

# Lightning-Link® Rapid Conjugation System

Applicable to:

Product series 310 to 369

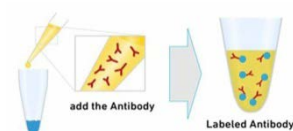
Revision 6

01/10/2014

## Introduction

Lightning-Link® Rapid technology works by targeting amine groups and can therefore be used for most biomolecules including antibodies, proteins and peptides. The Lightning-Link® Rapid kits are optimised for IgGs therefore please see the FAQs section of this protocol for recommended adjustments for biomolecules that differ in size from IgGs, including proteins and peptides.

The Lightning-Link® Rapid Antibody Labeling System allows conjugations to be set up in 30 seconds, and used within minutes (less than 20 minutes). The researcher simply pipettes the biomolecule into a vial of lyophilised mixture containing the label of interest and incubates (Figure 1).



By circumventing the desalting or dialysis steps that commonly interrupt traditional protein conjugation procedures, Lightning-Link® Rapid technology can be used to label small and large quantities of protein (10µg to 2mg) with 100% recovery.

Upon dissolution of the Lightning-Link® Rapid mixture with a solution of the antibody (or other biomolecule to be labeled) proprietary chemicals in the mixture become activated. This results in the directional coupling of the antibody to the label in a gentle and controlled process at near-neutral pH. The hands-on time for the entire procedure is typically 20-30 seconds.

Lightning-Link® Rapid makes it possible to label primary antibodies and other proteins with ease, and eliminates the need for secondary reagents in immunoassay procedures such as western blotting, ELISA and immunocytochemistry.

## Kit contents

- 1 or 3 glass vial(s) of Lightning-Link® Rapid mix
- 1 vial of LL-Rapid Modifier reagent
- 1 vial of LL -Rapid Quencher reagent

## Instructions

Setting up your conjugation reaction

1. Before you add antibody to the Lightning-Link® Rapid mix, add 1µl of LL-Rapid modifier reagent for each 10µl of antibody to be labelled. Mix gently.
2. Remove the screw cap from the vial of Lightning-Link® Rapid mix and pipette the antibody sample (with added LL-Rapid modifier) directly onto the lyophilised material. Resuspend gently by withdrawing and re-dispensing the liquid once or twice using a pipette.
3. Place the cap back on the vial and leave the vial standing for 15 minutes at room temperature (20-25°C) in the dark. Alternatively, and sometimes more conveniently, conjugations can be set up and left at 4°C overnight, as the longer incubation time has no negative effect on the conjugate.
4. After incubating for 15 minutes (or more), add 1µl of LL-Rapid quencher reagent for every 10µl of antibody used. The conjugate can be used after 4 minutes. The conjugates do not require purification.

## Amount and volume of antibody

Pack size	Amount of antibody	Recommended antibody volume
Up to 20µg	10-20µg	4µl-10µl
Up to 200µg	100-200µg	40µl-100µl
Up to 2mg	1-2mg	0.40-1ml

Antibody concentration should be between 1mg/ml and 2.5mg/ml.

## Shipping conditions

The kit is shipped at ambient temperature in a tamper-evident polypropylene container.

Store the kits at -20°C upon receipt.

Please note that the modifier and quencher can be stored at either 4°C or -20°C.

## Buffer considerations

Please see the below table for recommended buffer conditions and components:

pH	6.5-8.5
Amine free buffer (e.g. MES, MOPS, HEPES, PBS)	✓
Non-buffering salts (e.g. sodium chloride)	✓
Chelating agents (e.g. EDTA)	✓
Sugars	✓
Glycerol	<50%
Thiomersal	✗
Thimerosal	✗
Merthiolate	✗
Sodium Azide <sup>1</sup>	<0.1%
BSA <sup>1,2</sup>	<0.1%
Gelatin <sup>1,2</sup>	<0.1%
Tris	<20mM
Glycine	✗
Nucleophilic components (Primary amines e.g. amino acids or ethanolamine and thiols e.g. mercaptoethanol or DTT)	✗

<sup>1</sup> Please note that individually the concentrations shown should not affect the reaction. However in combination with additional compounds that are not recommended above a certain concentration, the reaction may be affected.

<sup>2</sup> If intending to use this kit for immunohistochemistry, it is recommended that there be no gelatin or BSA present.

## Storage of conjugates

For any new conjugate, initial storage at 4°C is recommended for 12-18 months\*. A preservative may be desirable for long-term storage up to 2 years. Other storage conditions (e.g. frozen at -70°C or stored at -20°C with 50% glycerol) may also be satisfactory. The best conditions for any particular conjugate must be determined by experimentation.

\*As long as the antibody/protein can be stored at 4°C – check the manufacturer's recommendation.

## FAQs

### Q1. What biomolecules can I label?

Lightning-Link® Rapid technology works by targeting primary amine groups on your target, meaning it can be used to label most biomolecules.

As the protocols provided were optimised for labeling IgGs, we would recommend you adjust the amount of material you add to the Lightning-Link® Rapid vial to allow for molecular weight difference. This should be done without changing the volume added to the vial, as this could affect the conjugation efficiency.

### Limited use license

Innova Biosciences' Lightning-Link® conjugation kits are offered for research purposes alone, and are not intended for human, therapeutic or diagnostic use. The purchase of this conjugation kit conveys to the buyer (whether the buyer is a not-for-profit, academic or for-profit entity) the non-transferable right to use the amount of product purchased and the components of the product for in-house research. The buyer shall not sell or otherwise transfer this product, its components, or materials prepared therefrom to any third party. The buyer shall not use this product or its components for commercial purposes. For the avoidance of doubt, 'commercial purposes' means any activity by a party for consideration and includes, without limitation, use of the product or its components (i) in the manufacturing of conjugated materials (e.g. labeled antibodies), (ii) to provide a service, information or data, (iii) for therapeutic, diagnostic or prophylactic purposes, or (iv) for repackaging/resale, whether or not such product or its components are resold for use in research. The use of this product by the buyer constitutes agreement with the terms of this limited use label license for Lightning-Link® products.

For information on purchasing a license for commercial applications contact Innova Biosciences Ltd, Business Development Office, Babraham Hall, Babraham, Cambridge, UK, CB22 3AT. Tel +44(0)1223 496170; Fax +44(0)1223 496172.

As a rough guideline, we would recommend changing the amount of material proportionally to the size difference with IgGs. An average IgG is about 160kD, therefore for a target that is ½ the size of an antibody (about 80kD), add ½ as much to the vial. Please note this is only a guideline and the best amount for your assay should be determined experimentally; our 3x10µg kits enable you to do this using small amounts of material and therefore at a low cost.

Calculate the amount of your sample you will need to add with our concentration calculator available at:

[www.innovabiosciences.com/innova/concentration-calculations.html](http://www.innovabiosciences.com/innova/concentration-calculations.html)

### Q2. Do I need to purify the conjugate?

No. The chemicals used in Lightning-Link® Rapid kits are highly efficient and the kits have been optimised so that there should only be low amounts of free label left at the end of the conjugation. Any remaining free label is deactivated by the quencher, and the by-products are benign and do not need to be removed.

\*Please view our website for more FAQs

<http://www.innovabiosciences.com>\*

## My buffer doesn't fit the requirements

If your antibody buffer is not compatible with our kits, we have developed the AbSelect™ purification kit range that allows you to quickly and simply purify your antibody and is fully compatible with the Lightning-Link® kits.

The appropriate kit to use depends on your particular sample (species, buffer, contaminants, volume,...). We have designed a handy flow chart on the AbSelect™ webpage to help you select a kit, visit:

[www.innovabiosciences.com/antibody-purification-kits.html](http://www.innovabiosciences.com/antibody-purification-kits.html).

Please consult the kit protocols to see the antibody amount/volume suitable for each kit.

If your antibody is already purified but its concentration is too low, you can concentrate it by using our Antibody Concentration and Clean Up Kit (product code 860-0010). This kit can also be used to remove low molecular weight contaminants such as azide, Tris or glycine by carrying out a buffer exchange into the buffer supplied in the kit, which is fully compatible with Lightning-Link® Rapid.

If your antibody contains BSA, you can now use our BSA removal kit to purify your antibody in a few simple steps. Please note this kit will also enable you to concentrate your antibody.

NB: All the AbSelect kits will ONLY work with antibodies. They will not purify other molecules. The only exception is the concentration and clean up kit (861-0010), which will work with other molecules greater than 10kD.