

MS Openings: Engineering Aspects in Cryopreservation

[Biothermal Technology Laboratory](#)
Department of Mechanical Engineering
Carnegie Mellon University
November 29, 2017

Why Cryopreservation?

Cryopreservation is the preservation of tissues and organs at very low temperatures.

From a recent [Nature Biotechnology](#) paper (June 2017):

- “The ability to replace organs and tissues on demand could save or improve millions of lives each year globally and create public health benefits on par with curing cancer.”
- “Unmet needs for organ and tissue preservation place enormous logistical limitations on transplantation, regenerative medicine, drug discovery, and a variety of rapidly advancing areas spanning biomedicine.”
- “..., recent discoveries provide proofs of principle for breakthroughs in a family of research areas surrounding biopreservation.”
- “A growing body of evidence indicates that a transformation in organ and tissue preservation is now achievable.”

Our Engineering Contributions to Cryopreservation Research:

Activity at the [Biothermal Technology Laboratory](#) applies engineering fundamentals for the benefit of biology and medical applications. Related efforts range from basic research, through technology development, to experimentation on biological systems. Core engineering areas include thermal sciences, solid mechanics, sensors and instrumentation, geometric modeling, computation, and engineering design.

The specific MS research openings are related to an NIH-funded project to study engineering aspects in cryopreservation. One opening is related to thermal effects in cryopreservation and the other to solid mechanics effects and the preservation of structural integrity.

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