

SOCIETY OF PHYSICS STUDENTS (SPS) EVENT

**FROZEN AND ALIVE: Uncovering the
secret of cryo-preservation!**

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Abstract:

School got ya stressed? Need a short break from life? Someday it might be possible to just put life on pause—to be frozen, yet alive—with cryogenic technology! While Mother Nature, the ultimate scientist, has already mastered this amazing field, we still have quite a bit of work to do to understand it. By studying the chemical composition of freeze-tolerant animals it has become apparent that glycerol plays a big role in effective preserving... could it be the key to surviving a total freeze?

I spent my summer researching the most basic science of this question at the University of Akron as part of an NSF REU program. My research project, which is now continued at CSU, involves studying the relaxation properties of protein in glycerol-water solvents and interpreting the effect of the glycerol on protein dynamics. My project employs both Dielectric Spectroscopy and Dynamic Light Scattering Spectroscopy at a wide range of temperatures and frequencies. The main goal is to explore the influence of the solvent on the dynamics of the protein with processes such as preferential hydration of the protein in solution and coupled or decoupled dynamics of proteins being the main focus. With this knowledge we could be one step closer to effectively manipulating cryo-preservation for the development of protein based pharmaceuticals, for the more effective storage of organs for transfer, and even for the total freezing of humans!

WHERE

SI – 117

WHEN

Noon- 1pm

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