

CURRICULUM VITAE

Lorraine E. Heath, M.Phil, F-ABC

L.E.Heath Forensic DNA Consulting

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EDUCATION:

Master of Philosophy in Forensic DNA Profiling of Soil,
Liverpool John Moores University, UK, 2005

Post Graduate Certificate in Teaching & Learning in Higher Education
Liverpool John Moores University, UK, 2002

Bachelor of Science in Forensic Science and Biology
Honours with High Distinction
University of Toronto, Canada, 1998

TESTIMONY EXPERIENCE:

- Testimony covering serology/biological fluid screening, nuclear DNA analysis (STR and Y-STR), blood stain pattern interpretation, and probabilistic genotyping.
- 20+ years of experience including video and in-person depositions for civil and criminal cases; telephonic and in-person court testimony in judge-only and jury trials; criminal trials including multiple death penalty cases; testimony for both prosecution and defense attorneys; and testimony in multiple jurisdictions including Washington, Arizona, California, and Ontario, Canada.

PROFESSIONAL EXPERIENCE:

10/19-Present **DNA Technical Leader**, San Bernardino County Sheriff's Department Scientific Investigations Department.

- Responsible for all technical aspects of DNA STR analysis within the Forensic Biology Unit.
- Validate and implement new methods and technology for DNA analysis and provide training for new and experienced analysts.
- Ensure quality of all casework produced within the unit and compliance with all relevant accreditation requirements.
- Perform internal and external ISO17025 and DNA QAS audits.

07/08-10/19 **Supervising Forensic DNA Scientist**, Washington State Patrol Crime Lab, Spokane, WA

- Perform and report results of forensic serological examinations and DNA analyses (STR and Y-STR).
- Crime scene investigation and bloodstain pattern interpretation.
- Supervise forensic scientists in DNA section.
- Perform internal and external ISO17025 and DNA QAS audits.

PROFESSIONAL EXPERIENCE (cont'd):

- 01/07-07/08 **Forensic Biology Scientist**, Centre of Forensic Sciences, Sault Ste. Marie, Ontario, Canada
- Performed and reported results of forensic serological examinations and DNA analyses (STR and Y-STR).
- 03/04-12/06 **DNA Criminalist**, Arizona Department of Public Safety Crime Lab, Phoenix, AZ
- Performed and reported results of forensic serological examinations and DNA analyses (STR and Y-STR).
 - Crime scene investigation and bloodstain pattern interpretation.
- 09/01-03/04 **Forensic Science Lecturer**, Liverpool John Moores University, Liverpool, UK
- Taught undergraduate forensic science courses.
 - Co-ordinated and supervised undergraduate research projects.
 - Performed research on forensic DNA analysis of soil.
- 05/00-09/01 **Forensic DNA Technician**, Lothian & Borders Police Forensic Lab, Edinburgh, UK
- Performed and reported results of forensic STR DNA analyses
- 01/99-05/00 **DNA Criminalist**, Kansas City, MO Police Department Crime Lab, MO
- Validated and performed forensic DNA STR analyses.
- 04/98-01/99 **Technical Sale Representative**, Helixx Technologies, Etobicoke, Canada
- Biotechnology product development, testing, and sales.

PROFESSIONAL TRAINING:

7th Annual Workshop on STRmix (9 hours) Virtual, CA DOJ & San Diego PD, San Bernardino, CA, 2021

Interpreting and Reporting DNA Results Workshop (12 hours), SBSD/Simon Gittleson, San Bernardino, CA 2021

2020 Quality Assurance Standards Training (16 hours), FBI Online Course, 2020

HID Future Trend in Forensic DNA Technology (8 hours), Applied Biosystems, Seattle, WA, 2019

5th Annual Workshop on STRmix (24 hours), CA DOJ & San Diego PD, San Diego, CA, 2019

2018 Technology Tour Seminar (8 hours), Promega, Seattle, WA, 2018

4th Annual Workshop on STRmix (24 hours), CA DOJ & San Diego PD, San Diego, CA, 2018

PROFESSIONAL TRAINING (cont'd):

Introduction to Lean Fundamentals and Six Sigma Operational Improvement (8 hours), American Academy of Forensic Sciences Annual Meeting, Seattle, WA, 2018

Fundamentals of Successful Project Management (16 hours), SkillPath Seminars, Spokane, WA, 2017.

DNA Technical Leaders Meeting (4 hours), International Symposium on Human Identification, Seattle, WA, 2017

Towards Better Solutions for Body Fluid Identification (8 hours), International Symposium on Human Identification, Seattle, WA, 2017

STRmix Training Workshop (32 hours), Institute of Environmental Research and Science, Seattle, WA, 2017

Viewing Research Through Different Lenses: How to Achieve Success in Court (8 hours), American Academy of Forensic Sciences Annual Meeting, New Orleans, LA, 2017

2016 Tech Tour Seminar (8 hours), Promega, Seattle, WA, 2016

The 5 Languages of Appreciation in the Workplace: Empowering Organizations by Encouraging People (4 hours), American Society of Crime Laboratory Directors Symposium, Bellevue, WA, 2016

Addressing Social Issues Encountered in Forensic Science Laboratories: An Interactive Workshop (4 hours), American Society of Crime Laboratory Directors Symposium, Bellevue, WA, 2016

Armed Xpert User Group Symposium (24 hours), US Army Criminal Investigation Laboratory, Atlanta, GA, 2016

Forensic Mixtures: Assessment, Analysis and Technology: Current Methods, New Approaches and Disruptive Technologies (8 hours), International Symposium on Human Identification, Grapevine, TX, 2015

DNA Technical Leaders Meeting (4 hours), International Symposium on Human Identification, Grapevine, TX, 2015

Developing Emotional Intelligence (8 hours), Fred Pryor Seminars, Spokane, WA, 2015

Obtaining Successful DNA Profiles from Challenging Samples (8 hours), American Academy of Forensic Sciences Annual Meeting, Orlando, FL, 2015

PROFESSIONAL TRAINING (cont'd):

Scientific Neutrality in Expert Witness Testimony (4 hours), American Academy of Forensic Sciences Annual Meeting, Orlando, FL, 2015

ASCLD/LAB ISO Assessor Training for Testing Laboratories (40 hours), American Society of Crime Laboratory Directors Laboratory Accreditation Board, Henderson, NV, 2014.

Root Cause Analysis – When Blaming the Analyst Completely Misses the Point (4 hours), American Academy of Forensic Sciences Annual Meeting, Seattle, WA, 2014

Managing the 21st Century Forensic Science Organizations (8 hours), American Academy of Forensic Sciences Annual Meeting, Seattle, WA, 2014

Armed Xpert DNA Mixture Analysis Software Training (8 hours), NicheVision, Seattle, WA, 2013

Amplifying Productivity in Today's Forensic Laboratory (4 hours), American Academy of Forensic Sciences Annual Meeting, Washington DC, 2013

Calculating Likelihood Ratios Incorporating a Probability of Drop-Out (4 hours), American Academy of Forensic Sciences Annual Meeting, Washington DC, 2013

Advanced Y-STR Training (8 hours), Sorenson Forensics, Portland, OR, 2013

HID Future Trends in Forensic DNA Technology, Life Technologies, Seattle, WA, 2012

Plexor HY System and Analysis Software Training (8 hours), Promega, Spokane, WA, 2012

Combined DNA Index System (CODIS) 7.0 Training (20 hours), FBI, Portland, OR, 2012

Crime Scene Analysis and Reconstruction (40 hours), Green Forensics, Shelton, WA, 2012

Advanced DNA Mixture Interpretations and Statistical Approaches (16 hours), American Academy of Forensic Sciences Annual Meeting, Atlanta, GA, 2012

Bloodstain Pattern Analysis II (40 hours), Bevel & Gardner, Shelton, WA, 2012

Statistical Methods for DNA Evidence (8 hours), International Conference on Forensic Inference and Statistics, Seattle, WA, 2011

ASCLD/LAB Internal Auditor Training (32 hours), American Society of Crime Lab Directors/ Laboratory Accreditation Board, Emeryville, CA, 2011

Bloodstain Pattern Interpretation from Photographs (4 hours), International Association for Identification Annual Conference, Spokane, WA, 2010

PROFESSIONAL TRAINING (cont'd):

Bloodstain Pattern Interpretation on Clothing (4 hours), International Association for Identification Annual Conference, Spokane, WA, 2010

Crime Scene Fingerprint Processing (8 hours), Washington State Patrol, Spokane, WA, 2010

Advances in Forensic DNA Analysis (10 hours), American Academy of Forensic Sciences Annual Meeting, Seattle, WA, 2010

Bullet Trajectory Analysis (10 hours), Washington State Patrol, Seattle, WA, 2009

Firearms Safety Handling Procedures (6 hours), Washington State Patrol, Seattle, WA, 2009

DNA Mixture Analysis (24 hours), Northwest Association of Forensic Scientists Fall Conference, Fort Collins, CO, 2009

DNA Population Statistics & Likelihood Ratios (24 hours), George Carmody, Seattle, WA, 2009

Advanced GeneMapper ID-X Software Training, Applied Biosystems, Seattle, WA, 2009

Forensic Y-STR Training (34 hours), Marshall University Forensic Science Centre, Huntington, VA, 2009

Future Trends in Forensic DNA Technology, Applied Biosystems, Seattle, WA, 2009

Combined DNA Index System (CODIS) Training, FBI, Arlington, VA, 2009

Leadership in Police Organizations, Washington State Patrol, Shelton, WA, 2008

Quality Assurance Standards Auditor Training, FBI, Arlington, VA, 2008

Future Trends in Forensic DNA Technology, Applied Biosystems, Seattle, WA, 2008

Human Identification e-Symposium on DNA Interpretation, The Forensic Institute, UK, 2008

Homicide Investigation, Trial Preparation and Testimony, American Academy of Forensic Sciences Annual Meeting, Washington DC, 2008

GeneMapper ID-X Next Generation Forensic Data Analysis Software and Expert System, Applied Biosystems, Webinar, 2007

Expert Evidence in Criminal Proceedings, Osgoode Hall Law School, Canada, 2007

Forensic DNA Statistics (24 hours), Bruce Budowle, Toronto, Ontario, Canada, 2007

PROFESSIONAL TRAINING (cont'd):

Annual Workshop on DNA Technology, Centre of Forensic Sciences & Promega, Canada, 2007

Human Identification e-Symposium on Profiling Degraded and Low Amounts of DNA, The Forensic Institute, UK, 2007

Forensic DNA Statistics (24 hours), Bruce Budowle & John Planz, Tucson, AZ, 2006

Math and Physics for Bloodstain Pattern Analysis (40 hours), Ontario Police College, Canada, 2006

Future Trends in Forensic DNA Technology, Applied Biosystems, Phoenix, AZ, 2006

DNA Mixture Interpretation (24 hours), George Carmody & Ray Wickenheiser, Phoenix, AZ, 2006

Statistical Analysis of Forensic DNA Evidence (16 hours), George Carmody, Phoenix, AZ, 2006

Promega 2005 Summer Expedition, Phoenix, AZ, 2005.

Basic & Advanced Bloodstain Pattern Recognition (80 hours), MVP Forensics, Scottsdale, AZ, 2005

Parentage and Mixture Statistics, International Symposium on Human Identification, Phoenix, AZ, 2004

Y-STRs: Practical Considerations and Interpretation Issues, International Symposium on Human Identification, Phoenix, AZ, 2004

Future Trends in Forensic DNA Technology, Applied Biosystems, Phoenix, AZ, 2004

Forensic Serology Training, Arizona Department of Public Safety, Phoenix, AZ, 03/04-05/04

Advanced Course on Forensic Human Identification (35 hours), Forensic Toxicological Service Analytical Unit, St. George's Hospital Medical School, London, UK, 2003

Y-Chromosome Analysis & Its Application to Forensic Casework, American Academy of Forensic Sciences Annual Meeting, Atlanta, GA, 2002

Basic Fingerprinting Technology, American Academy of Forensic Sciences Annual Meeting, Atlanta, GA, 2002

Blood Pattern Analysis, Forensic Alliance Ltd, Oxford, UK, 2001

PROFESSIONAL TRAINING (cont'd):

Bond Solon Courtroom Skills and Cross Examination Training, Lothian & Borders Police Forensic Lab, Edinburgh, UK, 2001

STR Analysis Data: Processing, Interpretation and Storage, American Academy of Forensic Sciences Annual Meeting, Seattle, WA, 2001

Sexual Offenses Investigation, Lothian & Borders Police Forensic Lab, Edinburgh, UK, 2000

Death Investigation, Jackson County Medical Examiner's Office, Kansas City, MO, 1999

Crime Scene Investigation Techniques Course (80 hours), Kansas City Police Department, Kansas City, MO, 1999

ABI Prism 310 Capillary Electrophoresis and AmpFISTR PCR, PE Biosystems, Kansas City, MO, 1999

Search & Seizure and Courtroom Demeanor, Jackson County Prosecutor, Kansas City, MO, 1999

Internship, Firearms & Toolmarks Section, Centre of Forensic Sciences, Toronto, Canada, 1998

Death Investigation Conference, Jefferson Parish Coroner, New Orleans, LA, 1995

Crime Scene Investigation and Evidence Collection, Peel Police, Mississauga, Canada, 1995

PRESENTATIONS/COURSES INSTRUCTED:

Hot Topics in DNA Analysis; Spokane County Sheriff's Office Detectives; Spokane, WA; 2018

Child Sexual Assault Evidence Collection; Tri-Cities Law Enforcement Officers, Prosecutors, and Medical Staff; Kadlec Hospital, Kennewick, WA; 2013

Washington State Patrol Crime Laboratory Law Enforcement Training; Grant County Law Enforcement Officers; Moses Lake, WA; 2011

Hot Topics in DNA Analysis; Spokane Police Detectives; Spokane, WA; 2011

Identifiler Plus DNA Mixture Interpretation; Washington State Patrol Forensic DNA Analysts; Seattle, WA; 2011

Likelihood Ratio Statistics for DNA Mixture Analysis; Washington State Patrol Forensic DNA Analysts; Seattle, WA; 2010

PRESENTATIONS/COURSES INSTRUCTED (cont'd):

Forensic DNA Analysis; Arizona Homicide Investigators Association Annual Conference; Phoenix, AZ; 2006

Careers in Criminalistics; Criminalistic Students – Everest College; Phoenix, AZ; 2006

Y-STR Casework Experience; Arizona Crime Laboratories Peer Group Meeting; Tucson, AZ; 2006

DNA Evidence Identification, Collection & Preservation for Law Enforcement (via US Dept. of Justice Community Oriented Policing Services Program);

Police Officers - Phoenix, Arizona; January 2006

Police Officers - Reno, Nevada; February 2006

Police Officers (and filmed for DVD) - Huntsville, Texas; March 2006

Police Officers & Civilian DNA experts (Train the Trainer format) - Salt Lake City, Utah; March 2006

Forensic DNA Analysis; Crime scene Investigators and Police Detectives from across Arizona, USA; 2005

DNA Profiling for Forensic Soil Comparisons; Paper Presentation to colleagues - American Academy of Forensic Sciences Annual Conference; Dallas, TX, 2004

Forensic Science Careers; Community College Students - Bolton Sixth Form College Careers Day; Bolton, UK; 2003

Forensic Biology; High School Students – Winstanley College Biology Conference; Wigan, UK; 2003

Biological Evidence Collection & Packaging; Central Ontario Crime Prevention Association; Toronto, Canada; 1998

Blood Evidence Collection; Forensic Science Students – Forensic Science Society; University of Toronto, Canada; 1995

PUBLICATIONS/PRESENTATIONS:

Heath, L. and Saunders, V., Spatial Variation in Bacterial DNA Profiles for Forensic Soil Comparisons. Canadian Society of Forensic Science Journal, 41(1), 29-37, 2008.

Heath, L. and Saunders, V., DNA Profiling for Forensic Soil Comparisons. Journal of Forensic Sciences, 51 (5), 1062-1068, 2006.

Harland, J., Reid, A., Pitt, S., Prosser, M. and **Heath, L.** Do Student Feelings About Their Term-Time Employment Relate to Any Effects on Their Work? Paper presented at Society for Research into Higher Education Annual Conference, Glasgow, UK, 2002

GRANTS AWARDED:

Forensic Science Foundation Acorn Grant, 2003

CONFERENCES ATTENDED:

American Society of Crime Laboratory Directors Annual Symposium – 2016

International Conference on Forensic Inference and Statistics – 2011

International Association for Identification Annual Conference – 2010, 2019

Northwest Association of Forensic Scientists Fall Conference – 2009, 2019

Annual National CODIS Conference – 2021, 2020, 2018, 2017, 2016, 2015, 2013, 2012, 2008

American Academy of Forensic Sciences Annual Meeting – 2022, 2018, 2017, 2015, 2014, 2013, 2012, 2010, 2008, 2004, 2002, 2001, 1998, 1997

International Symposium on Human Identification (Promega) – 2019, 2017, 2015, 2004

Canadian Society of Forensic Science Annual Conference – 1996, 1995

PROFESSIONAL AFFILIATIONS:

Technical Assessor – American Society of Crime Lab Directors Laboratory Accreditation Board (now ANSI-ASQ National Accreditation Board), 2014-Present

Fellow (Molecular Biology) – American Board of Criminalistics, 2011-Present

Member – International Association of Bloodstain Pattern Analysts, 2005-Present

Fellow – American Academy of Forensic Sciences, 2013-Present

Full Member – American Academy of Forensic Sciences, 2005-2013

Provisional Member – American Academy of Forensic Sciences, 2002-2005

Trainee Affiliate – American Academy of Forensic Sciences, 2000-2002

Student Affiliate – American Academy of Forensic Sciences, 1997-2000

Full Member – Forensic Science Society, 2001-2003

Member – Missouri Division of International Association of Identification, 1999-2000

Student Member – Canadian Society of Forensic Science, 1996-1998