

# Cucumber Mosaic Virus Inducible Viral Amplicon (CMViva) Expression System

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## ABSTRACT

A chemically inducible cucumber mosaic virus amplicon expression system for the production of recombinant proteins in plant-based systems.

## FULL DESCRIPTION

Plant cell cultures and transgenic plants have been developing as a potential platform for production of recombinant proteins, particularly playing an increasingly important role in production of human therapeutics. However, efficient expression systems that can be tightly regulated are currently lacking for plant-based protein expression.

Researchers at University of California, Davis have developed a novel protein expression system, called Cucumber Mosaic Virus Inducible Viral Amplicon (CMViva), to inducibly and efficiently produce recombinant proteins in transgenic plant cell cultures. This novel protein expression system can produce recombinant proteins in plant-based systems using either transient expression in whole plants, plant tissues or plant cell cultures (using wild type, non-transgenic host tissues), stably transformed plant cell cultures in bioreactors or in transgenic plants.

## APPLICATIONS

- ▶ Rapid, large-scale, and cost-effective production of functional human therapeutic proteins and vaccines or other commercially important proteins

## FEATURES/BENEFITS

CMViva system using transient production:

- ▶ Short timeframe from gene to product
- ▶ Can use non-transgenic plant materials that might be available at a large scale and relatively inexpensive for recombinant protein production

CMViva system using stably transformed cell cultures in bioreactors:

- ▶ Plant cells can be grown in inexpensive, chemically defined media devoid of any animal derived media components
- ▶ Containment which allows reproducibility and optimization of growth and induction conditions
- ▶ Ease of purification for secreted products

Both methods provide:

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## INVENTORS

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## OTHER INFORMATION

### KEYWORDS

Cucumber mosaic virus, viral amplicon, recombinant, proteins, recombinant proteins, protein expression system, CMViva, plant-based protein expression, bioreactor.

### CATEGORIZED AS

- ▶ **Agriculture & Animal Science**

- ▶ Production of safe human therapeutics and vaccines that are free from mammalian viruses/pathogens
- ▶ Production of proteins with post-translational modifications and complex glycosylation that is similar to mammalian systems.

## RELATED MATERIALS

- ▶ Sudarshana MR, Plesha MA, Uratsu SL, Falk BW, Dandekar AM, Huang TK, and McDonald KA. 2006. A Chemically Inducible Cucumber Mosaic Virus Amplicon System for Expression of Heterologous Proteins in Plant Tissues. *Plant Biotechnol J.* 4, 551-559.

- ▶ Other
- ▶ Plant Traits
- ▶ Plant Varieties
- ▶ Transgenics
- ▶ **Biotechnology**
- ▶ Other
- ▶ Proteomics

## RELATED CASES

2006-640-0

## PATENT STATUS

Country	Type	Number	Dated	Case
United States Of America	Issued Patent	10,421,973	09/24/2019	2006-640

## ADDITIONAL TECHNOLOGIES BY THESE INVENTORS

- ▶ In plantae production of heterologous proteins using viral amplicons
- ▶ Plants as Platform for the Biosynthesis of Melanin
- ▶ RNA-based, Amplification-free, Microbial Identification using Nano-Enabled Electronic Detection

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