



# Targeted Toxins for Neuroscience

## Antibody Screening for Neuroscience

There is a growing need for therapeutics for cancer, autoimmune diseases, blood diseases, and neurological diseases (e.g., Alzheimer's disease). Due to their ability to bind to a specific target antigen, monoclonal antibodies are increasingly being screened for therapeutic drug development. In May 2021, the FDA approved the 100th monoclonal antibody since 1986. Antibody therapeutics account for more than one fifth of the FDA's new drug approvals each year.

## The Importance of Screening Antibodies

There are a couple of very important reasons to screen antibodies.

- To discover useful antibodies for therapeutic and research purposes
- To determine specificity, functional binding, internalization, and EC<sub>50</sub> values

Advanced Targeting Systems (ATS) has screening tools to recognize any antibody with result times ranging from 24-72 hours.

Product	Screening Capabilities			
	Multiple Antibodies	Antibody Types	Antibody Species	Time to Results
ZAP Conjugates	X	IgG, IgM, IgY, All Biotinylated Antibodies	Human, Mouse, Rat, Rabbit, Alpaca/Llama, Chicken, Goat, Guinea Pig, Custom Requests, All Biotinylated Antibodies	72 hours
pHast Conjugates (pH-based)	X	All Biotinylated Antibodies	All Biotinylated Antibodies	24 hours

The **ZAP technology** provides the tools to attach your antibody to Saporin. Saporin is a ribosome-inactivating protein that has no way to enter a cell on its own (except through bulk-phase endocytosis). When attached to your primary antibody, it will be taken inside any cell that recognizes your antibody on the cell surface. Once inside, Saporin inactivates the ribosomes and provides a definitive result of how specific your antibody is to a particular cell surface marker.

The **pHast technology** works in a similar manner to attach your antibody to a pH-dependent fluorescent reporter. This fluorescent reporter will increase intensity as the pH of its surroundings becomes more acidic, as evident when exposed to the environment inside a cell. A successful assay will provide an EC<sub>50</sub> by way of a fluorescence detecting plate reader, illuminating your lead antibody candidates.

# Immunotoxins for Neuroscience Research

Immunotoxins made with Saporin are robust tools and are used frequently in immunology research. As studies in these fields expand, finding a modular way of creating screening tools is more desirable. Particularly in drug development, large numbers of antibodies need to be screened for suitability; choosing the right antibody (or other targeting agent) is key. Screening can be prohibitively expensive in both cost and time. That is why Advanced Targeting Systems developed the ZAP technology. ZAP conjugates are non-targeted Saporin conjugates that “piggyback” on to your primary targeting agent (biotinylated material or antibody).

## The Difference Between SAP conjugates & ZAP conjugates

### SAP Conjugates

(direct conjugate of Targeting Agent to Saporin)

Primary Targeting Agent

Saporin



### ZAP Conjugates

(require a Primary Targeting Agent)

Primary Targeting Agent

Saporin

Secondary Antibody or Streptavidin



Targeted conjugates are widely used to escort payloads to specific cell populations *in vitro* and *in vivo* for both basic research and drug development. A molecule that targets the extracellular marker of choice (a Targeting Agent) must be identified, produced, and specificity must be characterized. Desirable traits of a Targeting Agent include high specificity and rapid internalization. The Targeting Agent can be an antibody, peptide, protein, aptamer, or any other molecule that recognizes a cell-surface marker. Antibodies often make the best targeting agent, and the choice of the correct antibody is crucial to the specificity and performance of payload delivery. This allows a scientist to create their own Targeted Toxin.