

# MS Opening: Engineering Aspects in Cryosurgery

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

## Why Cryosurgery?

- Thermal surgery is a minimally invasive procedure to destroy cancerous tumors by heating or cooling.
- Thermal surgery represents a broad range of energy modalities in medicine, including high-frequency ultrasound, laser probes, nanoparticles, and freezing.
- Cryosurgery is the destruction of cancerous tumors by freezing. Among the various thermal surgery applications, cryosurgery is the most precise procedure, with a distinguished signature in medical imaging.

## Our Engineering Contributions to Cryosurgery 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.

This specific MS research opening is a part of a collaborated project with the industry to plan and optimize cryosurgical procedures. This opening is related to computer simulations, optimization of the cryosurgical process, and the development of [educational software](#).

For more information see:

- [Computerized planning of cryosurgery](#)
- [Computerized training tools for cryosurgery](#)
- [Simulation techniques for cryosurgery](#)

## Contact Information:

Professor Yoed Rabin  
Carnegie Mellon University  
321 Scaife Hall, 5000 Forbes Avenue, Pittsburgh, PA 15213  
Phone: (412) 268 2204  
[Rabin@CMU.edu](mailto:Rabin@CMU.edu)