



SAMABRIVA

From vision to reality: Samabriva's journey to delivering sustainable secondary metabolite production.

The pharmaceutical industry is driven by the need to innovate and address pressing challenges such as global supply chain stability and the growing issues related to climate change. The transition to more sustainable production processes is gathering pace.

Samabriva, a bioscience company co-founded by Dr Alain Huriez and Professor Michèle Boitel-Conti, is at the forefront of this transformation through its unique 'hairy root' plant-based systems. This is now revolutionizing the production of natural molecules and recombinant proteins.

For the co-founders and two other leading figures at Samabriva - Marina Guillet, CEO and Florian Cardon, CBO – these are exciting times.

A shared vision for the future

Alain Huriez, a physician by training, transitioned from practicing medicine to the biopharmaceutical industry 30 years ago. Initially focusing on drug development, the entrepreneurial Dr Huriez found himself managing a vaccine company that needed to buy cytokines.

The cost of producing human cytokines was eye-watering and Dr Huriez was intrigued by plant-based production systems. By chance, he met Professor Boitel-Conti. She had developed an innovative 'hairy root' platform - initially using tropical plants - to produce secondary metabolites.

Alain Huriez was not only impressed with her work, but he also spotted a massive opportunity, "I told [Professor Boitel-Conti], this is clever. But if you could produce metabolites and human enzymes, then you would move into the life science industry. That's so much more rewarding."

The pivot from producing secondary metabolites from plant roots, to producing human proteins took Professor Boitel-Conti a further five years. But finally, she had a process that worked using her hairy root platform. Dr Huriez and Pr Boitel-Conti founded Samabriva in 2011.

Finding an alternative, sustainable solution

Initially the focus was on producing recombinant proteins using the hairy root-based system. As part of this development, the Samabriva team sharpened their skills in gene editing and engineering. These capabilities later proved instrumental in enabling them to change the game for secondary metabolite production. Applying this expertise enabled the team to modify plant metabolic pathways, leading to big improvements in the production process.

Throughout this period, the effects of climate change were becoming more apparent. Open field production methods used for secondary metabolites were – and still are – increasingly unpredictable. This has been compounded by events such as the COVID-19 pandemic which ‘paused’ the global supply chain. These have generated a growing interest across the pharmaceutical industry for sustainable alternatives, such as Samabriva’s innovative plant-based system.

“The pressure on the industry to find a sustainable production process is increasing,” says Florian Cardon. “The issues are not going away. If they leave it too late to adopt new techniques, companies risk catastrophic financial damage.”

However, transitioning from established production methods to innovative, sustainable alternatives is challenging for companies, requiring significant investment and the ability to overcome internal resistance. Dr Cardon concludes, “We just have to convince them that we have the best, more robust, option.”

Building a resilient, scalable process

One of the major technical challenges Samabriva faced was scaling up the production of hairy roots in bioreactors. Unlike simple cell cultures, hairy roots are complex organs, making their cultivation in large-scale bioreactors difficult.

Developing new strategies and technologies to manage biomass transfer and productivity was crucial. Overcoming these challenges has led to significant increases in productivity, making their process competitive with traditional open-field production methods.

The next major milestone for Samabriva is industrialization, with plans to scale up to 50,000-liter unit production. They aim to establish their technology as a credible alternative to existing production methods in the pharmaceutical and cosmetic industries. Dr Cardon says, “Compared with the current production system, we can achieve a several thousand-fold increase in productivity.”

Marina Guillet is confident that therapeutic molecules produced using their technology will become commonplace. “Customers are already using our technology effectively for R&D and at a pilot scale. But this is just the start, we need to help more people understand its potential and use our technology in a routine way. The current partnerships that we have with industry leaders are moving toward industrial production. This will finally convince more people.”

In five years, Dr Guillet envisions Samabriva as the European leader in their field, with their innovative plant-based system being a standard production process for producing secondary metabolites.

Now a leading force in the bioscience industry

Samabriva’s journey from a fledgling start-up to a pioneering force in the bioscience industry is a testament to the vision and resilience of its founders and leaders. By overcoming technical challenges and establishing a unique plant-based production platform, Samabriva is well-positioned to lead the way towards more sustainable production methods for secondary metabolites.

With its innovative technology and the ambitious team behind it, Samabriva is set to make a lasting impact on the pharmaceutical and cosmetic industries, ensuring a better future for all.