



Global Partnerships

Action Plan for implementation of the Memorandum University of Benin (Nigeria) and Lakehead University, Thunder Bay.

A delegation from the University of Benin (Nigeria) came to Lakehead Thunder Bay campus on November 4th 2019 as a follow meeting on the Memorandum of Understanding which was signed on March 25th 2019. The purpose of this meeting was to discuss formulation of an Action Plan for implementation of the Memorandum of Understanding Practical forensic DNA training. This training may be in the form of subsidized Virtually ON-LINE, in person ON-SITE or a hybrid training. This training forms the Practical DNA component of Post-Graduate Diploma Course in Forensic DNA Analysis to be implemented by Lakehead Paleo-DNA Laboratory Thunder Bay, ON, Canada in association with Center for Forensic Program and DNA Studies (CFPDS) at University of Benin, Benin City, Nigeria.

The delegation, including Professor F.F.O Orumwense, the University of Benin's Vice-Chancellor, and Dr. Edeaghe (Eddy) Ehikhamenor, Project Coordinator of the Center for Forensic Programs and DNA Studies, Mrs. O. A. Oshodin Registrar UNIBEN, Dr. Victor Imagbe Legal Adviser UNIBEN and Professor Bright Bazuaye Ag Centre Director Center for Forensic Programs and DNA Studies UNIBEN, met with members of VPRI, Lakehead's Paleo-DNA Laboratory, Teaching Commons and Lakehead International.





PROGRAMS

ENGLISH LANGUAGE CENTRE

| PROGRAMS | |
|--|-----|
| Academic English Program (AEP) | T O |
| Intensive Academic English Program (IAEP) | T O |
| IELTS Preparatory Course & Testing | T |
| Visiting International Student Program (VIP) | T O |
| English Innovation Programs (EIP) | T O |
| Customized Programs | T O |

GRADUATE PROGRAMS

| MASTERS PROGRAMS | |
|--|---|
| BUSINESS | |
| Business Administration (MBA)* | T |
| Business Management (MScMgt) | T |
| Business Skills Development Program (GMAT Equivalent for Admissions) | T |
| ENGINEERING | |
| Civil Engineering *O | T |
| Chemical Engineering | T |
| Electrical and Computer Engineering *O | T |
| Mechanical Engineering *O | T |
| EDUCATION | |
| Master of Education * | T |
| HEALTH & BEHAVIOURAL SCIENCES | |
| Health Sciences | T |
| Kinesiology | T |
| Psychology: Clinical | T |
| Psychology: Psychological Science | T |
| Public Health * | T |
| Social Work | T |
| Gerontology & Nursing Specializations Available | T |
| NATURAL RESOURCES MANAGEMENT | |
| Science in Forestry * | T |
| SCIENCE & ENVIRONMENTAL STUDIES | |
| Biology | T |
| Chemistry | T |
| Computer Science *O | T |
| Economics *O | T |
| Geology | T |
| Mathematical Sciences * | T |
| Environmental Studies | T |
| Physics O | T |
| SOCIAL SCIENCES & HUMANITIES | |
| English * | T |
| History * | T |
| Social Justice * | T |
| Sociology | T |
| Women's Studies Specializations Available | T |
| DOCTORAL PROGRAMS | |
| ENGINEERING | |
| Doctor of Philosophy in Engineering (Electrical & Computer) | T |
| HEALTH & BEHAVIOURAL SCIENCES | |
| Doctor of Philosophy Clinical Psychology | T |
| Doctor of Philosophy Psychological Science | T |
| EDUCATION | |
| Doctor of Philosophy in Educational Studies | T |
| NATURAL RESOURCES MANAGEMENT | |
| Doctor of Philosophy in Forest Sciences | T |
| SCIENCE & ENVIRONMENTAL STUDIES | |
| Doctor of Philosophy in Chemistry and Materials Science | T |
| Doctor of Philosophy in Biotechnology | T |

UNDERGRADUATE PROGRAMS

| PROGRAMS | | SCIENCE & ENVIRONMENTAL STUDIES | |
|---|------|--|--|
| BUSINESS ADMINISTRATION | | Anthropology T O | |
| Honours Bachelor of Commerce (4 yr) | | Applied Life Sciences T O LG | |
| Accounting O | T | Bioinformatics T | |
| Business Administration | O | Biology T | |
| Business Economics | T | Chemistry T | |
| Business Finance O | T | Computer Science O | |
| General Management | T | Earth Science T | |
| Global Entrepreneurship | O | Economics T | |
| Human Resources Management/Industrial Relations O | T | Environmental Science T | |
| Information Systems O | T | Environmental Studies T | |
| International Business | T | Environmental Sustainability O | |
| Marketing O | T | Geography and the Environment T O | |
| Bachelor of Administration (3yr) | | Geology T | |
| Administration | T O | Lakehead Science One T | |
| Administration (Management) | O | Mathematics T | |
| ENGINEERING | | Mathematical Physics T | |
| Chemical Engineering O | T | Natural Science T | |
| Civil Engineering O | T | Physics O | |
| Electrical Engineering O | T LG | Resource & Environmental Economics T | |
| Mechanical Engineering O | T | Water Resource Science T | |
| Software Engineering O | T | SOCIAL SCIENCES & HUMANITIES | |
| EDUCATION | | Criminology O | |
| Consecutive Education (2 yr BEd after Honours or Bachelor degree) | T O | English T O | |
| Concurrent Education (4 yr HBA / HBSc + 2yr BEd) | T O | General Arts T O | |
| HEALTH & BEHAVIOURAL SCIENCES | | History T O | |
| Gerontology | T | Indigenous Learning T | |
| Kinesiology O | T | Interdisciplinary Studies O | |
| Nursing | T | Lakehead Arts One T | |
| Psychology | T | Languages T | |
| Social Work | T O | Media Studies O | |
| NATURAL RESOURCES MANAGEMENT | | Music T | |
| Environmental Management O | T | Outdoor Recreation, Parks & Tourism T | |
| Forestry O | T | Philosophy T | |
| | | Political Science (Pre-Law option available) T O | |
| | | Sociology T O | |
| | | Visual Arts T | |
| | | Women's Studies T | |

O Co-operative Education offered

NOTE: Programs are subject to change without notice.

O Orillia Campus T Thunder Bay Campus LG Lakehead-Georgian Campus



CANADA'S
TOP 10
UNIVERSITIES
(MACLEAN'S 2018)

FUN, SAFE, AFFORDABLE
LIVING: STUNNING, NATURALLY-
BEAUTIFUL CAMPUSES

There are plenty of indoor and outdoor spaces to relax in and spend time with friends outside of class. It is easy to get involved in student-run clubs and associations and recreational sports. Safety is the top priority for Lakehead University Security Services, and they offer 24-hour services

EXCEPTIONAL STUDENT SUPPORT

Lakehead is dedicated to your success. Our Student Success Centre runs workshops on study skills, research, career preparation and academic topics. There is also an Academic Support Zone offering free supports in writing, mathematics and small group tutoring. Our on-campus medical clinic with doctors, nurses and psychologists is here to care for you. Lakehead International can help you with study permits, housing, airport pick-up and social events.



TWO CAMPUSES

LAKEHEAD THUNDER BAY

Thunder Bay is the largest metropolitan centre in Northwestern Ontario, with a population of over 110,000. Experience the best of Canada with the breath-taking northern wilderness combined with a dynamic city life that creates endless opportunities for entertainment, leisure and adventure. The international airport makes it easy to access.

LAKEHEAD ORILLIA

Nestled between the lakes and forests near the Greater Toronto Area (GTA), Orillia is a vibrant city with a population of 30,000. The city offers year-round opportunities for education, culture and entertainment and is just outside Toronto. Over 20 festivals are held each year in Orillia, celebrating arts, culture, music and recreation.



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www.lakeheadu.ca

International DNA Training Program

LABORATORY/FORENSIC DNA SKILLS TRAINING PROGRAM

COURSE OUTLINE

A two-week (9 business days) intensive laboratory-based training program designed to teach students the fundamentals of molecular techniques including DNA extraction, amplification (using PCR), sequencing and interpretation. The course includes training in the latest DNA technologies, including multiplex PCR, real time PCR and use of the 3130xl automated sequencer.

Laboratory 1: Laboratory Techniques

Laboratory 2: Sample Collection and Preparation

Laboratory 3: Gel Electrophoresis

Laboratory 4: Extraction Procedures

Laboratory 5: Purification Procedures

Laboratory 6: Quantification Procedures

Laboratory 7: Mitochondrial DNA PCR Preparation

Laboratory 8: Gel Electrophoresis

Laboratory 9: Pre-Sequence Purification

Laboratory 10: Sequencing PCR Preparation

Laboratory 11: Post-Sequencing Purification

Laboratory 12: STR Multiplex PCR Preparation

Laboratory 13: Tissue Sample Preparation

Laboratory 14: Computer Lab

The laboratory sessions are designed to follow the general process of the collection and preparation of a sample followed by the extraction and analysis of the DNA. The laboratories will cover the different types of samples that can be used for DNA analysis (buccal, hair, blood, bone) and the different preparation procedures required for each sample type. The participants will learn various DNA extraction methods applied to a variety of tissue types. Students practice on their own DNA samples using PCR (polymerase chain reaction), Multiplex PCR, Real-time PCR, Sequencing, and fragment analysis. Other techniques covered in the lab sessions include gel (Agarose and polyacrylamide) and capillary electrophoresis, measuring, centrifugation and pipetting. The participants will analyze the control region of their own mitochondrial DNA, and STRs (short tandem repeats) within their nuclear DNA. One laboratory session is also dedicated to the computational aspects of analyzing DNA wherein each participant has their own computer and works through databases, websites and programs that are applicable to their analysis or the interpretation of their results.

A certificate of achievement will be issued upon completion

RESEARCH EXCELLENCE

With research opportunities at the undergraduate and graduate levels, Lakehead gives students the chance to start their research careers early and apply what they learn in class. Lakehead has ample lab space and an abundance of ongoing cutting-edge projects underway.

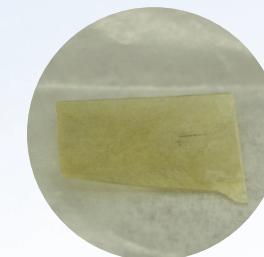
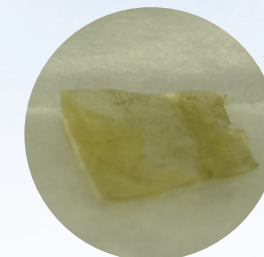
#1 Undergraduate RESEARCH UNIVERSITY
in Canada (RESEARCH Infosource 2015, 2016, 2017, 2018)

PALEO-DNA LABORATORY SAMPLE PROJECTS



SECRETS OF THE DEAD: TITANIC'S GHOSTS

1912, six days after the Titanic sank, the body of a small child was recovered by the men of the Mackay-Bennett (Canadian recovery ship). The body was never claimed. Paleo-DNA Laboratory helped identify the remains through degraded DNA analysis.



HUMAN LAMPSHADE: A HOLOCAUST MYSTERY

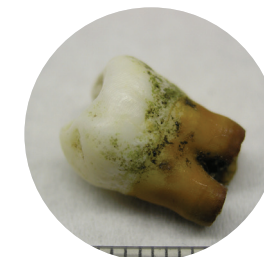
A lampshade made of skin surfaced in New Orleans at a yard sale after Hurricane Katrina. The Vendor claims it was made from human skin. Paleo-DNA worked on the lampshade to determine the species of the skin.

1917: THE MISSING

2003, construction workers building a gas pipeline south of Avion, France unearth two soldiers from WWI. PDL used Y-chromosome analysis to help identify one of the individuals.

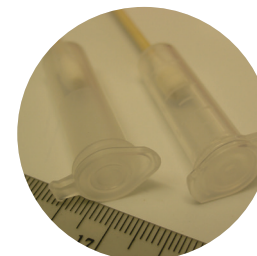
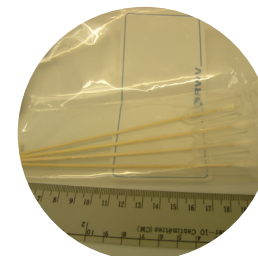
THE LOST TOMB OF JESUS

1980, a tomb was discovered in Jerusalem by a construction crew. 10 ossuaries were found dating back to the era of King Herod inscribed with names that could be translated to: Jesus, son of Joseph; Mara or Mary; Matthew; Yose or Joseph; Mariamne or Mary Magdalene and Judah, son of Jesus. Paleo-DNA worked on the submitted samples to help determine maternal relationship and ancestry.



FRANKLIN EXPEDITION

1845, Ships left England for an Arctic expedition. They never returned. What happened to the crew? Remains were found scattered near King William Island. Paleo-DNA Laboratory worked on a large number of samples to build a genetic database of possible crew members. Current research comparing DNA to living descendants is on-going.



STARCHILD SKULL

1930s, deformed skull is found in a cave in Mexico. It didn't look human. Could it be alien? Paleo-DNA Laboratory extracted mitochondrial DNA and nuclear DNA to determine its origin.

AMERICA UNEARTHED – MOTIVE FOR MURDER

1809, Meriwether Lewis (from the famous Lewis & Clark expedition) was found shot; it was ruled suicide. Years later, Paleo-DNA tested blood stains on Meriwether Lewis' masonic apron to see if DNA could reveal something else.



CASIMIR PULASKI

1779, General Pulaski was killed in battle, a revolutionary war hero. A monument was erected in his honour in 1825 and his supposed remains placed under it in 1854. Was it really him? Paleo-DNA Laboratory compared his DNA to a potential relative to find out.

WEERDINGE BOG BODIES

1904, two naked bodies discovered in southern Netherlands. One of them lays on the outstretched arm of the other (this one is male). Is the second body a male or female? Paleo-DNA Laboratory used DNA to help answer this question.