



Examination Candidate Handbook

Latest update: March 2022

Certified Histocompatibility Associate (CHA)

Certified Histocompatibility Technologist (CHT)

Certified Histocompatibility Specialist (CHS)

Certified Histocompatibility Laboratory Director

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ACHI Examination Candidate Handbook

All questions and requests for information about examination application and scheduling should be directed to:

PSI Candidate Services
18000 W. 105th St.
Olathe, KS 66061-7543
Phone: 888-519-9901
Fax: 913-895-4650
Website: <https://www.psonline.com>

All questions and requests for information about the ACHI (formerly known as ABHI) certification program should be directed to:

American College of Histocompatibility and Immunogenetics
1120 Route 73, Suite 200
Mount Laurel, NJ 08054
Phone: 856-335-3299 x7004
Fax: 651-305-3838
Website: <https://www.ashi-hla.org/page/ACHI>

Introduction

The American College of Histocompatibility and Immunogenetics (ACHI) was formerly known as the American Board of Histocompatibility and Immunogenetics (ABHI) until October 2018. The ACHI is a certifying board offering voluntary credentialing examinations in the field of histocompatibility and immunogenetics.

This Candidate Handbook was developed to assist you in preparing for the Certified Histocompatibility Associate (CHA), Technologist (CHT), Specialist (CHS) and Histocompatibility Laboratory Director examinations. These examinations are based on the content outlines developed from a national job analysis that identified tasks that are significant to the practice of histocompatibility associates, technologists, specialists and laboratory directors nationwide.

This handbook provides information about the examination and application process for the ACHI examinations. It outlines the design and content of the examination and guides you throughout the entire examination process from application through test taking. For your convenience, this handbook may also be downloaded from ACHI's website, located at <https://www.ashi-hla.org/page/ACHI>

Independent Testing Agency

ACHI has contracted with PSI Services to assist in the application, administration and scoring of the examinations. PSI is a leader in the testing industry, offering certification, licensing, talent assessment and academic solutions worldwide.

Nondiscrimination Policy

ACHI and PSI do not discriminate among candidates on the basis of race, color, creed, gender, religion, national origin, disability or marital status.

Eligibility Requirements

Applicants must meet the eligibility requirements and provide all supporting documentation for the requested examination as stated in the ACHI application form to gain admission to an examination.

Eligibility Requirements for Certified Histocompatibility Associate (CHA)

1. Completion of 24 hours of college level coursework from an accredited college or university in chemical, physical, biological or clinical laboratory science courses (qualifying courses can include general biology, immunology, zoology, genetics, biochemistry, physiology and clinical laboratory science). A minimum of 6 semester hours of chemistry and 6 semester hours of biology will be required within the 24 hours. Official transcripts will be required to document completed coursework.
2. In addition to the education requirements, the applicant must have a least **two** years of documented* relevant full-time work experience in on approved** laboratory performing histocompatibility testing. The two years of experience must be completed within five years prior to the last day of the month in which the examination is given.

** Documentation of histocompatibility work experience must be in the form of a statement of competency or a letter from the laboratory director verifying length of time in histocompatibility testing and detailing actual work performed with a brief description of the procedures used. This letter must be signed by the lab director. Special consideration **may** be given to applicants in instances where a sponsor's involvement in the field of histocompatibility testing is not in an ASHI/UNOS- or EFI accredited lab (i.e., origin of the laboratory is in a country/region where other governing bodies and organizations associated with the national ministry/department of health oversee and govern these activities) or hold a current ABHI/ACHI certification. In these instances, more weight **may** be placed on the applicant's qualifications and **letters of support**. Please allow additional time for processing in the event further documents are requested.*

*** An approved histocompatibility laboratory must be an ASHI/UNOS-or EFI-accredited laboratory. An applicant with insufficient work experience in an ASHI/UNOS or EFI accredited laboratory can petition to sit for the examination through the SPONSORSHIP route. However, a minimum of two years of relevant work experience is still required.*

Eligibility Requirements for Certified Histocompatibility Technologist (CHT)

1. A baccalaureate degree in chemical, physical, biological or clinical laboratory science from an accredited college or university or possess a baccalaureate degree with at least 24 semester hours of science courses that include – (i) Six semester hours of chemistry; (ii) Six semester hours of biology; and (iii) Twelve semester hours of chemistry, biology, or medical laboratory technology in any combination. Please submit official transcripts documenting completed coursework.
2. In addition to the education requirements, the applicant must have at least **one** year's documented* relevant full-time work experience in an approved** laboratory performing histocompatibility testing. This year of experience must be completed within five years prior to the last day of the month in which the examination is given.

** Documentation of histocompatibility work experience must be in the form of a statement of competency or a letter from the laboratory director verifying length of time in histocompatibility testing and detailing actual work performed with a brief description of the procedures used. This letter must be signed by the lab director. Special consideration **may** be given to applicants in instances where a sponsor's involvement in the field of histocompatibility testing is not in an ASHI/UNOS- or EFI accredited lab (i.e., origin of the laboratory is in a country/region where other governing bodies and organizations associated with the national ministry/department of health oversee and govern these activities) or hold a current ABHI/ACHI certification. In these instances, more weight **may** be placed on the applicant's qualifications and **letters of support**. Please allow additional time for processing in the event further documents are requested.*

*** An approved histocompatibility laboratory must be an ASHI/UNOS-or EFI-accredited laboratory. An applicant with insufficient work experience in an ASHI/UNOS or EFI accredited laboratory can petition to sit for the examination through the SPONSORSHIP route. However, a minimum of two years of relevant work experience is still required.*

Eligibility Requirements for Certified Histocompatibility Specialist (CHS)

1. A baccalaureate degree in chemical, physical, biological or clinical laboratory science from an accredited college or university or possess a baccalaureate degree with at least 24 semester hours of science courses that include – (i) Six semester hours of chemistry; (ii) Six semester hours of biology; and (iii) Twelve semester hours of chemistry, biology, or medical laboratory technology in any combination. Please submit official transcripts documenting completed coursework.
2. At least **five** years of documented,* relevant fulltime work experience in an approved** laboratory performing histocompatibility testing. This experience must be completed within 10 years prior to the last day of the month in which the examination is given.

** Documentation of histocompatibility work experience must be in the form of a statement of competency or a letter from the laboratory director verifying length of time in histocompatibility testing and detailing actual work performed with a brief description of the procedures used. This letter must be signed by the lab director. Special consideration **may** be given to applicants in instances where a sponsor's involvement in the field of histocompatibility testing is not in an ASHI/UNOS- or EFI accredited lab (i.e., origin of the laboratory is in a country/region where other governing bodies and organizations associated with the national ministry/department of health oversee and govern these activities) or hold a current ABHI/ACHI certification. In these instances, more weight **may** be placed on the applicant's qualifications and **letters of support**. Please allow additional time for processing in the event further documents are requested.*

*** An approved histocompatibility laboratory must be an ASHI/UNOS-or EFI-accredited laboratory. An applicant with insufficient work experience in an ASHI/UNOS or EFI accredited laboratory can petition to sit for the examination through the SPONSORSHIP route. However, a minimum of two years of relevant work experience is still required.*

Eligibility Requirements for Certified Histocompatibility Laboratory Director

Earned doctoral degree (PhD) in a biological science or have a medical degree (MD, DO).

In addition to the education requirements, the applicant must have:

1. At least 2 years of full-time post-doctoral laboratory training or experience in immunology, histocompatibility, immunogenetics, or a related field or a residency in clinical and/or anatomic pathology or other related medical specialty and have at least 2 years of fulltime post-doctoral training in directing or supervising high complexity testing in human histocompatibility and immunogenetics in an ASHI-accredited or approved laboratory. Reference letters from the individual or individuals responsible for the histocompatibility training, including their contact information, documenting the focus of training and the level of clinical involvement are required. A copy of a CV must accompany the application.
2. If the applicant has relevant pre-doctoral experience supervising high complexity testing in human histocompatibility and immunogenetics in an ASHI accredited or approved laboratory, this may be credited at a rate of 0.5 years of post-doctoral training per each year of appropriate pre-doctoral experience up to a total of 2 of 4 years of post-doctoral experience. Reference letters from the individual or individuals responsible for the histocompatibility training, including their contact information, documenting the focus of training and the level of clinical involvement are required. A copy of a CV must accompany the application.

Candidates who have received medical postdoctoral training may substitute training in certain specialties to offset a portion of the postdoctoral experience in immunology. For example:

- a. One year equivalent to training received in transfusion medicine/blood bank and clinical immunology/infectious disease serology.
- b. Six months equivalent to training in allergy/immunology and rheumatology and other clinical sub-specialties.

Official documentation of clinical training and experience in histocompatibility and immunogenetics as well as general laboratory management must be submitted.

Experience as described above should have been accrued within an eight-year period prior to submission of this application. Exceptions will be reviewed on an individual basis.

The degree and experience requirements to sit for the ACHI Board exam for Diplomates are similar to the ASHI requirements for a Laboratory Director. Thus, if one passes the ACHI board, he/she will usually be qualified to serve as an ASHI Director for at least one of the categories of testing. The difference may

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lie in the type of experience that is approved and accepted by ASHI. Eligibility to sit for the ACHI Diplomate exam does not guarantee that the individual will be qualified as an ASHI Director upon passing the exam and becoming board-certified. The credentials, training, and experience must be examined and approved by the ASHI Director Training Review and Credentialing Committee Board.

The training curriculum and work experience must appropriately prepare the candidate to fulfill the requirements of a Histocompatibility Laboratory Director. The candidate must provide documentation detailing his/her experience in histocompatibility and immunogenetics as well as general laboratory management. All documentation will be reviewed by the ACHI Credentials Committee.

OFFICIAL DOCUMENTS: Histocompatibility Laboratory Director

1. An **OFFICIAL TRANSCRIPT(S)** bearing the seal and signature of the registrar from the college or university conferring doctoral degree in a biological science. If your transcript is being sent directly to PSI, please indicate this in the appropriate box in section 1 of the application.
2. Documentation of equivalent work experience, as appropriate (see eligibility requirements). Foreign education: If a candidate is basing his/her eligibility on a degree or courses from a foreign university, the official transcript or copy must first be evaluated by the International Education Research Foundation, Inc., P.O. Box 3665, Los Angeles, CA, 90231-3665, 310-258-9451, Fax 310-342-7086. The evaluation must be submitted with the application for the Laboratory Director Examination.
3. **APPLICATION STATEMENT:** The statement at the end of the application must be completed and submitted for the application to be valid. Any application submitted with the completed statement will be deemed ineligible.

Examination Administration

The CHA, CHS, and CHT examinations will be offered four times a year in March, June, September and December. Applications are processed for the corresponding examination eligibility dates according to the table below.

CHA / CHS / CHT Examinations	
Application Dates	Eligibility Dates
October 16 - January 15	March 1 - March 31
January 16 - April 15	June 1 - June 30
April 16 - July 15	September 1 - September 30
July 16 - October 15	December 1 - December 31

The Histocompatibility Laboratory Director Examination applications are processed only one time per year with the corresponding examination eligibility dates.

Laboratory Director Examinations	
Application Dates	Eligibility Dates
January 1 - June 1	September 1 - September 30

The examination is delivered by computer at more than 190 PSI Test Centers geographically located throughout the United States. The examination is administered by appointment only Monday through Saturday at 9:00 a.m. and 1:30 p.m. during the months of March, June, September and December. Available dates will be indicated when scheduling your examination. Candidates are scheduled on a first-come, first-served basis.

The examinations are not offered on the first Monday in September, in observance of the Labor Day holiday, or during the Christmas holiday (December 24-26).

Associates, Technologists and Specialists will be given 3.5 hours of testing time.

Candidates for the Laboratory Directors examination will be given a total of 5 hours to complete the examination. Computer based testing allows 4-hour testing sessions, therefore 2 sessions of testing will be required for the directors, e.g. a morning session and an afternoon session.

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The content area of the Histocompatibility Laboratory Directors examination will be divided as follows:

Part 1: Content categories 2 and 5; 113 scored items to be administered in 3 hours.

Part 2: Content categories 1, 3, and 4; 87 scored items to be administered in 2 hours.

Please be aware that you will be required to complete both sessions to obtain a final score for testing.

Registering for an Examination

You should ensure that the ACHI Examination Application form has been properly completed and that the information provided is accurate. Your careful attention will enable prompt and efficient processing. You will not be able to schedule an examination appointment with PSI until the ACHI Application form and all verifying documents have been processed. PSI will send written notification via email to registered candidates with examination scheduling procedures.

If an application is processed and deemed ineligible, you will be notified in writing and given 10 business days from the ineligibility date to submit additional documentation. If the additional information is received after the 10 day requirement, the application will be processed for the next available testing window. After six months of an application's ineligibility, examination fees will be refunded less a \$75 processing fee.

FEES: You must submit the appropriate fee made payable to PSI Services Inc. with a complete examination application. Payment may be made by credit card (American Express, VISA, MasterCard or Discover), personal check, cashier's check or money order. A \$25 fee will be charged for any payment returned unpaid by the bank for any reason. Cashing of your check DOES NOT confirm acceptance to sit for the examination. In the event a candidate's application is rejected by ACHI, a \$75 non-refundable processing fee will be withheld, and the remainder will be returned to the candidate.

The examination fees are:

CHA – \$205 USD

CHT – \$225 USD

CHS – \$250 USD

Histocompatibility Laboratory Director – \$900 USD

Examination fees are subject to change.

SCHEDULING AN EXAMINATION: After you have received written confirmation from PSI, there are two ways to schedule an appointment for the examination.

1. Online Scheduling: You may schedule an examination appointment online at any time by using PSI's online application/scheduling service. To use this service, follow these easy steps:

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- Go to <https://www.psonline.com> and select “Candidates.”
- Follow the simple, step-by-step instructions to select your examination program and register for an examination.

OR

2. Telephone Scheduling: Call PSI at 888-519-9901 to schedule an examination appointment. This toll-free number is answered from 7:00 a.m. to 9:00 p.m. (Central Time) Monday through Thursday, 7:00 a.m. to 7:00 p.m. on Friday and 8:30 a.m. to 5:00 p.m. on Saturday.

When scheduling an examination appointment, you will need to provide your Social Security number as a unique identification number. PSI will use your Social Security number only as an identification number in maintaining your record. Also, be prepared to confirm a location and a preferred date and time for testing.

When you contact PSI to schedule an examination appointment, you will be notified of the time to report to the Test Center. It is the candidate’s responsibility to arrive at the Test Center on the date and time scheduled. Make a note of your examination appointment. If an email address is provided, an appointment confirmation email will be sent within 24 hours from the time of the confirmed appointment.

REQUEST FOR INTERNATIONAL TEST CENTER (including U.S.

Territories): International test centers may be arranged for candidates living outside of the United States. Reservations for these special sites require an additional test center fee of \$225. The ACHI examinations are offered in computerized format.

For a complete list of international PSI Test Centers, visit the www.psonline.com website. PSI is working toward continued expansion of the Test Center Network, and ACHI recommends that you continue to check the available list for additional sites.

If you have international scheduling questions or if you are ready to start the international scheduling process, please email AMPIntlExamServices@goAMP.com

SPECIAL ARRANGMENTS FOR CANDIDATES WITH DISABILITIES: ACHI and PSI comply with the Americans with Disabilities Act and strive to ensure that no individual with a disability is deprived of the opportunity to take the examination solely by reason of that disability. ACHI and PSI will provide reasonable accommodations for candidates with disabilities.

Wheelchair access is available at all Test Centers. Candidates with visual, sensory or physical disabilities that would prevent them from taking the examination under standard conditions may request special accommodations and arrangements. Candidates testing with approved special accommodations should schedule their examination via PSI's toll-free number to ensure their accommodations are confirmed. Be sure to inform PSI of your need for special accommodations when calling to schedule your examination.

EXAMINATION APPOINTMENT CHANGES: You may reschedule your examination appointment at no charge once by calling PSI at 888-519-9901 at least two business days prior to your scheduled examination appointment. (See table below.)

If your examination is scheduled on...	You must contact PSI by 3:00 p.m. Central Time to reschedule the examination by the previous...
Monday	Wednesday
Tuesday	Thursday
Wednesday	Friday
Thursday	Monday
Friday/Saturday	Tuesday

MISSED APPOINTMENTS AND FORFEITURES: You will forfeit the examination registration and all fees paid to take the examination under the following circumstances.

- You do not attempt an examination within the approved eligibility period,
- You wish to reschedule an examination but fail to contact PSI at least two business days prior to the scheduled testing session,
- You wish to reschedule a second time within your eligibility period,
- You wish to transfer to an alternate eligibility period,
- You appear more than 15 minutes late for an examination,
- You fail to report for an examination appointment, or
- You fail to provide proper ID at the Test Center.

A letter of intent and full examination fee are required to re-register for the examination.

INCLEMENT WEATHER, POWER FAILURE, AND/OR EMERGENCIES: In the event of inclement weather or unforeseen emergencies on the day of an examination, PSI will determine whether circumstances warrant the cancellation, and subsequent rescheduling, of an

examination. The examination will usually not be rescheduled if the Test Center personnel are able to open the Test Center.

You may visit the www.psonline.com website prior to the examination to determine if PSI has been advised that any Test Centers are closed. Every attempt is made to administer the examination as scheduled; however, should an examination be canceled at a Test Center, all scheduled candidates will receive notification following the examination regarding rescheduling or reapplication procedures.

If power to a Test Center is temporarily interrupted during an administration, your examination will be restarted where you left off and you may continue the examination. The responses provided up to the point of interruption will be intact, but for security reasons the questions will be scrambled.

Examination Content

Information regarding the content of the examination is presented in this handbook. The content outlines will give you a general impression of the examination and, with closer inspection, can give you specific study direction by revealing the relative importance given to each category on the examination.

AMERICAN COLLEGE OF HISTOCOMPATIBILITY AND IMMUNOGENETICS **Certified Histocompatibility Technologist and** **Certified Histocompatibility Associate** **Detailed Content Outline**

I. General Laboratory Skills – 12 items

- A. Specimen Collection and Handling
 1. Ship and receive samples (e.g., packaging, labeling, transport)
 2. Verify and maintain sample identity
 3. Verify requisition documentation
 4. Perform venipuncture
- B. Understand and follow laboratory safety and cleaning information and procedures (e.g., sharps, flammables, corrosives, volatiles, infectious agents)
- C. Monitor and maintain supply inventories
- D. Maintain patient records (paper or electronic)

E. Perform basic laboratory math (e.g., calculate totals, concentrations or dilutions based on counts, percentages or molarity)

II. Histocompatibility and Immunogenetics Testing – 58 items

A. Prepare, process, and store specimens (e.g., cryopreservation, target cell selection, DNA extraction, centrifugation, DTT treatment, adsorption, Pronase treatment, viability, concentration, sterility)

1. Theory (e.g., know how things work and why they are or are not appropriate in a particular case)
2. Application (e.g., know how things are done and when they are recommended or required)

B. Prepare, label, and store reagents (e.g., reconstitution, pH, sterility, lot number, expiration dates)

1. Theory (e.g., know how things work and why they are or are not appropriate in a particular case)
2. Application (e.g., know how things are done and when they are recommended or required)

C. Test Selection

1. Ensure the assay selected is appropriate for the intended purpose (e.g., level of resolution, sensitivity, limitations, variations)
 - a. Theory (e.g., know how the assay works and why it is or is not appropriate in a particular case)
 - b. Application (e.g., know how to perform an assay and when it is recommended or required)
2. Ensure the assay components are appropriate for the intended purpose (e.g., panel selection, primer and probe design, fluorescent markers, secondary antibody)
 - a. Theory (e.g., know how a component or process works and why it is or is not appropriate in a particular case)
 - b. Application (e.g., know how to perform or use a component or process and when it is recommended or required)

D. Ensure that the selection and use of equipment and materials are appropriate for the intended purpose (e.g., pipettors (adjustable ranges), plastic ware (composition), centrifuge rotors (style, radius), flow cytometers (PMT settings and filters, compensation, log or linear mode))

1. Theory (e.g., know how the equipment and materials work and why they are or are not appropriate in a particular case)

2. Application (e.g., know how to use the equipment and materials and when they are recommended or required)

E. Cell Associated Analytes

1. Assay for cell components that characterize or predict immunological status
 - a. Perform typing for transplantation, transfusion, disease association, or pharmacological applications (e.g., HLA Class-I & II, ABO, MICA, KIR)
 - b. Identify genes defining alleles of secreted factors (e.g., IFN, TNF)
 - c. Identify genes or loci driving cell processes (e.g., siRNA)
2. Assay for cell processes that characterize or predict immunological status (e.g., cell stimulation assays)

F. Secreted Analytes

1. Assay for secreted factors that characterize or predict immunological status
 - a. Identify and characterize antibodies (e.g., HLA Class-I & II, MICA, autoantibody, presence, absence, isotype, titre, PRA, specificity, crossmatch)
 - b. Identify and characterize Cytokines
 - c. Identify and characterize soluble forms of cell associated components (e.g., sHLA, sCD30)

G. Quality Control and Assurance

1. Evaluate and document the acceptability of specimens (collected, processed, or stored)
2. Evaluate and document the acceptability of reagents (prepared, labeled, or stored)
3. Evaluate and document the acceptability of individual assays or batch runs
4. Adhere to policies and guidelines to ensure assay integrity (e.g., maintain physical separation, avoid carry-over)

III. Test Interpretation and Reporting – 45 items

A. Interpret or calculate results

1. assign genotype, phenotype, haplotype
2. determine presence, absence, specificity, titre, isotype (e.g., HLA antibody, cytokine levels)
3. assess compatibility (e.g., crossmatch, HLA, GVH, HVG, KIR)
4. calculate results (e.g., PRA, cPRA, chi-square, r-value, engraftment/chimerism, relative risk)

B. Recognize common factors affecting interpretation (e.g., impact of linkage disequilibrium, null alleles, allele frequencies, CREGs, primer dimers, therapeutic agents)

C. Identify and address ambiguous results

- D. Identify and address atypical results (e.g., possibility of technical error)
- E. Identify and address differences between the current assay results and other results or clinical information
- F. Results Reporting
 - 1. Review reports for complete and required (i.e., reporting requirements specific to HLA) information
 - 2. Review reports for accuracy

IV. Histocompatibility and Immunogenetics Testing Principles and Theory – 16 items

- A. Understand nomenclature
- B. Understand relevant biological and therapeutic processes, mechanisms, and strategies (e.g., primary and secondary immune responses, tolerance, desensitization, immunosuppression)
- C. Understand the biological roles and characteristics of the analytes detected (e.g., properties of alleles, isotypes or subtypes, differences between MHC Class-I & II including antigen presentation, distribution, and structure)
- D. Understand the clinical significance of assay results (e.g., disease associations, vaccines, drug sensitivity, determination of unacceptable antigens)

V. Quality Systems – 15 items

- A. Perform and document QC, QA and compliance activities (not covered in II.G above) as mandated by relevant law and regulatory agencies.
 - 1. Understand and comply with regulations (e.g., HIPPA, CLIA, ASHI, OSHA)
 - 2. Perform routine monitoring of instruments and temperatures
 - 3. Maintain licensure and continuing education
 - 4. Perform competency assessments (of technical ability)
 - 5. Create and maintain procedure manuals
 - 6. Ensure compliance with laboratory safety requirements
 - 7. Ensure compliance with general clinical specimen collection and handling requirements
 - 8. Ensure compliance with general clinical reporting requirements when reporting results
 - 9. Perform assay validation
 - 10. Utilize quality indices (e.g., turnaround times, retest rates, Levey-Jennings)

11. Participate in risk management and assessment activities (e.g., perform or generate error tracking, occurrence reports, root cause analysis)

VI. Supervisory Functions and Management – 4 items

- A. Participate in the creation or monitoring of work schedules and duty assignments
- B. Participate in the training and education of laboratory staff or other medical professionals

AMERICAN COLLEGE OF HISTOCOMPATIBILITY AND IMMUNOGENETICS Certified Histocompatibility Specialist Detailed Content Outline

I. General Laboratory Skills – 6 items

- A. Specimen Collection and Handling
 1. Ship and receive samples (e.g., packaging, labeling, transport)
 2. Verify and maintain sample identity
 3. Verify requisition documentation
 4. Perform venipuncture
- B. Understand and follow laboratory safety and cleaning information and procedures (e.g., sharps, flammables, corrosives, volatiles, infectious agents)
- C. Monitor and maintain supply inventories
- D. Maintain patient records (paper or electronic)
- E. Perform basic laboratory math (e.g., calculate totals, concentrations or dilutions based on counts, percentages or molarity)

II. Histocompatibility and Immunogenetics Testing – 48 items

- A. Prepare, process, and store specimens (e.g., cryopreservation, target cell selection, DNA extraction, centrifugation, DTT treatment, adsorption, Pronase treatment, viability, concentration, sterility)

1. Theory (e.g., know how things work and why they are or are not appropriate in a particular case)
 2. Application (e.g., know how things are done and when they are recommended or required)
- B. Prepare, label, and store reagents (e.g., reconstitution, pH, sterility, lot number, expiration dates)
1. Theory (e.g., know how things work and why they are or are not appropriate in a particular case)
 2. Application (e.g., know how things are done and when they are recommended or required)
- C. Test Selection
1. Ensure the assay selected is appropriate for the intended purpose (e.g., level of resolution, sensitivity, limitations, variations)
 - a. Theory (e.g., know how the assay works and why it is or is not appropriate in a particular case)
 - b. Application (e.g., know how to perform an assay and when it is recommended or required)
 2. Ensure the assay components are appropriate for the intended purpose (e.g., panel selection, primer and probe design, fluorescent markers, secondary antibody)
 - a. Theory (e.g., know how a component or process works and why it is or is not appropriate in a particular case)
 - b. Application (e.g., know how to perform or use a component or process and when it is recommended or required)
- D. Ensure that the selection and use of equipment and materials are appropriate for the intended purpose (e.g., pipettors (adjustable ranges), plastic ware (composition), centrifuge rotors (style, radius), flow cytometers (PMT settings and filters, compensation, log or linear mode))
1. Theory (e.g., know how the equipment and materials work and why they are or are not appropriate in a particular case)
 2. Application (e.g., know how to use the equipment and materials and when they are recommended or required)
- E. Cell Associated Analytes
1. Assay for cell components that characterize or predict immunological status
 - a. Perform typing for transplantation, transfusion, disease association, or pharmacological applications (e.g., HLA Class-I & II, ABO, MICA, KIR)
 - b. Identify genes defining alleles of secreted factors (e.g., IFN, TNF)
 - c. Identify genes or loci driving cell processes (e.g., siRNA)

2. Assay for cell processes that characterize or predict immunological status (e.g., cell stimulation assays)

F. Secreted Analytes

1. Assay for secreted factors that characterize or predict immunological status
 - a. Identify and characterize antibodies (e.g., HLA Class-I & II, MICA, autoantibody, presence, absence, isotype, titre, PRA, specificity, crossmatch)
 - b. Identify and characterize Cytokines
 - c. Identify and characterize soluble forms of cell associated components (e.g., sHLA, sCD30)

G. Quality Control and Assurance

1. Evaluate and document the acceptability of specimens (collected, processed, or stored)
2. Evaluate and document the acceptability of reagents (prepared, labeled, or stored)
3. Evaluate and document the acceptability of individual assays or batch runs
4. Adhere to policies and guidelines to ensure assay integrity (e.g., maintain physical separation, avoid carry-over)

III. Test Interpretation and Reporting – 51 items

A. Interpret or calculate results

1. assign genotype, phenotype, haplotype
2. determine presence, absence, specificity, titre, isotype (e.g., HLA antibody, cytokine levels)
3. assess compatibility (e.g., crossmatch, HLA, GVH, HVG, KIR)
4. calculate results (e.g., PRA, cPRA, chi-square, r-value, engraftment/chimerism, relative risk)

B. Recognize common factors affecting interpretation (e.g., impact of linkage disequilibrium, null alleles, allele frequencies, CREGs, primer dimers, therapeutic agents)

C. Identify and address ambiguous results

D. Identify and address atypical results (e.g., possibility of technical error)

E. Identify and address differences between the current assay results and other results or clinical information

F. Results Reporting

1. Review reports for complete and required (i.e., reporting requirements specific to HLA) information
2. Review reports for accuracy

IV. Histocompatibility and Immunogenetics Testing Principles and Theory – 16 items

- A. Understand nomenclature
- B. Understand relevant biological and therapeutic processes, mechanisms, and strategies (e.g., primary and secondary immune responses, tolerance, desensitization, immunosuppression)
- C. Understand the biological roles and characteristics of the analytes detected (e.g., properties of alleles, isotypes or subtypes, differences between MHC Class-I & II including antigen presentation, distribution, and structure)
- D. Understand the clinical significance of assay results (e.g., disease associations, vaccines, drug sensitivity, determination of unacceptable antigens)

V. Quality Systems – 19 items

- A. Perform and document QC, QA and compliance activities (not covered in II.G above) as mandated by relevant law and regulatory agencies.
 - 1. Understand and comply with regulations (e.g., HIPPA, CLIA, ASHI, OSHA)
 - 2. Perform routine monitoring of instruments and temperatures
 - 3. Maintain licensure and continuing education
 - 4. Perform competency assessments (of technical ability)
 - 5. Create and maintain procedure manuals
 - 6. Ensure compliance with laboratory safety requirements
 - 7. Ensure compliance with general clinical specimen collection and handling requirements
 - 8. Ensure compliance with general clinical reporting requirements when reporting results
 - 9. Perform assay validation
 - 10. Utilize quality indices (e.g., turnaround times, retest rates, Levey-Jennings)
 - 11. Participate in risk management and assessment activities (e.g., perform or generate error tracking, occurrence reports, root cause analysis)

VI. Supervisory Functions and Management – 10 items

- A. Participate in the creation or monitoring of work schedules and duty assignments

- B. Participate in the training and education of laboratory staff or other medical professionals
- C. Participate in the hiring and discipline of laboratory staff and utilize institutional and regulatory policies regarding employee selection, job descriptions, performance evaluations (in the “business sense”), benefits, counseling and grievance procedures
- D. Participate in the budgeting process
- E. Participate in the allocation of space or laboratory design

AMERICAN COLLEGE OF HISTOCOMPATIBILITY AND IMMUNOGENETICS

Laboratory Director

Detailed Content Outline

I. Administration and Management – 40 items

- A. Quality Assurance (16 items)
 - 1. Determine if technical staff has received training and continuing education
 - 2. Select external laboratory proficiency testing programs or develop alternatives
 - 3. Develop quality assurance programs (e.g., appropriateness of work, timeliness of work)
 - 4. Monitor quality assurance program (e.g., monitor quality indicators)
 - 5. Evaluate competency of laboratories used for referral testing
 - 6. Monitor test utilization
 - 7. Review test results for accuracy and completeness
 - 8. Review safety requirement procedures followed when hazardous conditions occur (e.g., biological, chemical, fire, disaster)
- B. Fiscal Management (8 items)
 - 1. Allocate staff and resources
 - 2. Justify new and existing staff positions
 - 3. Consult with administrative personnel on laboratory procedures (e.g., accounting, billing, purchasing)
 - 4. Develop laboratory budget
 - 5. Develop fee structure for laboratory services
 - 6. Develop laboratory cost containment measures

7. Evaluate testing procedures considering cost/benefit criteria
 8. Monitor laboratory budget
 9. Negotiate contracts
 10. Negotiate personnel salaries and benefits
 11. Negotiate for laboratory equipment and facilities
 12. Negotiate resources for laboratory programs
 13. Develop fee structure for research testing
- C. Personnel Management (8 items)
1. Assign all duties and responsibilities of consultants, supervisors, and technologists
 2. Authorize or conduct personnel actions:
 - a. classification decisions
 - b. employee selection (e.g., interview, application review, reference checks)
 - c. grievance procedures
 - d. performance evaluations
 - e. performance feedback
 - f. promotions
 - g. qualification determination
 - h. salary determination
 - i. transfers
 - j. terminations
 3. Follow institutional guidelines on counseling personnel on personal or interpersonal problems
 4. Determine administrative actions to be taken from proficiency testing results
 5. Develop standards of performance for laboratory personnel
 6. Develop job descriptions
 7. Develop workload indicators
 8. Direct staff compliance with all federal, state, and local safety laws and regulations
 9. Evaluate competency of laboratory personnel:
 - a. assess performance of duplicate testing
 - b. assess performance of blind testing
 - c. assess performance of equipment maintenance procedures
 - d. assess problem solving skills
 - e. monitor recording of test results
 - f. observe test performance
 - g. review worksheets
 10. Evaluate staff knowledge of all federal, state, and local safety laws and regulations
 11. Monitor workload indicators
 12. Prevent unauthorized deviations from established laboratory procedures

13. Monitor internal and external work standards and regulations

D. Laboratory Operations (8 items)

1. Approve source of all reagents
2. Authorize a staff member to approve test reports
3. Authorize a staff member to release (sign) test reports
4. Determine if established protocols are being followed
5. Authorize deviations from established procedures, processes, and protocols when clinically indicated
6. Develop protocols for specimen collection and handling (including rejection criteria)
7. Develop protocols for collection, organization, and systematic retrieval of all test results
8. Develop or implement protocols and systems for safe handling, storage, and disposal of biological, chemical, and radioactive materials in compliance with governmental safety requirements
9. Develop procedures for laboratory test reporting to establish information to include on reports
10. Develop procedures for laboratory test reporting to determine when interpretive notes are necessary
11. Develop and maintain policy/protocol manual
12. Direct the implementation of necessary remedial actions when test results do not meet established limits of accuracy
13. Monitor remedial actions for effectiveness
14. Direct laboratory compliance with regulatory agencies
15. Evaluate equipment, personnel, and space requirements for reliable test performance
16. Direct implementation of institutional policy and programs
17. Maintain effective working relationships (e.g., interact with accrediting agencies, administrative officials, citizens groups, medical community, organ procurement organizations, regulatory agencies)
18. Maintain knowledge of professional liability and risk management issues
19. Participate in meetings with clinical teams
20. Plan short-term and long-term laboratory objectives
21. Investigate and resolve client complaints
22. Serve as managerial resource
23. Supervise laboratory equipment maintenance
24. Supervise laboratory staff
25. Supervise the reporting of all laboratory results
26. Ensure laboratory compliance with laws regarding protected health information

II. Clinical Functions – 65 items

A. Interpretation of Results (22 items)

1. Analyze immunologic risk factors for transplantation
2. Interpret and evaluate test results according to the clinical application
3. Interpret individual test results for correlation with clinical outcome
4. Define appropriate resolution of HLA type for clinical application
5. Provide interpretive notes for laboratory test reports
6. Review and sign test reports

B. Provide Consultation (22 items)

1. Consult with medical services regarding testing needs
2. Provide consultation to clinical teams in the areas of:
 - a. histocompatibility (including donor selection)
 - b. immunogenetics (including disease association, pharmacogenomics)
 - c. transplantation (including post-transplant monitoring)
3. Provide consultation to clinical teams on the interpretation of test results
4. Provide consultation on appropriateness of tests and results to interested parties (e.g., attorneys, parents, patients, other clients)
5. Provide consultation on alloantibody amelioration or avoidance
6. Serve as clinical resource

C. Correlative Functions (11 items)

1. Evaluate impact of HLA typing and histocompatibility testing on:
 - a. disease diagnosis
 - b. therapeutic regimens
 - c. immune status (including graft versus host disease, chimerism, etc.)
 - d. familial relationships
2. Evaluate impact of patient disease status, therapy, and immune status on laboratory test results
3. Evaluate potential for hyperacute and accelerated rejection
4. Evaluate donor and recipient histocompatibility
5. Evaluate prior sensitization of transplant recipient for clinical relevance
6. Evaluate clinical significance of pre-existing and de novo auto- and allo- antibodies
7. Correlate histocompatibility data with other laboratory tests, and clinical and pathologic findings (e.g., cytogenetics, hematology, histology of biopsies)
8. Verify test validity and accuracy of interpretation by establishing parameters for test results

D. Development of Clinical Testing Protocols (10 items)

1. Establish a process for developing and maintaining clinical testing protocols
2. Determine patient information to be provided to laboratory
3. Determine the appropriate selection of tests with clinical teams for various clinical applications
4. Determine appropriate specimen source and frequency of collection and testing
5. Develop pre- and post-transplant testing protocols
6. Select tests to best meet clinical needs of patient population served by laboratory

III. Technology Development and Implementation – 48 items

A. Development of Tests (16 items)

1. Evaluate new laboratory procedures for clinical utility
2. Select methods for test performance
3. Determine specimen requirements for specific tests
4. Select equipment for test performance
5. Select test reagents
6. Develop appropriate controls for each test
7. Develop testing procedures for special conditions/samples (e.g., abnormal blood profiles)
8. Establish criteria for acceptance of a test run
9. Develop follow-up procedures for test failures
10. Modify laboratory processes to accommodate changing clinical needs
11. Serve as a technical resource

B. Verification of Tests (17 items)

1. Develop quality control procedures to ensure reported test results are within established limits of accuracy
2. Develop equipment performance verification procedures
3. Review quality control data (e.g., reagents, equipment function and calibration)
4. Monitor test results for effectiveness of quality control procedures
5. Analyze clinical data to evaluate utility of test methods (e.g., graft outcome for transplantation, efficiency of drug protocols)
6. Determine actions to be taken after review of equipment verification, quality control data, and test results
7. Identify limitations of the tests employed in the laboratory

C. Implementation of Tests (15 items)

1. Develop, approve, and maintain all technical procedures

2. Validate and approve changes in technical procedures
3. Develop procedures for equipment operation
4. Establish normal ranges for test results
5. Monitor clinical data for ongoing evaluation of the utility of test methods

IV. Educational Activities and Professional Growth – 14 items

A. Education of Healthcare Professionals (5 items)

1. Conduct seminars in histocompatibility and immunogenetics for healthcare professionals
2. Develop and implement training programs for practicing and in-training healthcare professionals (e.g., laboratory staff, coordinators, students, residents, fellows)
3. Develop and implement orientation and training programs for laboratory personnel (e.g., histocompatibility testing, quality control of tests and reagents, preventative maintenance of equipment, safety measures, waste disposal)
4. Develop in-service education program for laboratory staff
 - a. general knowledge
 - b. application of laboratory techniques in clinical medicine
 - c. scientific basis of laboratory techniques
 - d. laboratory policies
5. Evaluate training and continuing education needs of clinical and technical staff
6. Select educational materials for use by laboratory staff (e.g., books, journals, web sites, teleconferences, podcasts)
7. Provide instruction to administrative personnel regarding billing and reimbursement

B. Education of General Public (4 items)

1. Develop educational materials for the public
2. Develop outreach programs and increase awareness of histocompatibility testing

C. Professional Growth (5 items)

1. Evaluate training and continuing education needs of self
2. Participate in immunology, immunogenetics, and transplantation continuing education (e.g., meetings, workshops, teleconferences, online resources)
3. Maintain currency with HLA nomenclature
4. Maintain currency with professional literature
5. Maintain currency with federal and state regulations

V. Scientific Principles – 33 items

A. Application of Basic Science (17 items)

1. Evaluate basic science research as to its clinical relevance
2. Serve as scientific resource
3. Apply basic science to the solution of clinical problems
4. Evaluate non-HLA antigens for their potential to act as histocompatibility antigens

B. Clinical Ramifications (9 items)

1. Analyze histocompatibility and immunogenetics testing in the context of:
 - a. solid organ transplants
 - b. bone marrow transplants
 - c. disease association
 - d. platelet transfusion support
 - e. antibody amelioration
 - f. TRALI
 - g. Pharmacogenomics
2. Evaluate diagnostic performance of new technology

C. Research (7 items)

1. Develop or collaborate on clinical, basic, and translational research projects (e.g., HLA and disease associations, immune phenotyping, development of new methodologies)
2. Develop innovative laboratory tests
3. Enhance performance characteristics of current laboratory tests
4. Identify and adapt methodologies from other disciplines to histocompatibility and immunogenetics testing applications
5. Participate at national or international histocompatibility meetings and workshops (e.g., present research findings)
6. Write scholarly articles, book chapters, grant proposals, etc.

SAMPLE EXAMINATION QUESTIONS *(answer key on next page):*

The ACHI Examinations have been developed to objectively measure the knowledge and skills required for histocompatibility technologists and specialists. The CHA, CHS and CHT examinations contain 150 multiple choice questions plus 20 non-scored questions. The Histocompatibility Laboratory Director examination contains 200 multiple-choice questions. The examinations are developed by an examination committee of experts in the field who are appointed by ACHI.

The following are examples of multiple-choice questions:

1. Which specimen type usually provides the highest yield of B lymphocytes?

- A. serum
- B. peripheral blood
- C. lymph node
- D. spleen

2. The build-up of residue will interfere with the performance of the Hamilton repeating syringe.

Which of the following procedures is most appropriate for cleaning the syringe?

- A. Soak in a strong acid solution.
- B. Rinse with detergent and water.
- C. Autoclave for 20 minutes.
- D. Soak in a clorox solution.

3. In a family study, the following typing is obtained:

Mother HLA –A1, 2, B7, 8

Child HLA –A2, B7, 8

The biological father of the child could have contributed all of the following HLA haplotypes EXCEPT:

- A. Ax, Bx.
- B. A2, B7.
- C. A2, B8.
- D. Ax, B7.

4. Antigen presentation to helper T cells is primarily a function of which of the following MHC classes?

I. Class I II. Class II III. Class III

- A. II only
- B. I and III only
- C. II and III only
- D. I, II, and III

Suggested Study Materials

As a certifying agency, ACHI is not directly involved in assisting individuals to prepare for examinations. Applicants may wish to consult some of the following sources for background and specific information in the various content areas to be covered by the CHA, CHT, CHS, or Histocompatibility Laboratory Director examinations. Alternate materials are also available in most medical libraries.

- **Content Areas**
 - ASHI University – ASHI approved examination study guide materials (not ACHI endorsed)
 - ACHI Statements of Competence for Histocompatibility Personnel, 1998
 - ASHI Standards for Histocompatibility Testing UNOS Standards for Histocompatibility
 - ASHI Laboratory Accreditation Inspection Checklist
 - CAP Laboratory General Checklist
 - CAP Histocompatibility Checklist

- **General Laboratory Skills and Safety**
 - OSHA Guidelines, Federal Register, 56 (No235): pp 64175-64182, 1991
 - CMS CLIA Regulations, Federal Register, 68 (No16): pp 3639-3714, 2003
 - Laboratory Safety: Principles and Practices (1995) Am Society Micro, Washington, DC
 - ASHI/ Laboratory Manual, 4th Ed. 2001, updates 2005

- **Laboratory Management**
 - Clinical Laboratory Medicine, K. McClatchey (ed), Lippincott, Williams & Wilkins, 2001
 - Management: Theory, Process and Practice, RM Hodgetts Clinical Laboratory Management Review. Bi-monthly from CLMA, Williams & Wilkins

- **Basic Immunology**
 - Cellular and Molecular Immunology, 5 th Ed. A. Abbas (ed). Saunders 2005
 - Essential Immunology, 6th Ed. Roitt, Brostoff & Male. Mosby 2001
 - Immunology: The Immune System in Health and Disease, 6th Ed. C. Janeway (ed) Garland Publishing, 2004
 - The Immune System. P. Parham, Garland Publishing, Elsevier Science, 2004
 - Illustrated Dictionary of Immunology, JM Cruse & RE Lewis. CRC Press, 2002

Answer key from quiz on previous page:

Item#	Category	Key
1	3A	D
2	4B	B
3	4A	A
4	5C	A

- **Histocompatibility and Immunogenetics**
 - HLA Facts Book, Marsh, Parham, & Barber, Academic Press, 2005
 - HLA in Health and Disease 2nd Ed., Academic Press, 2000
 - HLA Beyond Tears, 2nd Ed. GE Rodey DeNovo, Inc. 2000
 - The HLA Dictionary 2004, Schreuder, Hurley, Marsh, et al: Tissue Antigens (2005) 65,1-55; or Human Immunology (2005) 66,170-210; or International Journal of Immunogenetics (2005) 32,19-69.

- **Transplantation**
 - Primer on Transplantation, 2nd Ed. Norman & Suki, AST, 2001
 - Clinical Transplants, published yearly 1988-present, Cecka & Terasaki, (eds) UCLA Tissue Typing Laboratory, Los Angeles, CA
 - Hematopoietic Cell Transplantation, 3rd Ed. Thomas, Blume & Forman, Blackwell Science
 - Cord Blood Characteristics: Role in Stem Cell Transplantation. Cohen, Gluckman, Rubinstein & Madrigal (eds). Blackwell Science, Inc. 2000

- **Flow Cytometry**
 - Immunophenotyping, Stewart & Nicholson (eds) Wiley-Liss, Inc, 2000
 - Flow Cytometry in Clinical Diagnosis. Keren (ed) ASCP Press 3rd Ed, 2001
 - Practical Flow Cytometry, 4 th Ed. Shapiro {ed) Wiley-Liss, Inc. 2003

- **Molecular Biology**
 - DNA: The Secret of Life. Barry & Watson, Knopf Publishing, 2003.
 - Genes VIII. Lewin, 8 th Ed, Wiley & Sons, 2003.
 - PCR Technology: Current Innovations, Library of Congress, Cataloging-in-Publication Doto, 2nd Ed, 2003.
 - Molecular Biology of the Cell, 4 th Ed. Alberts, Garland Publishing, 2002.
 - Human Molecular Genetics, J•d Ed. Strachan, AP Read, 2003.
 - Molecular Typing 2000: A Technical Manual for Histocompatibility Laboratories, SEOPF

- **Seminars & Courses**
 - Georgetown Teleconferences offered by the Georgetown University Medical Center via interactive seminars covering many topics in histocompatibility and immunogenetics. Contact Georgetown University Medical Center at 202-784-2909.

- AFDT basic and advanced workshops offered biannually. Topics covered are histocompatibility and immunology and genetics. Contact AFDT at 804-323-9890 for more information.
- ASHI Regional meetings are usually offered in the spring and the ASHI Annual Meeting is usually held in the fall. Contact ASHI Executive Office at 856-335-3299 x7006 and x7007 for more information.
- ASHI/ Quarterly Quizzes, contact ASHI Executive Office of 856-335-3299 x 7005.

Taking the Examination

Your examination will be given by computer at a PSI Test Center. You do not need any computer experience or typing skills to take your examination. On the day of your examination appointment, report to the Test Center no later than your scheduled testing time. Look for the signs indicating PSI Test Center Check-in. IF YOU ARRIVE MORE THAN 15 MINUTES AFTER THE SCHEDULED TESTING TIME YOU WILL NOT BE ADMITTED.

IDENTIFICATION: To gain admission to the Test Center, you must present two forms of identification. The primary form must be government issued, current and include your name, signature and photograph. No form of temporary identification will be accepted. You will also be required to sign a roster for verification of identity.

- Examples of valid primary forms of identification are: driver's license with photograph; state identification card with photograph; passport; military identification card with photograph.
- The secondary form of identification must display your name and signature for signature verification (e.g., credit card with signature, social security card with signature, employment/student ID card with signature).
- If your name on your registration is different than it appears on your identification, you must bring proof of your name change (e.g., marriage license, divorce decree or court order).

Candidates must have proper identification to gain admission to the Test Center. Failure to provide appropriate identification at the time of the examination is considered a missed appointment. There will be no refund of examination fees.

SECURITY: PSI administration and security standards are designed to ensure all candidates are provided the same opportunity to demonstrate their abilities. The Test Center is continuously monitored by audio and video surveillance equipment for security purposes.

The following security procedures apply during the examination:

- Examinations are proprietary. No cameras, notes, tape recorders, pagers or cellular/smart phones are allowed in the testing room. Possession of a cellular/smart phone or other electronic devices is strictly prohibited and will result in dismissal from the examination.
- Only silent, non-programmable calculators without alpha keys or printing capabilities are allowed in the testing room.
- No guests, visitors or family members are allowed in the testing room or reception areas.

PERSONAL BELONGINGS: No personal items, valuables, or weapons should be brought to the Test Center. Only wallets and keys are permitted. Coats must be left outside the testing room. You will be provided a soft locker to store your wallet and/or keys with you in the testing room. The Test Center Administrator will lock the soft locker prior to you entering the testing room. You will not have access to these items until after the examination is completed. Please note the following items will not be allowed in the testing room except securely locked in the soft locker.

- watches
- hats
- wallets
- keys

Once you have placed everything into the soft locker, you will be asked to pull your pockets out to ensure they are empty. If all personal items will not fit in the soft locker you will not be able to test. The site will not store any personal belongings.

If any personal items are observed or heard (e.g., cellular/smart phone, alarm) in the testing room after the examination is started, the administration will be forfeited.

EXAMINATION RESTRICTIONS:

- Pencils will be provided during check-in.

ACHI Examination Candidate Handbook

- You will be provided with one piece of scratch paper at a time to use during the examination, unless noted on the sign-in roster for a particular candidate. You must return the scratch paper to the supervisor at the completion of testing, or you will not receive your score report.
- No documents or notes of any kind may be removed from the Test Center.
- No questions concerning the content of the examination may be asked during the examination.
- Eating, drinking or smoking will not be permitted in the Test Center.
- You may take a break whenever you wish, but you will not be allowed additional time to make up for time lost during breaks.

MISCONDUCT: If you engage in any of the following conduct during the examination you may be dismissed, your scores will not be reported and examination fees will not be refunded. Examples of misconduct are when you:

- create a disturbance, are abusive, or otherwise uncooperative;
- display and/or use electronic communications equipment such as pagers, cellular/smart phones;
- talk or participate in conversation with other examination candidates;
- give or receive help or are suspected of doing so;
- leave the Test Center during the administration;
- attempt to record examination questions or make notes;
- attempt to take the examination for someone else;
- are observed with personal belongings, or
- are observed with notes, books or other aids without it being noted on the roster.

COPYRIGHTED EXAMINATION QUESTIONS: All examination questions are the copyrighted property of ACHI. It is forbidden under federal copyright law to copy, reproduce, record, distribute or display these examination questions by any means, in whole or in part. Doing so may subject you to severe civil and criminal penalties.

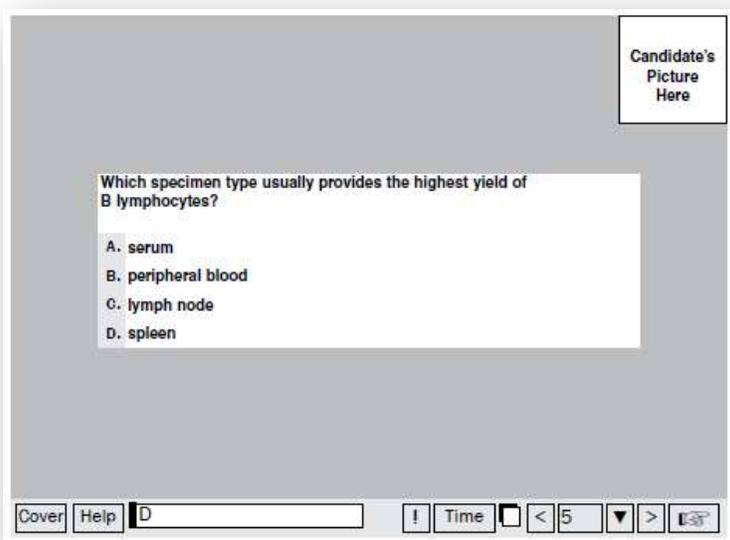
COMPUTER LOGIN: After your identification has been confirmed, you will be directed to a testing carrel. You will be instructed on-screen to enter your Social Security number. You will take your photograph which will remain on-screen throughout your examination session. This photograph will also print on your score report.

PRACTICE EXAMINATION: Prior to attempting the examination, you will be given the opportunity to practice taking an examination on the computer. The time you use for this practice examination is NOT counted as part of your examination time or score. When you are comfortable with the computer testing process, you may quit the practice session and begin the timed examination.

TIMED EXAMINATION:

Multiple-Choice Software

Following the practice examination, you will begin the timed examination. Before beginning, instructions for taking the examination are provided on-screen.



The computer monitors the time you spend on the examination. The examination will terminate if you exceed the time allowed. You may click on the "Time" box in the lower right portion of the screen to monitor your time. A digital clock indicates the time remaining for you to complete the examination. The Time feature may be turned off during the examination.

All items on the ACHI examinations are multiple-choice and have equal weight for scoring, excluding the non-scored items used for pretesting purposes. Pretesting is accomplished by interspersing new untried items throughout the examination. These items are not scored as part of the candidate's credentialing examination, and they do not affect an individual's pass/fail status. Pretesting is used to collect meaningful statistics about new items that may appear as scored items on future examinations.

ACHI Examination Candidate Handbook

The 20 non-scored items are in addition to the 150 scored items on the CHT, CHA and CHS examination. Testing time for the previously mentioned examinations will be 3.5 hours to allow ample time to complete the examinations.

The Histocompatibility Laboratory Director Examination has 200 scored items. You will be given five hours to complete the examination in two testing sessions.

Only one examination question is presented at a time. The question number appears in the lower right portion of the screen. Choices of answers to the examination question are identified as A, B, C, or D. You must indicate your choice by either typing in the letter in the response box in the lower left portion of the computer screen or clicking in the option using the mouse. To change your answer, enter a different option by typing A, B, C, or D or by clicking on the option using the mouse. You may change your answer as many times as you wish during the examination time limit.

To move to the next question, click on the forward arrow (>) in the lower right portion of the screen. This action will move you forward through the examination question by question. If you wish to review any question or questions, click the backward arrow (<) or use the left arrow key to move backward through the examination.

An examination question may be left unanswered for return later in the examination session. Questions may also be bookmarked for later review by clicking in the blank square to the right of the Time button. Click on the hand icon to advance to the next unanswered or bookmarked question on the examination. To identify all unanswered and bookmarked questions, repeatedly click on the hand icon. When the examination is completed, the number of examination questions answered is reported. If not all questions have been answered and there is time remaining, return to the examination and answer those questions. Be sure to provide an answer for each examination question before ending the examination. There is no penalty for guessing.

CANDIDATE COMMENTS: During the examination, comments may be provided for any question by clicking on the button displaying an exclamation point (!) to the left of the Time button. This opens a dialogue box where comments may be entered. Comments will be reviewed, but individual responses will not be provided

Following the Examination

After completing the examination, you are asked to answer a short evaluation of your examination experience. Then, you are instructed to report to the Test Center Administrator to receive your score report. Scores are reported in printed form only, in person or by U.S. mail. International testing candidates' score reports will be mailed by PSI 3 to 5 business days following completion of the examination.

Scores are not reported over the telephone, by electronic mail or by facsimile. Your score report will indicate "pass" or "fail." Your pass/ fail status is determined by your raw score. Additional detail is provided in the form of raw scores by major content category. A raw score is the number of questions you answered correctly.

Because the Histocompatibility Laboratory Director Examination is administered in two testing sessions and pre-equated questions are not used on the examination, instant scoring is not possible. You will be provided a provisional score report, and the pass/fail score report will be directly mailed to you within a 3 to 4 week period.

- **Pass/Fail Score Determination**

The methodology used to set the minimum passing score is the Angoff Method; this is a criterion reference process in which expert judges estimate the passing probability of each question on the examination. These judgments are averaged to determine the minimum passing score (i.e. the number of correctly answered questions required to pass the examination), to ensure that those who pass the examination have demonstrated a sufficient level of knowledge of histocompatibility to warrant certification. Statistical equating procedures are used to ensure that each examination form that is developed will be of consistent level of difficulty, based on the average difficulty of the questions being scored.

- **Scores Cancelled by ACHI or PSI**

ACHI and PSI are responsible for the validity and integrity of the scores they report. On occasion, occurrences, such as computer malfunction or misconduct by a candidate, may cause a score to be suspect. ACHI and PSI reserve the right to void or withhold examination results if, upon investigation, violation of its regulations is discovered.

- **If You Pass the Examination**

When you pass any ACHI certification examination for the first time, you will be awarded either the Certified Histocompatibility Associate (CHA), Certified Histocompatibility Technologist (CHT), Certified Histocompatibility Specialist (CHS) or the Associate A(ACHI) credential for laboratory directors. You will receive a certificate acknowledging your achievement.

- **If You Do Not Pass the Examination**

If unsuccessful, you will be given the opportunity to apply for a future examination. To reapply, you will need to submit a letter of intent and the appropriate application fee. Additional documentation of your education and experience will not be required unless later requested.

Failing to Report for an Examination

If you fail to report for an examination, you will forfeit the registration and all fees paid to take the examination. To reapply, you will need to submit a letter of intent and the appropriate application fee. Additional documentation of your education and experience will not be required unless later requested.

Confidentiality

Information about candidates for testing and their examination results are considered confidential. Studies and reports concerning candidates will contain no information identifiable with any candidate, unless authorized by the candidate.

Application Instructions

APPLICATION DATES FOR CHA, CHT, CHS:	October 16-January 15 January 16 - April 15 April 16 - July 15 July 16 - October 15	for March Testing for June Testing for September Testing for December Testing
APPLICATION DATES FOR Histocompatibility Laboratory Director:	January 1 - June 1	for September Testing

APPLICATION SUBMISSION: Your application and all verifying documents (i.e., transcripts and statements of competency or letters of competency) and fees must be received by PSI postmarked no later than the application deadline indicated on the cover page of this packet. If an application is processed and deemed ineligible, you will be notified in writing and given 10 business days from the ineligibility date to submit additional documentation. If the additional information is received by PSI after the 10 day requirement, the application will be processed for the next available testing window. After six months of an application’s ineligibility, examination fees will be refunded less a \$75 processing fee.

APPLICATION FEES: (Fees for exams are subject to change.)

- CHA: \$205 U.S. Dollars
- CHT: \$225 U.S. Dollars
- CHS: \$250 U.S. Dollars
- Histocompatibility Laboratory Director: \$900 U.S. Dollars

*International (including U.S. Territories) Fee – \$225 U.S. Dollars is required with application fee

Please make checks payable to PSI Services Inc.

An application received without the appropriate application fees will be deemed ineligible.

IMPORTANT NOTE:

To prevent a delay in processing your application, answer all information blanks carefully and completely. If the requested information does not apply to you, **enter N/A (not applicable)** where appropriate. Any blanks may cause your application to be perceived as incomplete and require further documentation.

MAIL ORIGINAL TO:

PSI
ACHI Examination
18000 W. 105th St.
Olathe, KS 66061-7543

ACHI Examination Candidate Handbook



Examination Application

Sponsored by: *The American College of Histocompatibility & Immunogenetics*

TYPE OR PRINT CLEARLY

I would like to take the following exam:

- CHA
- CHT
- CHS
- Histocompatibility Laboratory Director
- Recertification

I wish to take the examination in:

- March
- June
- September (only option for director exam)
- December

I wish to take the examination:

- In the United States via CBT (computer-based testing)
- Outside the United States via WEB (international testing locations - including U.S. Territories) with the required additional \$225 international test center fee

Have you ever applied/sat for an ABHI/ACHI examination before?

- Yes
- No

If so, which exam and when? _____

First Name	
Middle Name	
Last Name	
SS #	

ACHI Examination Candidate Handbook

Work Address	
Home Address	
Work Phone:	
Home/Mobile Phone:	
Fax:	
Email:	

NOTE: Please line through or put "N/A" for "not applicable" in all areas of the application that do not pertain to you. Any areas not filled out or noted as "not applicable" will be assumed to be incomplete. ALL DOCUMENTATION MUST BE SUBMITTED AT THE TIME OF APPLICATION.

Section I – Education

INSTITUTION/ADDRESS	MAJOR	DEGREE	GRAD DATE	OFFICIAL TRANSCRIPTS (circle one)	
		/		ENCLOSED	ORDERED
		/		ENCLOSED	ORDERED
		/		ENCLOSED	ORDERED
		/		ENCLOSED	ORDERED
		/		ENCLOSED	ORDERED

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If you are applying for the Histocompatibility Laboratory Directors Examination, complete only pages 50-52 and submit appropriate documentation.
(The next Histocompatibility Laboratory Director examination will be in September.)

Section II – Experience

Employment experience in HISTOCOMPATIBILITY TESTING. Please give exact dates.
 Please provide a completed HLA Work Experience Statement of Competency form signed by the laboratory director for multiple departments.

Dates:	
Role/Position:	
Institution:	
Department:	
Address:	
Director:	
Was this laboratory ASHI/UNOS- or EFI-accredited during dates of employment? <input type="checkbox"/> Yes <input type="checkbox"/> No If no, please see SPONSORSHIP route of application.	

Dates:	
Role/Position:	
Institution:	
Department:	
Address:	
Director:	
Was this laboratory ASHI/UNOS- or EFI-accredited during dates of employment? <input type="checkbox"/> Yes <input type="checkbox"/> No If no, please see SPONSORSHIP route of application.	

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Dates:	
Role/Position:	
Institution:	
Department:	
Address:	
Director:	
Was this laboratory ASHI/UNOS- or EFI-accredited during dates of employment? <input type="checkbox"/> Yes <input type="checkbox"/> No If no, please see SPONSORSHIP route of application.	

NOTE: For those individuals requiring sponsorship:

I will be sponsored for HLA experience. My sponsors will be:

1. NAME: _____

TITLE: _____

INSTITUTION: _____

2. NAME: _____

TITLE: _____

INSTITUTION: _____

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Please check the areas in which your laboratory is ASHI accredited below and indicate which tests your laboratory performs:

Areas of Accreditation	Testing Categories, Technologies & Methods	
<input type="checkbox"/> HSC/BM Transplantation: Related Donor	<input type="checkbox"/> KIR Typing	<input type="checkbox"/> Antibody Screen/ID: CDC
<input type="checkbox"/> HSC/BM Transplantation: Related Donor	<input type="checkbox"/> Serologic Typing	<input type="checkbox"/> Antibody Screen/ID: Solid Phase
<input type="checkbox"/> Solid Organ Transplantation: Live Donor	<input type="checkbox"/> Molecular Testing SSP	<input type="checkbox"/> Antibody Screen/ID: Microarray
<input type="checkbox"/> Solid Organ Transplantation: Deceased Donor	<input type="checkbox"/> Molecular Testing SSO	<input type="checkbox"/> Antibody Screen/ID: Flow
<input type="checkbox"/> Histocompatibility Testing for Other Clinical Purposes	<input type="checkbox"/> Molecular Testing SBT	<input type="checkbox"/> Crossmatch: CDC
<input type="checkbox"/> Transfusion Support	<input type="checkbox"/> Molecular Testing NGS	<input type="checkbox"/> Crossmatch: Solid Phase
	<input type="checkbox"/> ABO/Rh Testing	<input type="checkbox"/> Crossmatch: Flow
	<input type="checkbox"/> Anti-A1 titers	<input type="checkbox"/> Engraftment Monitoring: STR/VNTR
	<input type="checkbox"/> Immunophenotyping	<input type="checkbox"/> Other:
	<input type="checkbox"/> Cellular Assays	<input type="checkbox"/> Other:

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HLA WORK EXPERIENCE FROM LABORATORY DIRECTOR STATEMENT OF COMPETENCY

Applicant's Name: _____ SS# _____

Please give the approximate percent of time working in each area and techniques/responsibility:

	CLINICAL <i>% of effort + description</i>	RESEARCH <i>% of effort + description</i>
Molecular Testing		
Crossmatch Testing		
Antibody Testing (Screen & ID)		
Flow Cytometry Testing:		
Engraftment Monitoring:		
Immunophenotyping:		
Other Testing:		

Additional information (attach additional sheet if needed):

The above-named individual has worked in my laboratory for _____ (years) and _____ (months).

- Full-time capacity
- Part-time capacity

I hereby certify that _____ is qualified to sit for the
 CHA CHT CHS examination according to the ACHI eligibility requirements.

I am the director of an ASHI/UNOS-or EFI-accredited laboratory. I _____
print name

DO SOLEMNLY SWEAR (AFFIRM) THAT I HAVE MADE OR READ THE CONTENTS HEREOF (INCLUDING HLA

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EXPERIENCE AS NOTED IN SECTION II AND THE STATEMENT OF COMPETENCY FROM THE LABORATORY DIRECTOR), AND TO THE BEST OF MY KNOWLEDGE AND BELIEF, THE FOREGOING STATEMENTS AND ANSWERS ARE TRUE IN SUBSTANCE AND EFFECT, AND ARE MADE IN GOOD FAITH.

Signature of Laboratory Director: _____

Laboratory Directors are permitted to verify previous HLA work experience of employee, in the event prior experience was a consideration for hiring. Please indicate in the "Additional Information" area if you are verifying previous experience.

NOTE: This page may be photocopied and used for additional laboratory directors to document previous experience.

SPONSORSHIP PROGRAM DOCUMENTATION OF WORK EXPERIENCE

Individuals applying for examination through the Sponsorship route must complete this portion of the application.

NOTE: This page may be photocopied and used for additional sponsors.

Applicant's Name: _____ SS# _____

APPLICANTS:

Individuals lacking relevant work experience in an approved histocompatibility laboratory must fulfill the requirement by sponsorship. Each applicant must have this form completed by two sponsors. The sponsor forms must be completed and include the signature of the sponsor.

Additional supporting documentation of participation in the field of HLA such as ACHI-approved workshops and SEOPF courses should be included with the application. Individuals who are pursuing eligibility through the sponsorship route may contact the Credentials Committee Chair (or committee member) or ACHI executive office for assistance.

CHA – Must have forms submitted by one CHS with current ABHI certification and one laboratory director (director of ASHI/UNOS or EFI-accredited laboratories) or two CHS's with current ACHI certification.

CHT – Must have forms submitted by one CHS with current ACHI certification and one laboratory director (director of ASHI/UNOS- or EFI-accredited laboratories) or two CHS's with current ACHI membership.

CHS – Must have forms submitted by two sponsors. The sponsors are to include one CHS with current ACHI certification and a laboratory director (laboratory directors must be from ASHI/UNOS or EFI-accredited laboratories) or two laboratory directors.

SPONSORS:

The sponsorship route for applying to sit for the ACHI CHA, CHT and CHS examination is designed to allow applicants who meet both the requirement for education and time working in the field of histocompatibility testing, but whose working experience was not obtained in an ASHI/UNOS- or EFI-accredited laboratory.

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Special consideration **may** be given to applicants in instances where a sponsor's involvement in the field of histocompatibility testing is not in an ASHI/UNOS- or EFI-accredited lab (i.e., origin of the laboratory is in a country/region where other governing bodies and organizations associated with the national ministry/department of health oversee and govern these activities) or hold a current ACHI certification. In these instances, more weight **may** be placed on the applicant's qualifications and **letters of support**. Please allow additional time for processing in the event further documents are requested.

Please answer the following questions and have your signature notarized before returning to the applicant.

Describe your working relationship with the applicant:
In detail, list previous relevant work experience (i.e., Immunology, Histocompatibility, research, etc.) and time spent in area(s):
List the laboratory skills that are unique to histocompatibility testing that the applicant has been trained to perform and has successfully mastered:
List relevant professional activities that you have shared with the applicant such as workshops, publications or other mutual associations:
Explain why you as a histocompatibility professional believe the applicant is qualified to sit for the ACHI credentialing examination:

SIGNATURE OF SPONSOR: _____

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Complete this page if you are applying for the Histocompatibility Laboratory Directors Examination.

The next administration of the Histocompatibility Laboratory Directors Exam will be September

Section II – Training

POSTDOCTORAL TRAINING IN IMMUNOLOGY, IMMUNOGENETICS, OR CELL BIOLOGY:	DATES OF TRAINING
INSTITUTION	
ADDRESS	
MENTOR	

Documentation Enclosed ____ OR Being sent under separate cover ____

Section III – Experience

FORMAL TRAINING IN HUMAN HISTOCOMPATIBILITY TESTING:	YOUR CAPACITY	DATES OF EMPLOYMENT
INSTITUTION		
ADDRESS		
MENTOR		

Documentation Enclosed ____ OR Being sent under separate cover ____

PROFESSIONAL EXPERIENCE IN THE HISTOCOMPATIBILITY LAB AT THE EQUIVALENT OF AN ASSOCIATE/ASSISTANT DIRECTOR OR OTHER SUPERVISORY LEVEL	YOUR CAPACITY	DATES OF EMPLOYMENT
INSTITUTION		
ADDRESS		
MENTOR		

Documentation Enclosed ____ OR Being sent under separate cover ____

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If you have special circumstances or need clarification of qualification contact: info@ashi-hla.org

Important Notice: The candidates should be advised of the low passing rate of applicants lacking the appropriate clinical experience. All tasks are clinically oriented and require substantial hands-on experience in the daily routine of an HLA laboratory to pass successfully.

APPLICATION STATEMENT

I hereby make application to the American College of Histocompatibility and Immunogenetics (ACHI) for admission to the examination leading to the issuance to me of the appropriate Certificate, all in accordance with and subject to the ACHI's Rules and Regulations. I agree to accept and abide by disqualification from the examination or from the issuance of a Certificate, and to return to the College any such Certificate in the event that the College shall determine that any of the statements made by me in connection with this application for examination are false in any material respect, or that I violated any of the rules governing such examinations.

In consideration of the acceptance of this application for examination, I hereby release the College, its members, examiners, officers, and agents from any and all liability to me which, but for this release, may arise out of or in connection with this application, the related examinations, the score or scores given with respect to such examination, or any failure of the College to issue me a Certificate. I agree to indemnify the College, its members, examiners, officers and agents and hold them harmless from any loss, damage, cost or expense (including attorney's fees), in any suite or complaint, threatened or filed, in law or in equity and arising out of or in connection with this application, the related examinations, the score or scores given with respect to such examinations, the issuance to me of a Certificate, or any failure of the College to issue me a Certificate.

I, _____, DO SOLEMNLY SWEAR (AFFIRM) THAT I AM THE APPLICANT
(PRINT NAME)

NAMED IN THIS APPLICATION, THAT I HAVE MADE OR READ THE CONTENTS HEREOF, AND TO THE BEST OF MY KNOWLEDGE AND BELIEF, THE FOREGOING STATEMENTS AND ANSWERS ARE TRUE IN SUBSTANCE AND EFFECT AND ARE MADE IN GOODFAITH.

Signature

Date

CHECKLIST (to be completed by the applicant):

- Check or money order for application fee*
payable to PSI Services, Inc.
**Including additional international test center fee, if applicable*
- Completed Application
- Application Statement
- Documentation
- Transcripts
 - Enclosed
 - Ordered

METHOD OF PAYMENT:

- Check payable to PSI Services, Inc.

Credit Card:

- American Express
- Mastercard
- Visa

Card Number: _____

Expiration Date: _____

CVC/CVV code: _____

Cardholder Name: _____

Cardholder Signature: _____

REMEMBER: IT IS THE APPLICANT'S RESPONSIBILITY TO MAKE SURE THE APPLICATION(S), TRANSCRIPT(S) AND ALL NECESSARY DOCUMENTATION IS RECEIVED BY PSI BY THE STATED DEADLINE. IF YOU HAVE ANY QUESTIONS, PLEASE CALL PSI CANDIDATE SERVICES AT **888-519-9901**.

MAIL APPLICATION AND FEES TO: PSI, ACHI Examination, 18000 W. 105th St., Olathe, KS 66061-7543

Request for Special Examination Accommodations Form

If you have a disability covered by the Americans with Disabilities Act, please complete this form and provide the Documentation of Disability-Related Needs on the next page so your accommodations for testing can be processed efficiently. The information you provide and any documentation regarding your disability and your need for accommodation in testing will be treated with strict confidentiality.

Candidate Information:

SSN: _____ - _____ - _____

Requested Exam Date: _____

Name: _____

Address: _____

City/State/Zip/Country: _____

Phone Number & Email: _____

Special Accommodations

I request special accommodations for the _____ examination.

Please provide (check all that apply):

Reader

Extended testing time (time and a half)

Reduced distraction environment

Please specify below if other special accommodations are needed:

PLEASE READ AND SIGN:

I give my permission for my diagnosing professional to discuss with PSI staff my records and history as they relate to the requested accommodation.

SIGNATURE: _____ DATE: _____

Return this form with your examination application and fee to:

PSI, 18000 W. 105th St., Olathe, KS 66061-7543.

If you have questions, call Candidate Services at 888-519-9901.

Documentation of Disability-Related Needs

Please have this section completed by an appropriate professional (education professional, physician, psychologist, psychiatrist) to ensure that PSI is able to provide the required test accommodations.

Professional Documentation

I have known _____ since ____/____/____ in my capacity as a
Candidate Name DATE

Professional Title

The candidate discussed with me the nature of the examination to be administered. It is my opinion that, because of this candidate’s disability described below, he/she should be accommodated by providing the special arrangements listed on the Request for Special Examination Accommodations form.

Description of Disability:

SIGNED: _____ **Title:** _____

Printed Name: _____

Address: _____

Telephone Number: _____

DATE: _____ **LICENSE # (if applicable):** _____

Return this form with your examination application and fee to: PSI, 18000 W. 105th St., Olathe, KS 66061-7543. If you have questions, call Candidate Services at 888-519-9901