

## Automated Tissue Dissociation

### Rapid, Reliable Extraction of Viable Cells

#### The Potential of Living Cells

Tissue dissociation separates tissue into individual, living cells that are essential to modern biomedical and industrial research. These cells enable scientists to study disease pathways, test new drugs, and ensure safety in areas such as food and diagnostics.

Traditional methods rely on manual cutting, grinding, or enzyme digestion. While effective, these approaches are slow, variable, and difficult to standardize, creating challenges for high-throughput workflows and compliance. Fraunhofer USA CMI delivers faster, more reproducible results to address this critical bottleneck.

#### Applications

Fraunhofer USA's automated tissue dissociation service supports a wide range of fields:

- **Biomedical research:** Preparation of primary cells for studying disease models and cellular responses
- **Regenerative medicine:** Extraction of mesenchymal stem cells (MSCs) from sources such as umbilical cord tissue
- **Pharmaceutical development:** Rapid preparation of single-cell suspensions for drug discovery, screening, and toxicology
- **Food safety and diagnostics:** Tissue homogenization to support microbial and quality testing

**85%**  
Faster  
processing time  
compared to  
manual methods

## Our Advantage

Fraunhofer USA CMI is uniquely positioned to deliver both technical expertise and practical impact:

- **Reproducibility:** Automated methods reduce human error and variability
- **Performance:** Cell yields match or exceed manual methods across diverse tissue types
- **Versatility:** Capable of processing everything from small lymph nodes to dense, fibrous tissues such as uterus and umbilical cord
- **Cost savings:** Faster workflows reduce labor demands and consumable use
- **Integration-ready:** Designed to connect with larger automation platforms such as stem cell factories, enabling end-to-end production pipelines

## Proven Results

- **Murine organs:** Automated dissociation matched or exceeded cell yields from manual methods while reducing processing time from 5–15 minutes per sample to less than one minute
- **Umbilical cord tissue:** Traditionally requiring extensive cutting and digestion, this tough tissue was successfully homogenized in 2 minutes, enabling efficient extraction of mesenchymal stem cells

These results highlight the reliability and adaptability of our approach across a wide range of tissue types.

## The Future of Cell Processing

Fraunhofer USA CMI continues to expand its capabilities in automated cell processing, including:

- Scaling workflows to support clinical-grade stem cell factories
- Developing standardized protocols for challenging tissues
- Exploring new applications in pharmaceuticals, diagnostics, and regenerative medicine
- Partnering with industry and academia to accelerate translation from research to real-world therapies

## About Fraunhofer USA CMI

Fraunhofer USA is a nonprofit research & development organization working with industry, universities, and state and federal governments on contract research projects. We design and develop prototypes, establish and validate manufacturing processes, and bridge the gap between basic research and market-driven innovations.

The Fraunhofer USA Center for Manufacturing Innovation CMI offers expertise in automation of production technologies, energy and climate, resources technology, and biotech. The center is located in Brookline, Massachusetts.

Accelerate your research with Fraunhofer USA's automated tissue dissociation expertise. Contact our team to explore collaboration opportunities in biomedical, pharmaceutical, and industrial applications.

## Key Capabilities

- 85% faster than manual processing
- Works with spleen, liver, lung, uterus, lymph nodes, and umbilical cord
- 24 parallel samples processed at once
- Compatible with robotic platforms for seamless integration
- Enables stem cell extraction for regenerative therapies



## Contact

Fraunhofer USA Center for Manufacturing Innovation  
15 Saint Marys Street  
Brookline, MA 02446, USA  
[cmi@fraunhofer.org](mailto:cmi@fraunhofer.org)  
[www.cmi.fraunhofer.org](http://www.cmi.fraunhofer.org)