

Consumer Benefits of Plant-made Pharmaceuticals

Since ancient times, plants have been a source of drugs and therapies. New advances in biotechnology make it possible to use plants not just as food crops, but also as biological factories to produce innovative therapeutic proteins to fight cancer, HIV, heart disease, diabetes, Alzheimer's disease and other debilitating illnesses.

Facilitating Production of New Medicines

As scientists begin to better understand the genetic make-up of humans, they are simultaneously making headway in developing treatments that utilize human proteins. Compared to existing recombinant production methods, plants have a superior ability to assimilate genetic information and produce complex proteins that can be used to make more effective therapeutics. Plants also offer opportunities to make drugs that cannot be made using existing methods.

More Access, More Options for Doctors and Patients

Traditional methods of producing pharmaceutical materials using bacteria, animals, or animal cell factories are limited, because it takes time and money to build the required manufacturing facilities, and production is limited to the capacity.

In many cases, it costs significantly less to grow plants with the ability to mass-produce pharmaceuticals because plant-based techniques don't require the same costly investments. Plant-made pharmaceutical production can also be more easily expanded to provide larger quantities if demand for the medicine increases.

Production and cost advantages of plant-made pharmaceuticals can allow more capital to be invested in research and development of new therapeutics, giving patients access to new drugs faster. In addition, expanded manufacturing capacity of high-quality proteins will spur

development of more medicines by removing a key hurdle to mass production.

A Naturally Sustainable Process

Making pharmaceuticals from plants is a sustainable process, because the plants and crops used as raw materials are renewable.

When Demand Exceeds Capacity

Introduced in 1997, Enbrel has proved to be one of the most successful biotechnology treatments ever. Manufactured by Immunex Corporation, it is a protein that treats rheumatoid arthritis – a painful joint inflammation that afflicts more than 1 million arthritis sufferers – and 3 million chronic-heart-failure patients.

The results (two of three patients enjoy relief) have had patients clamoring for it and created the most overwhelming supply shortage in drug history. It has been rationed much like penicillin during World War II, and patients have even participated in a lottery-type system in order to gain access to this treatment.

In March 2002, there was a waiting list of 13,000 names to receive the drug, which has been in short supply for more than a year; the manufacturer has even instituted programs to keep patients from hoarding the drug.

The problem? Production capacity. This is a liquid protein made with living cells and very difficult to make. It's manufactured in 10,000-liter tanks in sterile manufacturing facilities that cannot be built fast enough to keep up with patient demand.

This is just one example of why biotechnology firms are looking to plant-made pharmaceuticals to expedite patient access to new therapeutics.

The Biotechnology Industry Organization (BIO) represents more than 1,000 biotechnology companies, academic institutions, state biotechnology centers and related organizations in all 50 U.S. states and 33 other nations. BIO members are involved in the research and development of health-care, agricultural, industrial and environmental biotechnology products.