AMP 2023
MOLECULAR GENETIC PATHOLOGY
VIRTUAL REVIEW COURSE
May 16-19, 2023
MEET THE 2023 FACULTY

Lauren L. Ritterhouse, MD, PhD
Massachusetts General Hospital
Chair: MGP Review Course

Annette Kim, MD, PhD
Brigham and Women’s Hospital

Jason Rosenbaum, MD
Kaiser Permanente, Northern California

Pinar Bayrak-Toydemir, MD, PhD, FACMG
University of Utah/ARUP

Angela M Lager, PhD
University of Chicago

Laura J. Tafe, MD
Dartmouth-Hitchcock Health System

Jesse Cox, MD, PhD
University of Nebraska Medical Center

Diana Mandelker, MD, PhD
Memorial Sloan Kettering

Eric Vail, MD
Cedars Sinai

Erin Graf, PhD, D(ABMM)
Mayo Clinic Arizona

Ryan Peña, MD, PhD, D(ABHI)
Beth Israel

Rena Xian, MD, MS
Johns Hopkins University School of Medicine

Lawrence Jennings, MD, PhD
Northwestern University Feinberg School of Medicine

Honey V. Reddi, PhD, FACMG
Medical College of Wisconsin
SUMBIT YOUR ABSTRACT TODAY!

SUBMISSIONS ACCEPTED UNTIL JUNE 30, 2023 @11:59 PM ET
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https://amp23.amp.org/abstract-posters/abstract-submission-information/
## Disclosure Summary Report

### Association for Molecular Pathology

2023 Molecular Genetic Pathology Review Course

#### Disclosure of Conflict of Interest

The following table of disclosure information is provided to learners and contains all financial relationships that each individual in a position to control the content disclosed to ASCP. All of these relationships were treated as a conflict of interest, and have been mitigated.

All individuals in a position to control the content of CE are listed below.

<table>
<thead>
<tr>
<th>First Name</th>
<th>Last Name</th>
<th>Ineligible Company : Relationship</th>
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<tbody>
<tr>
<td>Eriko</td>
<td>Clements</td>
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<td>Melissa</td>
<td>Kauffman</td>
<td>NA</td>
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<td>Christal</td>
<td>Ralph</td>
<td>Regeneron Pharmaceuticals: Stock options or bond holdings</td>
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<td>Akkari</td>
<td>Bio-Rad: Consulting fees or other remuneration</td>
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<td>Pinar</td>
<td>Bayrak-Toydemir</td>
<td>American College of Medical Genetics: Speakers bureau</td>
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<td>Jesse</td>
<td>Cox</td>
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<td>Erin</td>
<td>Graf</td>
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<td>Jennings</td>
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<td>Annette</td>
<td>Kim</td>
<td>Multiple Myeloma Research Foundation: Research grants</td>
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<td>Lager</td>
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<td>Diana</td>
<td>Mandelker</td>
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<td>Honey</td>
<td>Reddi</td>
<td>Biofidelity Inc: Consulting fees or other remuneration</td>
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<td>Lauren</td>
<td>Ritterhouse</td>
<td>Amgen: Consulting fees or other remuneration • Merck: Consulting fees or other remuneration positions of influence • PeerView: Honoraria • Medscape: Honoraria • Clinical Care Options: Honoraria • Abbvie: Consulting fees or other remuneration • Personal Genome Diagnostics: Consulting fees or other remuneration • Bristol Myers Squibb: Consulting fees or other remuneration • Loxo Oncology at Lilly: Consulting fees or other remuneration • Sanofi-Genzyme: Consulting fees or other remuneration • EMD Serono Consulting fees or other remuneration</td>
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<td>Jason</td>
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<td>Eric</td>
<td>Vail</td>
<td>Bayer: Speakers bureau • Eli Lilly: Speakers bureau • Janssen: Speakers bureau</td>
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<tr>
<td>Rena</td>
<td>Xian</td>
<td>Invivoscribe: Honorarium</td>
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### Contact Information

If you have questions regarding the educational material in this activity, please contact AMP at ampeducation@amp.org.
Emerging & Evolving Biomarkers: RECENT FINDINGS, LABORATORY CONSIDERATIONS, AND CLINICAL IMPLICATIONS

Explore extraordinary advancements in cancer biomarker testing free and at your own pace. Micro-learning modules and CE-eligible webinars now available at AMP.org/EEB

Learn about these and other biomarkers in our ongoing virtual educational series:

- **MGMT**  
  Speaker: Tejus Bale, MD, PhD

- **HRD Score**  
  Speaker: Melinda Telli, MD

- **METex14**  
  Speaker: Nikoletta Sidiropoulos, MD

- **NTRK**  
  Speaker: Lynette M. Sholl, MD

- **ERBB2 (HER2) in Colorectal Cancer**  
  Speaker: Sinchita Roy-Chowdhuri, MD, PhD

- **Myeloid Malignancy MRD**  
  Speaker: David Wu, MD, PhD

- **KRAS**  
  Speaker: Craig Mackinnon, MD, PhD

- **Methylation Profiling**  
  Speaker: Brent Orr, MD, PhD

- **Immunoglobulin & T-cell Receptor Gene Sequencing**  
  Speaker: Rena Xian, MD

- **Mutational Signatures in Cancer**  
  Speaker: Fei Dong, MD

- **Microsatellite Instability (MSI) Testing for Cancer**  
  Speaker: Sameek Roychowdhury, MD, PhD

- **Being eNRY Conscious: Understanding NRG1 Fusions**  
  Speaker: Stephan Liu, MD

This program has been supported through educational grant funding provided by Amgen and Loxo Oncology at Lilly (for further information concerning Lilly grant funding visit www.lillygrantoffice.com.) Supporting companies had no control over its content. No personally-identifiable information regarding you is provided to any grant supporters.
TUESDAY, MAY 16, 2023

All times are in Eastern Time Zone

9:00-9:15 AM
Welcome
Lauren L. Ritterhouse, MD, PhD | Massachusetts General Hospital

9:15-10:00 AM
Technology: Nucleic Acids Extraction, Pre-Analytic Considerations
Lauren L. Ritterhouse, MD, PhD | Massachusetts General Hospital
CME/CMLE: 0.75

10:00-10:45 AM
Technology: Microarrays with Clinical Examples
Angela M. Lager, PhD | University of Chicago
CME/CMLE: 0.75

10:45-11:00 AM
Break

11:00 AM-12:00 PM
Identity Testing with Case Studies
Jesse Cox, MD, PhD | University of Nebraska Medical Center
CME/CMLE: 1.00

12:00-12:45 PM
Technology: Sanger Sequencing with Clinical Examples
Honey V. Reddi, PhD, FACMG | Medical College of Wisconsin
CME/CMLE: 0.75

12:45-1:30 PM
Lunch

1:30-3:30 PM
Technology: NGS
Jason Rosenbaum, MD | Kaiser Permanente
CME/CMLE: 2.00

3:30-3:45 PM
Break

3:45-5:00 PM
NGS Bioinformatics
Jason Rosenbaum, MD | Kaiser Permanente, Northern California
CME/CMLE: 1.25

5:00-6:00 PM
Technology: Nucleic Acid Amplification Techniques with Case Examples
Eric Vail, MD | Cedars Sinai
CME/CMLE: 1.0

6:00-6:30 PM
Meet the Faculty
The Molecular Pathology Competency Series

These microlearning modules are targeted to practicing laboratory professionals and cover many aspects of competency in the laboratory. They are short (10-15 minute) presentations covering Core (basic proficiency) or Advanced (specialized and/or recently updated) concepts in a particular area of laboratory training.

This content addresses specific advances in training, technology, and laboratory operations and acts as review and/or updates in important principles for laboratorians over the full arc of their careers.


**CORE: Biomarkers for Immunotherapy**  
Speaker: Honey V. Reddi, PhD, FACMG

**ADVANCED: Biomarkers for Immunotherapy**  
Speaker: Honey V. Reddi, PhD, FACMG

**CORE: Germline / Somatic Variants**  
Speaker: Alanna Church, MD

**ADVANCED: Germline / Somatic Variants**  
Speaker: Alanna Church, MD

**CORE: Lymphoid Clonality Testing**  
Speaker: Nathan Montgomery, MD PhD

**CORE: Fluorescence in Situ Hybridization (FISH): Methodology and Clinical Utility**  
Speaker: Lori Ramkissoon, MD

**CORE: Fusion Detection by Next Generation Sequencing Using RNA**  
Speaker: Alanna Church, MD

**CORE: Quantitative PCR**  
Speaker: Lawrence Jennings, MD

**CORE: PCR and Sanger Sequencing**  
Speaker: Va Lip

**ADVANCED: Detection of a Cryptic Gene Fusion in a B-ALL**  
Speaker: Valentina Nardi, MD
Welcome and Updates
Lauren L. Ritterhouse, MD, PhD | Massachusetts General Hospital

Math 101: Applications of Bayesian Analysis in Molecular Testing
Annette Kim, MD, PhD | Brigham and Women's Hospital
CME/CMLE: 1.25

Cytogenetics and Case Studies
Yassmine Akkari, PhD | Legacy Health
CME/CMLE: 1.00

Break

FISH and Cases
Angela M Lager, PhD | University of Chicago
CME/CMLE: 0.75

HLA and Case Studies
Ryan Peña, MD, PhD, D(ABHI) | Beth Israel
CME/CMLE: 1.00

Lunch

Germline Cancer Syndromes
Diana Mandelker, MD, PhD | Memorial Sloan Kettering
CME/CMLE: 0.75

Inherited Conditions I and Case Studies
Pinar Bayrak-Toydemir, MD, PhD, FACMG | University of Utah/ARUP
CME/CMLE: 1.25

Break

Inherited Conditions II and Case Studies
Pinar Bayrak-Toydemir, MD, PhD, FACMG | University of UTAH/ARUP
CME/CMLE: 1.75

Meet the Faculty
AMP 2022
On-demand Recordings
amp22.amp.org/recordings
THURSDAY, MAY 18, 2023

All times are in Eastern Time Zone

9:00-9:02 AM
Welcome and Updates
Lauren L. Ritterhouse, MD, PhD | Massachusetts General Hospital

9:02-10:00 AM
Hematopathology I and Case Studies (Myeloid)
Annette Kim, MD, PhD | Brigham and Women’s Hospital
CME/CMLE: 1.00

10:00-11:00 AM
Molecular Pathology Pearls in Lymphoid Malignancies
Rena Xian, MD, MS | Johns Hopkins University School of Medicine
CME/CMLE: 1.00

11:00-11:15 AM
Break

11:15 AM-12:15 PM
Key Molecular Laboratory Management Concepts that Impact Patient Care
Erin Graf, PhD, D(ABMM) | Mayo Clinic Arizona
CME/CMLE: 1.00

12:15-1:15 PM
Laboratory Finances: Reimbursement, Laboratory Budgets and Implications for your Routine Practice
Erin Graf, PhD, D(ABMM) | Mayo Clinic Arizona
CME/CMLE: 1.00

1:15-2:00 PM
Lunch

2:00-3:45 PM
Molecular Oncology I and Case Studies
Laura J. Tafe, MD | Dartmouth-Hitchcock Health System
CME/CMLE: 1.75

3:45-4:00 PM
Break

4:00-5:00 PM
Molecular Oncology II and Case Studies
Laura J. Tafe, MD | Dartmouth-Hitchcock Health System
CME/CMLE: 1.00

5:00-6:15 PM
Pharmacogenomics and Case Studies
Lawrence Jennings, MD, PhD | Northwestern University Feinberg School of Medicine
CME/CMLE: 1.25

6:15-6:45 PM
Meet the faculty
Utility of Cell-Free DNA in the Clinic: Current State and Future Directions

To register or learn more about this FREE eight part series, visit: www.amp.org/LiquidBiopsy

Supported by educational funding provided by AstraZeneca and Amgen.
<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Speaker</th>
<th>Institution</th>
<th>CME/CMLE:</th>
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<tbody>
<tr>
<td>9:00-9:02 AM</td>
<td>Welcome and Updates</td>
<td>Lauren L. Ritterhouse, MD, PhD</td>
<td>Massachusetts General Hospital</td>
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<tr>
<td>9:02-10:15 AM</td>
<td>Infectious Diseases I: Overview of an Appropriate Infectious Diseases Molecular Menu and How it Should be Used with Case Studies</td>
<td>Erin Graf, PhD, D(ABMM)</td>
<td>Mayo Clinic Arizona</td>
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<tr>
<td>10:15-11:30 AM</td>
<td>Infectious Disease II: Important Limitations and Stewardship Approaches to Infectious Disease Molecular Testing with Case Studies</td>
<td>Erin Graf, PhD, D(ABMM)</td>
<td>Mayo Clinic Arizona</td>
<td>1.25</td>
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<tr>
<td>11:30-11:45 AM</td>
<td>Break</td>
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<tr>
<td>11:45 AM-12:15 PM</td>
<td>Faculty Panel and Closing Remarks</td>
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In collaboration with the European Society of Pathology, MSD, and AstraZeneca, the Association for Molecular Pathology (AMP) is pleased to present a new online learning experience. The Ovarian Cancer Virtual Education Series is freely available now at educate.amp.org.

- The Ovarian Cancer Virtual Education Series are now available for registration on AMPED™
- Learning modules on diagnostic testing in ovarian cancer have been co-created with expert pathologists and molecular geneticists in collaboration with AstraZeneca and MSD

Modules:
- **Theory**: Learn more about the background to ovarian cancer including epidemiology, HRRm tumour biology, diagnosis workflows, and treatment options
- **Practical**: Understand the concepts and techniques involved in tissue and germline BRCA testing, as well as HRD testing in ovarian cancer
- **Best Practice**: Learn the latest best practice guidance on molecular sequencing in ovarian cancer from testing to reporting

Each module will include a short summary video and a self assessment module to support your learning.

All modules of this free online learning experience are available now at AMPED™. educate.amp.org

This educational curriculum is not supported by CME points. These educational materials are co-developed and funded by AstraZeneca and MSD. Z4-48417; Date of Preparation: September 2022
The following books are suggested for those preparing for the Molecular Genetic Pathology board exam administered by the American Board of Medical Genetics and the American Board of Pathology.

This list represents the recommendations of the MGP Review Course faculty and the AMP Training and Education Committee; endorsement by the ABMG or the ABP is not implied.

### GENERAL MOLECULAR PATHOLOGY

*Thompson & Thompson Genetics in Medicine, 8th edition.* Nussbaum RL et al., eds. Elsevier, 2015


*Molecular Diagnostics: Fundamentals, Methods, and Clinical Applications 3rd edition.* Buckingham L. ASCP, 2021


### CYTOGENETICS

*Gardner and Sutherland's Chromosome Abnormalities and Genetic Counseling, 5th edition.* McKinlay Gardner RJ, Amor DJ. Oxford University Press, 2018


### FORENSICS / HLA TYPING


*Transplantation Immunology: Methods and Protocols.* Zachary AA and Leffell MS, Eds. Humana Press 2013

*HLA Disease Associations. The Autoimmune Diseases Site Histocompatibility & Immunogenetics.* Kallon D. eBook
LABORATORY MANAGEMENT


Laboratory Administration for Pathologists, 2nd edition. College of American Pathologists, January 1, 2019

MEDICAL GENETICS


Vogel and Motulsky’s Human Genetics: Problems and Approaches. Speicher MR, Antonarakis SE, Motulsky AG, eds. Springer, 2010


  Note: Scriver's OMMBID (online version of the above) available to subscribers online at http://www.genetics.accessmedicine.com


METABOLIC GENETICS

  Note: Scriver's OMMBID (online version of the above) available to subscribers online at http://genetics.accessmedicine.com


MOLECULAR GENETICS / BIOLOGY

Human Molecular Genetics, 5th edition. Strachan TS and Read AP. CRC Press, 2019

MOLECULAR HEMATOLOGY, HEMATOPATHOLOGY, AND ONCOLOGY


Diagnostic Molecular Pathology: A Guide to Applied Molecular Testing 2nd Edition by William B. Coleman (Editor), Gregory J. Tsongalis PhD HCLD CC FNACB (Editor)

MOLECULAR MICROBIOLOGY


PHARMACOGENETICS


PharmGKB. https://www.pharmgkb.org/

PharmVar. https://www.pharmvar.org/genes

RISK ASSESSMENT AND GENETIC COUNSELING


Practical Genetic Counseling for the Laboratory. Goodenberger ML Thomas BC, Kruisselbrink T eds. Oxford University Press, 2017
These exam questions were written by MGP faculty from many MGP-Fellowship institutions and cover a range of topics.

For each examination, a total of 45 questions populate from a large question bank. At the end of the exam, participants receive results, an explanation of the correct choice, and references for further information.

Molecular in My Pocket™ reference card series is for anyone looking to quickly reference molecular diagnostics information in a convenient format.

There are now more than 20 of the popular Molecular in My Pocket cards, available at no cost by downloading from the AMP website.

Cards were assembled, and are reviewed annually, by subject matter experts on the AMP Training and Education Committee.

This course is an AMP Certificate Program on the introduction to pharmacogenomics and a review of AMP’s expert consensus recommendations for standardization of alleles for clinical pharmacogenomic genotyping assays.

Participants can earn a certificate after passing an examination on the content.

This course is free for AMP members.

An AMP Certificate Program to provide training in laboratory management and soft skills required for operating clinical molecular laboratories.

It includes approximately 10 hours of lecture content from an expert faculty as well as templates, exercises, and reference materials.

Participants can earn a certificate after passing an examination on the content.

This course is offered free for everyone.
RESOURCES

**NGS101 v2.0 SHORT COURSE**
This course is an AMP Certificate Program on the fundamentals of Next-Generation Sequencing. It provides a comprehensive overview on implementing and running NGS in your laboratory. Participants can earn a certificate after passing an examination on the content.

This course is free for AMP members.

**REVIEW FLASHCARDS**
Use these flashcards for quick review. We are continuously adding more flashcards so check back often.

The flashcards are free for AMP members.

**GetAMPed! COURSE**
This yearly course is held live the day before the AMP Annual Meeting & Expo.

The course features presentations and case studies designed to update learners on the most current technologies and molecular pathology principles.