



Paleo-DNA Laboratory Newsletter

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Ancient DNA Success

There are many factors affecting the preservation of remains. A sample that has been stored for generations usually provides some challenges in terms of DNA acquisition. When amplifying ancient or degraded remains, short fragments about 100-300bp in length should be targeted. Most DNA degrades over time making longer read lengths extremely difficult to obtain, however not impossible. Targeting smaller regions of DNA will increase the success of amplification. If longer read lengths are necessary for analysis, simply overlap a series of short amplified fragments to produce a simulated longer read. If you require help in designing primers for overlapping regions, the Paleo-DNA Laboratory has vast experience in this area.



Biotech Week

This year's biotech week hosted at Lakehead University involved students from four public secondary schools and volunteers from local biotech companies. Events included detecting blood at a mock crime scene, identification of unknown substances, and a virtual tour of a forensic DNA laboratory among other activities. The goal was to interest and educate the students in the field of forensics.



DNA Training Course

The Lakehead University Paleo-DNA Laboratory Ancient DNA Training Course is preparing for 2007. The tentative dates are May 22 to June 9. Guest lecturers are to be announced. The course is limited to facilitate a maximum practical experience. Students will learn a variety of DNA extraction and amplification techniques as well as exposure to both nuclear and mitochondrial DNA analysis. This can be taken as a full university course credit but is not limited to university students. Please check our website for updated information.



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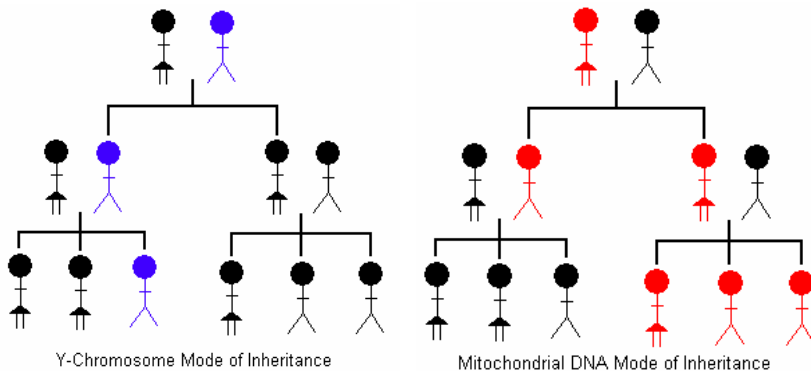
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The Power of Nuclear DNA Markers

Nuclear DNA is unique for every individual. Nuclear DNA marker analysis, also known as short tandem repeat or STR analysis can be used to distinguish a variety of familial relationships. Commercial kits can amplify anywhere from 4 to 16 loci in a single reaction. The higher the number of loci amplified, the greater the power of discrimination. With one STR kit, a laboratory can match or exclude an individual to forensic crime scene evidence, establish paternity, siblingship, or whether twins are fraternal or identical. The same kit can also be used to ascertain biological relationships for immigration or estate purposes. The Paleo-DNA Laboratory currently analyzes 16 individual STR loci for all nuclear DNA analysis.

Mitochondrial DNA- A Mother's Gift

Mitochondrial DNA (mtDNA) is passed down through the maternal lines. Only a female can pass their mtDNA down to their offspring. A mother will have the same mtDNA profile as her children. Thus males can receive mtDNA from their biological mothers but they cannot pass it on. This type of DNA is useful in establishing relationships where key individuals are absent. mtDNA is very robust in that in most cases where nuclear DNA is unobtainable, mtDNA is the next best choice. The Paleo-DNA Laboratory has been doing mtDNA analysis long before commercial kits were available. We use customized reagents that have been vigorously tested to ensure the highest quality result.



Y-Chromosome – Males Only

Commercial kits have become available to gather information about the Y-chromosome. The Y-chromosome is passed down through the paternal or male lineage. A father and son will have the same Y-chromosomal DNA profile. With Y-chromosomal kits familial relationships can be established when normal STR testing would not be possible. Such is the case where relationships must be established in the absence of key individuals. The Paleo-DNA Laboratory currently uses a 17 loci kit.