Forensic Science

TOPIC CATALOG

1.800.EDVOTEK
www.edvotek.com

EDVOTEK®

Designed for the Classroom
SINCE 1987

EDVOTEK®

The Biotechnology Education Company®

Edvotek® was the world's *first company* dedicated to demystifying biotechnology for young people.
In 1987, we envisioned how the emerging area of biotechnology could *inspire* students to choose a career in science.

Since then, Edvotek® has *expanded* to become the world's *leading supplier* of safe, affordable and easy-to-use *biotechnology kits and equipment* designed specifically for education.

Let us help you bring the exciting world of biotechnology into your classroom!

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EDVOTEK®

About Forensic Science

Today's detectives work closely with scientists as criminal investigators. The success or failure of a criminal investigation begins with the proper collection of samples from the crime scene. With forensic science kits from Edvotek®, you can turn your classroom into a crime scene analysis laboratory!

The materials left behind at a crime scene can be a stain of blood on a piece of clothing, on a wall or floor, a droplet of blood on a knife, fingerprints on an object such as a glass or knife handle, and many other things. In some cases, a few cells caught under the victims nails during a struggle, or often human hair, can provide a wealth of information. Evidence can be obtained based on microscopic examination and compared to a sample obtained from a person of interest who may have been at the site of the crime. Samples that are collected cannot be tainted and must be secured and stored with proper identification from the first test to data analysis.

Depending on the sample collected, different tests can be used to point investigators towards the criminal. For example, blood is one of the most common forensic samples found at a crime scene. Detectives can perform forensic blood typing analysis to rule out possible suspects, determine if the blood is from a human or an animal, and detect blood that may not be visible to the naked eye.

Blood samples, as well as hair, tissues, and other fluids, can also be used to investigate the make-up of the DNA. In humans, DNA is packaged into 23 pairs of chromosomes. Although most of this DNA is identical between individuals, small sequence differences, or "polymorphisms", occur at specific locations throughout the genome. These polymorphisms can be detected and analyzed using forensic science.

With forensic science kits from Edvotek®, you can transform your classroom into a CSI lab! Determine blood types, perform DNA fingerprints, analyze ink in a ransom note, and more.

EDVOTEK®

Lesson Plan

Free Lesson Plan
Left at the Scene of the Crime!
An Introduction to Forensic Science

Available as a free download on our website:
www.edvotek.com/Lesson_Plan_Forensic_Science.pdf

Note: This webpath is case sensitive.

Introduction to Forensic Science

With our introductory forensic science kits, you'll be able to bring the fun and excitement of forensic science into your classroom without any extra equipment. Get your detectives ready to solve their first crime!

Whose Fingerprints Were Left Behind?

After a crime has been committed, the evidence left behind can identify a potential culprit. Even in this age of DNA, fingerprints and blood stains are still important at helping to identify a criminal. In this experiment your students will learn to detect and analyze fingerprints and then use these techniques to solve a classroom crime.

Cat# S-91   ***For 32 students***


NEW! Write to a Fair Trial: Forensic Handwriting Analysis

Your lab notebook has been stolen, replaced with a ransom note demanding lunch money in exchange for its safe return! In this hands-on experiment, students will use principles of forensic handwriting analysis and paper chromatography to examine writing samples from 4 potential suspects. Only after careful analysis will they be able to solve the classroom crime.

Cat# 196   ***For 10 groups***

EDVOTEK ®
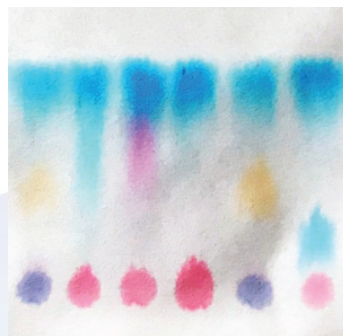
Blood-Based Forensic Tests

Forensic Enhancement Techniques

Trace amounts of blood are often sufficient to identify the individual responsible for any number of crimes, including murder, burglary, or assault. Enhancement procedures can make a small stain of body fluid or tissue visible to the naked eye. In this experiment, students will act as detectives following the aftermath of a drug bust involving gang warfare over territory. Reagents that are routinely used as a first screen will be utilized to detect simulated blood and DNA. In addition, biological materials will be recovered from splatters, blood trajectory, and small droplets of simulated human materials.

Cat# 194   *For 10 groups*

Blood Typing

ABO typing of blood left at the scene of a crime can help to narrow down a list of suspects. In this experiment, your students will use agglutination to identify the blood type of unknown blood samples as a step to identify a criminal.

Cat# 140   *For 10 groups*

Forensic Blood Typing

In this combination experiment, students are introduced to some of the techniques used by forensics scientists for analyzing blood. The students first check for the presence of blood typing using the phenolphthalein test. Then the students will apply the concept of blood type-based screening for potential suspect(s) present at a crime scene.

Cat# 191   *For 10 groups*

Forensic Antigen Detection

In this experiment, students will determine the validity of the hypothesis set forth by a detective in a homicide case. Using an antigen-antibody solution, students will perform the Ouchterlony procedure and determine if the blood left at the scene of the murder is human or feline.
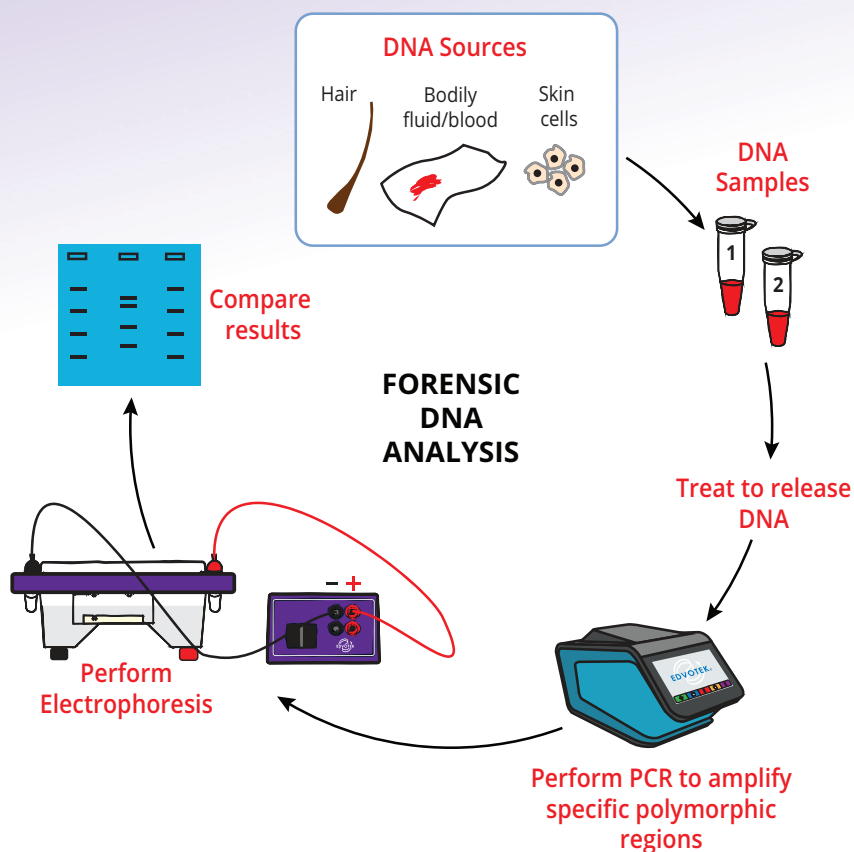
Cat# 192   *For 10 groups*

DNA Fingerprinting

The human genome is 99.9% identical between individuals. However, polymorphisms provide regions of variation within our genome. Each of us inherits a unique combination of polymorphisms from our parents. By focusing on several polymorphic regions, scientists can uncover a person's "DNA fingerprint". Like a regular fingerprint, a DNA fingerprint can be used to identify and distinguish between individuals. Teach your students all the different ways that DNA can be used in forensics to identify suspects.

DNA Sources

Hair   Bodily fluid/blood   Skin cells

DNA Samples

1   2

Compare results

FORENSIC DNA ANALYSIS

Treat to release DNA

Perform Electrophoresis

− +

Perform PCR to amplify specific polymorphic regions

EDVOTEK

Whose DNA Was Left Behind?

DNA obtained from just a single hair left behind at a crime scene can be used to identify a criminal! In this experiment, your students will compare simulated crime scene DNA with that of two suspects.

Cat# S-51   For 10 groups

DNA Fingerprinting by PCR Amplification

Forensic DNA fingerprinting has become a universally accepted crime-fighting tool. Recent advances use the polymerase chain reaction (PCR) to amplify human DNA obtained from crime scenes and examine it using gel electrophoresis. This experiment, based on a crime scene scenario, has a true inquiry-based component. All samples are provided ready-to-load, no PCR machine is needed.

Cat# 130   *For 8 gels*

DNA Fingerprinting by Restriction Enzyme Patterns

Basic concepts of DNA fingerprinting are featured in this lab by comparing crime scene DNA with suspect DNAs. Fingerprint patterns are separated by agarose gel electrophoresis and the students determine who may have done-it. With Ready-to-Load™ QuickStrips™, the crime scene and criminal DNA have been pre-digested with restriction enzymes and are ready for your classroom!

Cat# 109   *For 8 gels*
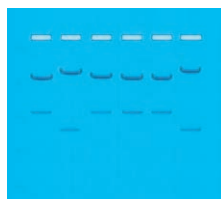
DNA Fingerprinting Using Restriction Enzymes

Teach your students about restriction enzyme digests in the context of forensic science. Your students will cut DNA with restriction enzymes and then compare the banding pattern of the crime scene DNA versus that of two suspects using agarose gel electrophoresis. The restriction enzymes come as lyophilized Dryzymes®, eliminating worry about loss of enzymatic activity with time.

Cat# 225   *For 6 gels*

DNA Fingerprinting Using PCR

This kit provides easy to follow instructions for your students to develop various crime scene scenarios independently and determine the criminal. Plasmid DNA, when amplified by PCR, provides products that represent individual DNA profiles. Plasmid, primers, and PCR reaction components are provided: your students can assemble and run the PCR to solve a crime!

Cat# 371   *For 25 students working in 5 groups*
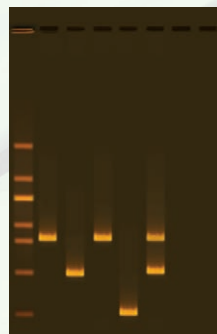
Forensic Analysis Using Proteins and Toxicology

How can scientists find out if someone has been drugged? What about who is responsible for a car accident by driving impaired? Teach your students about how different proteins and metabolites can signal changes in a person's behavior and be used to solve crimes!

Forensic Enzymology

In a head-on automobile collision, each driver claimed the other driver caused the accident by falling asleep at the wheel. The two passengers, one from each car, were critically injured, yet the drivers walked away with barely a scratch. Upon arrival at the local hospital, one of the passengers succumbed to his injuries and the accident is now a case of vehicular manslaughter. The attending physician completed a thorough examination of the two drivers by collecting blood and urine samples, as well as by taking their temperature. The physician saved the disposable plastic mouthpiece and tongue depressor used during the examination, knowing that sleep deprivation causes the level of saliva amylase to increase in humans. Students will determine the level of saliva amylase for the two drivers to discover who was responsible for the accident.

Cat# 193   For 10 groups

NEW! Forensic Toxicology

In today's forensic science laboratory, toxicologists identify drugs and toxins in samples collected from crime scenes, victims, and potential suspects. If present, the toxicologist also determines whether the drug or toxin contributed to a person's behavioral changes or death. In this forensic science experiment, students will use the Enzyme Linked Immunosorbent Assay (ELISA) to analyze simulated crime scene samples for the presence of drugs.

Cat# 195   For 10 lab groups

EDVOTEK®
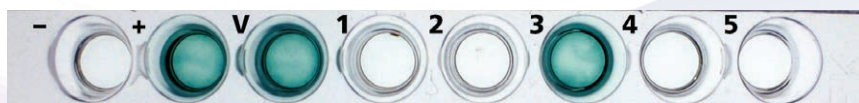
M12 Complete™
Electrophoresis Package

Run the full spectrum of horizontal electrophoresis experiments with this versatile package! Our newly reimagined M12 Complete™ supports one or two student groups in two standard length gel trays for experiments that require less separation, or one long gel tray for experiments that require more. Produces excellent results in 10-20 minutes and includes a lifetime warranty.

Features:
- Sleek New Design Speeds Electrophoresis
- Complete Set of Electrophoresis Accessories Included
- Contoured Lid for Enhanced Gel Visualization
- Large Color Coded Push Tabs for Easy Lid Insertion and Removal
- Pour Spout for Buffer Disposal
- Improved Ventilation Reduces Lid Condensation
- User Replaceable Electrodes
- Reverse Compatible with Previous Edvotek® Accessories
- Ability to Run at High Voltage Saves Time
- US Design Patent No. D749,235
- Made in USA
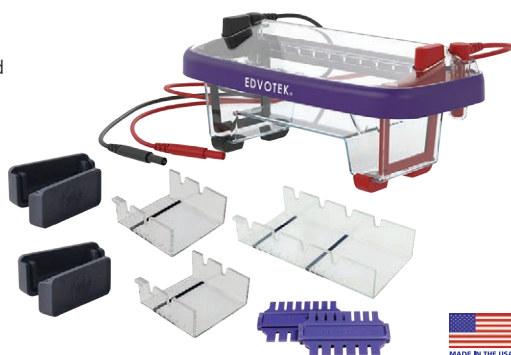
Cat# 502-504   *For 1 or 2 lab groups*

MADE IN THE USA

M36 HexaGel™
Electrophoresis Apparatus

The latest in electrophoresis design! Our newly reengineered M36 Electrophoresis Apparatus supports up to six student groups. Produces excellent results in 10-20 minutes and includes a lifetime warranty.

Features:
- Sleek New Design Speeds Electrophoresis
- Contoured Lid for Enhanced Gel Visualization
- Large Color Coded Push Tabs for Easy Lid Insertion and Removal
- Pour Spout for Buffer Disposal
- Improved Ventilation Reduces Lid Condensation
- User Replaceable Electrodes
- Reverse Compatible with Previous Edvotek® Accessories
- Ability to Run at High Voltage Saves Time
- US Design Patent No. D749,235
- Made in USA
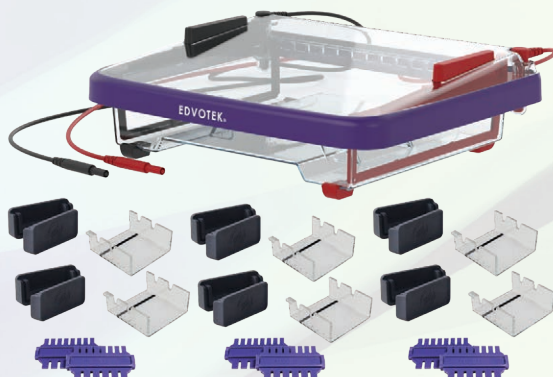
Cat# 515   *For 6 lab groups*

MADE IN THE USA

Power Supplies

DuoSource™ 150
• 75/150 V, for 1 or 2 Units
  Cat# 509

QuadraSource™
• 10-300 V, for 1 to 4 Units
  Cat# 5010

Trays, Combs, and End Caps

E-Z Align™ Trays
• 7x7 cm tray with end caps
  Cat. #684
• 7x10 cm tray with end caps
  Cat. #686
• 7x14 cm tray with end caps
  Cat. #685

Combs and End Caps
• Double 6/8
  Tooth Comb
  Cat. #680-683

• Rubber End Caps
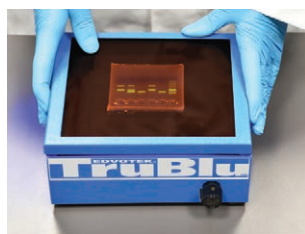 *Cat. #687*

Gemini Split Tray™
• Two 7x7 cm trays with end
  caps and two Double 6/8
  Tooth Combs
  Cat. #535

Visualization and Analysis

**TruBlu™ Blue Light LED
Transilluminator**
Cat# 557

**White Light LED
Transilluminator**
Cat# 552

**Midrange UV
Transilluminator**
Cat# 558

Long Wave UV Mini Light
Cat# 969

**EdvoFoto™
Digital GelCam**
Digital camera and
hood. For gels up
to 7x14 cm.
Cat# 551

**UV Digital
Photodocumentation
System**
*(Both Cat. 558
and Cat. 551)*
*Cat# 555*

Pipets and Liquid Handling

EDVOTEK® Variable Micropipettes

- 0.1-2.5 µL Micropipette
  Cat. # 589-2
- 0.5-10 µL Micropipette
  Cat. # 589
- 2-20 µL Micropipette
  Cat. # 589-1
- 5-50 µL Micropipette
  Cat. # 590
- 10-100 µL Micropipette
  Cat. # 591
- 20-200 µL Micropipette
  Cat. # 591-1
- 100-1000 µL Micropipette
  Cat. # 592-1
- 500-5000 µL Micropipette
  Cat. # 593-1

EdvoPette™ Pipet Controller
- For pipets 1-100 mL
  Cat# 594
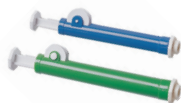
Pipet Pumps
- Green, for pipets 5-10 mL
  Cat# 640
- Blue, for pipets up to 2 mL
  Cat# 641

Serological Pipets
- 5 mL pipets, 50/pkg
  Cat. # 645
- 10 mL pipets, 50/pkg
  Cat. # 646

Fixed Volume MiniPipets™

- 5 µL MiniPipet™
  Cat. # 585
- 10 µL MiniPipet™
  Cat. # 586
- 20 µL MiniPipet™
  Cat. # 586-1
- 30 µL MiniPipet™
  Cat. # 587-1
- 35 µL MiniPipet™
  Cat. # 587-2
- 40 µL MiniPipet™
  Cat. # 588
- 50 µL MiniPipet™
  Cat. # 588-1
- 75 µL MiniPipet™
  Cat. # 588-2
- 100 µL MiniPipet™
  Cat. # 588-3
- 200 µL MiniPipet™
  Cat. # 588-4

Micro Transfer Pipets
- 400/pkg, disposable
  Cat. # 632

Pipette Stand
- For 6 Modern Variable Micropipettes.
  Cat. # 796

Tips

Ultra Tips, 0.5-10 µL
- 2 racks of 96 each
  Cat. # 635
- Bag of 1000 tips
  Cat. # 635-B

Yellow Tips, 1-200 µL
- 2 racks of 96 each
  Cat. # 636
- Bag of 1000 tips
  Cat. # 636-B

Blue Tips, 100-1000 µL
- 2 racks of 100 each
  Cat. # 637
- Bag of 1000 tips
  Cat. # 637-B

Fine Tips, 1-200 µL
- 1 rack of 204
  Cat. # 638
- Bag of 1000
  Cat. # 638-B

Jumbo Tips, 1000-5000 µL
- Bag of 100 tips
  For Modern Variable Pipets
  Cat. # 637-3
- Bag of 100 tips
  For Legacy Variable Pipets
  (pre-2015)
  Cat. # 637-2

Classic Pipette Stand
- For 6 Legacy Variable Micropipettes (pre-2015).
  Cat. # 796-C

LabStation™ Equipment Packages

Classroom DNA Electrophoresis LabStation™
Cat# 5062

DNA HexaGel™ LabStation™
Cat# 5071

HexaGel™ DNA LabStation™
Cat# RHLSE-3

Classroom PCR LabStation™
For up to 25 Students
Cat# 5067

Comprehensive Biotechnology LabStation™
For up to 48 Students
Cat# 5068

Ultimate Biotechnology LabStation™
For up to 64 Students
Cat# 5069

NEW! EdvoCycler™ 2

The sequel to the bestselling EdvoCycler™ has been fully reimagined to offer the classroom advanced PCR functionality at the lowest sample price. At 48 wells, the EdvoCycler™ 2 doubles the capacity of the original machine and offers faster performance and ease-of-use in a sleek new form factor with a 7" HD touchscreen display. Proudly made in the USA and backed by a 2 year warranty!

Features:
• Easy to use and program!
• Holds 48 x 0.2 mL PCR Samples and 8- Tube Strip Compatible
• 7" HD Touchscreen Displays Real-Time Cycling Data
• Edvotek® PCR Programs Included + Storage for 100 More
• Standalone Machine - No PC or Smartphone Required
• Heated Lid Prevents Sample Evaporation
• Instant Incubate Function
• Active Cooling to 4° C
• Temperature Range: 4 -99° C
• Maximum Ramp Rate: 4° C
• 2 Year Warranty; Extended Warranty Available
• Made in USA

Cat# 541-542

EDVOTEK ®

Reagents

PCR EdvoBeads™

PCR EdvoBeads™ provide the reagents for 25 PCR reactions in a convenient ambient-temperature-stable bead. PCR Beads have been optimized for PCR reactions and contain buffer, nucleotides and Taq DNA Polymerase. The only reagents that must be added to the reaction are template DNA and specific primers.
Cat# 625   25 Beads

Stains and Visualization

*   **SYBR® Safe Stain**
    Cat# 608   For 750 mL

*   **FlashBlue™ DNA Staining System**
    Cat# 609   For 1.2 L

*   **InstaStain® Ethidium Bromide**
    Cat# 2001   For 40 gels, 7x7 cm

*   **InstaStain® Blue, 7 x 7 cm**
    Cat# 2003   For 40 gels, 7x7 cm

*   **10X Gel Loading Solution**
    Cat# 606   Yields 5 mL

Agarose and Buffer

*   **Melt and Pour UltraSpec-Agarose™**
    Cat# 601   400 mL
    Cat# 601-B   5 x 400 mL

*   **UltraSpec-Agarose™**
    Cat# 605-3g
    Cat# 605-20g
    Cat# 605-100g
    Cat# 605-500g

*   **Electrophoresis Buffer 50x TAE**
    Cat# 607   100 mL
    Cat# 607-XL   500 mL

*   **TBE Powdered Electrophoresis Buffer**
    Cat# 607-1   For 5 Liters

Packages

*   **Electrophoresis Package with FlashBlue™**
    Includes: UltraSpec-Agarose™ (10 g), 100 mL Electrophoresis Buffer (50x), 0.5 mL Gel Loading (10x) Solution with tracking dye, and FlashBlue™ stain (for 1.2 L).
    Cat. #604

DNA Markers

*   **DNA Standard Marker**
    Cat. #750-1   For 20 gels

*   **100 bp DNA Ladder**
    Cat. #755   For 20 gels

*   **200 bp DNA Ladder**
    Cat. #756   For 20 gels

Practice

*   **Practice Gel Loading Solution**
    Cat# 606-P   5 mL

*   **DNA DuraGel™**
    Six reusable DNA DuraGels™, 4 FlashBlue™ and 4 Ethidium Bromide gel images, practice gel loading solution and mini-transfer pipets.
    Cat# S-43   For 12 to 24 students

Restriction Enzyme Analysis

Restriction Enzyme Reaction Buffer
*   **2 ml concentrate for 200 reactions.**
    Cat. #610

Dryzymes® Lyophilized
*   ***Eco*RI, 1500 units.**
    Cat. #715
*   ***Hin*dIII, 1500 units.**
    Cat. #716
*   ***Bam*HI, 1500 units.**
    Cat. #717

Lambda DNA
*   **Digested w/*Eco*RI and *Hin*dIII, 20 µg for 20 gels**
    Cat. #710
*   **Digested w/*Hin*dIII, 20 µg for 20 gels**
    Cat. #711

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Cell Biology | Neurobiology | & More!

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