

**Technology**

Urokinase in a three-dimensional tissue culture system

Inventor

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Key Features

- Three-dimensional system results in more favorable efficacy
- Produces increased amounts of urokinase
- Ability to produce proteins
- Multipotent cells from postnatal and adult tissues
- Cost-effective

Stage of Development

Reduced to practice with successful demonstration

Keywords

Therapeutic
- Urokinase
- Fibrinolysis
- Vascular disease therapy
- Three-dimensional tissue culture

Patent Status

[US Pat. No. 7,361,493](#)

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Production of Urokinase in 3-Dimensional Kidney Cell Culture

(VA Reference No. 02-018)

Cost-effective method of producing urokinase for potential therapy in patients with acute vascular diseases

Technology

The Department of Veterans Affairs has developed a cost-effective method of producing urokinase, a therapeutic enzyme, in a three-dimensional tissue culture system that uses immortalized human kidney cells.

Description

The initiation of fibrinolysis is useful for a variety of medical treatments, such as the treatment of patients suffering from acute vascular diseases. Since urokinase causes the initiation of fibrinolysis, it has significant medical utility and several urokinase-based products are marketed worldwide. Urokinase is especially effective for the treatment of vascular diseases characterized by thrombosis or thromboembolism. In addition to its medical utility for breaking down existing blood clots, urokinase also is useful for inhibiting the formation of new blood clots.

The technology developed by the VA produces urokinase from an immortalized human kidney cell line grown in three-dimensional suspension culture on beads as a support matrix. Using immortalized cells is typically simpler than using primary cell cultures and results in molecules that are identical to the natural compound with more favorable efficacy. In addition, the technology produces an environment that allows for improved culture of many cell types since it maintains the three-dimensional orientation of the cells.

Competitive Advantage

Most conventional techniques for the production of urokinase are complex, expensive, and are not designed to produce large quantities of urokinase.

This invention:

- Results in increased in vitro expression of receptors and biomolecules.
- Produces increased amounts of urokinase when grown in suspension culture.
- Has the ability to produce proteins that are expressed in vivo.

Status

The Department of Veterans Affairs is looking for a partner for further development and commercialization of this technology through a license, and the VA inventors are available to collaborate with interested companies through a Cooperative Research and Development Agreement (CRADA).

