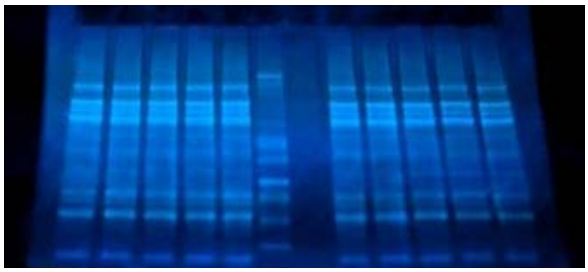
nUView Precast Gels

NuSep
Experts in protein discovery

UV Visualization

All nUView precast gels incorporate a unique formulation allowing protein bands to be visualized in only 2 minutes in the presence of ultraviolet (UV) light - taking you from analysis to results faster than any other gel on the market!
With nUView technology you no longer have to stain and de-stain your gels – increasing protein recovery and saving you significant time while achieving improved results.



2 minute visualization under uv light

Visualization of Proteins in SDS-PAGE nUView System

SDS-PAGE (Sodium Dodecyl Sulphate - Polyacryl-amide Gel Electrophoresis) is possibly the most common and long standing analytical tool used in protein chemistry [Laemmli, 1970].
The method is used to separate proteins according to their electrophoretic mobility which in SDS-PAGE is a function of length of polypeptide chain or molecular weight due to the proteins in the samples having near identical charge per unit mass due to the binding of SDS. Visualization commonly uses textile dyes such as Coomassie Brilliant Blue (CBB). These and other approaches such as silver staining, fluorescent dyes and heavy metal binding are protracted methods of staining. Most of these methods utilize either expensive reagents, cause problems with waste disposal or require specialized imaging systems.

UV Visualization

In contrast, nUView gels allow the separated protein bands to be visualized by illuminating the gel on a standard UV transilluminator such as that commonly used in molecular biology laboratories for the visualization of DNA with interchelating dyes (e.g., ethidium bromide).
The amino acid tryptophan is naturally fluorescent, but not in the visible spectrum. Photo-induced adduct formation between the tryptophan and the trihalo-compound, under UV illumination, results in proteins becoming fluorescent in the visible range, with excitation by UV light.
Optimal results are dependent on the trans-illuminator wavelength, the filters in place and the camera system used to document the fluorescence. Bands can be seen within 2 minutes of UV exposure. Therefore, one needs to optimize the conditions for any given gel documentation system and UV trans-illuminator.
Increased exposure times may lead to increased fluorescence intensity. However, cumulative UV exposure times will alter the tryptophan adduct to a nonfluorescent form, thus the protein bands dim (starting after approx. 7 minutes) and eventually are no longer visible under UV illumination.

Process Optimization

Use a UV transilluminator with UV tubes that provide a wavelength in the range 250–320 nm. 300–310 nm is preferred but the others can be optimized. To determine the optimal illumination time, run a gel with a range of loading concentrations of a commonly used sample or molecular weight standards. Remove gel from the cassette, rinse briefly with RO water (do not soak the gel) and place directly onto the trans-illuminator (rinsing can be omitted, however the salts in the surface buffer on the gel may be corrosive for parts of the trans-illuminator). Turn the UV light on and expose gel for 2 minutes. It may be possible to monitor the gel development in real time. Optimize your camera parameters (F stop, focus, etc). At 2 minutes and regular intervals up to 10-15 minutes (at the longer time you may notice a decrease in intensity) take photos/images of the exposed gel. Compare the pictures and select the optimal detection time.

Applications

The nUView method provides benefits in electroblotting to evaluate/document a gel prior to Western blotting [Ladner et al., 2004] and autoradiography; as it does not require a replicate gel to be run and, after blotting, the original gel can be placed back on the transilluminator to evaluate the degree of protein transfer to the membrane.
Bands visualized by nUView can be excised and analysed by mass spectrometry. The bands visualized with the nUView method could be digested and applied to MALDI/TOF plates directly [Ladner et al., 2006].
Proteins must be fixed before being digested and eluting peptides from the gel for LC-MS analysis.
nUView visualized gels can be over-stained by any preferred method - CBB, silver, Sypro, zinc/copper, etc. Thus the nUView method provides instant visualization, which then can be followed by standard imaging techniques. Furthermore, this combination provides a more comprehensive picture of all proteins in the sample as not all proteins are necessarily detectible by a single visualization method. Membrane proteins may be more easily visualized with nUView versus CBB due to tryptophan content of this class of proteins.

References
Ladner, C. Yang, J., Turner, R.J., & Edwards, R. A. (2004) Visible Fluorescence Detection of Proteins in Polyacrylamide Gels without staining. Anal. Biochem. 326;13-20.
Ladner, C.L., Edwards, R.A., Schriemer, D.C., & Turner, R.J. (2006) Identification of trichloroethanol visualized proteins from two-dimensional polyacrylamide gels by mass spectrometry. Analytical Chemistry. 78; 2388-2396.
Laemmli, U.K. (1970) Cleavage of Structural Proteins during the Assembly of the Head of Bacteriophage T4. Nature 227; 680-685.
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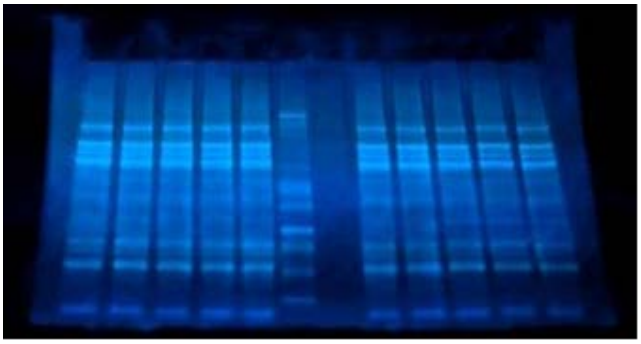
NuSep Precast Gels - Application

Visualization under UV light

With NuSep pre-cast gels, the separated bands can be visualized in two ways:
Place the gel on a standard UV light table or in a gel documentation system.

The amino acid tryptophan is naturally fluorescent, but not in the visible spectrum. UV excitation can convert this to a visible blue spectrum.
This produces images similar to those obtained with other staining methods.



2 minutes visualization in the presence of uv light

A. Standard UV Transilluminator

1. Start a run with NuSep gels.
2. Briefly wash the gel surface.
3. Place the gel on the disc.
4. Turn on the UV light for at least 90 seconds.
5. Check the fluorescent bands.
6. Take a photo with a suitable camera, ideally with a blue lens.

B. Gel Documentation System

1. Start a run with NuSep gels.
2. Briefly wash the gel surface.
3. Place the gel on the slide.
4. Select a suitable UV excitation of 300 nm.
5. Set the short-wave emission filter (green/blue).
6. Apply UV light for 90 seconds until the bands become visible.
7. Acquire the image with an exposure of 1-2 seconds.

Applications

1. Transfer the gels to PVDF for Western blot.
2. After transfer, the same gel can be viewed under UV light to check protein efficiency.
3. Bands can be captured for MS analysis or post-stained with regular Coomassie.

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NuSep Precast Gels - Assortment

Kassettenauswahl

Scope of Delivery 10 Cassettes	Acrylamide %	10 Well (50 µl)	12 Well (30 µl)	15 Well (25 µl)	17 Well (20 µl)
NN Cassette Size: 10 x 10 cm Suitable for Invitrogen™ Novex® XCell I and II and SureLock™ and other Max gel systems	8 %	NN10-008 / 102.0615	NN12-008 / 102.0620	-	NN17-008 / 102.0625
	10 %	NN10-010 / 102.0616	NN12-010 / 102.0621	-	NN17-010 / 102.0626
	12 %	NN10-012 / 102.0617	NN12-012 / 102.0622	-	NN17-012 / 102.0627
	8 - 16 %	NN10-816 / 102.0618	NN12-816 / 102.0623	-	NN17-816 / 102.0628
	4 - 20 %	NN10-420 / 102.0619	NN12-420 / 102.0624	-	NN17-420 / 102.0629
NB Cassette Size: 10 x 8.5 cm (W x H) Suitable for Bio-Rad Mini-Protean® tanks and other Mini gel systems	8 %	NB10-008 / 102.0630	NB12-008 / 102.0635	-	NB17-008 / 102.0640
	10 %	NB10-010 / 102.0631	NB12-010 / 102.0636	-	NB17-010 / 102.0641
	12 %	NB10-012 / 102.0632	NB12-012 / 102.0637	-	NB17-012 / 102.0642
	8 - 16 %	NB10-816 / 102.0633	NB12-816 / 102.0638	-	NB17-816 / 102.0643
	4 - 20 %	NB10-420 / 102.0634	NB12-420 / 102.0639	-	NB17-420 / 102.0644
NG Cassette Size: 10 x 8.0 cm (W x H) Suitable for all other 10 cm standard tanks (former iGels)	8 %	NG21-008 / 102.0300	NG11-008 / 102.1300	NG31-008 / 102.1310	-
	10 %	NG21-010 / 102.0301	NG11-010 / 102.1301	NG31-010 / 102.1311	-
	12 %	NG21-012 / 102.0302	NG11-012 / 102.1302	NG31-012 / 102.1312	-
	8 - 16 %	NG21-816 / 102.0304	NG11-816 / 102.1304	NG31-816 / 102.1314	-
	4 - 20 %	NG10-420 / 102.0303	NG11-420 / 102.1303	NG31-420 / 102.1313	-