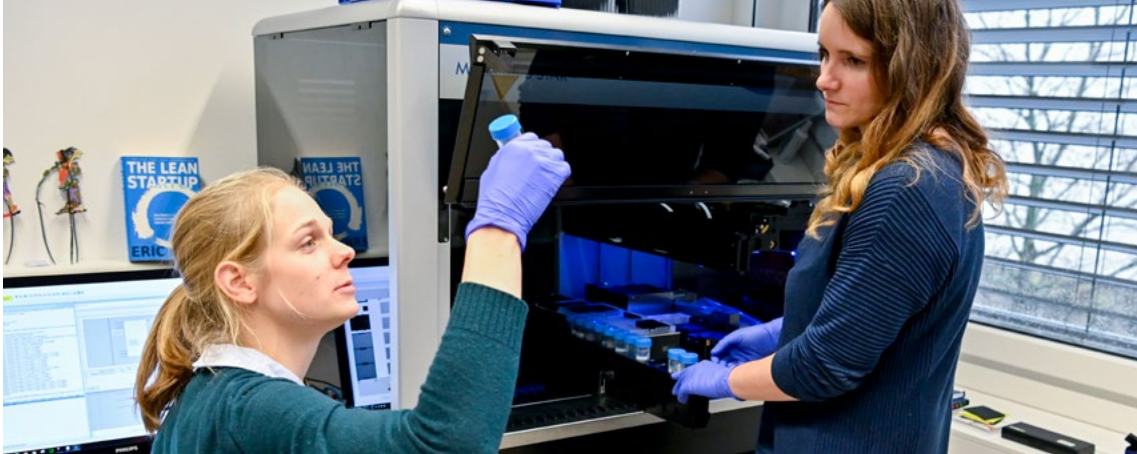


# Cartier

## WOMEN'S INITIATIVE



2019 FINALIST FOR EUROPE

## SYLKE HOEHNEL

SUN bioscience - SWITZERLAND

[www.sunbioscience.ch](http://www.sunbioscience.ch)

**“We founded SUN bioscience to be master of our own ideas  
and to be able to make decisions while upholding our own values.”**

Precision medicine aims to tailor treatments to each patient for a more effective health care system, especially for complex diseases where the “one drug fits all” concept does not hold true. While genetic biomarkers are a potential solution, little is still understood about DNA, making precise and unbiased predictions difficult. To test emerging drugs and understand the accuracy of genetic biomarkers, pharmaceutical companies need to conduct their tests on materials as close to the patient as possible. The answer can be found in one of the hottest topics in life science today: organoids, miniature three-dimensional human tissue cultures derived from stem cells that reproduce much of the original human organ at tiny scale in the laboratory.

“Organoids can be multiplied without changing the cells’ DNA. This makes them unique and a faithful representation of the genetic and functional machinery of patients and their diseases,” explains Sylke Hoehnel. “They are ideal testbeds, but to increase their adoption we need to make them more user-friendly.” In 2016, Sylke co-founded SUN bioscience to standardise organoid culture and facilitate their use in drug screenings.

### AN INNOVATIVE PRODUCTION PROCESS

To achieve this, Sylke and her co-founder, Nathalie Brandenburg, have developed a proprietary hardware technology called Gri3D, used to produce organoids at large scale, high quality and lower cost. The company has developed its own custom manufacturing robot to make Gri3D, allowing the technology to be fine-tuned to every organoid system. Launched in 2016, the company has already notched up 58 clients in 13 countries, including important pharmaceutical firms and European stem cell academics.

## VALIDATING THE APPROACH OF ORGANOID-DRIVEN PRECISION MEDICINE

One of the first organoids grown on SUN bioscience's Gri3D are "mini-intestines" for Cystic Fibrosis research. "Cystic Fibrosis serves as an ideal proof-of-concept to demonstrate the effectiveness of this type of precision medicine," says Sylke. "Drug efficacy for the disease hovers at barely over 50% for the most common mutation. Testing directly on an organoid, rather than predicting success based on genetic analysis, has the potential to improve these results." To carry out these tests, SUN bioscience is exploring new clinical readouts that work exclusively with its Gri3D-produced organoids. A clinical pilot in Switzerland using their technology is currently underway.

**"Don't let gender, race or age define you. Let character define you."**

Alongside medical benefits come economic and environmental advantages. "Our technology maximises the amount of readable data points per surface, with up to 1,000 more than other organ-on-a-chip technologies, but at a comparable price." And since the plastics employed in this field are single-use, 1,000 more data points can eliminate hundreds of plates that would normally be used, saving on plastic waste.

Keen to protect patient data and identities and anticipate upcoming regulations, SUN bioscience is also developing strategies to allow access to large sets of patient-specific organoids while maintaining privacy. "We want patients to be directly involved in decisions about how their cells are used and what data is generated on them," says Sylke.

## FROM LAB TO PATIENT

Like many scientists turned entrepreneurs, Sylke evokes the frustration of seeing how much fine scientific research ends up tucked away in university drawers. Her company was born from a side project which she and Nathalie worked on to standardise fabrication of retinal organoids, in collaboration with the Jules Gonin Eye Hospital in Lausanne. It was here that they started to develop their Gri3D technology. "It was exciting because it was a tricky project that we conducted alongside our PhD without even knowing if it would work!" says Sylke. "But it was also inspiring to be so close to doctors' and patients' needs."

**"It can be very challenging when we come up against situations that have never existed, we can't even ask someone with experience for advice!  
At the same time, it's also the best part of building something new."**



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