the Board of Ziccum published the decision to officially change the company's language to English for all external communications.
- On May 9, it was announced that Ziccum has been elected onto the Technical Activities Committee of the US National Institute for Innovation in Manufacturing Biopharmaceuticals (NIIMBL). NIIMBL, co-funded by the US Department of Commerce, funds and initiates a wide range of public-private research projects throughout the US.
- On May 9, Ann Gidner took office as new CEO. Ann has 25+ years of experience from Life Science management internationally, with a significant track record in strategic development, focused leadership, deal making and sales growth.
- On June 3, it was announced that Ziccum has extended an ongoing pilot evaluation study agreement with a leading pharmaceutical corporation following the completion of the latest stage of the project.
- On June 22, the company informed that the installation of a new cell lab was completed, enabling in-house in vitro research. Ziccum has significantly expanded its lab facilities and capabilities, particularly in the area of mRNA/LNP. Strategic investments in addition to the new cell lab are for example a system for manufacturing and evaluating dry formulations of mRNA/LNP materials.
- During the second quarter CEO Ann Gidner bought 15,000 shares in Ziccum. In addition, the Board members Andreas Pettersson Rohman also bought 39,333 shares and Fredrik Sjövall 10,000 shares in the Company.



Q3
July-Sep
Significant events

- On July 19, Ziccum published the selected partner for the development of its crucial new nebulizer component for the LaminarPace system. The chosen partner TEKCELEO is an innovative mechatronic manufacturer with advanced knowledge of nebulizers. The component is central to the advanced drying capabilities and scaleup of Ziccum's LaminarPace system.
- On July 21, it was announced that Ziccum together with the Zurich University of Applied Sciences (ZHAW) are applying for funding from the Eurostars funding body for a joint project that will develop the 3D modelling stage of LaminarPace. The project aims to strengthen, support and accelerate the development of LaminarPace – offering high-value insights into its unique particle properties, and accelerating and optimizing industrialization.
- On August 2, Ziccum informed about a reorganisation aiming to facilitate and accelerate its new strategic focus on key projects and vaccine platforms. As part of the reorganization, Senior Formulation Specialist Fabrice Rose was appointed Scientific Director. The reorganization was implemented on August 1, 2022.
- On September 1, Ziccum announced that the company will be intensifying its partnering and networking dialogues by attending major industry events across Europe.
- On September 14, Ziccum and Zurich University of Applied Sciences's School of Engineering (ZHAW) did submit a joint application for Eurostars funding. The proposed project will develop 3D modelling, and ultimately a Digital Twin, of LaminarPace (LAPA) that will accelerate development and scale-up and promote tech transfer, partnering and ultimately sales.
- On September 23, Ziccum received results from evaluation study with leading Pharmaceutical corporation, analyzing LaminarPace's ability to dry four test substances. Data demonstrated excellent results on thermostability, positive results on particle appearance but significant loss of infectivity, requiring further development. The client has paused assessment of LaminarPace on the current vaccine platform, but will consider the technology in regard to other vaccine platforms, where dry formulation could be a higher priority.
- On September 27, It was announced that Ziccum has reopened its application process for CEPI's Call for Proposals from companies developing innovative technologies to improve vaccine thermostability. Ziccum will submit an Expression of Interest with a new partner – a well-established, innovative biotechnology company.
- During the third quarter CEO Ann Gidner bought 35,000 shares in Ziccum. In addition, the Chairman of the Board Fredrik Sjövall bought 40,000 shares in the company.

Significant events after the reporting period

- On January 18, Ziccum announced that the company on 24 - 26 January will attended the mRNA-based Therapeutics Summit in Berlin, the leading European event for mRNA innovation expertise in Europe. On the event, CEO Ann Gidner will present LaminarPace with a presentation titled *LaminarPace: a novel unit operation successfully drying mRNA/LNP by mass transfer* to an audience of senior Pharmaceutical industry decision makers, scientists and key opinion leaders.
- On January 23, Ziccum announced that the company has submitted its Expression of Interest application for CEPI's Call for Proposals for funding of innovations that improve vaccine thermostability. The Coalition for Epidemic Preparedness (CEPI), in 2022 invited players developing innovative technologies to improve vaccine thermostability to apply for a funding opportunity.

CEO statement



Creating a strong industry position in a booming market

It has been a very rewarding year for Ziccum (or eight months for my part), making such big strides towards a position as a top rank provider of game-changing technology to the international pharmaceutical industry, where achieving thermostable vaccines is highly desirable.

Setting the Ziccum direction

Defining a sharper strategy with selected vaccine platforms, and most importantly the high value next-generation mRNA vaccines and RNA therapeutics as top priority, has given consistent positive confirmations - from partnering dialogues, from our Biopharma licensing mRNA Market study and from our own internal trial results. We are confident going forward with this key focus.

The new business model defined, a classical Pharma out-licensing model starting with feasibility studies, has been well received and gives crisp clarity to business development efforts ahead. Given the strong interest in partnering dialogues, we have the Pharmaceutical Platform technology company business model strongly confirmed, giving licenses internationally, not producing as a contractor.

Pivotal transformation of the vaccine field and new applications of mRNA technology

Externally, the vaccine industry has gone through a complete transformation. From being a conservative, low margin segment of the Pharma industry, it has become a hot spot for rapid development, where existing players increase efforts significantly, and numerous new players want to enter the market. The Covid pandemic brought completely new insights, fuelling a strong industry desire for new vaccine development as well as for applying the novel mRNA approach in a range of new fields, like cancer vaccines and personalized therapeutics.

Business development progress

The booming market demand for new vaccine technology in combination with Ziccum's unique drying concept enabling thermostable vaccines, now proven in a number of steps, makes for a great opportunity. Thanks to a clearly business-driven approach and an extensive industry network we are taking advantage of this, generating a significant number of partnering dialogues at four international conferences during fall. These are now pursued with in-depth dialogues going forward.

Proving the LaminarPace ability for mRNA/LNP

Getting the proof of successful drying of vaccine LNP particles at this point was most welcome. The LaminarPace drying has given good read-outs in terms of encapsulation, yield and particle preservation: keeping the LNP particles nicely in good shape and staying the correct size. We are delighted to bring these results to our business dialogues, and we are now setting up continued trials regarding vaccine activity; the verification that dried vaccine material is not only kept in good condition in high yields, but also giving a similar vaccine activity effect.

Developing ground-breaking technology, the smartest way

As novel, unique technology certainly needs development efforts, we took the important decision to run a multi-year 3D-Modelling project with a leading partner, the Zurich Institute of Applied Sciences. This way we efficiently come forward using the latest digital methods. We can run all the trials we want digitally, instead of a few selected, time-consuming physical trials. Ultimately, the project will also result in a Digital twin which can serve efficiently in tech transfer for successful process integration in the partner set-up.

We also applied to the EU organization Eurostars jointly with the Zurich Institute for soft funding of this ambitious effort, and just before Christmas we had the fantastic news of getting top ranking and receiving the full grant! This way we certainly can begin 2023 with full steam ahead.

Wrapping up 2022

An extra bonus was the launching of the new Ziccum website end of year, a total remake much better reflecting our offering: our technology and our team. Also, I was happy to present Ziccum at BioStock Life Science, getting significant interest. Finally, we had the great pleasure to expand our team with a Quality specialist, warm welcomes to Fatemeh starting in January.

Many thanks to the Ziccum team for great efforts and enthusiasm all year, taking the new strategy forward together, and to all supporting parties, owners and business partners for engaging in fruitful dialogues and supporting our efforts!

Lund, January 27, 2023

Ann Gidner, CEO



Expected future development

The company's overall objective is to enter into license agreements to industrialize and commercialize the technology in collaboration with one or more major pharmaceutical companies.

The path to licensing agreements goes through evaluation agreements where LaminarPace functionality and capacity are evaluated together with a partner. If successful, the ambition is to continue to a negotiation regarding a license agreement. Primarily for a specific project or vaccine.

A prerequisite for being a relevant and attractive licensing partner is to be able to describe what an industrial version of LaminarPace can look like, and make it probable that the technology is suitable for upscaling and GMP production. Therefore, Ziccum conducts its own development projects where important components in LaminarPace are developed and adapted to industrial requirements. Ziccum is carrying out intensive work on developing 3D modelling, and ultimately a Digital Twin, of LaminarPace in partnership with the ICP Institute of Computational Physics team at the Zurich University of Applied Sciences's School of Engineering (ZHAW.) The 3D modelling is being used to optimize LaminarPace design, exploring optimal capacity loads and increasing the repeatability of outcomes. It will be a valuable enabler of tech transfer and integration into existing pharmaceutical production chains.

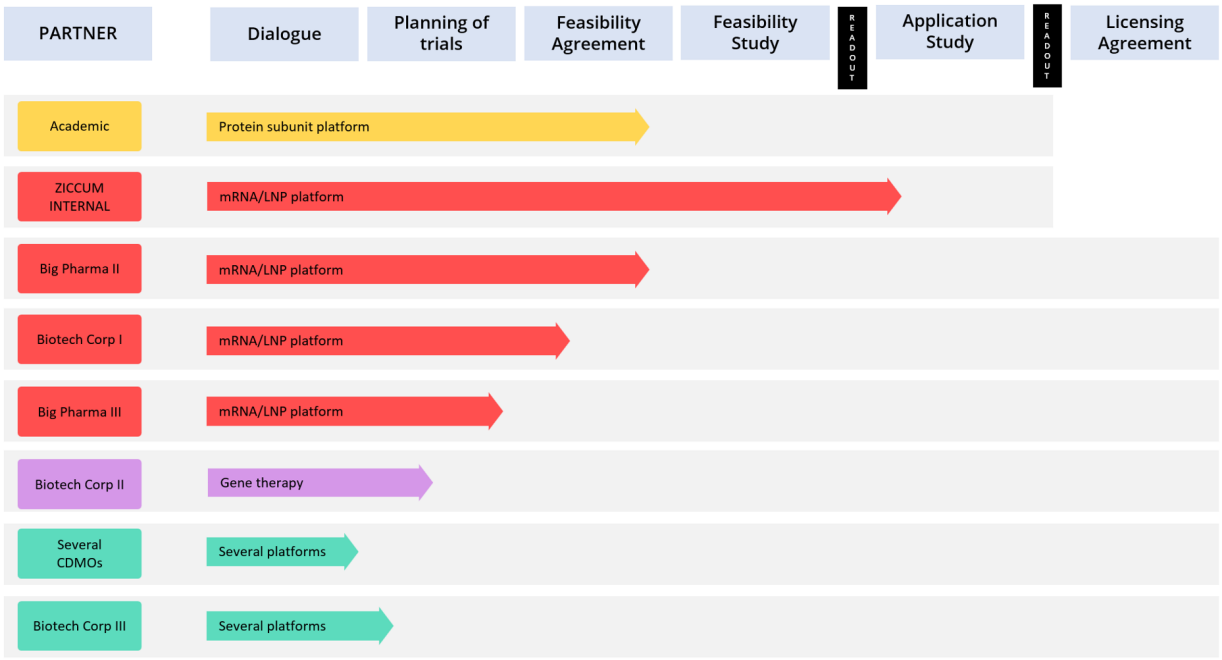
Another priority area is applications for external and non-dilutive funding for further development of the technology. Ziccum actively monitors announcements that suit the Company's area of operation and technical phase.

Project Portfolio overview

The Ziccum pipeline of external projects is depicted in a portfolio overview. This gives a general representation of the key steps towards the desired commercialization by entering into license agreements, licensing the LaminarPace technology for specific applications, and the current status of each project. The actual progress in a specific project may proceed via alternative or additional steps, and the timeline varies greatly depending on the resulting read-outs and the counterpart preferences.

Pharmaceutical development in general is subject to very strict confidentiality, and certain collaborations are given without partner name publication, until name disclosure is possible.

The company also pursues earlier dialogues with other counterparts in on-going business development efforts.



Project portfolio overview as of 31 Dec, 2022

**The text in the arrow represents the technology platform*