

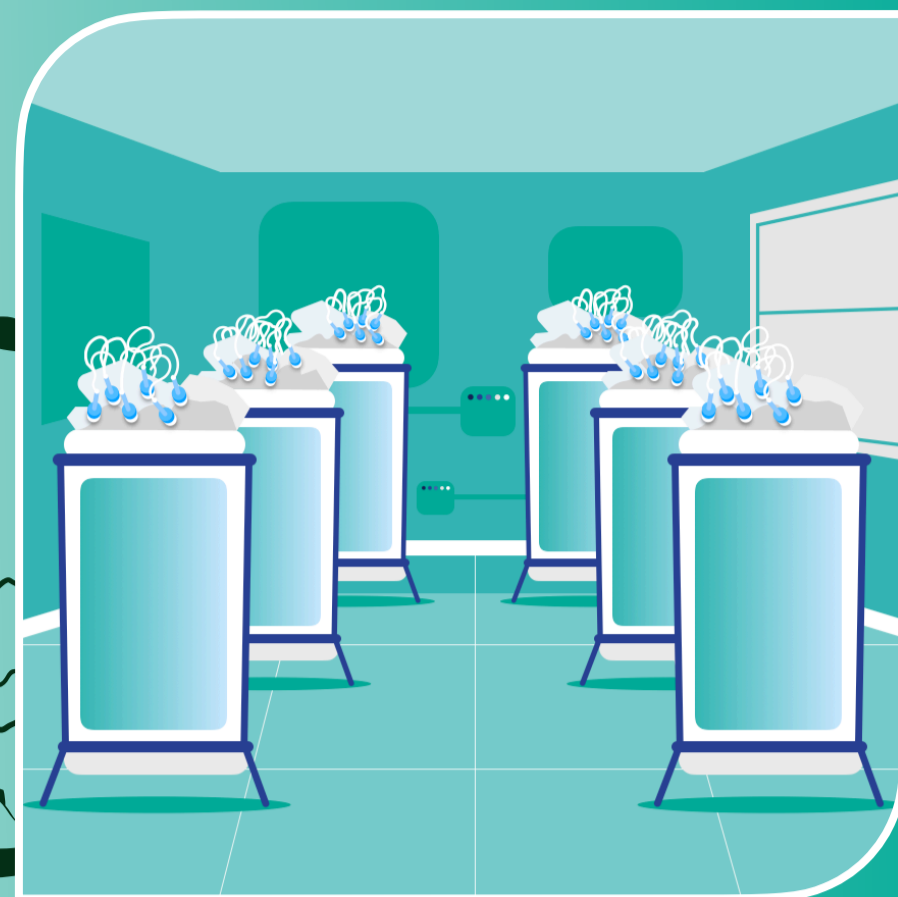
Achieving sustainable production of natural active molecules.

Pressure on agricultural land is increasing. Taking plant-based production of secondary metabolites out of the field and into the factory could be the answer.



Move off the land

Traditional production methods are unsustainable.



Step into the factory

Hairy root bioproduction provides a more predictable and efficient approach to manufacturing.

Growing area

9 billion

The global population by 2050 that the world will need to feed sustainably.

12 million hectares

The productive arable land being lost every year to desertification.



No more fields or greenhouses

Hairy root bioproduction can replace traditional manufacturing methods, offering a more environmentally friendly and sustainable way of production.

2,000m²

The space required by a bioproduction facility to match the API yield from 10 million m² of land.

Environment

4th highest emitter of CO₂

The pharmaceutical industry is responsible for approximately 52 megatons of CO₂ equivalent emissions annually, stemming solely from its direct operations.



Around 50% reduction in CO₂

Bioproduction requires less energy, water and materials than existing methods of production. This dramatically reduces the CO₂ output.

2 out of 3

of the 50,000 medicinal plant species are collected from the wild.

Zero impact

Plant based bioproduction provides access to rare plants without impacting biodiversity or nature.

20% at risk

The number of medicinal plant species whose survival is under threat from climate change.

Production

1 to 3%

of a plant's dry weight contains secondary metabolites (at best).

2,000 kg

of dried leaves are required to produce one gram of vincristine.



~10,000-fold increase in yield

By cultivating transgenic material and using enhanced elution strategies, bioproduction offers big productivity improvements.

12 months, from seed to harvest

The average growing cycle for most plants.

All year-round production

Bioproduction continues regardless of season. Rapid scale-up also eliminates the need for stockpiling.

Cost

\$1 million per kilo

The final cost of producing vincristine from cultivation of *Catharanthus roseus* in India.



Stable, predictable pricing

With hairy root bioproduction, costs remain stable over time. Manufacturing doesn't involve numerous steps and is unaffected by environmental factors.

The cost of growing is growing

They are heavily reliant on oil and natural gas, resources that have been impacted by geopolitical instability. In 2022, fertilizer prices rocketed by 80% and in 2023 they were up by another 30%.

The technology is also energy-efficient requiring no light or heat, while minimising the need for extensive transportation.

Supply chain

72% in the US | 35% in Europe

The proportion of APIs currently imported.



Anywhere, all year around

Bioproduction offers a more sustainable and predictable way to make high value biomolecules all year round, in any location. It even works in geographies that are not suitable for medicinal plant production.

Up to 300 days

The average time required from field to final drug.

Available on demand

Continuous bioproduction of APIs throughout the year minimizes the need to store stock and the production cycle can be as short as two months.

Ready to grow with us?

Samabriva's innovative plant-based system could be the answer to delivering more sustainable, stable and consistent API manufacturing for the pharmaceutical industry.

If you'd like to find out more, visit samabriva.com