

**Following your trusted
protocol but getting
inconsistent results?**

**It might be the
quality of your protein sample.**



If you're getting inconsistent results...

Are there impurities in your sample?

Could it be the salt, pH or buffer that's affecting your protein?

Did you use the right amount of material required by your protocol?

Is your protein even present in your sample prep?

Maybe your samples weren't properly stored?

Did your protein lose its functional activity?

Is the batch of protein you're using similar to the last one?

If you're not confident about the answers to these questions, start by identifying the quality of your protein sample.

Starting with the best quality material gives you the highest chance of success in getting the consistent results you want when you follow the same protocol.

When you have more complete information about the quality of your protein—its presence, purity, concentration, structural integrity, similarity, and functionality—you'll be able to make better decisions on whether to continue using your sample in further experiments.

And, if you check the quality of your protein to make sure it's right before you begin your work as well as throughout critical steps in your process, you'll finally be on the path to generating more consistent results when you follow that protocol.

How to evaluate the quality of your protein

There are multiple aspects to evaluating the quality of your protein. Having a sample of the right quality means you're confident that your sample is structurally intact or properly folded and free of contaminants.

Part of determining the quality of that sample in your tube is confirming your protein is present and how much you isolated. Check the concentration of

your protein if you want to ensure you're using just the right amount of protein for your experiment.

Also, why assume your sample is biologically active? Further confirming the quality of your sample involves testing if your protein interacts with other molecules. Which in the end lets you know that it's functional to some degree.

Finally, further understand the quality of your samples by comparing the sample you prepped today with one you made earlier to ensure you are working with the same quality material.

What's the best way to identify the quality of my protein?

In this piece, you'll learn more about protein quality and details on how to evaluate it.

If you're interested in learning about technology to help you determine the quality of your sample, look out for information about Tycho.



Verify the quality of your starting material or new batch of protein

You work with so many types of samples—some you prepared yourself, some you bought commercially, and others you inherited from someone else.

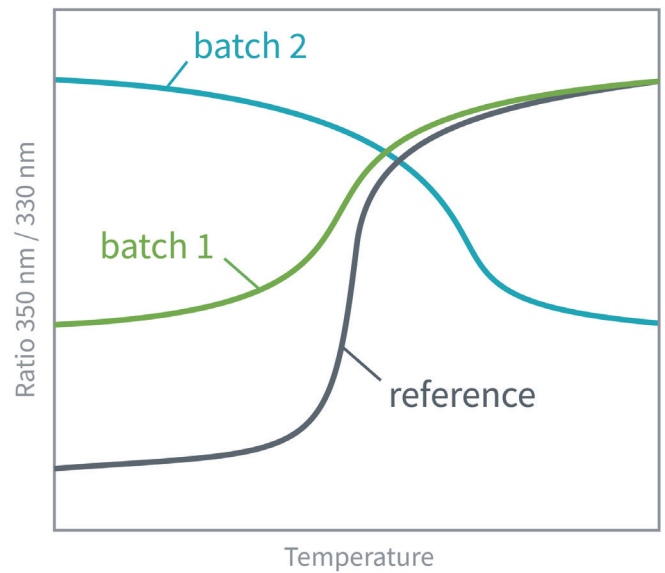
And, you're assuming that the quality of your sample is good. You probably don't even know if the sample you bought or prepared yourself is similar to the previous batch you tested. You also don't have a way to easily verify if the sample you inherited is of the right quality.

It's not until you get to the end of a long drawn-out experiment that you find out something went wrong.

Then comes the need to troubleshoot the problem (which is not fun). Maybe you ended up with a smear on your SDS-PAGE, or you didn't see a band on your Western. You're so frustrated that you didn't detect a signal from your ELISA, or that there was no interaction in your binding assay.

With Tycho, compare the structural integrity or folding profile of that new sample prep to your reference sample of the right quality to verify their similarity. If they differ, you may have a sample of lower quality that contains contaminants—this indicates the need to further purify it or optimize your purification workflow.

Batch to batch comparison



Tycho tells you if you are working with similar batches of material

Check for the presence, amount and purity of your protein

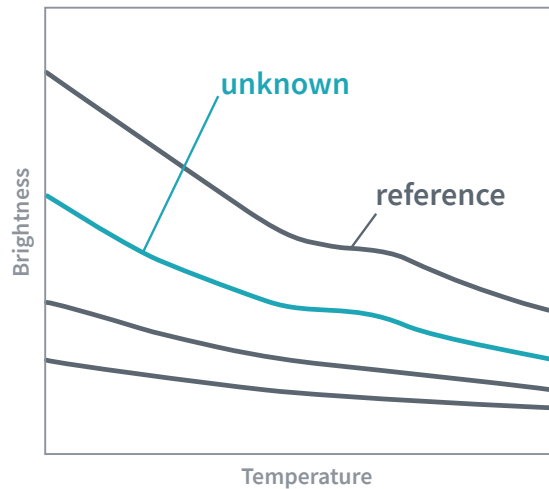
Your protein sample is precious material—especially to you. After all that time and effort spent isolating it, are you sure your purification worked? How much did you recover? Really, what's in that tube?

Part of determining the quality of that sample in your tube is confirming your protein is present and how much you isolated. You need this info to properly plan your next experiments.

Typically, you would use a spectrophotometer to check purity and concentration followed by confirmation of its identity by SDS-PAGE or Western blot. But, you don't actually need to keep doing it that way.

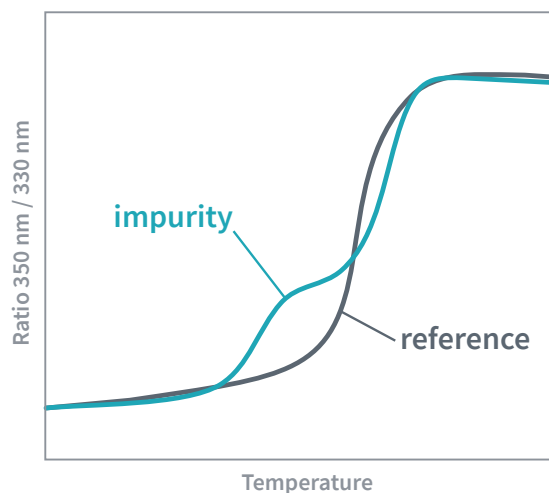
Once you've run Tycho to confirm results from traditional methods, you'll realize that the results from Tycho not only show you the presence of your protein but also its identity. And, it even lets you determine the concentration of it. So in the future, shelve those traditional methods that take time and use up a lot of your precious material.

Identification and concentration



Tycho quickly helps to ID your protein and gives you an indication of its concentration compared to a reference sample of known concentration

Monitor purity



Tycho detects impurities in your sample compared to a reference standard

Determine the right buffer formulation of your protein for storage or assay development

You've spent a ton of time purifying your protein. Then you have to decide whether to use it right away or store it. Regardless, you have to make sure your protein is happy and is in the right buffer formulation—pH, salts or additives—or you're right back to purifying another batch of protein.

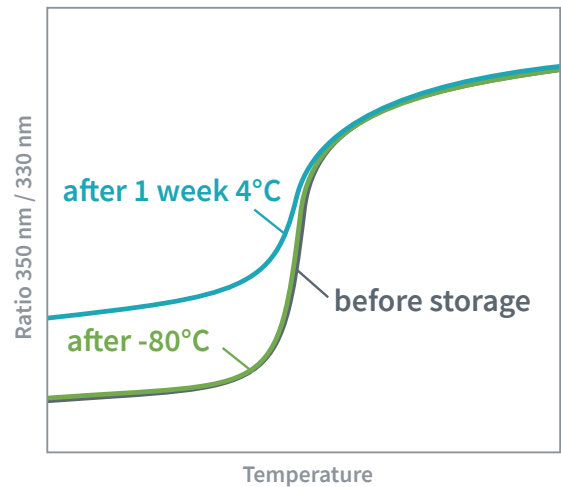
If you use it right away, first you have to ask yourself whether your sample is compatible with the conditions of your assay or next steps. If not, you'll have to figure out the right buffer recipe that will work for your experiment and maintain your protein's quality.

If you choose to store it, your protein may require its own unique buffer formula depending on if you deep freeze it, or if you decide to temporarily put it in the fridge or on ice.

Any mishaps can cause your protein to degrade, lose its activity, or fall out of solution which in addition also causes the concentration to change. All of these things impact the quality of your protein.

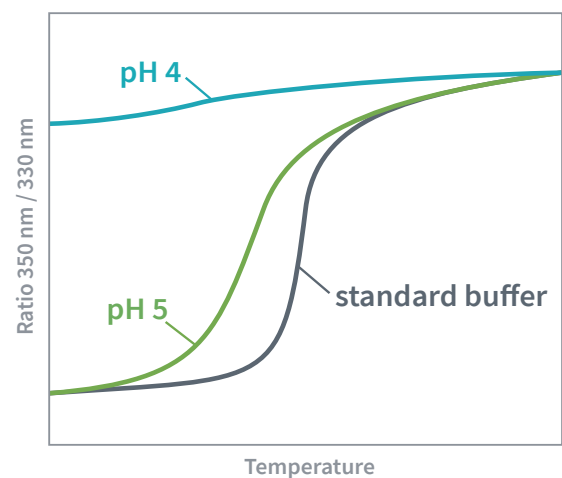
Use Tycho to identify the right buffer formulation for storage or assay development to preserve the quality of your protein. Quickly screen different buffers, additives and excipients as well as storage temperatures and time periods to determine the right conditions for your protein samples. In the end, you'll spend less time generating unnecessary batches of protein.

Test the effects of storage conditions



Confirm your samples are properly stored with a quick test on Tycho

Assay optimization



Quickly screen and determine the appropriate buffer to assay your protein using Tycho

Confirm the quality of your protein

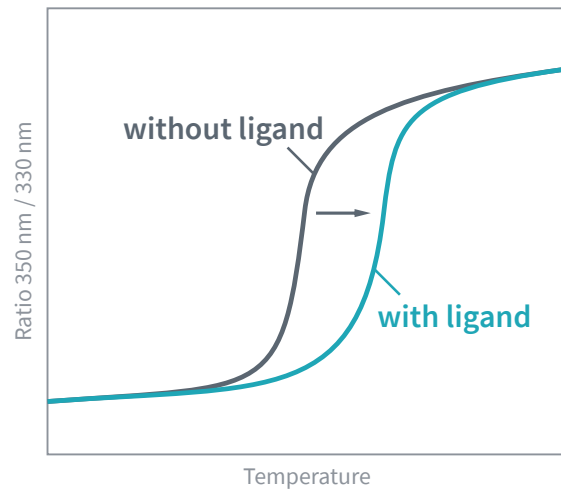
You've run that gold-standard method everyone uses in the lab, but you're getting unexpected results you can't explain. You find yourself stuck in that endless loop of troubleshooting each assay variable and repeating the experiment until you get the expected result. That trusted protocol isn't turning out to be as reliable as you thought.

The real issue could be functionality of your protein, which is the aspect of sample quality that is often overlooked. Since traditional tests for functionality that look at interactions between two molecules take too much time or are too complicated to set up, they aren't worth the effort to run or are skipped until issues arise.

A simple test looking at functionality earlier in the process, though, could have saved you from spending a lot of time and effort troubleshooting, only to get inconclusive results. The reality is that any assay, even a gold-standard method, will need some tweaks or optimization.

Tycho tests functionality in 3 minutes and tells you if your protein is interacting with other molecules. Since it does this in a label-free way with very little sample, it's way easier than traditional methods, so now there's no reason why you wouldn't do it earlier.

Functionality



*Test the functional activity of your protein
with Tycho*

Tycho measures protein quality.

Tycho quickly reveals protein quality—presence, purity, concentration, similarity, and functionality—by looking at the structural integrity or folded state of your protein all within a single experiment.

Using a tiny volume of sample, find out the quality of any protein in minutes and make your assay development and purification workflows more efficient.

