

<b>General Course Details</b>	
<b>Course Title</b>	Overview of Matrices in Forensic Toxicology
<b>Course Duration</b>	~50 minutes
<b>Initial Launch Date</b>	On demand
<b>Course Description</b>	<p>This course provides a comprehensive introduction to the biological and alternative matrices used in forensic toxicology and their role in the detection, interpretation, and monitoring of drugs and other toxicologically relevant substances. Participants will explore the principles of specimen collection, handling, storage, and analysis, with an emphasis on how matrix selection influences toxicological findings and case interpretation.</p> <p>The course begins with a review of sampling considerations and the traditional matrices most commonly encountered in forensic toxicology—blood and urine. Participants will examine the composition of these matrices, their relationship to pharmacokinetics and drug disposition, and their applications in both antemortem and postmortem investigations.</p> <p>Building on this foundation, the course examines a variety of alternative matrices, including vitreous humor, hair, oral fluid, sweat, and meconium. For each matrix, participants will review its biological characteristics, mechanisms of drug incorporation, collection and storage requirements, analytical considerations, advantages, limitations, and appropriate forensic applications. Special attention is given to the interpretation of results, including factors such as postmortem redistribution, contamination, drug stability, detection windows, and the relationship between matrix concentrations and drug exposure.</p> <p>The course concludes with an evaluation of pre-analytical, analytical, and post-analytical considerations for each matrix, along with case-based examples demonstrating how alternative specimens can provide critical information when traditional specimens are unavailable or insufficient.</p>
<b>Learning Objectives</b>	<p>Upon completion of this course, participants will be able to:</p> <ol style="list-style-type: none"> <li>1. Define traditional and alternative biological matrices used in forensic toxicology.</li> </ol>

	<ol style="list-style-type: none"> <li>2. Describe the composition and physiological characteristics of major forensic toxicology matrices.</li> <li>3. Explain how drugs and metabolites are incorporated into blood, urine, vitreous humor, hair, oral fluid, sweat, and meconium.</li> <li>4. Discuss specimen collection, preservation, storage, and preparation requirements for each matrix.</li> <li>5. Compare the advantages and limitations of traditional and alternative matrices in forensic investigations.</li> <li>6. Evaluate pre-analytical and post-analytical factors that affect toxicological interpretation.</li> <li>7. Assess the suitability of specific matrices for postmortem investigations, workplace testing, drug-facilitated crimes, abstinence monitoring, neonatal exposure assessment, and other forensic applications.</li> <li>8. Apply matrix-specific considerations to the interpretation of toxicological findings through case-based examples.</li> </ol>
<b>Lessons</b>	3
<b>Quizzes</b>	1
<b>Format</b>	<p>Courses on DrugImpairment.com are offered in an asynchronous e-learning format. Each course consists of individual lessons and each lesson contains video-based instruction or a written learning assignment. Lessons are equipped with timers and activity monitoring for completion integrity. Certificates are granted upon completion of all lessons in a course and achieving satisfactory performance on any associated quizzes. Course learning hours are determined by run-time, with a minimum of 50 minutes required per credit hour.</p>

### Instructor Information

<b>Instructor Name</b>	Karen Scott, Ph.D., F-ABFT
<b>Instructor Biography</b>	Dr. Karen Scott is the Director of the Forensic Toxicology Laboratory and an Associate Professor of Laboratory Medicine at

	<p>the University of Alabama at Birmingham. She has over 30 years of experience in the fields of forensic and clinical toxicology and is published in the areas of post-mortem and human performance toxicology, and hair and alternative matrix testing. She is also a reviewer for three of the main Forensic Toxicology journals.</p> <p>Dr. Scott has a Bachelor of Science degree in Forensic &amp; Analytical Chemistry from the University of Strathclyde (Glasgow, UK, 1994) and a PhD in Forensic Toxicology from the University of Glasgow (UK, 1998)). On completion of her degrees, she carried out postdoctoral research in Tokyo, Japan investigating incorporation rates of drugs into hair. Dr. Scott has been a member of the Alcohol Drugs and Impairment Division of the National Safety Council since 2015 and sits on the executive board of this organization. She is also on the editorial board of Clarkes Analysis of Drugs and Poisons and a member of the OSAC Forensic Toxicology subcommittee.</p>
<b>ABFT Certified</b>  <b>POST Instructor</b>  <b>DRE</b>  <b>DRE Instructor</b>	<p><b>Yes</b> No Not Applicable</p> <p>Yes No <b>Not Applicable</b></p> <p>Yes No <b>Not Applicable</b></p> <p>Yes No <b>Not Applicable</b></p>