

Executive Summary

Penn State Ancient Biomolecules Research Environment
Category J

Analyzing one-million-year-old DNA is a tricky business. The samples must be handled in a scrupulously sterile environment, free of contaminants, to protect their integrity. Using DNA to examine life over the past one million years has taught scientists about the origins of some modern diseases, improving human health by showing us the keys to thwarting illnesses.

To meet the needs of the specialty team at Pennsylvania State University, Gannett Fleming, Inc. designed a lab devoted solely to handling ancient DNA. The complex lab environment required a unique workflow and cleanroom-like conditions to keep samples pure and store them at cool temperatures. Airflow and air-filtration systems keep airborne particulate matter to a minimum. A refrigeration system stays at temperatures between -20 and 4 degrees Celsius, as required for DNA handling. An emergency power generator keeps these vital systems running in the event of power failure.

Because intense decontamination is a daily part of lab maintenance, finish materials are both antimicrobial and durable enough to handle harsh bleach cleanings. Furthermore, a sanitizing ultraviolet (UV) lighting system helps prevent contamination in the laboratory. To offset the dangers of UV rays, the team incorporated safety precautions into the design, including doors and occupancy sensors linked to the system to prevent exposure.

Now complete, the \$1.9 million, 1,406-square-foot lab is an oasis of modern science and high-tech equipment within a 70-year-old building on Penn State University's main campus. The facility supports the critical work of studying the past to discover the keys to the future.