

RUTH ELIZABETH BALLARD, M.S., Ph.D.

Curriculum Vitae

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Overview

I am a human molecular geneticist with an expertise in forensic serology and DNA. I earned my B.S. in Biological Sciences at California State University, Sacramento in 1991 and M.S. and Ph.D. degrees in Genetics at UC Davis in 1994 and 1997, respectively. I have been a professor at California State University, Sacramento since 1998, where I developed and currently run an undergraduate education program in forensic biology.

I am the author of a forensic biology laboratory manual, *Murder and Molecules, a Laboratory Manual for Forensic Serology and DNA*, and created the Department's forensic biology curriculum, including a capstone experience that provides CSUS students with exceptional preparation for careers as criminalists. My laboratory, CSI-TRU (Crime Scene Investigations: Training and Research for Undergraduates), has helped dozens of students bridge the gap from college to careers in crime labs.

I have reviewed DNA discovery in more than 100 criminal and civil cases since 2000, providing an independent assessment of DNA discovery and serving as an educator for attorneys, judges, and juries. I have produced reports or testified in court in most of these cases and stay current in the technologies and chemistries utilized in the profession. I view consulting as an extension of my teaching: translating complex scientific ideas/concepts into clear, accessible language for non-experts.

I live and work in Sacramento, California but consult for attorneys throughout the United States and, occasionally, overseas. My primary focus is criminal defense and much of my work is with public defenders.

Experience and Qualifications

Education

- Ph.D., Genetics, University of California Davis, 1997.
- M.S., Genetics, University of California Davis, 1994.
- B.S., Biological Sciences, California State University Sacramento, 1991

Academic Appointments

- Professor, Department of Biological Sciences, CSUS: 2010-present
- Department Chair, Department of Biological Sciences, CSUS: 2014-2015
- Assistant Chair, Department of Biological Sciences, CSUS: 2006 and 2013
- Associate Professor, Department of Biological Sciences, CSUS: 2005-2010
- Assistant Professor, Department of Biological Sciences, CSUS: 1998-2005
- Assistant Adjunct Professor, Department of Environmental Toxicology, University of California, Davis, 2010-2013

Related Employment

- President, Ruth E. Ballard Ph.D., Inc. (Forensic DNA consulting); 2006-present
- Founder and Director, CSI-TRU (Crime Scene Investigation Training and Research for Undergraduates), CSUS: 2006-present
- DNA/Biology Adviser, Forensic Science Graduate Program, University of California, Davis: 2008-2013
- Founder and Director of FHIL (Forensic Human Identification Laboratory), UC Davis: 2008-2013
- Director of DNA-HIT, international research program in forensic biology, Tanzania and Kenya: 2002-2010

Teaching Experience (25 years)

- CSUS: Multiple courses at undergraduate and graduate levels in molecular biology, genetics, and applied forensic biology; mentorship of 100+ students in human genetics and forensic biology research
- UC Davis: Graduate-level laboratory course in applied forensic biology; mentorship of graduate students in forensic serology and DNA research projects
- California Department of Justice (CCI Program): Workshops in DNA extraction, human DNA identification, and capillary gel electrophoresis
- Workshops in DNA, third world allele frequency databases, and paternity testing for the California Association of Criminalists, the Sacramento County District Attorney's Laboratory of Forensic Services, and the Jan Bashinski DNA laboratory (Department of Justice)
- Author of laboratory course pack *Murder and Molecules: A Laboratory Manual for Forensic Serology and DNA*; CSUS)
- Coauthor of general genetics laboratory course pack (*BIO 184 Laboratory Manual*; CSUS)
- Developed Forensic Biology concentration at CSUS, including two major's courses in applied forensic biology: BIO 150 (Forensic Biology) and BIO 151 (Independent Laboratory Techniques in Forensic Biology)
- Number of former students working as criminalists: California State and Local Crime Laboratories: 42; graduate programs in forensic science: 10; Other science-related jobs: 150+ (estimated)

Forensic DNA Consulting (Serology and DNA)

- Placer County, CA
 - People v Huerta-Vega (criminal defense; consult, 2018)
 - People v M Diaz (criminal defense; public defender Leslie Ramos; consult: 2015)
 - People v H. Aller (criminal defense; public defender Erik Beauchamp; consult: 2014)
 - People v M Garcia (criminal defense; public defender Ken Hahus; consult: 2014)
 - People v J Cooper (criminal defense; public defender Erik Beauchamp; consult: 2014)

- People v J Baker (criminal defense; public defender John Mustapha; consult: 2013)
- People v Konnerth (criminal defense; public defender John Spurling; consult: 2013)
- People v Yarbrough (criminal defense; public defender John Spurling; consult: 2013)
- People v B Miller (criminal defense; public defender Chris Van Meir; testimony: 2012)
- People v Bolden (criminal defense; public defender John Spurling; consult: 2012)
- People v C Roush (criminal defense; public defender James Shin; consult: 2011)
- Tetrick v Laubinger (civil; attorney Karen Velez; consult: 2009)
- People v D Terry (criminal defense; public defender Daniel Proud; consult: 1999)
- Fresno County, CA
 - People v M Aleman (criminal defense; public defender Angelica Rivers; consult: 2018)
 - People v C Roberts (criminal defense; public defender Margarita Martinez; consult: 2016)
 - People v G Gonzalez (criminal defense; public defender James Lambe; consult: 2014)
 - People v M Hernandez (criminal defense; public defender Margarita Martinez; consult: 2013)
 - People v B Walker (criminal defense; public defender Jeffrey Hammel; consult: 2013)
 - People v Jimenez (criminal defense; public defender Marina Pincus; testimony: 2013)
 - People v M Gonzalez (criminal defense; public defender Jason Sorenson; consult: 2013)
 - People v D Goff (criminal defense; attorney Doug Foster; consult: 2012)
 - People v K Xiong (criminal defense; public defender Scott Baly; consult: 2011)
 - People v P Rivera (criminal defense; attorney Curtis Sok; consult: 2011)
 - People v Columbero (criminal defense; attorney Curtis Sok; consult: 2011)
 - People v P Rivera (criminal defense; public defender Curtis Sok; consult: 2010)
 - People v R Herrera (criminal defense; public defender Deborah Girard-Gross; testimony: 2010)
 - People v C Flemming (criminal defense; public defender Margarita Martinez; testimony: 2009)
 - People v J. Malanche (criminal defense public defender Deborah Girard-Gross; consult: 2009)
 - People v J Martinez (criminal defense; public defender Deborah Girard-Gross; consult: 2009)
 - People v J Wright (criminal defense; public defender Manuel Nieto; consult: 2009)
 - People v T Blueford (criminal defense; public defender James Lambe; consult: 2009)
 - People v G Perez (criminal defense; (public defender Margarita Martinez; consult: 2008)
 - People v E Scott (criminal defense; public defender Margarita Martinez; testimony: 2008)
- Monterey County, CA
 - People v J Johnson (criminal defense; public defender Maribel Ferreira; consult: 2015)
 - People v H Martinez (criminal defense; public defender Chris Van Meir; consult: 2015)
- Nevada County, CA
 - People v Marin (criminal defense; public defender M Phillips; consult: 2008)
- Southern California
 - People v D Sharper (private; defense; Attorney L Levine; Los Angeles; testimony: 2014)
 - Debauffer v S Mundy (criminal defense; attorney Alec Rose; Santa Monica; consult: 2014)
 - People v A DeGuzman (criminal defense; attorney Leonard Levine; Los Angeles; consult: 2012)
 - People v N Farahmand (private criminal defense; attorney E Eady; consult: Orange County: 2012)
 - People v Ifroze (paternity; M Ifroze; consult: 2012)

- People v R Ruelas (criminal defense; Public defender Marjorie Barrios; Los Angeles; consult: 2011)
- People v M Rodgers (paternity; attorney Kathleen Mitchell; Rancho Cucamonga: CA; consult: 2007)
- Sacramento
 - People v Darius Wells (criminal defense; public defender Eric Handler; testimony; 2018)
 - People v Markel Forrest (criminal defense; public defender David Kelvin; testimony 2018)
 - People v Donnell Jones (paternity; district attorney Casey Newton; consult: 2011)
 - People v R Randall (paternity; district attorney Brian Morgan; consult: 2009)
 - People vs. E. Androshchuk (criminal defense; attorney Marsha Randall; consult: 2007)
 - Nash v. Pride Industries; Attorneys Laplante, Spinelli, and Donald; consult: 2005)
 - Sacramento County District Attorney paternity consultant; 13 cases (2004-2008)
- Contra Costa County
 - People v. K Somphonphakdy (criminal defense; public defender Lawrence Kaplan; consult: 2014)
 - People v D Johnson (criminal defense; public defender Howard Williams; consult: 2013)
 - People v D Ware (criminal defense; public defender Howard Williams; consult: 2013)
 - People v B Richardson; criminal defense; public defender Lawrence Kaplan; testimony: 2012)
 - People v R Lampkin (criminal defense; public defender John Coke; testimony: 2012)
- Butte County, CA
 - People v C Yang (criminal defense; public defender Philip H. Heithecker; testimony: 2010)
 - People v Thames (criminal defense; public defender Eric Ortner; consult: 2009)
 - People v Redwine (Criminal defense; public defender Eric Ortner; consult; 2008)
 - People v Taffola (Criminal defense; public defender Eric Ortner; consult: 2008)
- Amador County
 - People v R Correa (criminal defense; public defender Erik Beauchamps; consult; 2018)
- Tehama County, CA
 - People v J Carter; criminal defense; public defender Ken Miller; Red Bluff; consult: 2011)
- El Dorado County, CA
 - People v B Spears (criminal defense; attorney Davia Weiner; El Dorado Hill; consult: 2015)
 - People v J Chamness (criminal defense; attorney Erik Davenport; Cameron Park, CA; consult; 2013)
- Santa Cruz County
 - People v Martinez (criminal defense; attorney Doug Fox; consult; 2008)
- Stanislaus County
 - People vs L. Mounthala (criminal defense; public defender Mark Sullivan; testimony: 2002)
- Santa Clara County
 - People v G Gamino (criminal defense, attorney L McAllister; San Jose; testimony: 2008)
- San Joaquin County
 - People v T Tath (criminal defense; attorney Michael Platt; Stockton; consult: 2012)
 - People v A Juarez (criminal defense, public defender Chris Masood; consult: 2012)
 - People v M.H. Louis (criminal defense; public defender Michael Platt; consult: 2008)
- Washington
 - People v Bayless (criminal defense; public defender Loebach; Spokane; consult: 2015)

- People v Jesse Johnson (criminal defense; public defender Jeff Compton; Spokane; consult: 2014)
- People v Arteaga (criminal defense; public defender Jackie Geurin; Spokane; consult: 2014)
- People v R Newport (criminal defense; attorney Michael Golden; Colville; consult: 2014)
- People v Gibson (criminal defense; public defender V Blumhorst; Spokane: testimony: 2012)
- Arizona
 - People v D Archuleta (Criminal defense; attorney Laura Caputo; Scottsdale; consult: 2012)
 - People v H Ohanlon (criminal defense; attorney Robert Dossey; Chandler AZ; consult: 2012)
- Nevada
 - People v David Chmielnik (criminal defense; attorney Steve Karen; consult: 2019)
 - People v Kayshawn Smith-Harper (criminal defense; attorney Mary Puisch; testimony: 2018)
 - US vs Miller (criminal defense; attorney Theresa Ristenpart; consult: 2018)
 - People v Patel (criminal defense; public defender Kate Hickman; Reno: testimony: 2018)
 - Jeffcock and Psychiatric Solutions (civil; attorneys Lewis and Roca LLC; consult; Las Vegas, NV: consult: 2013)
- Colorado
 - Westermann v T Lambert (paternity; attorney Michael Richardson; Pueblo; consult: 2014)
 - People v D Bean (criminal defense; attorney Phil Winegar; Colorado Springs; testimony: 2012)
 - People v T Newton (criminal defense; Koncilja & Koncilja, P.C.; .Pueblo; consult: 2008)
- New Mexico
 - Urbina vs Defined Fitness (civil; attorney Clea Gutterson of Civerolo, Gralow, Hill & Curtis; Albuquerque; consult: 2012)
- Illinois
 - Joesting vs Nault (paternity; attorney Scott Anderson, Jr. of Dodson, Piraino and Associates; Champaign, IL; consult: 2013)
 - Liautaud v Nault (paternity; attorney David A. Baker; Chicago; consult: 2013)
- Massachusetts
 - People v Tempest (criminal defense; innocence project case; McDermott Will & Emery LLP; consult: 2013)
- Louisiana
 - People v A Smith (private review for family; criminal defense; Baton Rouge; consult: 2015)
- Alaska
 - People v R West (criminal defense; attorney Ronald West; Anchorage; consult: 2013)
- Guam
 - People v R Comacho (criminal defense; attorneys Lujan, Aguigui, & Perez, LLP; consult: 2007)
- Cayman Islands
 - Queen v Bush (criminal defense; public defender George Knightley; testimony: 2009)
 - Queen v M Voiculescu (criminal defense; public defender George Knightley; consult: 2008)
 - Queen v Clarke (criminal defense; public defender Nicholas Dixey; testimony: 2008)
 - Queen v R Ebanks (criminal defense; public defender Ben Tonner; consult: 2007)

Mentored Research: Thesis, Abstracts, and Publications

- Hickey, E., DeRobertis, S., and Ballard, R. “Analysis of DNA mixtures recovered from shared hoodies.” BIO 151 poster session, CSUS Sacramento (2017); CAC Spring Seminar, Concord CA (2018)
- Johnson, B., Silva, C., and Ballard, R. “Detection of blood and contact DNA evidence from sink pipes.” BIO 151 poster session, CSUS Sacramento (2017); CAC Spring Seminar, Concord CA (2018)
- Kiwan, R. Orozco, D., Dickover, R., and Ballard, R. “True Allele and STRmix: A comparison of two probabilistic DNA typing software programs.” In collaboration with the Forensic Science Graduate Program at UC Davis and the Kern County Regional Crime Laboratory in Bakersfield, CA. BIO 151 poster session, CSUS Sacramento (2017); CAC Spring Seminar, Concord CA (2018)
- Chan, T., Williams, A., and Ballard, R. “Optimal recovery of DNA from dried blood on wood.” BIO 151 poster session, CSUS Sacramento (2017)
- Juarez, M, Juarez, K. and Ballard R. “The effect of ignitable heating residue procedures on the ability to recover blood stains in arson investigations. *In collaboration with the Sacramento County DA’s Laboratory of Forensic Services.* BIO 151 poster session, CSUS Sacramento (2017)
- Schaller H., Olmos, R., and Ballard, R. “Does sunlight damage DNA on cigarette butts?” BIO 151 poster session, CSUS Sacramento (2017)
- Valente, J., Thao, B., and Ballard, R. “Identifying an art forger by touch DNA.” BIO 151 poster session, CSUS Sacramento (2017)
- Bachman, A., Kan, L., and Ballard, R. “Patterns of DNA transfer onto common household items by cohabitants.” California Association of Criminalists Spring Seminar, San Francisco CA (2017).
- Mallory, A., Lionudakis Perez, C., and Ballard, R. “Breaking up is easy: The uncoupling of serological and DNA tests in blood exposed to UV light.” California Association of Criminalists Spring Seminar, San Francisco CA (2017).
- McNeese, M., Marty, S., and Ballard, R. “Recovery of Blood and Human DNA from a Washing Machine.” California Association of Criminalists Spring Seminar, San Francisco CA (2017).
- Pritchett, D., Layne, N., and Ballard, R. “Patterns of Recovery of Touch DNA from Shoes and Socks. California Association of Criminalists Spring Seminar, San Francisco CA (2017).
- Carter, J., Lewis K., and Ballard, R. From Trash to Treasure: Recovering salivary DNA from old soda cans. California Association of Criminalists Spring Seminar, North Hollywood CA (2016).
- Caswell, K., Wander, M., Williams, S., Calloway, S., Ballard, R., Hopkins, C., Green, W., Kanthaswamy, S., Panacek E. California Association of Criminalists Spring Seminar, San Diego CA (2014).
- DNA allele frequencies of the 15 AmpfI STR Identifiler STR loci in the Lao, Kelenjin, and Kamba tribes of Kenya. Gordon, R., Reed, M., Mukwana, S., Viong, J., Kanthasway, S., Rice, R., Ballard, R. California Association of Criminalists Spring Seminar, San Diego CA (2014).
- Martinez, D., Rusnak, R., and Ballard, R. Detection of blood and recovery of Gordon, R. “DNA allele frequencies of the 15 AmpFISTR Identifiler STR loci in the Luo, Kalenjin, and Kamba tribes of Kenya.” (UC Davis MS thesis: 2014); Gordon, R. and Ballard, R. “DNA allele frequencies of the 15 AmpFISTR Identifiler STR loci in the Luo, Kalenjin, and Kamba tribes of Kenya. American Academy of Forensic Sciences, Seattle WA (2013)
- Newfelft, J. "The Effect of Dry-cleaning on Semen Stains" (UC Davis MS thesis: 2013)
- Kun, T., Lyons, L. Sacks, B.N., Ballard, R.E., Lindquist, C., and Wictum, E.J. "Developmental validation of Mini-DogFiler for degraded canine DNA." *For Sci Int Genetics*, 7(1): 151-158 (UC Davis MS thesis, 2013)
- Fong, T., Green, W., Panacek, E., Ballard, R. Optimization of Drying Conditions of Sexual Assault Swabs. California Association of Criminalists Spring Seminar , Pasadena CA (2013)

- Mollet, S., White, A., and Ballard, R. Collection of Sexual Assault Evidence from a Toilet.” California Association of Criminalists Spring Seminar, Pasadena CA (2013 Association of Criminalists Spring Seminar , Pasadena CA (2013)
- Huang, A. "Recovery of male DNA deposited on female skin after oral contact." (UC Davis MS thesis: 2013); California Association of Criminalists Fall Seminar, San Jose CA (2012)
- Charron, J., Tan, R., and Ballard, R. Identification of Sperm in the Presence of Vomit. California Association of Criminalists Spring Seminar , Pasadena CA (2013)
- Lowe, J., Oga C., and Ballard, R. “Comparison of Three Preservation Methods on the Recovery of DNA from Wet Cigarette Butts. California Association of Criminalists Spring Seminar , Pasadena CA (2013)
- Palomar, C., Shau, S., and Ballard, R. Can DNA be transferred between Swabs in a Swab Dryer? California Association of Criminalists Spring Seminar , Pasadena CA (2013)
- Doneva, K. "Inter-tissue somatic mosaicism in blood, hair, and epithelial cheek cells at the ABI AmpFISTR Identifiler loci " (UC Davis MS thesis: 2012); California Association of Criminalists Spring Seminar, Bakersfield CA (2012); American Academy of Forensic Sciences annual conference (2013)
- Gualco, J. “The effect of Dry-cleaning on Semen Stains.” (UC Davis MD thesis (2013); Gulaco, J. and Ballard, R. The effect of dry-cleaning on semen stains. California Association of Criminalists Spring Seminar , Bakersfield CA (2012)
- Ballard, R. CSI-Kenya: Blood Stones in Corruption-free Zones. California Association of Criminalists Spring Seminar, Bakersfield CA (2012)
- Corona, C., Sosiuk, M. and Ballard, R. Recovery of Sperm from the Inside of a Washing Machine. California Association of Criminalists Spring Seminar , Bakersfield CA (2012)
- Middlebrook, S., Kaur, S., and Ballard, R., The effect of dry-cleaning on blood stains. California Association of Criminalists Spring Seminar , Bakersfield CA (2012)
- Patel, D., Mumford, D. and Ballard R: “Serological detection and DNA recovery from blood stains exposed to four common household water conditions.” California Association of Criminalists Fall Seminar, San Jose CA (2012)
- Oh, D. "DNA Allele Frequencies of the AmpFISTR® Identifiler® STR alleles in the Kikuyu and Luhya Tribes of Kenya" (UC Davis MS thesis:2012)
- Bischof, S. "The Effects of Water Type, Exposure Time, and Water Agitation Level on the Ability to Detect Semen, Sperm, and Human DNA on Cotton Fabric "(UC Davis MS thesis: 2011)
- Marlia, G. "DNA Yield from oral samples obtained after oral sex" (UC Davis MS thesis: 2011)
- Pereira, L., Alshamali, F., Andreassen, Ballard, R., et al. “PopAffiliator: online calculator for individual affiliation to a major population group based on 17 autosomal STR genotype profile.” *Int J Legal Med.* 125:5, 629-636 (2011)
- Branch, L. "Generating forensic DNA profiles from ‘contact’ DNA on cartridge cases and gun grips.” (CSUS MS thesis: 2010)
- Charoenchote, W. “AmpFISTR® Identifiler™ STR allele frequencies and PowerPlex™ Y STR haplotype frequencies of the Meru population in Northern Tanzania.” (UC Davis MS thesis: 2008)
- Sheehan, S. "Blood, spit, and hair: Somatic mosaicism at the nine Profiler Plus human DNA identification loci." (CSUS MS thesis: 2008)
- Gaggero, L. “STR Mosaicism: A problem for DNA forensic science?” (CSUS MS thesis 2008)
- Forward, B.W., Nyambo, T., and Ballard, R. “AMPF/STR Identifiler™ STR Allele Frequencies in Tanzania, Africa.” *J For Sci*, 53:1, 245-247 (2008)
- Ballard, R. “DNA as a Tool for Social Justice: Service Learning and Paternity Testing in Tanzania, Africa.” *Gender, Identity, Equity, and Violence*, Calderon, J.Z., ed. Stylus Publishing LLC (2008)

Current and Recent Collaborators in Forensic Research and Consulting

- Ruth Dickover, PhD., former DNA Technical Lead, Kern County Forensic Sciences Division; Current Director of the UC Davis Graduate Program in Forensic Sciences (Applied forensic biology; DNA mixture analysis)
- Chip Pollock, Director of the Sacramento County DA's Laboratory of Forensic Services.
- Dianna Taylor, IGNIS Forensics, LLC, Castle Rock, CO (Crime scene investigation)
- Sophie Mukwana, M.S., Director, Biotech Forensics, Nairobi, Kenya (Third world forensic DNA allele frequency databases)
- William Green, M.D. University of California Davis Medical Center (Sexual assault evidence)
- Edward Panacek, PhD, MPH. University of California Davis Medical Center (Sexual assault evidence)
- Shannon Datwyler, PhD, Department Chair, CSUS (DNA sequencing for mitochondrial DNA in crimes involving hair or bone)
- Wayne Carlsen, Microbial Vac Systems® Inc., Bluffdale, Utah (Recovery of touch DNA from surfaces and fabric)

Professional Affiliations

- California Association of Criminalists (Full Member; www.cac.org)
- 350 Sacramento (Level: Sustainer; Climate Champion; www.350sacramento.org)
- Union of Concerned Scientists (www.ucsusa.org)
- The Honor Society of Phi Kappa Phi (recognition and promotion of academic excellence in all disciplines; former Vice-President of the CSUS local chapter (www.phikappaphi.org/))
- Phi Beta Delta Honor Society (for faculty and students engaged in international research) (www.phibetadelta.org)