



Health, Medicine and Biotechnology

Miniature Bioreactor System for Cell Culture

Automated bench-top cell culturing and sampling
system for varied length terms

Scientists at the NASA Johnson Space Center and the University of Houston have developed a miniature bioreactor system for varied term cell culturing and sampling. The miniature bioreactor allows for continuous and simultaneous short, moderate, or long-term cell culturing of several types of cells and tissues. The invention can be used to study cell cultures and their response to stressors such as pharmaceuticals, hypoxia, pathogens, and more. The bioreactor is ideally suited for periodic cell harvesting and medium processing for secreted cellular components. The miniature bioreactor system has an existing prototype and an initial proof of concept has been completed. The miniature bioreactor system is available for licensing.

This NASA Technology is available for your company to license and develop into a commercial product. NASA does not manufacture products for commercial sale.

BENEFITS

- Small and lightweight - miniature bioreactor system
- Automation - computer controlled operation option
- Diverse - suited for studying short, moderate and long term cell culture studies

technology solution



THE TECHNOLOGY

The miniature bioreactor system was developed to provide the capabilities for NASA to perform cell studies in space and then provide results back to investigators on Earth with minimal tools and cost. The miniature bioreactor system has the potential to also be used on Earth as a laboratory bench-top cell culturing system without the need for expensive equipment and reagents.

The system can be operated under computer control to reduce the operator handling and to reduce result variations. The system includes a bioreactor, a fluid-handling subsystem, a chamber wherein the bioreactor is maintained in a controlled atmosphere and temperature, and control subsystems. The system can be used to culture both anchorage dependent and suspension cells (prokaryotic or eukaryotic cell types). Cells can be cultured for extended periods of time in this system, and samples of cells can be extracted and analyzed at specified intervals. The miniature bioreactor system for cell culturing has applications in pharmaceutical drug screening and cell culture studies.



The miniature bioreactor can be used to do pharmaceutical drug studies.

APPLICATIONS

The technology has several potential applications:

- Pharmacokinetic and Pharmacodynamics studies
- Pharmaceutical Drug Screening
- Laboratory Cell Culturing

PUBLICATIONS

Patent No: 9023642

National Aeronautics and Space Administration

Agency Licensing Concierge

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