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The REPAIR project: investigating the effects of sub-natural background radiation exposure within SNOLAB - (in-person)

Tuesday, 20 August 2024 11:00 (30 minutes)

20-minute talk + 10-minute questions

Living systems are continually exposed to background ionizing radiation and have evolved and adapted in its presence. However, the potential biological impacts of this chronic low dose rate exposure remain poorly understood. The REPAIR (Researching the Effects of the Presence and Absence of Ionizing Radiation) project, located at SNOLAB in Sudbury, Ontario, Canada, is investigating the biological effects of sub-natural background radiation exposure. This talk will provide an overview of the current results and future experimental goals of REPAIR. To date, experiments have been conducted with various model systems including human cell culture, yeast, C. elegans, and lake whitefish embryos. A custom designed tissue culture glovebox was constructed to control radon gas and gamma radiation in the underground laboratory, providing an environmental dose rate of 2.5 nGy/hr, approximately 30-fold lower than on surface. A further significant reduction in experimental dose rate has recently been achieved through removal of endogenous potassium-40 from culture media. Overall, these ongoing experiments in SNOLAB will contribute to the wider underground scientific community in hopes of elucidating the biological role of natural background ionizing radiation.

Presenter: THOME, Chris

Session Classification: Studies of Life in Low Background Radiation