

Relationship Testing Statistical Calculation Training

Module 1 Syllabus



AABB Relationship Testing Statistical Calculation Training Module 1: Parentage Calculations

Syllabus

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Association for the Advancement of Blood & Biotherapies

Technical Requirements and Contact Information for Assistance

This program is offered entirely online as independent, self-paced study through AABB's Education Platform located at <u>http://education.aabb.org</u>.

Technical Requirements - learners must:

- Have an internet connection to access the course.
- Navigate and be able to use the features of the course content and Education Platform.

The course can be viewed on a mobile device; however, a desktop or laptop computer is recommended. AABB recommends registered learners use Google Chrome, Safari, Microsoft Edge, or Firefox browsers to access the program. Anyone using MAC or PC can <u>download Google Chrome</u>. Internet Explorer is not supported.

For questions related to the program submit an enquiry via email to the AABB eLearning team at <u>eLearning@aabb.org</u>. A response should be expected Monday – Friday during business hours (US Eastern Standard Time or EST) within 72 hours of request.

Course Description

This unique program seeks to educate laboratory scientists and forensic analysts on the statistical methods used to determine genetic parentage and other familial relationships.

Featuring self-paced, multi-media online training and practice exercises, this course includes three (3) units:

- Unit 1: Foundations in Parentage Calculations
- Unit 2: Paternity Trio Calculations
- Unit 3: Parentage Duo Calculations

Practice exercise worksheets, downloadable MP3 audio files and a handout of each unit are also included within the course.

Course Goals

Upon completion of this course, learners should be able to:

- Discuss Hardy-Weinberg Equilibrium, Bayes Theorem and prior probability.
- Set up a likelihood ratio equation.
- Calculate individual likelihood ratios for each genetic system tested.
- Calculate the combined likelihood ratio.
- Calculate the probability of relationship (W).
- Perform various parentage calculations.
 - o Trios (M, F, C)
 - **Duos (F, C)**
- Interpret results and write reports that meet the AABB Standards for Relationship Testing Laboratories.

The course is expected to take approximately 4-6 hours to complete and can be taken asynchronously at the convenience of the learner.

Prerequisites

Learners should have a basic understanding of reproductive biology, Mendelian inheritance, and DNA testing through analysis of short tandem repeats (STRs).

Learning Objectives

Each unit builds upon the prior unit and covers elements relevant to developing an overall understanding and foundation of parentage calculations.

Unit 1: Foundations in Parentage Calculations

Upon completion of this unit, a learner should be able to:

- Discuss basic rules of population, probability and frequency.
- Derive mathematical expressions for genotype likelihoods.
- Describe Likelihood Ratios and Paternity Index.

To illustrate the relationship testing fundamentals, paternity testing is used as an example. The fundamental principles in this training apply to other types of relationship tests, such as maternity and siblingship.

Presented by: Megan Shaffer, PhD, S(ACHI)

Unit 2: Paternity Trio Calculations

Upon completion of this unit, a learner should be able to:

• Apply principles described in Unit 1, Foundations in Parentage Calculations, to the analysis of paternity trios: mother, child, and tested man.

Presented by: Liz Kopitke, MS

Unit 3: Parentage Duo Calculations

Upon completion of this unit, a learner should be able to:

• Apply principles described in Unit 1, Foundations in Parentage Calculations, to the analysis of parentage duos using "motherless paternity" (AF-C pairs) as examples, but LR construction and formulas apply equally to maternity testing (M-C pairs).

Presented by: Liz Kopitke, MS

Activities for Successful Completion of the Course

Read and study all materials for each unit and complete each activity as presented including the practice exercises. Since this is a self-paced program, learners may decide how much time is needed to review and study the materials. Follow the units in order as information builds upon preceding lessons.

This foundational course provides material important in understanding the core statistical elements involved in parentage calculations. For successful completion of the course resulting in the conferral of a certificate of completion:

- Watch the video for each unit and complete the practice exercise worksheets provided.
- After completing all units, a course quiz is provided. Answer all of the quiz questions; scoring 80% or higher (21 out of 26 questions to score 80%). The quiz is a pass/fail exercise where learners will have two (2) opportunities to achieve 80% or higher. There is no grade provided for the quiz; rather an opportunity to reinforce your understanding of the content provided in the course. On the quiz:
 - Learners will receive quiz questions (i.e., multiple choice) and asked to select the correct answer.
 - Learners will receive feedback as to whether an answer choice is correct or incorrect.
- Complete the Parentage Calculations Post-Program Evaluation. This is your opportunity to share with AABB your experiences and recommendations to further enhance the program.
- Claim continuing education (CE) credit type (CE certificate/Certificate of Completion issued).

Continuing Education Credits

This course is eligible for six (6) continuing education credits/contact hours for California Nurses, California Lab Personnel, Florida Lab Personnel and General Participation credit. The number and type of credits awarded for this course was determined by the estimated program completion time. This course is not eligible for continuing medical education (CME) credit for physicians. For more information on each credit type please visit the AABB <u>Continuing Education Credits webpage</u>. A continuing education certificate/certificate of completion will be immediately provided to learners upon completing all three units, successful completion of the course quiz, completion of the program evaluation, and claiming your continuing education credit type.

Program Access & Retakes

Access to the program in the AABB Education Platform will be available to learners for one (1) year from the date of registration for the course. This program is self-paced; however, learners must complete all units, worksheet exercises, course quiz, program evaluation, and claim continuing education credit type within the year to receive the Continuing Education Certificate/Certificate of Completion.

Learners are provided two (2) attempts to successfully pass the quiz. If after both attempts the learner does not achieve the minimum score of 80%, the learner will not be able to receive a certificate of completion. AABB provides the opportunity for a retake (2 additional quiz attempts) at a reduced price. Instructions on requesting a retake registration form are provided in the course or the learner can contact <u>elearning@aabb.org</u>.

Course Faculty & Contributors

This course is brought to you by the AABB Relationship Testing Accreditation Committee. While there are numerous participants that have brought this program to fruition, key faculty include *(titles and affiliations at the time of program development)*:

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Program Manager, Relationship Testing

Course References

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Gayon J. From Mendel to epigenetics: History of genetics. C R Biol 2016;339:225-30.

Wenk RE, Houtz T, Chiafari FA. Maternal typing and test sufficiency in parentage analyses. Transfusion 2006;46:199-203.

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