SYPRO® Ruby Protein Gel Stain

S12000 SYPRO® Ruby Protein Gel Stain, 1 L
S12001 SYPRO® Ruby Protein Gel Stain, 200 mL
S21900 SYPRO® Ruby Protein Gel Stain, 5 L

Quick Facts

Storage upon receipt:

- Room temperature
- Protect from light

Ex/Em: 280, 450/610 nm

Introduction

Molecular Probes SYPRO® Ruby protein gel stain is a ready-to-use, ultrasensitive, luminescent stain for the detection of proteins separated by polyacrylamide gel electrophoresis (PAGE). SYPRO® Ruby stain is ideal for use in 1-D (Figure 1) and 2-D PAGE (Figure 2). The sensitivity of SYPRO® Ruby stain is as good as or better than the best silver staining techniques.[1-3]

Basic vs. Rapid Staining with SYPRO® Ruby Protein Gel Stain

- The basic protocol results in the maximum signal strength and widest linear dynamic range for quantitating both high and low abundance proteins. The basic protocol involves overnight staining and achieves sensitivities in the 1 ng range for most proteins in 1-D and 2-D gels of all types and sizes.

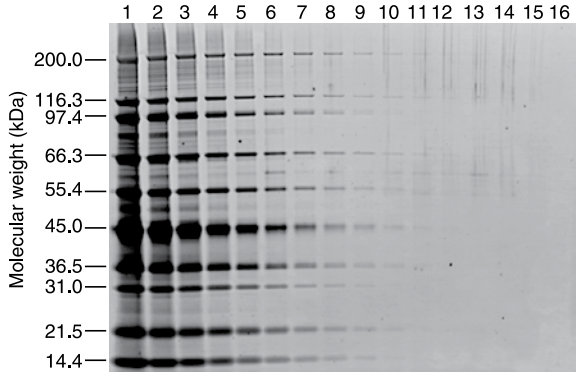

Figure 1. SYPRO® Ruby protein gel stain on a 1-D gel. Two-fold dilution series of Mark12™ unstained standards supplemented with ovalbumin, separated on a NuPAGE® 4–12% Bis-Tris gel, and stained with SYPRO® Ruby gel stain following the rapid stain protocol. Lane 9 is approximately 1 ng protein.

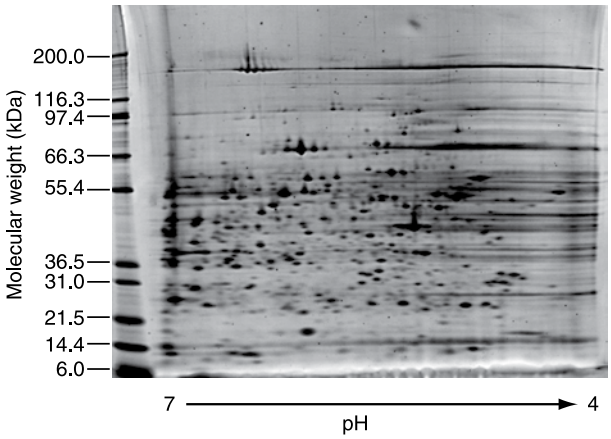

Figure 2. SYPRO® Ruby protein gel stain on a 2-D gel. Rat liver lysate (20 µg) separated on a pH 4–7 IPG strip and then on a NuPAGE® 4–12% Bis-Tris gel and stained with SYPRO® Ruby gel stain following the rapid stain protocol.

- The rapid protocol gives excellent results in 90 minutes. The rapid protocol is optimized for Invitrogen NuPAGE® gels, but will give comparable results with most types of minigels. The protocol involves microwaving the stain briefly and has excellent linearity and low background, with a lower limit of detection of 0.25 to 1 ng for most proteins.

General Features of SYPRO® Ruby Protein Gel Stain

- Linear quantitation range of over three orders of magnitude [1,4,5]
- Lower detection limit of 0.25 to 1 ng
- Stains most classes of proteins, including glycoproteins, phosphoproteins, lipoproteins, calcium binding proteins, fibrillar proteins, and other proteins that are difficult to stain [1]
- Does not stain extraneous nucleic acids [1]
- Less protein-to-protein variability than seen with silver stains or other fluorescent total-protein stains, because SYPRO® Ruby stain binds to basic amino acids and the polypeptide backbone [2,6]
- Can be multiplexed with other gel stains to obtain more information from one gel (Pro-Q® Diamond phosphoprotein gel stain, Pro-Q® Emerald 300 glycoprotein gel stain, Pro-Q® Sapphire and InVision™ oligohistidine-tag gel stains, Pro-Q® Amber transmembrane protein gel stain, and SilverXpress® and SilverQuest™ stains)[7-12]
- Compatible with subsequent analysis of proteins by Edman-based sequencing or mass spectrometry [13-18]

- Both protocols are compatible with most types of denaturing protein gels, including Invitrogen NuPAGE® Novex Bis-Tris and Tris-acetate gels, Novex® Tris-glycine gels, and Novex® Tricine gels in 1-D or 2-D format. The overnight protocol is also compatible with nondenaturing gels, IEF gels, and gels with plastic backing.
- Compatible with most laser-based and UV imaging systems (optimal with UV transillumination, 473–488 nm and 532 nm laser sources)
- Bright fluorescent signal can be seen by eye on UV and blue-light transilluminators
- Convenient, ready-to-use 1X stain
- Shipped at room temperature and can be stored on the bench-top for over nine months
- Simple protocol requires minimal hands-on time
- New rapid stain protocol gives results in 90 minutes

Materials

Contents

SYPRO® Ruby protein gel stain is supplied ready to use in three sizes:

- SYPRO® Ruby protein gel stain, 200 mL (S12001) provides sufficient material to stain 3–4 minigels
- SYPRO® Ruby protein gel stain, 1 L (S12000) provides sufficient material to stain 15–20 minigels or 2–3 large format gels
- SYPRO® Ruby protein gel stain, 5 L (S21900) provides sufficient material to stain 75–100 minigels or 10–15 large format gels

Materials Supplied by User

- Staining containers, 1 per gel (see *General Protocol Considerations*)
- Reagent-grade methanol
- Reagent-grade acetic acid
- Trichloroacetic acid (for IEF gels only)
- Ultrapure water (18 megohm-cm recommended)
- Rotary shaker
- Powder-free latex or vinyl gloves
- Microwave oven (700–1200 W) (optional)
- Water bath set at 80°C (optional)

Storage

SYPRO® Ruby protein gel stain is stable for at least 9 months when stored at room temperature, protected from light. For convenient storage and dispensing, the 5 L unit size is packaged in a cubical box with a spigot. Once opened, the box can be stored on its side with the top flap closed to protect the stain from light.

Handling and Disposal

SYPRO® Ruby protein gel stain is characterized as an irritant due entirely to the solvent system and buffer salts in the product. The heavy metal component of the stain (ruthenium) is not a regulated hazardous heavy metal in the United States. Independent toxicity tests found SYPRO® Ruby stain to be nontoxic at 5000 mg/kg in Sprague-Dawley™ rats. Nevertheless, SYPRO® Ruby stain should be handled with care, consistent with good laboratory practices.

Federal regulation in the US does not consider ruthenium or the solvent system and buffers in SYPRO® Ruby protein gel stain to be hazardous waste. Nevertheless, the solvent may be subject to more stringent regulations local to the user, so we recommend that used staining solution be mixed with flammable waste and disposed by destructive incineration and not by sewerage or landfill.

General Protocol Considerations

- Perform all fixation, staining, and washing steps with continuous, gentle agitation (e.g., on an orbital shaker at 50 rpm).
- Staining containers should be meticulously clean; we typically rinse the containers with ethanol before use. Keep containers covered when not in use. We recommend polypropylene or polycarbonate containers; these high-density plastics adsorb minimal amounts of the dye (examples include Servin' Saver® and Stain Shield® containers from Rubbermaid). For best results, use containers dedicated for SYPRO® Ruby dye gel staining to minimize dye cross-contamination or other artifacts. For large format 2-D gels, polyvinyl chloride photographic staining trays also work well. Glass dishes are not recommended.
- The minimal recommended staining volume is approximately 10 times the volume of the gel in a container that is slightly larger than the dimensions of the gel. Use a sufficient volume so that staining solution flows over the surface of the gel. Using too little stain will result in reduced sensitivity.
- For convenience, gels may be left in fix solution overnight or longer.
- For convenience, gels may be left in SYPRO® Ruby stain indefinitely without overstaining, although speckling artifacts tend to increase over time.
- As with any fluorescent stain, cover the gel container during staining and subsequent wash steps to exclude light.

Protocol Quick Guide for Experienced Users

	Reagent	Basic Protocol	Rapid Protocol
Fix	50% methanol, 7% acetic acid	100 mL, 30 min	100 mL, 15 min
		100 mL, 30 min	100 mL, 15 min
Stain	SYPRO® Ruby gel stain	60 mL, overnight	60 mL microwave 30 seconds agitate 30 seconds microwave 30 seconds agitate 5 minutes microwave 30 seconds agitate 23 minutes
Wash	10% methanol, 7% acetic acid	100 mL, 30 min	100 mL, 30 min
Hands-on time		10 minutes	15 minutes
Total time		~18 hours	90 minutes

Preparation of Solutions

The basic protocol and the rapid protocol are both optimized for standard 1 mm thick, 8 cm × 8 cm SDS-PAGE minigels. The volumes of fix, staining, and wash solutions are easily optimized for larger or thicker gels. Use 20 times the volume of the gel for each fixation and wash step, and 10 times the volume of the gel of SYPRO® Ruby stain.

Fix Solution

Prepare a fix solution of 50% methanol, 7% acetic acid. Prepare 200 mL fix solution per minigel or 1.6 L fix solution for each large format gel (i.e., 20 cm × 20 cm × 1 mm).

Note: For IEF gels, prepare a fix solution of 40% methanol, 10% trichloroacetic acid. Prepare 100 mL of this solution, or an amount equal to 20 times the volume of the gel.

Wash Solution

Prepare a wash solution of 10% methanol, 7% acetic acid. Prepare 100 mL wash solution per minigel or 800 mL wash solution for each large format gel (i.e., 20 cm × 20 cm × 1 mm).

Basic Protocol

Notes on the Basic Protocol

- The basic protocol is optimized for standard 1 mm thick, 8 cm × 8 cm SDS-PAGE minigels, such as Invitrogen NuPAGE® Novex Bis-Tris and Tris-acetate gels, Novex® Tris-glycine gels, and Novex® Tricine gels.
- The basic protocol can also be used for nondenaturing gels, IEF gels, and gels with plastic backing.
- Larger or thicker gels require additional volumes of reagents and/or longer incubation times. The basic staining protocol is easily optimized. Use 20 times the volume of the gel for fix and wash solutions, and 10 times the volume of the gel for the staining solution.

1.1 Fix. After electrophoresis, place the gel into a clean container with 100 mL of fix solution and agitate on an orbital shaker for 30 minutes. Repeat once more with fresh fix solution. Pour off the used fix solution.

Note: For IEF gels, place the gel into a clean container with 100 mL of IEF fix solution and agitate on an orbital shaker for 3 hours. After fixing, perform 3 washes in ultrapure water for 10 minutes each, before proceeding to the staining step.

1.2 Stain. Add 60 mL of SYPRO® Ruby gel stain. Agitate on an orbital shaker overnight.

1.3 Wash. Transfer the gel to a clean container and wash in 100 mL of wash solution for 30 minutes. The transfer step helps minimize background staining irregularities and stain speckles on the gel. Before imaging rinse the gel in ultrapure water a minimum of two times for 5 minutes to prevent possible corrosive damage to the imager.

Rapid Protocol

The rapid stain protocol requires only 90 minutes. While the maximum fluorescence signal strength is lower than for the overnight protocol, the rapid protocol results in lower background and fewer speckling artifacts, allowing sensitivities as low as 0.25 ng in 1-D gels. Similar sensitivity is obtained in 2-D gels.

Notes on the Rapid Protocol

- The rapid protocol is optimized for standard 1 mm thick, 8 cm × 8 cm SDS-PAGE minigels, such as Invitrogen NuPAGE® Novex Bis-Tris and Tris-acetate gels, Novex® Tris-glycine gels, and Novex® Tricine gels. The protocol is easily optimized for larger gels. Use 20 times the volume of the gel for fix and wash solutions, and 10 times the volume of the gel for the staining solution. Microwave times should be optimized for large format gels. Microwave the stain on full power for 30–45 seconds per round, until the stain reaches 80–85°C.
- Although SYPRO® Ruby stain solution is not flammable, use caution when microwaving SYPRO® Ruby stain as the solution becomes very hot. Wear eye protection, gloves and lab coat during all procedures. Placing a lid loosely over the staining container will minimize fumes. Do not heat the fixative solution or other methanolic solutions in the microwave.

2.1 Fix. After electrophoresis, place gel into a microwavable container with 100 mL of fix solution and agitate on an orbital shaker for 15 minutes. Repeat once more with fresh fix solution. Pour off the used fix solution.

2.2 Stain. Add 60 mL of SYPRO® Ruby gel stain. Microwave 30 seconds, agitate 30 seconds to distribute heat evenly, microwave another 30 seconds to 80–85°C, and agitate on an orbital shaker for 5 minutes. Reheat the gel by microwaving a third time for 30 seconds and then agitate on an orbital shaker for 23 minutes for a total stain time of 30 minutes. An acceptable alternative to the microwave procedure is to incubate the gel at 80°C in a shaking water bath for 30 minutes.

2.3 Wash. Transfer the gel to a clean container and wash in 100 mL of wash solution for 30 minutes. The transfer step is necessary to avoid heating the destain solution, which may reduce stain sensitivity, and also helps minimize background staining irregularities and stain speckles on the gel. Before imaging, rinse the gel in ultrapure water a minimum of two times for 5 minutes to prevent possible corrosive damage to the imager.

Using SYPRO® Ruby Stain As a Post-Stain

SYPRO® Ruby stain can be used subsequent to staining with other gel stains such as Pro-Q® Diamond phosphoprotein gel stain, Pro-Q® Emerald 300 glycoprotein gel stain, Pro-Q® Sapphire or InVision™ oligohistidine-tag gel stains, or Pro-Q® Amber transmembrane protein gel stain. SYPRO® Ruby stain should always be used last, because its bright fluorescent signal tends to dominate the signal from other stains. SYPRO® Ruby stain does not work well as a post-stain for colorimetric stains such as Coomassie® and silver stains.

3.1 Image the gel following staining with the first gel stain.

3.2 If the gel is not already in water, rinse the gel a minimum of two times for 5 minutes each in ultrapure water.

3.3 Incubate the gel directly in SYPRO® Ruby gel stain solution. There is no need to repeat the fixation step.

3.4 Continue with the basic or rapid stain protocol and imaging method just as when using SYPRO® Ruby stain alone.

Optional: SYPRO® Ruby dye–stained gels can be post-stained with a silver stain such as Invitrogen SilverQuest™ or SilverXpress® stain. Post-staining can be useful for detecting some proteins that are difficult to stain, and can provide additional total-protein information.

Viewing and Photographing the Gel

SYPRO® Ruby protein gel stain has two excitation maxima, one at ~280 nm and one at ~450 nm, and has an emission maximum near 610 nm (Figure 3). Proteins stained with the dye can be visualized using a 300 nm UV transilluminator, a blue-light transilluminator, or a laser scanner. The stain has exceptional photostability allowing long exposure times for maximum sensitivity.[6]

- SYPRO® Ruby stain and other fluorescent dyes such as SYPRO® Orange stain, Coomassie Fluor™ Orange stain, SYBR® stains, Pro-Q® stains, and ethidium bromide may leave a fluorescent residue on scanner plates or transilluminator surfaces. If the glass surface is not thoroughly cleaned, this residue can interfere with subsequent images and produce high background fluorescence. Wiping the glass surface with 100% ethanol followed by high-purity water is sufficient to remove any residue. Surfaces should be cleaned using lint-free cloths. The use of any type of paper towel, such as Kimwipes® tissues, will generate particulate matter that will be visualized as "speckles."
- We recommend using powder-free gloves. Rinse gloves with water prior to handling gels. Any powder transferred to the gel may appear as speckles or large spots on images.

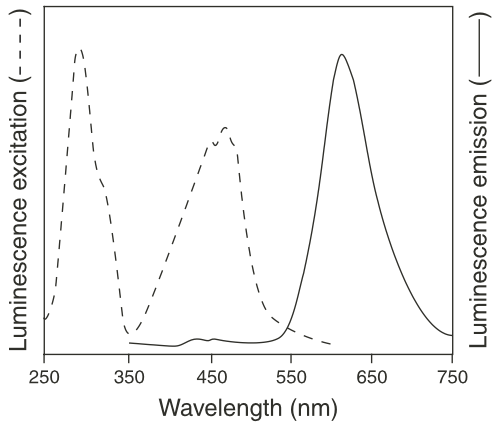

Figure 3. Excitation (dashed line) and emission (solid line) spectra for SYPRO® Ruby protein gel stain.

- Prior to imaging, equilibrate gels in water with a minimum of two changes for 5 minutes each to minimize acetic acid vapor that can damage your imager. Remove the gel promptly after imaging.

UV or Blue-Light Transilluminator

Proteins stained with SYPRO® Ruby protein gel stain are readily visualized using a UV or blue-light source. The use of a photographic camera or CCD camera and the appropriate filters is essential to obtain the greatest sensitivity. The instrument's integrating capability can make bands visible that cannot be detected by eye.

- We use a 300 nm transilluminator with six 15 W bulbs. Excitation with different UV wavelengths may not give the same sensitivity.
- Using a Polaroid® camera and Polaroid® 667 black-and-white print film, the highest sensitivity is achieved with a 490 nm longpass filter, such as the SYPRO® photographic filter (S6656). We typically photograph minigels using an f-stop of 4.5 for 1 second.
- Using a CCD camera, images are best obtained by digitizing at about 1024 × 1024 pixels resolution with 12- or 16-bit grayscale levels per pixel. Please contact your camera manufacturer for filter set recommendations. A CCD camera–based image analysis system can gather quantitative information that will allow comparison of fluorescence intensities between different bands or spots. Using such a system, we have found that the SYPRO® Ruby gel stain has a linear dynamic range of over three orders of magnitude.
- The polyester backing on some premade gels is highly fluorescent. For maximum sensitivity using a UV transilluminator, the gel should be placed polyacrylamide side down and an emission filter, such as the SYPRO® photographic filter (S6656), used to screen out the blue fluorescence coming from the polyester backing. The use of a blue-light transilluminator or laser scanner will reduce the amount of fluorescence from the backing so that the gel may be placed polyester side down.

Laser-Scanning Instruments

Gels stained with the SYPRO® Ruby protein gel stain are readily visualized using imaging systems equipped with lasers that emit at 450, 473, 488, or 532 nm. For information on filter sets appropriate for use with common laser scanners, refer to our online Handbook at www.probes.com.

Optional: Following imaging, gels may be vacuum- or air-dried or sealed in a small amount of SYPRO® Ruby stain for permanent storage.

- To dry the gel, incubate the gel in a solution of 2% glycerol for 30 minutes, then vacuum-dry following the dryer manufacturer's protocol. An alternative is to use the DryEase® Mini-Gel Drying System (Invitrogen catalog # N12387) and air-dry according to the manufacturer's protocol.
- To store the gel wet, seal the stained gel in a small volume of fresh SYPRO® Ruby stain (approximately 1–5 mL, enough to wet the gel) containing a preservative such as sodium azide, press out any air, and store at 4°C. The Seal-A-Meal® food storage system is useful for this method of preservation.

Analysis of Stained Proteins

Image Analysis

SYPRO® Ruby stain sometimes generates small speckles of precipitated dye on the gel. The speckles have diameters approximately 20% the size of the smallest stained protein spot, making them very easy to distinguish. Analysis software for 2-D gels will ignore small speckles if the minimum spot size of the program is set appropriately (determined by trial and error).

Identification of Individual Protein Spots

The SYPRO® Ruby gel stain involves a noncovalent interaction and will generally be removed during preparation of the sample for mass spectrometry or Edman analysis. Edman-based sequencing or mass spectrometry data can be obtained after staining, with no interference from the stain.[13-17] Accurate mass spectrometry has been performed on a spot containing as little as 75 fmol of stained protein.[2]

Troubleshooting Suggestions

Problem	Possible Causes	Suggestions
Gels tearing and breaking during fix/stain/destain	Shaking motion too vigorous; sharp utensils used to handle gel. Wear and tear on the gel is also proportional to the number of solution changes, the total time of the staining procedure, and the amount the gel is handled.	Decrease shaker speed/motion, use smooth plastic utensils. For in-house prepared gels, use Rhinohide™ gel strengthener (R33400, R33410).
Elevated background levels	Some gel types, such as gradient gels, tend to show increasing background levels toward the bottom of the gel; very thick gels have higher background staining.	Use the rapid stain protocol, which is less sensitive to gel effects; after the MeOH/HAc wash step, continue to wash the gel in 2–3 changes of ultrapure water for 15–30 minutes each; use stain at 3/4X concentration (e.g., dilute by adding 20 mL ultrapure water to 60 mL SYPRO® Ruby 1X stain for final 3/4X concentration).[19,20]
Spots and streaks are visible, or there is an uneven background	Contamination of solutions used to make in-house poured gels, running buffer or sample loading buffer; poor water quality; contamination of imager surface with fluorescent compounds; handling of gel with bare hands or powdered gloves; staining of gel with insufficient agitation; incomplete immersion of gel during staining.	Use freshly made and filtered solutions, or buy premade gels; use ultrapure water of >18 megohm-cm resistance; use glass columns and sterile pipettes to prepare reagents; wash glassware thoroughly; clean the surface of the imaging system thoroughly with 100% ethanol followed by ultrapure water; always handle gels with powder-free gloves; perform all incubations for staining and washing steps on an orbital shaker set at 50–60 rpm.
Small speckles are seen in the image	Poor water quality; contamination by lint or dust on the surface of the gel or imager; SYPRO® Ruby stain that has accumulated on the surface of the staining container during long incubations (i.e., during overnight staining) has come off during the wash step.	Use ultrapure water of >18 megohm-cm resistance; use lint-free wipes; use the rapid stain protocol, which minimizes the time available for dye aggregate formation; transfer the gel to a clean container between the stain and the wash step.
Presence of a 50–68 kDa band in all lanes	Contamination with keratin from skin or hair.	Use clean gloves when handling and loading gels. Rinse all wells of the gel with ultrapure water before sample loading.
Negative staining of pre-stained protein markers	Some blue-colored protein markers, such as BenchMark™ Pre-Stained Protein Ladder or some proteins in the SeeBlue® Plus2 Pre-Stained Standard, quench the fluorescence of SYPRO® Ruby stain.	Use unstained markers, such as Mark12™ Unstained Standard (Invitrogen cat. # LC5677), or green-fluorescent markers, such as BenchMark™ Fluorescent Protein Standard (Invitrogen cat. # LC5928).

References

SYPRO® Ruby Stain Basics

1. Electrophoresis 21, 2509 (2000); **2.** Electrophoresis 21, 3673 (2000); **3.** Electrophoresis 21, 1037 (2000); **4.** Proteomics 2, 486 (2002); **5.** Electrophoresis 23, 2203 (2002); **6.** Electrophoresis 25, 2511 (2004).

Multiplexed Proteomics® Technology

7. J Chromatogr B 793, 127 (2003); **8.** Proteomics 3, 1128 (2003); **9.** Electrophoresis 25, 2539 (2004); **10.** Proteomics 4, 3464 (2004); **11.** Curr Opin Chem Biol 6, 63 (2001); **12.** J Biol Chem 278, 27251 (2003).

Mass Spectrometry Compatibility

13. Proteomics 2, 591 (2002); **14.** Electrophoresis 22, 906 (2001); **15.** Neuroreport 13, 611 (2002); **16.** Proteomics 2, 76 (2002); **17.** Electrophoresis 24, 3508 (2003).

Microwave Method

18. Rapid Commun Mass Spectrom 16, 272 (2002).

SYPRO® Ruby Stain Dilution

19. Biotechniques 35, 376 (2003); **20.** Electrophoresis 25, 2506 (2004).

Product List *Current prices may be obtained from our Web site or from our Customer Service Department.*

Cat #	Product Name	Unit Size
M33307	Multiplexed Proteomics® Glycoprotein Gel Stain Kit *with 1 L each of Pro-Q® Emerald 300 and SYPRO® Ruby (S12000) gel stains*	1 kit
M33305	Multiplexed Proteomics® Phosphoprotein Gel Stain Kit #1 *with 1 L each of Pro-Q® Diamond (P33300) and SYPRO® Ruby (S12000) gel stains*	1 set
M33306	Multiplexed Proteomics® Phosphoprotein Gel Stain Kit #2 *with 200 mL each of Pro-Q® Diamond (P33301) and SYPRO® Ruby (S12001) gel stains*	1 set
M33308	Multiplexed Proteomics® Transmembrane Protein Gel Stain Kit *with 500 mL each of Pro-Q® Amber and SYPRO® Ruby gel stains*	1 kit
P33300	Pro-Q® Diamond phosphoprotein gel stain	1 L
P33301	Pro-Q® Diamond phosphoprotein gel stain	200 mL
P33302	Pro-Q® Diamond phosphoprotein gel stain *bulk packaging*	5 L
P33310	Pro-Q® Diamond phosphoprotein gel destaining solution	1 L
P33311	Pro-Q® Diamond phosphoprotein gel destaining solution *bulk packaging*	5 L
P21855	Pro-Q® Emerald 300 Glycoprotein Gel Stain Kit *with SYPRO® Ruby protein gel stain* *10 minigels*	1 kit
P21857	Pro-Q® Emerald 300 Glycoprotein Gel and Blot Stain Kit *10 minigels or minigel blots*	1 kit
P21875	Pro-Q® Emerald 488 Glycoprotein Gel and Blot Stain Kit *10 minigels or minigel blots*	1 kit
P21876	Pro-Q® Sapphire 365 oligohistidine gel stain *20 minigels*	500 mL
P21877	Pro-Q® Sapphire 488 oligohistidine gel stain *20 minigels*	500 mL
P33354	Pro-Q® Sapphire 532 oligohistidine gel stain *20 minigels*	500 mL
R33400	Rhinohide™ polyacrylamide gel strengthener concentrate *sufficient additive for 1 L of 30% acrylamide/bis-acrylamide (37.5:1)*	200 mL
R33410	Rhinohide™ Polyacrylamide Gel Strengthener Kit *makes 1 L of Rhinohide™ 30% acrylamide/bis-acrylamide (37.5:1)*	1 kit
S6656	SYPRO® photographic filter	each
S12000	SYPRO® Ruby protein gel stain	1 L
S12001	SYPRO® Ruby protein gel stain	200 mL
S21900	SYPRO® Ruby protein gel stain *bulk packaging*	5 L

Product List *Products and current prices may be obtained from Invitrogen (www.invitrogen.com).*

Cat #	Product Name	Unit Size
LC5928	BenchMark™ Fluorescent Protein Standard	125 µL
N12387	DryEase® Mini-Gel Drying System	1 kit
LC6030	InVision™ His-tag In-gel Stain	500 mL
LC6033	InVision™ His-tag In-gel Staning Kit	1 kit
LC5677	Mark12™ Unstained Standard	1 mL
NP0330BOX	NuPAGE® Novex 4-12% Bis-Tris ZOOM® Gels, 10 gels	1 box
LC6100	SilverXpress® Silver Staining Kit	1 kit
LC6070	SilverQuest™ Silver Staining Kit	1 kit
ZM0002	ZOOM® IPGRunner™ Combo Kit	1 kit
ZM0011	ZOOM® Strips, pH 3-10 NL	12 strips
ZM0018	ZOOM® Strips, pH 3-10 L	12 strips
ZM0012	ZOOM® Strips, pH 4-7	12 strips
ZM0013	ZOOM® Strips, pH 6-10	12 strips
ZM0017	ZOOM® Strips, pH 9-12	12 strips
ZS10003	ZOOM® 2D Protein Solubilizer Kit	2 x 5 mL
ZF10001	ZOOM® IEF Fractionator Combo Kit	1 kit
ZF10006	ZOOM® Basic Protein Kit	1 kit

Contact Information

Further information on Molecular Probes products, including product bibliographies, is available from your local distributor or directly from Molecular Probes. Customers in Europe, Africa and the Middle East should contact our office in Paisley, United Kingdom. All others should contact our Technical Service Department in Eugene, Oregon.

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