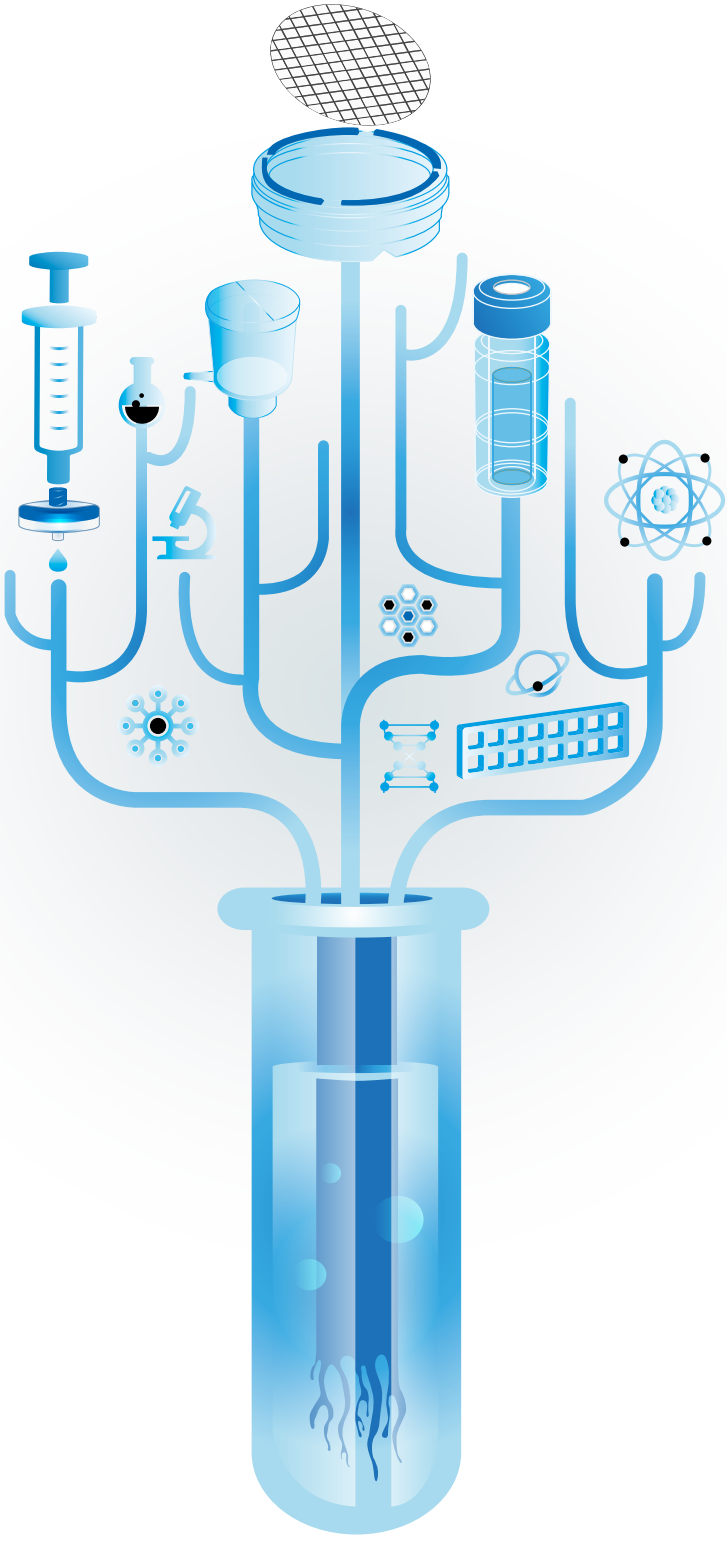
FILTER TECHNOLOGY

MOLECULAR BIOLOGY PRODUCT COLLECTION

GVS

FILTER TECHNOLOGY



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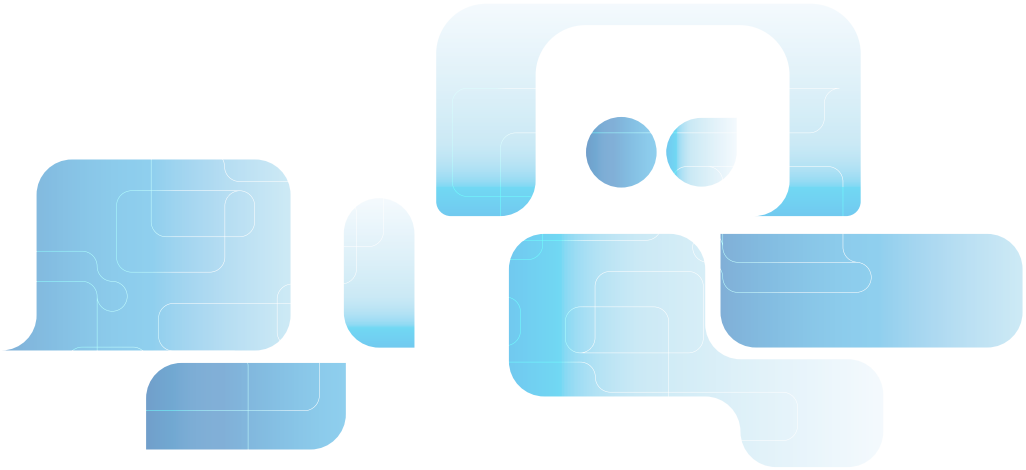
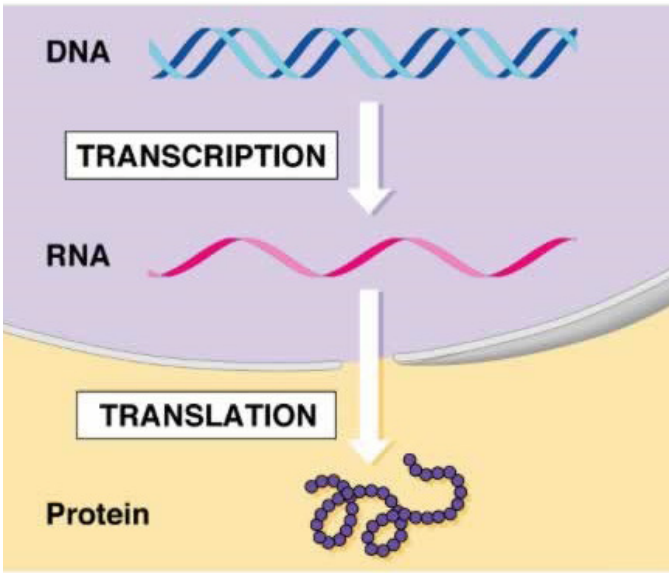
Molecular Biology

Index



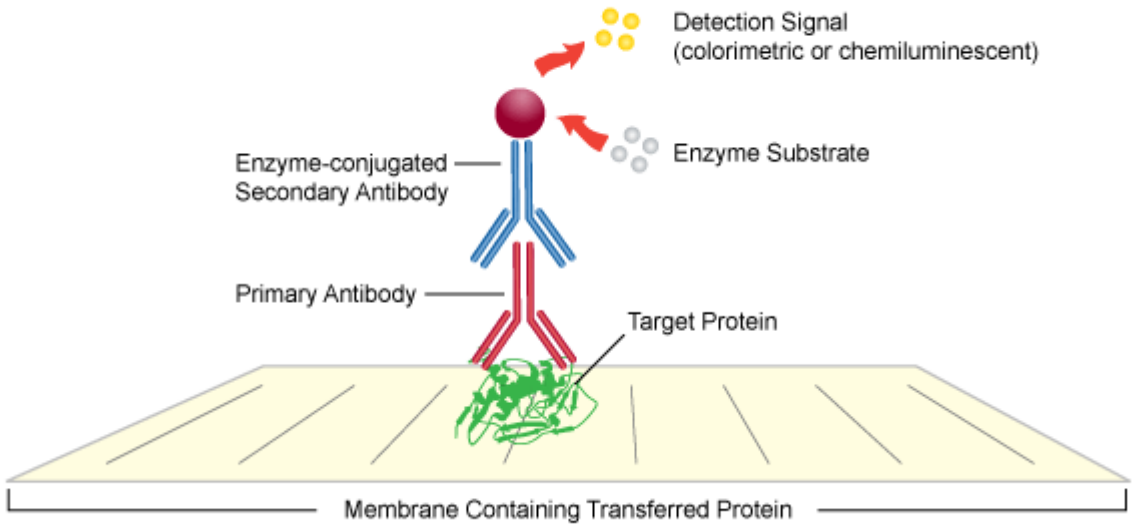
Molecular Biology Analysis

Molecular analysis studies subcellular components such as proteins and nucleic acids (DNA, RNA). These molecules can be detected by various blotting techniques. The sample of interest is separated according to size by electrophoresis through a gel. Molecules from the sample are transferred and bound to a microporous membrane Then, specific molecules of interest are detected using another molecule which specifically binds to the molecule of interest and can be detected by color, light or radioactivity.



Western Blot

Western blotting is a common and important technique used in molecular biology. It is used to detect a specific protein or protein fragment from a complex mixture such as a cell lysate, tissue extract, blood or serum sample or culture supernatants. The complex mixture is separated according to size by gel electrophoresis and then transferred to a membrane. A protein of specific interest is immunodetected using primary and secondary antibodies.



Western Blot Application Examples:

- **Protein expression and modification studies, may be quantitative;**
- **Amino acid analysis;**
- **Diagnostics development;**
- **Medical diagnosis such as for HIV and Lyme disease.**

Electrophoretic separation of proteins

Separation into polyacrylamide gel according to molecular wieght. In order to separate the proteins of lower molecular weight, use of more concentrated gel is required.

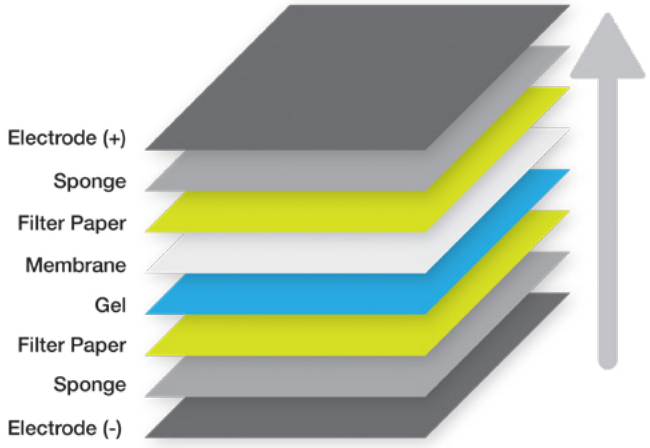
Transfer of proteins

Transfer from gel onto membrane followed by:

- Blocking;
- Applying a primary antibody specific for your protein of interest;
- Applying secondary antibody that will recognize the primary antibody.

Role of protein binding

Set up for transfer



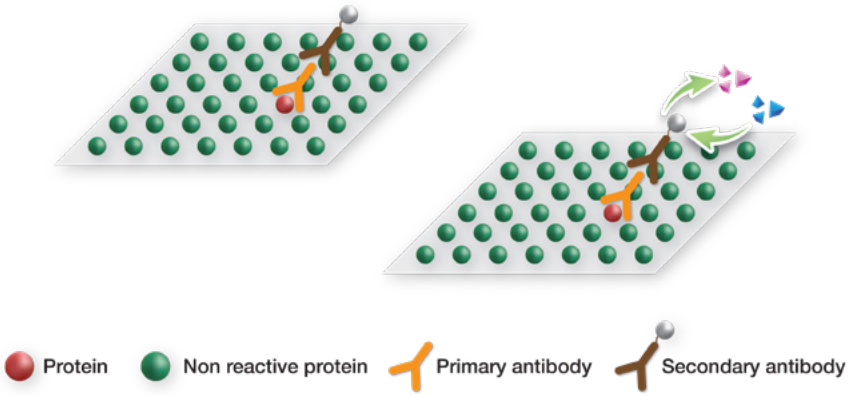
TYPICALLY TWO TYPES OF MEMBRANES:

- Nitrocellulose (hydrophilic)
- Polyvinylidene fluoride (hydrophobic)

Protein to membrane binding interactions:
hydrophobic, electrostatic, dipolar

Detection of proteins

Proteins can be detected by immunodetection methods which use enzyme conjugated/labeled secondary antibodies. When the enzyme substrate is added, a product is formed. This product can be detected by fluorescence, colormetrically, or by chemiluminescence. Enhanced chemiluminescence (ECL) produces light as a by-product when the substrate is catalyzed by the enzyme. This light is then captured on X-ray film or by a digital imaging system.



No separation of proteins

The protein is spotted on to a nitrocellulose or PVDF membrane, for example using a low-volume pipette.

Serial dilution of purified proteins

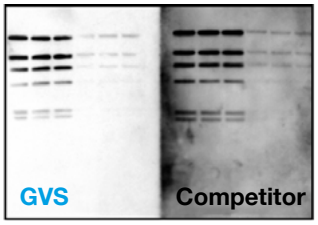
Pure Nitrocellulose

NITRO *Pure*
Unsupported
Nitrocellulose

Pure Nitrocellulose is the membrane of choice for all protein or immunoblotting application. The most common used membrane for western blotting techniques.
Supplied in various porosity and format

Features and Benefit

- High resolution
- Low Background, easily blocked
- Wets out naturally
- Compatible with all detection system



Ordering information

Pore sizes	Dimensions (mm) Packaging	70x84 mm 10/pk	100x100 mm 10/pk	150x150 mm 5/pk	200x200 mm 25/pk	200x3000 mm 1/pk	300x3000 mm 1/pk
	0.22 µm	1213991	1213999	1215463	1215392	1215469	1215458
	0.45 µm	1213888	1213314	1215476	1221976	1215483	1215471

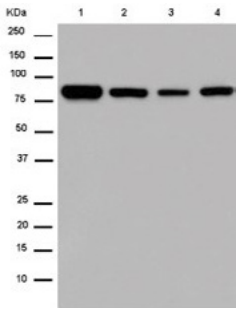
Supported Nitrocellulose

NITRO Plus
Supported
Nitrocellulose

Supported Nitrocellulose Transfer Membrane combines the binding characteristics of nitrocellulose membrane with the strength of nylon membrane.
Supplied in various porosity and format

Features and Benefit

- Supported for procedures requiring rigorous handling
- Strong will not curl, bend or crack after baking
- High sensitivities, low backgrounds
- Multiple reprobings
- BSA binding capacity up to



All lanes : Anti-Furin antibody [EPR14674] (ab183495) at 1/5000 dilution

Lane 1 : HepG2 whole cell lysate
Lane 2 : HeLa whole cell lysate
Lane 3 : U87-MG whole cell lysate
Lane 4 : Caco-2 whole cell lysate
Lysates/proteins at 20 µg per lane.
Secondary
Goat Anti-Rabbit IgG, (H+L), Peroxidase conjugated at 1/1000 dilution
Predicted band size : 87 kDa

Ordering information

	Dimensions (mm) Packaging	70x84 mm 10/pk	100x100 mm 10/pk	150x150 mm 5/pk	200x200 mm 5 /pk	200x3000 mm 1/pk	300x3000 mm 1/pk
Pore sizes	0.22 µm		1214560	1212669	1212689	1212690	1212632
	0.45 µm	1214978	1213943	1212596	1212597	1212602	1212590

Polyvinylidene Fluoride PVDF

PVDF is a naturally hydrophobic unsupported transfer membrane.
It has an high binding capacity and low backgrounds
Supplied in various porosity and format

Features and Benefit

- Superior Strength: Can withstand aggressive handling or be used with automated equipment without breaking or tearing
- Low extractable: Ensures tests will be clean with consistent results
- Exceptional sensitivity: Detects low-level components
- Hydrophobic: For high protein binding
- Lot to lot consistency: Quality checks ensure consistent binding for dependable results every time
- High binding capacity: Binds a wide range of fragment sizes
- High range of chemical Resistant to most commonly used chemicals compatible with chemically aggressive solvents

Ordering information

Dimensions (mm) Packaging	70x84 mm 10/pk	100x100 mm 10/pk	150x150 mm 5/pk	200x200 mm 5/pk	200x3000 mm 1/pk	300x3000 mm 1/pk
Pore sizes						
0.22 µm	1214588		1215037	1215032	1214726	1214429
0.45 µm	1213992	1212644	1212636	1212637	1212783	1212639

LIGHTwave™

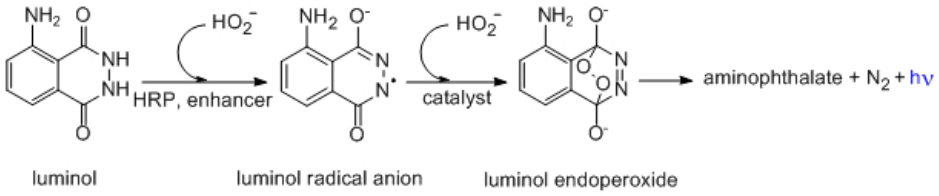
ECL SUBSTRATES
FOR WESTERN BLOTTING

About us

The GVS Group is one of the world's leading manufacturers of filters and components for applications in the Healthcare, Life Sciences, Automotive, Appliance, Safety, and Commercial & Industrial Filtration.
The Group's clear strategy towards internationalization, has led to the opening of 12 production facilities located in Italy, UK, Brazil, the United States, China and Romania, as well as offices in Russia, Turkey, Argentina, Japan, Korea. GVS currently have a workforce of over 2,700 people globally.
For 40 years, GVS has focused on innovation in its products range and production processes, constantly improving its development capacity to provide the best service and support for its clients
We offer a full range of branded products through a global network of dealers and distributors. We also make available all these capabilities on an OEM basis by working closely with companies around the world to provide state of the art materials solutions and/or turn-key final product solutions used in critical applications for the pharmaceutical, medical device, diagnostic, food & beverage and environmental monitoring markets.

All GVS substrates are protected by **US7803573**, **EP1962095**, **US7855287**, **EP1950207**, **US2012009603** (A1), **CA2742025**, **EP2405016**, foreign equivalents and pending patents.

LightWave™ detection reagents are non-isotopic, luminol-based chemiluminescence substrate, designed for the chemiluminescent detection of immobilized proteins and immobilized nucleic acids conjugated with horseradish peroxidase (HRP).
LightWave™ is intended for research use only, and shall not be used in any clinical procedures, or for diagnostic purposes.



Storage/expiry
One year at room temperature (max. 25°C).

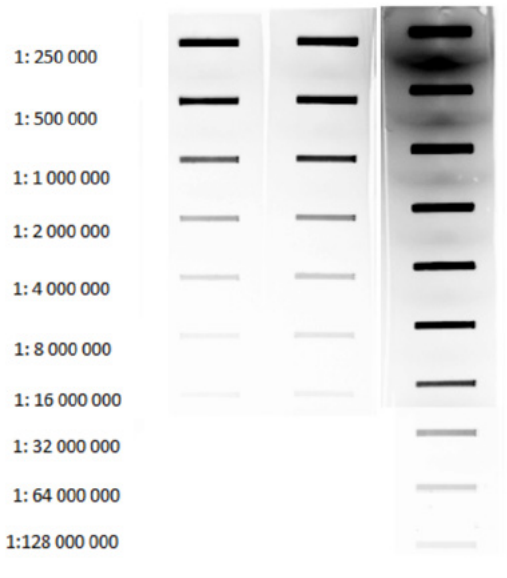
LightWave™ product line

Product	LightWave™	LightWave™ Plus	LightWave™ Max
Signal intensity	Medium	High	Ultra High
Signal duration	Medium	Extended	Short
Protein abundance	High	Medium	Ultra-low

GVS LightWave Substrates

Overview

HPR - Antibody dilutions



LightWave - Low picogram detection level
LightWave Plus – Mid femtogram detection level
LightWave Max – low femtogram detection level

Product	Suggested antibody dilutions	
LightWave™	Primary Ab	1:500 - 1:5,000
	Secondary Ab	1:20,000 - 1:100,000
LightWave™ Plus	Primary Ab	1:1000 - 1:15,000
	Secondary Ab	1:25,000 - 1:150,000
LightWave™ Max	Primary Ab	1:5000 - 1:100,000
	Secondary Ab	1:100,000 - 1:500,000

Quick start protocol

- Perform electrophoresis, membrane transfer and antibody incubation and washes
- Prepare Lightwave™ ECL substrate by mixing equal volumes of the two solutions
- Apply Lightwave™ chemiluminescent substrate to the membrane (1 mL per 10 cm3 of the membrane), incubate 2 minutes with the substrate
- Expose the substrate-treated membrane using a chemiluminescence imager or X-ray film

Product	Competitors
LIGHTwave™	PIERCE™ ECL PLUS - THERMO SCIENTIFIC™ IMMOBILION® CLASSICO - MILLIPORE™ WESTERN LIGHTNING™ PLUS - PERKINELMER WESTERNBRIGHT™ ECL - ADVANSTA
Plus LIGHTwave™	CLARITY™ - BIORAD SUPERSIGNAL™ WEST DURA - THERMO SCIENTIFIC™ AMERSHAM™ ECL PRIME™ - GE HEALTHCARE SUPERSIGNAL™ WEST PICO PLUS - THERMO SCIENTIFIC™ IMMOBILION® CRESCENDO - MILLIPORE™ WESTERNBRIGHT™ QUANTUM™ - ADVANSTA
Max LIGHTwave™	CLARITY MAX™ - BIORAD SUPERSIGNAL™ WEST FEMTO - THERMO SCIENTIFIC™ AMERSHAM™ ECL SELECT™ - GE HEALTHCARE WESTERNBRIGHT™ SIRIUS™ - ADVANSTA WESTERN LIGHTNING™ ULTRA - PERKINELMER

GVS Lightwave

LIGHTwave™

Competitor Pico

Competitor Classico

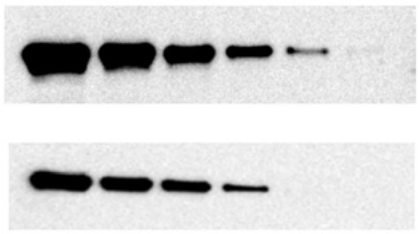
Competitor ECL

Features

- Low picogram detection
- Ideal for routinary analysis
- Working solution stable for at least three days
- The best entry level ECL substrate on the market
- Signal duration 5 hours
- Stable for 1 year at RT

Code	Description
LW0001	LightWave™ Western blotting substrate 10 mL
LW0002	LightWave™ Western blotting substrate 250 mL

GVS Lightwave Plus

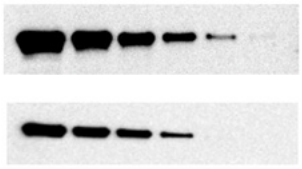


Plus LIGHTwave™

Competitor B

Features

- Mid femtogram detection
- Extended signal duration
- High range flexibility
- Working solution stable for at least three days
- The perfect ECL formulation combining great sensitivity and long signal duration
- Signal duration 25 hours
- Stable for 1 year at RT

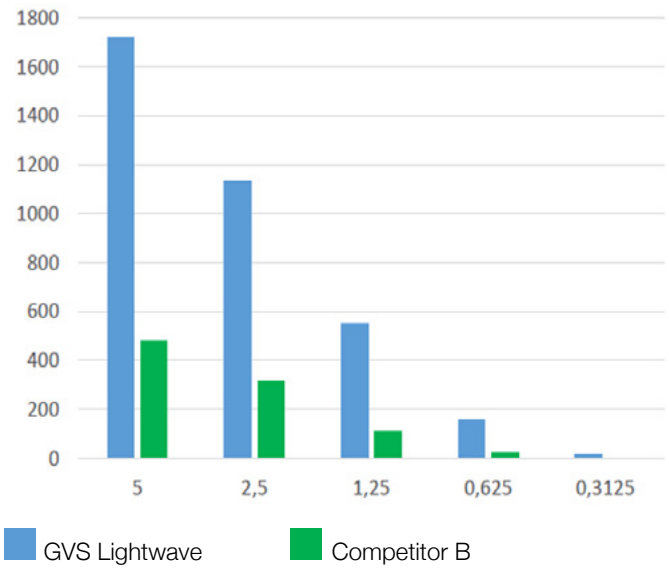


Plus LIGHTwave™

Competitor

Western blotting detection of HDAC-1 on Hela cells
Hela cell lysate from 5 to 0,078 µg
Ab 1° Rabbit anti HDAC1 1:5000
Ab 2° Goat anti rabbit 1:50000
Exposure time: 3 minutes
Imager: LAS4000 (GEHC)

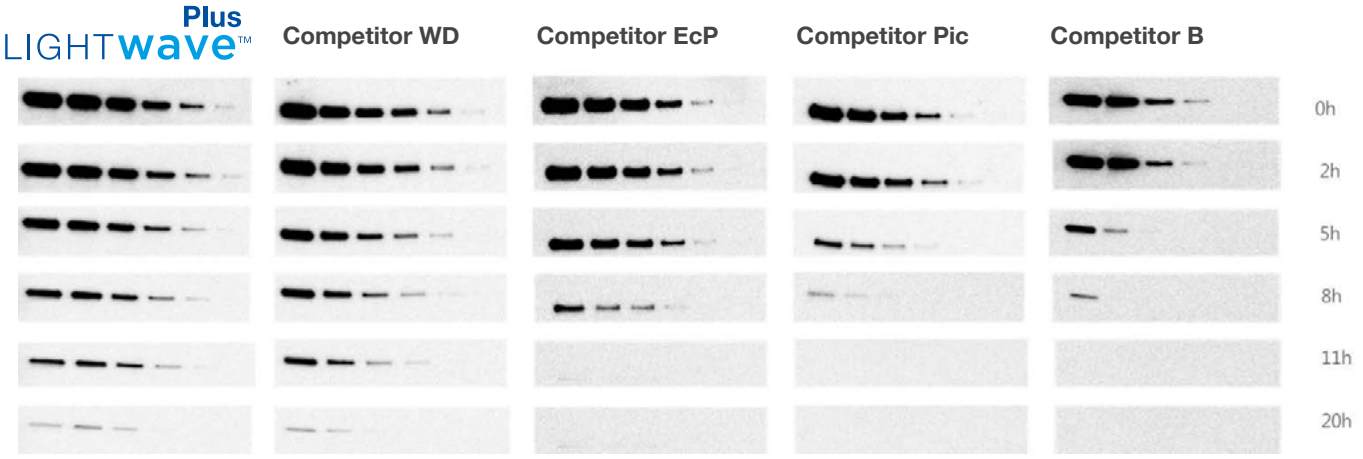
Signal to noise ratio



GVS LightWave Plus vs Competitor Signal duration

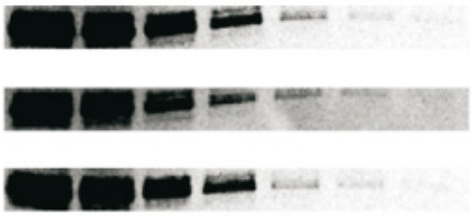
Signal duration

LightWave™ Plus provides an extremely extended signal duration when compared to most mid-level range ECL substrates. The HDAC-1 signal intensity variation over time was analyzed using **LightWave™ Plus** and its competitors (Figure 3).



Code	Desciption
LW0003	LightWave™ Plus Western Blotting Substrate 10 ml
LW0004	LightWave™ Plus Western Blotting Substrate 250 ml

GVS Lightwave Max



Max
LIGHTwave™

Competitor Femto

Competitor ECL Select

Features

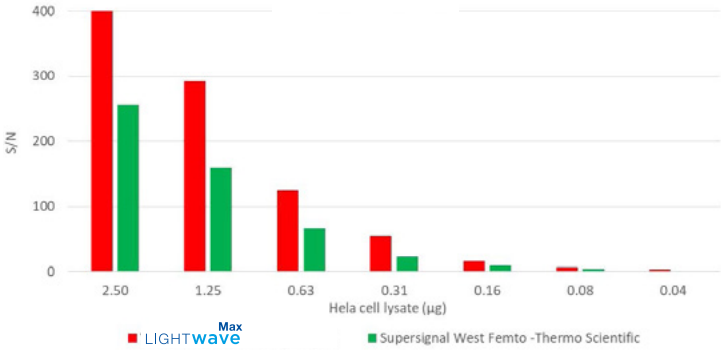
- Low femtogram detection
- Low antibody consumption to save your money
- Working solution stable for at least three days
- The ECL substrate with the highest signal on the market
- Signal duration 8 hours
- Stable for 1 year at RT

Figure 2. Low background for high sensitive detection with LightWave™ Max.

A) Western blotting detection of HDAC-1 on HeLa cell lysate with LightWave™ Max compared to SuperSignal™ West Femto-Thermo Scientific™. Triplicate blots for each substrate containing 2-fold dilutions of HeLa whole cell lysate were incubated with primary antibody (Rabbit-anti Human HDAC-1) 1:15000 and secondary antibody (Goat anti Rabbit-HRP) 1: 300000 and were simultaneously imaged for 120 seconds with ImageQuant™ LAS 4000 (GE Healthcare).

B) Signal-to-noise ratio (S/N) analysis. LightWave™ Max displays the best combination of sensitivity and signal with low background.

Signal to noise ratio



Detection level: **Low-femtogram**

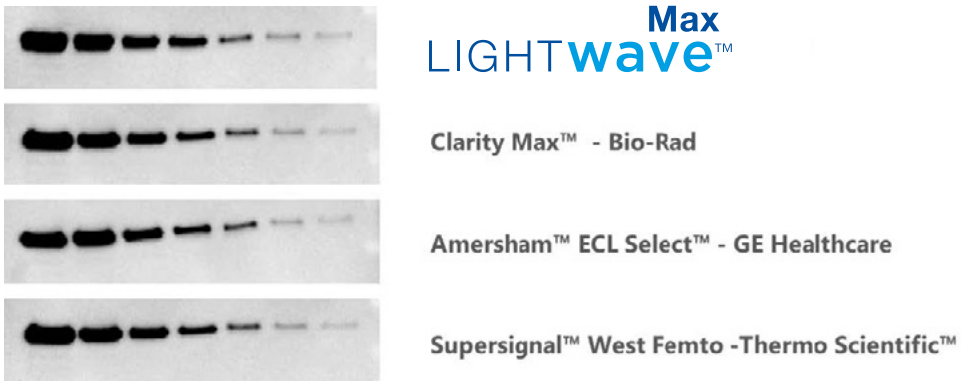


Figure1.Western blotting detection of HDAC-1 on HeLa cell lysate with LightWave™ Max and other chemiluminescent reagents in the same sensitivity range.

Signal duration

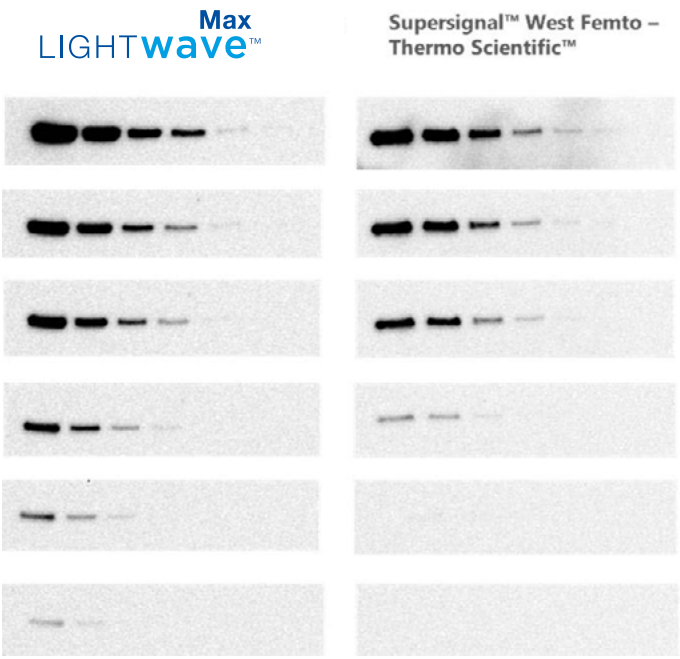


Figure 3. Signal duration of LightWave™ Max compared to SuperSignal™ West Femto-Thermo Scientific™. Quadruplicate blots for each substrate containing 2-fold dilutions of HeLa whole cell lysate were incubated with primary antibody (Rabbit-anti Human HDAC-1) 1:15000 and secondary antibody (Goat anti Rabbit-HRP) 1: 300000 and were simultaneously imaged with ImageQuant™ LAS 4000 (GE Healthcare) at time points up to 11 hours post substrate addition.

Code	Desciption
LW0005	LightWave™ Max Western Blotting High Sensitive Substrate 10 ml
LW0006	LightWave™ Max Western Blotting High Sensitive Substrate 100 ml

FILTER TECHNOLOGY

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