Hapolens Laboratories

Lipoprotein Electrophoresis System

Quick Gel Lipoprotein Electrophoresis System

The Quick Gel Lipoprotein Electrophoresis System is currently the recommended method for the analysis of lipoprotein fractions in a Quick Gel 3000 analyzer system. For this method in a Quick Gel 2000 system, please contact your local wholesaler.

1. Lipoprotein Electrophoresis

2. Electrophoresis System

WARNING: The use of this system will result in a significant increase in the amount of visible light at the gel plate. These electrophoretic fractionation systems are not equipped with a gel plate filter. When the staining reagent is used, a gel plate filter or gel plate with a neutral density filter should be used to reduce the amount of visible light. A suitable gel plate filter can be obtained from the manufacturer.

3. Sample Preparation

4. Storage and Stability

Storage: Freeze the samples in a polystyrene tube at -20°C or below. The samples should be stored at -20°C or below until they are analyzed. After thawing, the samples should be kept at 4°C until analyzed.

Stability: The Quick Gel Lipoprotein Electrophoresis System is currently the recommended method for the analysis of lipoprotein fractions in a Quick Gel 3000 analyzer system. For this method in a Quick Gel 2000 system, please contact your local wholesaler.

<table>
<thead>
<tr>
<th>Cat. No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>3348</td>
<td>Quick Gel Lipoprotein Electrophoresis System</td>
</tr>
<tr>
<td>3349</td>
<td>Quick Gel Lipoprotein Electrophoresis System, Reagent Pack</td>
</tr>
</tbody>
</table>

Note: This system is currently the recommended method for the analysis of lipoprotein fractions in a Quick Gel 3000 analyzer system. For this method in a Quick Gel 2000 system, please contact the manufacturer for details.

---

**Type I: Hyperlipoproteinemia**

Type I is a primary hyperlipoproteinemia caused by an inherited deficiency of lipoprotein lipase. This results in the inability to hydrolyze triglycerides in the chylomicrons and VLDLs, leading to their accumulation in the blood. Characteristic features include elevated levels of triglycerides, chylomicrons, and VLDLs, which may be present even in the absence of dietary fat intake.

**Type II: Hyperlipoproteinemia**

Type II hyperlipoproteinemia is a primary hyperlipoproteinemia caused by an inherited deficiency of lipoprotein lipase. This results in the inability to hydrolyze triglycerides in the chylomicrons and VLDLs, leading to their accumulation in the blood. Characteristic features include elevated levels of triglycerides, chylomicrons, and VLDLs, which may be present even in the absence of dietary fat intake.

**Type III: Hyperlipoproteinemia**

Type III hyperlipoproteinemia is a primary hyperlipoproteinemia caused by an inherited deficiency of lipoprotein lipase. This results in the inability to hydrolyze triglycerides in the chylomicrons and VLDLs, leading to their accumulation in the blood. Characteristic features include elevated levels of triglycerides, chylomicrons, and VLDLs, which may be present even in the absence of dietary fat intake.

**Type IV: Hyperlipoproteinemia**

Type IV hyperlipoproteinemia is a primary hyperlipoproteinemia caused by an inherited deficiency of lipoprotein lipase. This results in the inability to hydrolyze triglycerides in the chylomicrons and VLDLs, leading to their accumulation in the blood. Characteristic features include elevated levels of triglycerides, chylomicrons, and VLDLs, which may be present even in the absence of dietary fat intake.

**Type V: Hyperlipoproteinemia**

Type V hyperlipoproteinemia is a primary hyperlipoproteinemia caused by an inherited deficiency of lipoprotein lipase. This results in the inability to hydrolyze triglycerides in the chylomicrons and VLDLs, leading to their accumulation in the blood. Characteristic features include elevated levels of triglycerides, chylomicrons, and VLDLs, which may be present even in the absence of dietary fat intake.

---

**Lipoprotein Electrophoresis System**

The lipoprotein electrophoresis system is currently the recommended method for the analysis of lipoprotein fractions in a Quick Gel 3000 analyzer system. For this method in a Quick Gel 2000 system, please contact your local wholesaler.

**Table 1: Classification and Composition of Lipoprotein Fractions**

<table>
<thead>
<tr>
<th>Lipoprotein Fraction</th>
<th>Lipoprotein Composition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alpha HDL*</td>
<td>50% 6% 18% 26%</td>
</tr>
<tr>
<td>Beta LDL*</td>
<td>21% 12% 45% 22%</td>
</tr>
</tbody>
</table>

---

**Storage and Stability**

The Quick Gel Lipoprotein Electrophoresis System is currently the recommended method for the analysis of lipoprotein fractions in a Quick Gel 3000 analyzer system. For this method in a Quick Gel 2000 system, please contact your local wholesaler.

**WARNING:** The gel plate filter or gel plate with a neutral density filter should be used to reduce the amount of visible light. A suitable gel plate filter can be obtained from the manufacturer.

---

**Sample Preparation**

The Quick Gel Lipoprotein Electrophoresis System is currently the recommended method for the analysis of lipoprotein fractions in a Quick Gel 3000 analyzer system. For this method in a Quick Gel 2000 system, please contact your local wholesaler.

**Equipment Needed**

- Quick Gel 3000 Analyzer
- Quick Gel Blotter X (20)
- SPIFE Blotter C (10)
- SPIFE 3000 Analyzer 1088
- Quick Gel Scan 2000 1660
- SPIFE Prep 3100
- RE Prep 3000
- Quick Gel Block Remover
- Lipoprotein Stain (1 vial)
- Quick Gel Blotter X (20)
- SPIFE Blotter C (10)
- SPIFE 3000 Analyzer 1088
- Quick Gel Scan 2000 1660
- SPIFE Prep 3100
- RE Prep 3000
- Quick Gel Block Remover
- Lipoprotein Stain (1 vial)
- Quick Gel Blotter X (20)
- SPIFE Blotter C (10)
- SPIFE 3000 Analyzer 1088
- Quick Gel Scan 2000 1660
- SPIFE Prep 3100
- RE Prep 3000
- Quick Gel Block Remover
- Lipoprotein Stain (1 vial)
- Quick Gel Blotter X (20)
- SPIFE Blotter C (10)
- SPIFE 3000 Analyzer 1088
- Quick Gel Scan 2000 1660
- SPIFE Prep 3100
- RE Prep 3000
- Quick Gel Block Remover
- Lipoprotein Stain (1 vial)
- Quick Gel Blotter X (20)
- SPIFE Blotter C (10)
- SPIFE 3000 Analyzer 1088
- Quick Gel Scan 2000 1660
- SPIFE Prep 3100
- RE Prep 3000
- Quick Gel Block Remover
- Lipoprotein Stain (1 vial)
- Quick Gel Blotter X (20)
- SPIFE Blotter C (10)
- SPIFE 3000 Analyzer 1088
- Quick Gel Scan 2000 1660
- SPIFE Prep 3100
- RE Prep 3000
- Quick Gel Block Remover
- Lipoprotein Stain (1 vial)
- Quick Gel Blotter X (20)
- SPIFE Blotter C (10)
- SPIFE 3000 Analyzer 1088
- Quick Gel Scan 2000 1660
- SPIFE Prep 3100
- RE Prep 3000
- Quick Gel Block Remover
- Lipoprotein Stain (1 vial)
- Quick Gel Blotter X (20)
- SPIFE Blotter C (10)
- SPIFE 3000 Analyzer 1088
- Quick Gel Scan 2000 1660
- SPIFE Prep 3100
- RE Prep 3000
- Quick Gel Block Remover
- Lipoprotein Stain (1 vial)
I. Chamber Preparation

2. Carefully cut open the end of the gel pouch. Remove one gel from the protective packaging. Place the gel into the chamber by sliding it under the agarose.

3. Place the edge of the gel into the agarose, leaving about 0.5 cm of the gel at the side edge and slightly off the side of the agarose block. This will allow the gel to expand under the agarose.

4. Use the agarose to support the gel as necessary to prevent the gel from floating. The gel should be in direct contact with the agarose on all sides. Place the gel block in the magnetic plate.

5. Place the agarose sheet over the gel block.

II. Stainer Preparation

2. Place the Stainer over the agarose sheet and wait 4 minutes. Pour off the stain.

3. Destain the gel with the Destain solution for 10 to 20 seconds. Pour off the Destain.

4. Use a QuickGel Blotter to gently blot the gel until no more water is seen. The gel should be dry to the touch.

5. The alfa-lipoprotein (HDL) band is the fastest moving fraction and is used to determine the total concentration of lipoprotein. The relative percent of each band is determined.

6. Any quantitation of Lp (a) must be added to pre-beta for an accurate total.

7. Use the QuickGel Blotter to gently blot the gel until no more water is seen. The gel should be dry to the touch.

8. Use a QuickGel Blotter to gently blot the gel until no more water is seen. The gel should be dry to the touch.

9. The alfa-lipoprotein (HDL) band is the fastest moving fraction and is used to determine the total concentration of lipoprotein. The relative percent of each band is determined.
3. Pre-Treatment

Reagents

Electrophoresis Unit

Pre-Beta: 46-100 mg/dL
Beta: 100-200 mg/dL
Alpha 1: 200-400 mg/dL
Alpha 2: 400-800 mg/dL
Beta: 800-1200 mg/dL

Sample Preparation

Preparation of Staining Solution:

Mix the Lipoprotein Stain in 1 liter deionized water. Mix thoroughly.

NOTE: In the presence of blood on the gel, render the gel transparent

3. Pre-Treatment

Reagents

Electrophoresis Unit

Pre-Beta: 46-100 mg/dL
Beta: 100-200 mg/dL
Alpha 1: 200-400 mg/dL
Alpha 2: 400-800 mg/dL
Beta: 800-1200 mg/dL

Sample Preparation

Preparation of Staining Solution:

Mix the Lipoprotein Stain in 1 liter deionized water. Mix thoroughly.

NOTE: In the presence of blood on the gel, render the gel transparent
<table>
<thead>
<tr>
<th>Item</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPIFE Disposable Sample Cups (Deep Well)</td>
<td>3360</td>
</tr>
<tr>
<td>QuickGel Chamber Alignment Guide</td>
<td>86541003</td>
</tr>
<tr>
<td>QuickGel Blotter X (20)</td>
<td></td>
</tr>
<tr>
<td>Applicator Blade Assembly - Blade</td>
<td>20 Sample (10)</td>
</tr>
<tr>
<td>SPIFE/QuickGel Disposable Stainless Steel Electrodes</td>
<td>3357</td>
</tr>
<tr>
<td>SPIFE/QuickGel Hold-Off Electrode</td>
<td></td>
</tr>
<tr>
<td>QuickGel Hold-Off Electrode</td>
<td></td>
</tr>
<tr>
<td>QuickGel Blotter A-1</td>
<td></td>
</tr>
<tr>
<td>QuickGel Blotter A-2</td>
<td></td>
</tr>
<tr>
<td>QuickGel Electrode</td>
<td></td>
</tr>
<tr>
<td>QuickGel Electrode</td>
<td></td>
</tr>
<tr>
<td>QuickGel Electrode</td>
<td></td>
</tr>
<tr>
<td>QuickGel Electrode</td>
<td></td>
</tr>
<tr>
<td>QuickGel Electrode</td>
<td></td>
</tr>
</tbody>
</table>

**Procedure**

1. **Preparation of Staining Solutions**
   - Prepare a working solution of Lipoprotein Stain by adding 5 mL of Stock Lipoprotein stain solution to 1 liter of methanol.

2. **Preparation of Gel:**
   - Place the gel in the SPIFE Set Gel Chamber.

3. **Electrophoresis**:
   - Place the gel in the SPIFE Set Gel Chamber.
   - Run the gel at 2000 V for 20 minutes.
   - Remove the gel from the chamber and discard the gel blocks. Place an anode on the top of the gel.
   - Mix the Lipoprotein Stain in 1 liter of methanol.
   - Remove excess stain from the sample area using a gloved finger to gently blot.

4. **Visualization of the Lipoprotein Bands**
   - A QuickGel Lipoprotein gel illustrating the band positions.

**Interpretation of Results**

- **Beta band**: The most prominent band is the Beta band. This band is present in all serum samples and is the major lipoprotein band. Chylomicrons are generally larger than the Beta band. The intensity of the Beta band increases with age.
- **Pre-Beta band**: This band is present in all serum samples and is the major lipoprotein band. Chylomicrons are generally larger than the Beta band. The intensity of the Pre-Beta band increases with age.
- **Alpha band**: This band is present in all serum samples and is the major lipoprotein band. Chylomicrons are generally larger than the Alpha band. The intensity of the Alpha band increases with age.

**References**

Laboratory Findings: Fat, oil, FS, as well as the Sudan black stain, has a major role. It is important to examine lipids in the thin-layer chromatography plate using thin layer chromatography to investigate the plasma lipids.

Criteria: Increased pre-Beta, increased triglycerides, normal or slightly increased total plasma lipid value. Since most laboratories routinely offer total cholesterol tests, increased total cholesterol is also known as "floating Beta." The condition is rare.

Type IIa: Increased pre-Beta, increased triglycerides, normal or slightly increased total plasma lipid value. Since the lipid composition of each lipoprotein is different, the results for each lipoprotein are different. The results for pre-Beta lipoproteins are usually normal. If there is a high concentration of triglycerides, the pre-Beta lipoproteins will be abnormal.

Type IIa and IIb: Increased pre-Beta, increased triglycerides, normal or slightly increased total plasma lipid value. Since the lipid composition of each lipoprotein is different, the results for each lipoprotein are different. The results for pre-Beta lipoproteins are usually normal. If there is a high concentration of triglycerides, the pre-Beta lipoproteins will be abnormal.

Type IIa and IIb: Increased pre-Beta, increased triglycerides, normal or slightly increased total plasma lipid value. Since the lipid composition of each lipoprotein is different, the results for each lipoprotein are different. The results for pre-Beta lipoproteins are usually normal. If there is a high concentration of triglycerides, the pre-Beta lipoproteins will be abnormal.

Type IIa and IIb: Increased pre-Beta, increased triglycerides, normal or slightly increased total plasma lipid value. Since the lipid composition of each lipoprotein is different, the results for each lipoprotein are different. The results for pre-Beta lipoproteins are usually normal. If there is a high concentration of triglycerides, the pre-Beta lipoproteins will be abnormal.

Type IIa and IIb: Increased pre-Beta, increased triglycerides, normal or slightly increased total plasma lipid value. Since the lipid composition of each lipoprotein is different, the results for each lipoprotein are different. The results for pre-Beta lipoproteins are usually normal. If there is a high concentration of triglycerides, the pre-Beta lipoproteins will be abnormal.

Type IIa and IIb: Increased pre-Beta, increased triglycerides, normal or slightly increased total plasma lipid value. Since the lipid composition of each lipoprotein is different, the results for each lipoprotein are different. The results for pre-Beta lipoproteins are usually normal. If there is a high concentration of triglycerides, the pre-Beta lipoproteins will be abnormal.

Type IIa and IIb: Increased pre-Beta, increased triglycerides, normal or slightly increased total plasma lipid value. Since the lipid composition of each lipoprotein is different, the results for each lipoprotein are different. The results for pre-Beta lipoproteins are usually normal. If there is a high concentration of triglycerides, the pre-Beta lipoproteins will be abnormal.

Type IIa and IIb: Increased pre-Beta, increased triglycerides, normal or slightly increased total plasma lipid value. Since the lipid composition of each lipoprotein is different, the results for each lipoprotein are different. The results for pre-Beta lipoproteins are usually normal. If there is a high concentration of triglycerides, the pre-Beta lipoproteins will be abnormal.

Type IIa and IIb: Increased pre-Beta, increased triglycerides, normal or slightly increased total plasma lipid value. Since the lipid composition of each lipoprotein is different, the results for each lipoprotein are different. The results for pre-Beta lipoproteins are usually normal. If there is a high concentration of triglycerides, the pre-Beta lipoproteins will be abnormal.

Type IIa and IIb: Increased pre-Beta, increased triglycerides, normal or slightly increased total plasma lipid value. Since the lipid composition of each lipoprotein is different, the results for each lipoprotein are different. The results for pre-Beta lipoproteins are usually normal. If there is a high concentration of triglycerides, the pre-Beta lipoproteins will be abnormal.

Type IIa and IIb: Increased pre-Beta, increased triglycerides, normal or slightly increased total plasma lipid value. Since the lipid composition of each lipoprotein is different, the results for each lipoprotein are different. The results for pre-Beta lipoproteins are usually normal. If there is a high concentration of triglycerides, the pre-Beta lipoproteins will be abnormal.
Laboratory Features
Fat, cholesterol, and triglycerides, as well as the selenium black, a marker of its color, are present in the test strip. The control of hypercholesterolemia is achieved by the specific expression of LDL receptors, which is necessary for the normal removal of LDL from the circulation.

Understanding the Basis of the Hypercholesterolemia Test
A test strip for the determination of total cholesterol is used to clinically diagnose hypercholesterolemia. The test strip contains a reagent layer containing cholesterol oxidase, which catalyzes the oxidation of cholesterol to cholesteryl radicals. These radicals are then detected by a specific enzyme, which produces a signal that is proportional to the cholesterol concentration.

WANING IN VITRO DIAGNOSTIC USE ONLY. The test is not intended to be used in the diagnosis of hypercholesterolemia, nor should it be used to determine the prognosis of patients with this condition. The test is intended to be used as an aid in the management of patients with hypercholesterolemia, as it can help to identify patients who are at risk of developing cardiovascular disease.

Preparation of Stock Stain Solution:
1. Dissolve 1 g of acrylamide in 100 mL of water.
2. Add 100 mL of distilled water to the acrylamide solution.
3. Mix well and filter before use.

Ingest. Danger: Flammable. Never pipette by mouth. If skin contact occurs, flush with copious amounts of water. If eye contact occurs, flush with water for at least 15 minutes. If swallowed, seek medical attention immediately.

The diluted stain should be a homogeneous mixture free of precipitate. The stain should be stable until the expiration date indicated on the package. Do not store at room temperature. Store at -20°C (−4°F) until use. Do not freeze.

AIAA Automated System for Lipid Electrophoresis
The AIAA Automated System for Lipid Electrophoresis is a fully automated system that performs lipid electrophoresis and separates lipoproteins in a single step. The system is based on the principle of isoelectric focusing (IEF), which separates lipoproteins based on their isoelectric point.

The system consists of a sample preparation module, a separation module, and a detection module. The sample preparation module is used to prepare the sample for electrophoresis. The separation module performs the electrophoretic separation of lipoproteins. The detection module is used to detect and measure the separated lipoproteins.

The AIAA Automated System for Lipid Electrophoresis is designed to be used in a laboratory setting. It is not intended for use as a stand-alone device. The system should be used by trained personnel who are familiar with the principles of lipid electrophoresis and the operation of the system.

The system is a valuable tool for the analysis of lipoproteins in clinical and research settings. It is particularly useful for the analysis of complex lipoprotein samples, such as those obtained from patients with hyperlipidemia.

The system is easy to use and requires minimal training. The operation of the system is controlled through a user-friendly interface. The system is capable of producing high-quality electrophoresis gels and can be used to analyze a wide range of lipoprotein samples.

The AIAA Automated System for Lipid Electrophoresis is a valuable tool for the analysis of lipoproteins in clinical and research settings. It is particularly useful for the analysis of complex lipoprotein samples, such as those obtained from patients with hyperlipidemia.

The system is easy to use and requires minimal training. The operation of the system is controlled through a user-friendly interface. The system is capable of producing high-quality electrophoresis gels and can be used to analyze a wide range of lipoprotein samples.

The AIAA Automated System for Lipid Electrophoresis is a valuable tool for the analysis of lipoproteins in clinical and research settings. It is particularly useful for the analysis of complex lipoprotein samples, such as those obtained from patients with hyperlipidemia.

The system is easy to use and requires minimal training. The operation of the system is controlled through a user-friendly interface. The system is capable of producing high-quality electrophoresis gels and can be used to analyze a wide range of lipoprotein samples.

The AIAA Automated System for Lipid Electrophoresis is a valuable tool for the analysis of lipoproteins in clinical and research settings. It is particularly useful for the analysis of complex lipoprotein samples, such as those obtained from patients with hyperlipidemia.

The system is easy to use and requires minimal training. The operation of the system is controlled through a user-friendly interface. The system is capable of producing high-quality electrophoresis gels and can be used to analyze a wide range of lipoprotein samples.

The AIAA Automated System for Lipid Electrophoresis is a valuable tool for the analysis of lipoproteins in clinical and research settings. It is particularly useful for the analysis of complex lipoprotein samples, such as those obtained from patients with hyperlipidemia.

The system is easy to use and requires minimal training. The operation of the system is controlled through a user-friendly interface. The system is capable of producing high-quality electrophoresis gels and can be used to analyze a wide range of lipoprotein samples.

The AIAA Automated System for Lipid Electrophoresis is a valuable tool for the analysis of lipoproteins in clinical and research settings. It is particularly useful for the analysis of complex lipoprotein samples, such as those obtained from patients with hyperlipidemia.

The system is easy to use and requires minimal training. The operation of the system is controlled through a user-friendly interface. The system is capable of producing high-quality electrophoresis gels and can be used to analyze a wide range of lipoprotein samples.

The AIAA Automated System for Lipid Electrophoresis is a valuable tool for the analysis of lipoproteins in clinical and research settings. It is particularly useful for the analysis of complex lipoprotein samples, such as those obtained from patients with hyperlipidemia.

The system is easy to use and requires minimal training. The operation of the system is controlled through a user-friendly interface. The system is capable of producing high-quality electrophoresis gels and can be used to analyze a wide range of lipoprotein samples.

The AIAA Automated System for Lipid Electrophoresis is a valuable tool for the analysis of lipoproteins in clinical and research settings. It is particularly useful for the analysis of complex lipoprotein samples, such as those obtained from patients with hyperlipidemia.

The system is easy to use and requires minimal training. The operation of the system is controlled through a user-friendly interface. The system is capable of producing high-quality electrophoresis gels and can be used to analyze a wide range of lipoprotein samples.

The AIAA Automated System for Lipid Electrophoresis is a valuable tool for the analysis of lipoproteins in clinical and research settings. It is particularly useful for the analysis of complex lipoprotein samples, such as those obtained from patients with hyperlipidemia.

The system is easy to use and requires minimal training. The operation of the system is controlled through a user-friendly interface. The system is capable of producing high-quality electrophoresis gels and can be used to analyze a wide range of lipoprotein samples.