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The real cost of poorly validated antibodies

NeoBiotechnologies
Your Partner in Proteome Research

2026

About Sanbio

Sanbio has supported immunological research since 1978. At that time, monoclonal antibody technology was opening new possibilities for studying immune responses, disease mechanisms and cellular targets. Since then, monoclonal antibodies have become essential tools in biomedical research, supporting applications ranging from basic research to biomarker discovery and drug development.

Built on scientific understanding

From these early days, Sanbio's strength has not only been in supplying products, but in understanding how they are used. Finding an antibody is one thing. Knowing whether it will perform in a particular application, sample or experimental setup is another. That requires scientific knowledge, practical experience and a critical understanding of validation data. This foundation still shapes how we work today.

More than product availability

Today, Sanbio supports researchers in biotech, pharma, CROs, academic institutes and diagnostic laboratories with access to specialised antibody manufacturers and expert guidance. We look beyond product availability alone. Choices in antibody specificity, validation and application suitability directly influence reproducibility, data interpretation and continuity throughout a research project.





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Antibody selection as a quality question
That is why we see antibody selection not as a simple product question, but as a quality question. With almost 50 years of experience in life sciences, Sanbio helps researchers make well-informed choices that fit their application, protocol and research goals.

We support teams in evaluating validation data, comparing alternatives and identifying potential performance issues before they become costly problems. Through the Sanbio Antibody Promise, we also stand behind the antibodies we supply, offering defined solutions when an eligible antibody does not perform as stated in the manufacturer's datasheet.

Reliable research does not start with ordering an antibody. It starts with understanding what is needed. Because when results depend on antibody performance, knowledge is not an extra service. It is a condition for results you can build on.





Barry Leenders
Managing Director

- Supporting life science research since 1978
- Access to specialised antibody manufacturers
- Scientific guidance for antibody selection
- **Backed by the Sanbio Antibody Promise**

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The real cost of poorly validated antibodies

Antibodies play a fundamental role in life science research, supporting applications such as Western blotting, immunohistochemistry, flow cytometry and immunofluorescence. Yet despite their widespread use, antibody performance remains a significant source of experimental variability.

When antibodies lack sufficient validation for their intended application, the consequences can extend far beyond a failed experiment. Repeated assays, extensive troubleshooting, unreliable data and project delays all contribute to costs that are often overlooked.

This whitepaper examines the financial and scientific impact of poorly validated antibodies, drawing on an industry analysis to explore the hidden costs of antibody-related research waste and the importance of robust validation for reliable, reproducible results.

According to an analysis by NeoBiotechnologies, poorly validated antibodies contribute to an estimated $1.8 billion in wasted research funding every year in the United States alone, with the global impact rising to approximately $4.28 billion annually when broader research spending is considered. These costs arise not only from failed experiments, but also from the time, labour and lost opportunities associated with generating unreliable data.

$1.8 billion

Annual antibody-related research waste in the US

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Based on: NeoBiotechnologies. (n.d.). *The real cost of bad antibodies: $1.8 billion in wasted research funding.*

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The purchase price is only the beginning

When selecting antibodies, the purchase price is often an important consideration, but it represents only part of the potential cost of an experiment. NeoBiotechnologies estimates that 25-30% of antibody purchases ultimately contribute to failed experiments, resulting in an average direct cost of approximately $2,400 per failed project.



These direct expenses can include replacement antibodies, additional assay reagents, repeat sample preparation and repeated instrument runs. However, the financial impact becomes much greater once labour and project delays are taken into account.

25 - 30% Of antibody purchases contribute to failed experiments

The cost of troubleshooting

When an antibody generates unexpected or inconsistent results, researchers are often forced into lengthy troubleshooting cycles. This may involve repeating experiments, testing alternative concentrations, optimising protocols, introducing additional controls or evaluating other antibody clones.

According to the NeoBiotechnologies analysis, laboratories spend an average of more than 160 hours troubleshooting failed antibody experiments, with the associated researcher time valued at approximately $8,000-15,000 per project.

In practical terms, a reagent that appears inexpensive on paper can become one of the most costly components of a project if it prevents researchers from generating reliable data. Every hour spent investigating an unreliable antibody is time that cannot be spent advancing research objectives, analysing results or developing new experiments.

Billions lost to research inefficiency

The impact of poorly validated antibodies extends beyond individual projects. NeoBiotechnologies estimates that annual antibody-related research waste can be broken down into three major categories:

$1.8 billion

Estimated total annual research waste in the United States



$720M	Labour and personnel costs
$630M	Opportunity costs
$450M	Direct reagent-related losses

The estimated $630 million in opportunity costs reflects delayed research progress, reduced publication output and missed funding opportunities.

Together, these categories account for the estimated $1.8 billion annual burden on the US research sector.

The largest contributor is personnel time, highlighting the reality that failed experiments rarely end with the loss of a single reagent. The greatest expense is often the collective effort of scientists, technicians and project managers attempting to recover lost progress.

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Project delays with lasting consequences

The effects of antibody failure are rarely limited to a single experiment. When key data cannot be generated on schedule, entire research programmes can be disrupted.

NeoBiotechnologies reports that projects affected by poorly performing antibodies experience an average delay of 18 months, with researchers seeing a 35% reduction in publication output compared with projects that progress as planned.



18 months

Estimated average delay

35%

Estimated reduction in publications

Academic research

For academic researchers, these delays can affect grant applications, publication timelines and career progression. The report further suggests that graduate students may experience PhD extensions of six to twelve months, while delayed publications can negatively affect postdoctoral opportunities and faculty hiring prospects.

Industry research

In industry, project delays can slow target validation, biomarker development and therapeutic discovery efforts, increasing costs and extending development timelines.

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The reproducibility challenge

Poor antibody validation also contributes to the broader reproducibility challenges facing the life sciences sector. If results cannot be replicated because of inconsistent antibody performance, additional studies are often required to verify findings.

This lack of reproducibility creates a ripple effect throughout the research ecosystem. Delayed publications may attract fewer citations, grant applications may lack robust preliminary data and institutions may see reduced research output despite significant investments in infrastructure and personnel.

The resources required to repeat experiments can exceed the additional cost of selecting a better-validated antibody.

Why antibody validation matters

Robust antibody validation reduces the risk of failed experiments by demonstrating that an antibody performs as expected in a specific application and biological context.

Effective validation strategies may include:

- Confirming target specificity
- Using appropriate positive and negative controls
- Demonstrating performance in the intended application
- Assessing reproducibility across experiments
- Comparing results with orthogonal validation methods

While these activities require an upfront investment, they can help laboratories avoid the far greater costs associated with troubleshooting, repeated experiments and project delays.

Looking beyond reagent costs



The figures presented by NeoBiotechnologies highlight an important consideration for research organisations: the cheapest antibody is not always the most economical choice.

When researchers consider the potential cost of weeks of troubleshooting, repeated experiments and delayed project milestones, investing in antibodies supported by comprehensive validation data becomes a practical decision rather than an additional expense.

By evaluating the total cost of experimental failure rather than focusing solely on purchase price, laboratories can reduce research waste, improve reproducibility and make more efficient use of valuable resources.

Conclusion

Poorly validated antibodies can impose substantial, often overlooked costs on biomedical research. With an estimated $1.8 billion lost annually in the United States, the impact extends far beyond failed experiments to encompass lost productivity, delayed discoveries and reduced research output.

As pressure grows to improve reproducibility and maximise research efficiency, antibody validation should be viewed as an essential investment. Selecting thoroughly validated antibodies helps researchers generate reliable data, avoid costly setbacks and accelerate progress towards meaningful scientific discoveries.

Reliable research starts with informed antibody selection.

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References

This whitepaper draws primarily on an industry analysis by NeoBiotechnologies, supplemented by published scientific literature on research reproducibility and antibody reliability.

Industry cost analysis

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Need support selecting antibodies?

Our team can help you select suitable antibodies, evaluate validation data and troubleshoot antibody performance issues.



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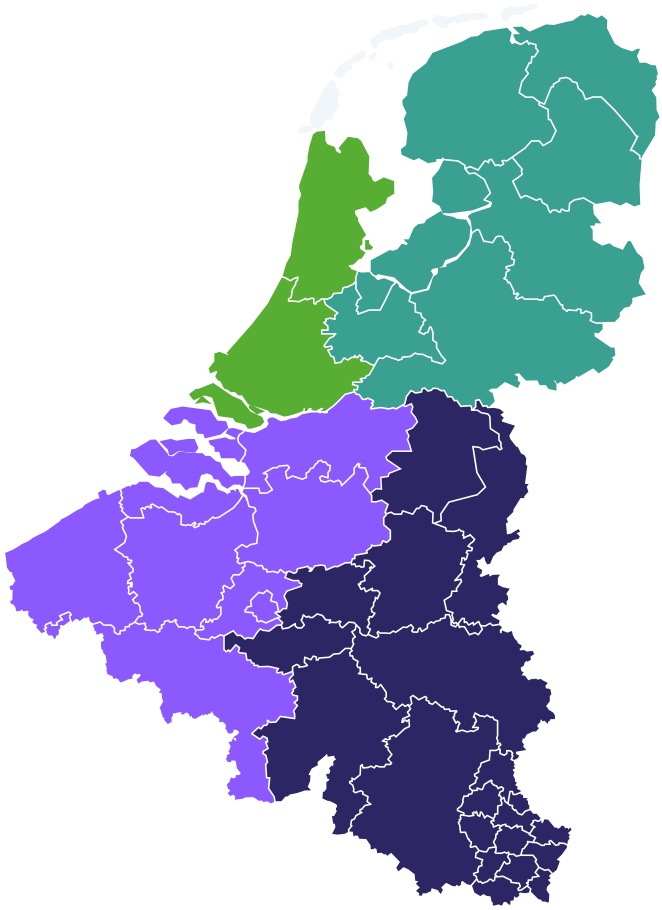
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