




PRODIGENE®

Production of Proteins from Plants



Isolate a gene from plant, animal, human, viral, fungal or bacterial DNA.



Engineer the gene into a plant vector.



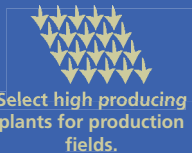
Plant vector inserts gene into the DNA of a plant cell.



Engineered plant cells are grown in culture.



Engineered cells grow into whole plants that produce the new protein.



Select high producing plants for production fields.



Harvest seeds which produce the new protein and use, or...



Separate and purify protein for delivery to plants, animals, or people.

Contact Us

Anthony G. Laos
President and CEO

John B. McClellan
Director of Marketing

ProdiGene
101 Gateway Blvd., Suite 100
College Station, Texas 77845

Telephone: 979-690-8537
Facsimile: 979-690-9527
Web: www.prodigene.com

TRYPSIN PRODUCT BACKGROUNDER

Producing Economic, Non-animal Sourced Biologics

About Trypsin

Trypsin is an enzyme naturally produced by the pancreas that catalyzes the breakdown of proteins by cleaving specific amino acids. Today, most commercial trypsin comes from the pancreas of animals, such as cows and pigs.

Trypsin has several uses including:

- Manufacturing insulin
- Releasing cells from culture plates to facilitate laboratory research
- Producing vaccines by cleaving antigens from cells
- Removing non-living or inflamed tissue for inflammation treatment and wound care
- Digestive aids

Challenges in Production

Recombinant Trypsin

Trypsin is a very difficult protein to produce in recombinant systems because of its proteolytic nature (i.e., breaking down proteins). Recombinant systems are living systems made up of proteins and the proteolytic nature of trypsin makes it detrimental, if not lethal, to most of those systems.

Safety

There is increasing public concern regarding the possible transmission of animal pathogens (such as bovine spongiform encephalopathy (BSE), which is thought to cause Mad Cow Disease) through therapies utilizing animal-source proteins.

Scale-up

Current manufacturing methods of recombinant proteins lack the necessary flexibility for quick production scale-up or scale-down. The protracted time required for scale up, such as constructing facilities, as well as the resources going to waste when production is scaled-down, make it impractical, if not impossible, for manufacturers to successfully meet market demands.

Capacity

U.S. and European companies are rapidly exhausting available manufacturing capacity for recombinant proteins. Even if traditional fermentation manufacturers were to triple or quadruple their facilities -- at a considerable cost in time and capital -- they will not be able to support the enormous demand for capacity.

ProdiGene's Solution

ProdiGene technology provides a recombinant system that can produce the proteolytic enzyme trypsin in large quantities. The system also provides a solution to the safety, scale-up and capacity issues. Using a technology with transgenic plants, ProdiGene has developed a highly scalable platform technology for the expression of recombinant proteins in maize.

This technology involves targeting and inserting a gene into plant tissue, which is then regenerated into whole plants that are screened for expression of the gene of interest. Following cultivation, the seed is harvested and stored and the recombinant protein is extracted using standardized purification techniques. The relative ease in which ProdiGene can supply high volumes of proteins, including trypsin, gives the company a significant edge over traditional fermentation procedures, and other emerging technologies. Advantages for companies that use trypsin include lower capital requirements that shorten implementation of the technology, the ability to both quickly scale-up and scale-down production, as well as the production of proteins that are free of mammalian viral or prion contaminants.

Trypsin Highlights

- ProdiGene began commercial scale up of trypsin in the first quarter of 2002
- Limited quantities will be available in late 2002 with scale up to meet market demand in 2003.
- Plants are not carriers of human or other mammalian viral proteins or prions, resulting in a safer product