RAININ
Pipetting 360°

PureSpeed Tips

Fastest Immunoprecipitation

- Highest protein concentration
- Extraordinary data quality
- Both direct and indirect IP
- Process up to 12 samples at once

High Performance IP™

Semi-automated processing with PureSpeed

METTLER TOLEDO

Fast Immunoprecipitation
Quality, highly concentrated protein

- **Supports both direct and indirect IP protocols**
- **Processes up to 12 samples simultaneously in less than 30 minutes**
- **Requires less hands-on time than either magnetic or agarose bead methods**
- **Provides high sample-to-sample reproducibility and negligible background, comparable to agarose and magnetic bead techniques**
- **Automatically records and documents IP protocols, increasing intra- and inter-lab data reproducibility**

IP experiments should provide strong, reproducible signals in order for researchers to be sure of their results and minimize the need to repeat experiments. Rainin's PureSpeed IP™ system is a breakthrough technology that enables researchers to precisely control their experiments and optimize their results.

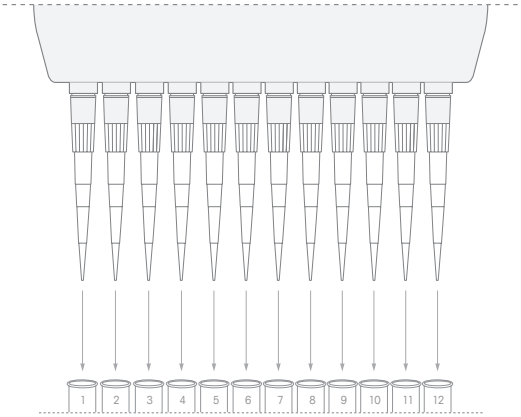
- Rainin's PureSpeed IP system produces protein bands of higher intensity and reproducibility on SDS-PAGE gels.
- PureSpeed's washing step for ProA and ProG tips strip contaminated proteins from bound antibody-antigen complexes, producing SDS-PAGE data with very low background – a critical factor for achieving accurate conclusions.
- PureSpeed IP produces more concentrated protein, providing a stronger signal than competing techniques and minimizing the need to repeat experiments.

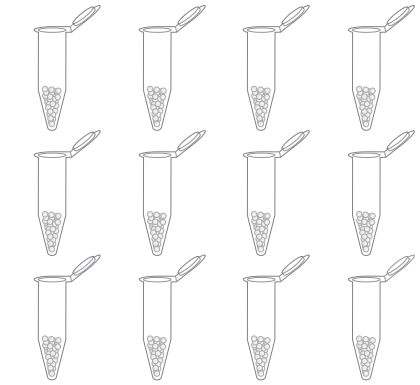
PureSpeed's IP technology yields higher concentrated protein in less time and at a lower cost than either magnetic or agarose-based methods.

The PureSpeed advantage

Rainin's PureSpeed system for immunoprecipitation delivers unparalleled performance. Agarose and magnetic bead methods can usually process one sample at a time, while PureSpeed processes up to 12 samples in parallel – and in under 30 minutes.

PureSpeed vs. agarose and magnetic bead methods – processing 12 samples





PureSpeed

26 min.

Parallel sample preparation

vs.

Agarose 252 min.

Magnetic or 116 min.

Sequential sample preparation

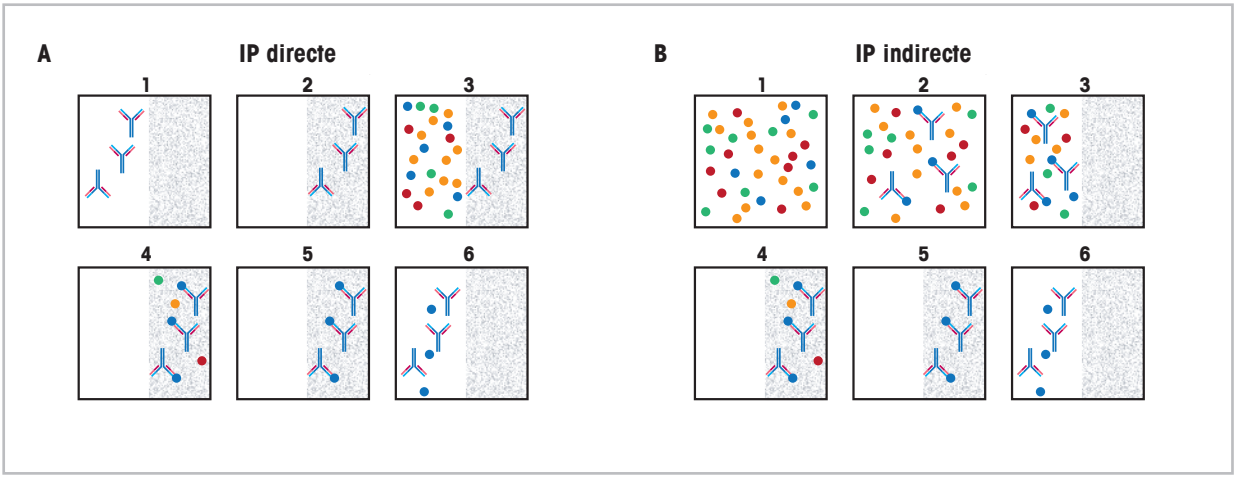
For the price of a manual system, PureSpeed immunoprecipitates proteins at speeds comparable to automated systems.

The Ultimate in Flexibility
Validated for direct and indirect IP

Most IP products on the market are validated for either direct or indirect IP, but PureSpeed IP performs both, giving researchers the ultimate in flexibility. The direct method involves binding a specific antibody to an immobilizing resin contained within the PureSpeed tip, then capturing the desired antigen onto the resin. The indirect method binds the antibody/antigen complex to the resin in the tip.

With PureSpeed IP, direct IP for 1-12 samples takes approximately 50 minutes, while indirect IP for 1-12 samples generally requires less than 30 minutes.

Figure 1. Direct and Indirect IP.



With direct IP, an antibody is exposed to an antibody-binding resin (1). The antibody binds, and excess antibody is washed away (2). After antibody immobilization, protein solution containing an antigen protein is exposed to the resin (3). The immobilized antibody binds to the antigen protein, immobilizing this protein on the resin (4). After washing to remove nonspecifically bound proteins, the antigen-antibody complex is the predominant species on the resin (5). Finally, the antibody-antigen complex is eluted from the resin (6).

With indirect IP, a protein solution containing the antigen protein is prepared (1). Antibody is added to this sample and the antibody binds to the antigen (2). Next, the antigen-antibody containing protein mixture is applied onto antibody-binding resin (3). The antibody-antigen complex binds to the resin as well as nonspecific proteins (4). After resin washing, the antibody-antigen complex is the predominant species on the resin (5). Finally, the antigen-antibody complex is eluted from the resin (6).

The E4 XLS Electronic Pipette
Executes and records every step protocol

Reproducible IP results are an important consideration in hypothesis validation and, ultimately, publication. If researchers in the same or different labs obtain different results, more time and money is often required to clarify an experimental outcome.

Rainin's E4 XLS electronic pipette is an integral component of the PureSpeed IP system. In addition to executing most of the steps in the IP protocol, the E4 XLS records capture, wash and elution volumes, as well as pipetting speeds, aliquots and pipetting cycle numbers. With every aspect of the experiment documented and recorded, communicating the exact conditions for a successful IP experiment is easy and extremely accurate.

Select the mode
Once installed, PureSpeed becomes a standard mode on the options carousel of the E4 XLS.

Customize the protocol
Whether it is sample volume, flow rate or number of cycles, every step in the protein purification protocol is easy to access and optimize for specific applications.

Run the protocol
PureSpeed protocols take full advantage of the E4's intuitive, easy-to-use joystick control and carousel-like menu structure. The E4's soft keys enable the user to navigate through a protocol's various steps.

PureSpeed vs. other IP Techniques
Faster, more highly-concentrated protein

PureSpeed IP – faster results with more highly-concentrated protein than either magnetic or agarose bead techniques

For this experiment, 5 µg of GST-tagged antigen protein were spiked into 200 µL of 625 µg/mL total E. coli protein sample. 10 µg of monoclonal α-GST antibody were used to immunoprecipitate the GST-tagged antigen protein using the direct and indirect method. For the direct method, IP was performed using the PureSpeed IP system with 20 µL ProG tips and compared with Protein G magnetic beads from another manufacturer. For the indirect method, IP was performed using the PureSpeed system with 20 µL ProG tips and compared with Protein G agarose beads from another manufacturer.

Experimental samples, which included both the antibody and antigen protein, were carried out in triplicate to understand the reproducibility of each technique. Control reactions that omitted antibody, antigen, or both species, were also carried out to control against nonspecific protein binding to the protein G resins.
Compared to other techniques, the results show that PureSpeed ProG tips successfully perform IP experiments faster and produce more highly concentrated protein with either the direct or indirect methods.

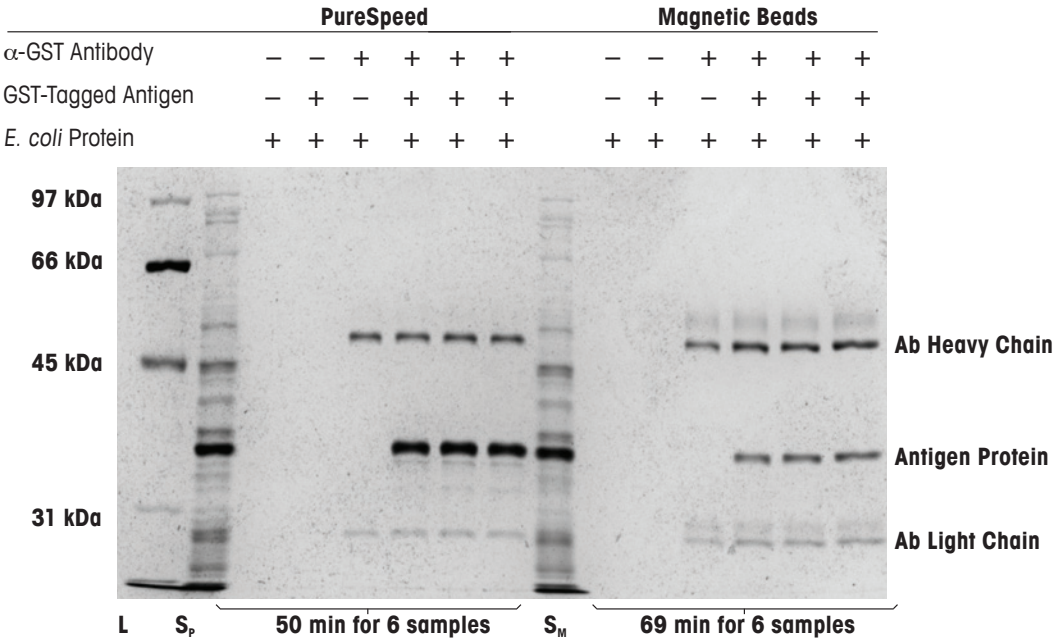


Figure 2. Direct IP with PureSpeed ProG Tips and a competitor's Protein G magnetic beads. In this experiment, 10 µg of antibody was used to immunoprecipitate 5 µg of GST-tagged antigen using the direct method with PureSpeed ProG Tips, or a competitor's Protein G magnetic beads. The IP reactions occurred in the context of 125 µg of *E. coli* protein (total volume was 200 µL). The protein ladder is denoted as L, while the protein solutions (containing antigen for the direct method) are labeled S_P and S_M (the P and M subscripts indicate the protein solutions for the PureSpeed and magnetic beads protocol, respectively). Sample eluates for PureSpeed and magnetic beads IP are in lanes 3-8, and 10-15, respectively. Pluses and minuses indicate whether a certain component was included, or excluded in a given IP reaction. Lastly, the time at the bottom at the gel indicates the time needed for each protocol.

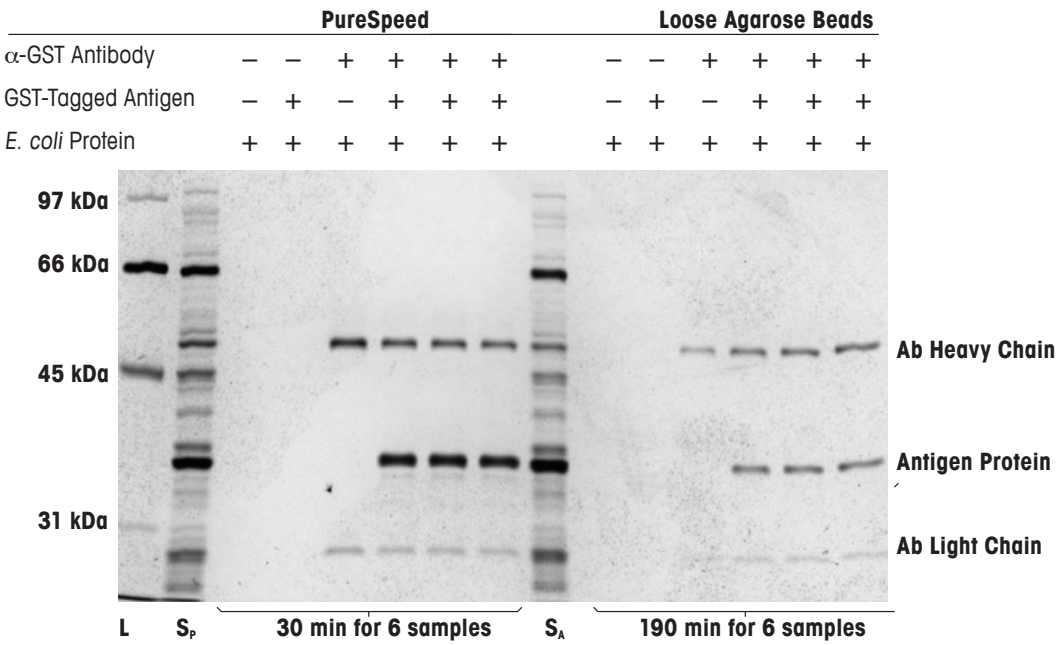


Figure 3. Indirect IP with PureSpeed Protein G TIps and loose Protein G agarose leads. Here, 10 µg of antibody was used to immunoprecipitate 5 µg of GST-tagged antigen using the indirect method with PureSpeed Protein G Tips, or loose Protein G agarose beads. The IP reactions occurred in the context of 125 µg of *E. coli* protein (total volume was 200 µL). The protein ladder is noted as L, while the protein solutions (containing antigen for the direct method) are labeled S_P and S_A (the subscripts P and A distinguish the protein solutions used for the PureSpeed and Protein G Agarose samples, respectively). Sample eluates for PureSpeed and Protein G Agarose IP are in lanes 3-8, and 10-15, respectively. Pluses and minuses indicate whether a certain component was included, or excluded in a given IP reaction. Lastly, the time at the bottom at the gel indicates the time needed for each protocol.
*The time for indirect IP does not include the 4 °C overnight incubation of IP samples. This incubation is illustrated in Figure 1B as step 2.

PureSpeed for IP

High performance immunoprecipitation

The PureSpeed for IP system comprises PureSpeed ProA or ProG tips, the E4 XLS electronic pipette and the PureSpeed Accessory Kit. PureSpeed ProA or ProG tips are available with either 5 or 20 µL of resin (200 µL max. volume) and 20 or 80 µL of resin (1000 µL max. volume).

Quickly set up your IP experiments with PureSpeed starter kits. The multi-channel kits process up to 12 samples in parallel.

Catalog No.	MT Order No.	Description
PureSpeed Tips and Accessories		
PT-2-A5	17012561	ProA 5 µL Resin, 200 µL tip, 12 tips
PT-2-A20	17012562	ProA 20 µL Resin, 200 µL tip, 12 tips
PT-2-G5	17012563	ProG 5 µL Resin, 200 µL tip, 12 tips
PT-2-G20	17012564	ProG 20 µL Resin, 200 µL tip, 12 tips
PT-10-A20	17012568	ProA 20 µL Resin, 1000 µL tip, 12 tips
PT-10-A80	17012569	ProA 80 µL Resin, 1000 µL tip, 12 tips
PT-10-G20	17012570	ProG 20 µL Resin, 1000 µL tip, 12 tips
PT-10-G80	17012571	ProG 80 µL Resin, 1000 µL tip, 12 tips
PT-ACC	17012588	PureSpeed Accessories
LR-P2-96P-5	17012623	2.2 mL 96-Deepwell Plate
PureSpeed Single Channel Starter Kits		
PT-S2-A20	17012577	Starter Kit: E4-200XLS + ProA PureSpeed Tips
PT-S2-G20	17012578	Starter Kit: E4-200XLS + ProG PureSpeed Tips
PT-S10-A20	17012579	Starter Kit: E4-1000XLS + ProA PureSpeed Tips
PT-S10-G20	17012580	Starter Kit: E4-1000XLS + ProG PureSpeed Tips
PureSpeed Multichannel Starter Kits		
PT-S2-E8	17013548	Starter Kit: E8-200 XLS and Accessory Kit
PT-S10-E8	17013546	Starter Kit: E8-1200 XLS and Accessory Kit
PT-S2-E12	17013549	Starter Kit: E12-200 XLS and Accessory Kit
PT-S10-E12	17013547	Starter Kit: E12-1200 XLS and Accessory Kit

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