

# Ziccum in brief

Ziccum's patented technology LaminarPace air-dries liquid vaccine into a thermostable powder vaccine. Before the vaccine is administered, the vaccine powder is mixed with liquid and can then be injected in exactly the same way as a liquid solution vaccine.

The LaminarPace technology is gentle, air drying takes place at room temperature, resulting in powder vaccines becoming thermostable. This means that the vaccine can be transported and stored at room temperature, unlike today's vaccines that require costly, complex logistics with an unbroken freezer or cold chain.

## Vision

Ziccum's vision is to increase vaccination coverage worldwide. This can be made possible by minimizing dependence on expensive, impractical, and energy-intensive refrigerated and frozen transport systems and storage.

## Business model

Ziccum's business model is to offer licenses and tech transfers to vaccine companies based on Ziccum's patent portfolio.

## History

LaminarPace was developed by Inhalation Sciences Sweden AB (publ) to generate small amounts of micronized material for aerosolization. However, the many additional high-potential areas the technology could be applied to soon became apparent, and for that reason, Inhalation Sciences carried out a spin-out of LaminarPace into a subsidiary, Ziccum AB, which since mid-2017 has been developing and commercializing the technology on its own.

Ziccum's shares were listed on Spotlight Stock Markets on October 25, 2018.

On December 1 2020, Ziccum moved to Nasdaq First North Growth Market.

## Market

Ziccum's primary market consists of vaccines where the need for new methods for producing dry preparations is greatest. Ziccum addresses the possibility of developing dry preparations (powders) which are reconstituted at the administration stage, i.e. dissolved with sterile liquid. Thus, the advantages of a liquid dosage form are maintained without being forced to maintain a complicated and costly cold chain from factory to patient.

The vaccine market has very strong growth driven by COVID-19. But even apart from the COVID-19 vaccine, the WHO predicts growth for almost all vaccines. In 2019, the global vaccine market was worth 33 billion USD, divided into 5.5 billion doses, excluding military and travel vaccines (WHO Global vaccine market report 2020).

Global vaccine production for 2021 is forecast at about 20 billion doses. Future growth largely depends on how COVID-19 develops in terms of re-vaccinations and mutations.

## Technical description

The basic principle of LaminarPace is a column that separates the ingoing comminuted liquid that contains the active component from a countercurrent dry air flow that slowly and gently causes evaporation. The result is a finely divided powder. The drying cycle is a so-called semi-continuous process. The system not only retains all the properties of sensitive active substances, but also allows great possibilities to control certain properties of the particles, e.g. particle size that is crucial for creating an inhalable material.

The powder produced during the process is normally very easy to dissolve, which enables flexible application possibilities, e.g. vials of intravenously administered drugs, inhalable drugs and even for topical application of particles through the skin.

