

# Strategies for crafting effective abstracts

Additional Resources

# For every abstract, make sure you consider these **six** key aspects

1. Establish a clear argument, using Claim-Evidence-Reasoning (CER)
2. Your title and “here we show” statement convey the same message
3. Your problem statement and “here we show” statement are next to each other
4. Your results reflect your take home message
5. Use your “here we show” to guide the type of background you include
6. The subject of each sentence should lead to the subject of the next sentence

# Create an argument to convince readers that your work is important

argument = Claim + Evidence + Reasoning

**Claim** A statement of our understanding about a phenomenon, about the outcome of a study, or about the author's view of the field

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**Evidence** Data to support the claim

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**Reasoning** Justification of the claim that shows **how** the evidence specifically supports the claim

# Signaling words help your reader understand what part of the argument you are communicating

<b>Claim</b>	<i>Here, we show</i> the bromodomain containing protein, BRD4, regulates transcription of PPAR $\gamma$ and C/EBP $\alpha$ .
	<i>Analysis</i> of BRD4 chromatin occupancy <i>reveals</i> ...
<b>Evidence</b>	<i>Inhibition</i> of the bromodomain and extraterminal domain (BET) family of bromodomain-containing proteins <i>impedes</i> ...
	<i>Furthermore, silencing</i> of these BRD4-occupied distal regulatory elements at the Pparg locus by CRISPRi <i>demonstrates</i> ...
<b>Reasoning</b>	<i>Together, these data establish</i> BET bromodomain proteins as time and context-dependent coactivators of the adipocyte cell state transition

# Signaling words help guide the reader

Question + Experiment	Results	Answer/ Conclusion	Implication
To determine whether..., we...	We found...	We conclude that...	These results suggest that...
We asked whether...	Our results show...	Thus,...	These results may play a role in...
To answer this question, we...	Here we report...	These results indicate that...	Y can be used to...
X was studied by...			

Read lots of abstracts and collect useful phrases, choose **clarity** over originality.

Your title should reflect your “here we show”  
take home message claim

Title:

**A Small-Molecule Inhibitor to the Cytokine Interleukin-4**

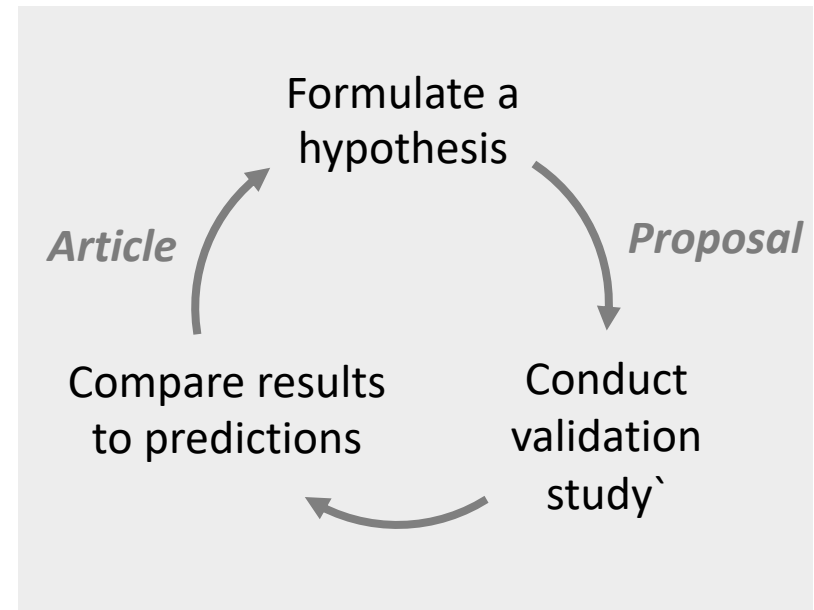
“Here we show”:

Here, we describe the first IL-4 small-molecule inhibitor identified and characterized through a combination of binding-based approaches and cell-based activity assays.

# Hypothesis vs. claim: motivation for study is distinct from conclusions drawn from data

- focus on what you **learned** more so than what you were *hoping* to achieve
- the cycle of hypothesis-driven research is communicated in different ways at different stages
  - research articles are used to convey findings of work done
  - communicating goals is more the focus of research proposals

## HYPOTHESIS-DRIVEN RESEARCH CYCLE



# Your knowledge gap and “here we show” statement should appear sequentially

but identifying effective chemotypes that inhibit the protein–protein interactions between cytokines and their receptors remains an active area of research. As a result, no small-molecule inhibitors to the soluble IL-4 cytokine have yet been reported.

**KNOWLEDGE  
GAP**

Here, we describe the first IL-4 small-molecule inhibitor identified and characterized through a combination of binding-based approaches and cell-based activity assays.

**HERE WE  
SHOW**

This is a good check for you and helps your reader



# Your results should reflect your take home message

## Technology Focus

Here we show that RNA-seq can be used to identify mechanisms of drug action within a cell.

1. What data did you use?
2. What analysis tools?
3. Did you find any interesting pathways?

## Biology Focus

Here we use a cell viability assay and analysis of RNA-seq data to understand the mechanism through which target cells have increased survival after drug treatment.

1. What did you learn about the mechanism from these assays?
2. What can you do next?

Be quantitative about the results that you include

# To write your background, work backwards from your “here we show” statement

Interleukin-4 (IL-4) is a multifunctional cytokine and an important regulator of inflammation. When deregulated, IL-4 activity is associated with asthma, allergic inflammation, and multiple types of cancer. While antibody-based inhibitors targeting the soluble cytokine have been evaluated clinically, they failed to achieve their end points in trials. Small-molecule inhibitors are an attractive alternative, but identifying effective chemotypes that inhibit the protein–protein interactions between cytokines and their receptors remains an active area of research. As a result, no small-molecule inhibitors to the soluble IL-4 cytokine have yet been reported.

Here, we describe the first IL-4 small-molecule inhibitor identified and characterized through a combination of binding-based approaches and cell-based activity assays.

# Make strategic use of a sentence's “stress” and “topic” positions

topic position

“**Information** is interpreted more easily and uniformly if it is placed where most **readers expect to find it.**”

stress position

- “**topic position**”: readers expect the **start of a sentence** to provide perspective and context for the information that follows
- “**stress position**”: readers commonly emphasize material that appears at the **end of a sentence**

Use the order of information to guide your reader to the subject of the sentence

Cells were pelleted gently in order to remove supernatant without lysing cells.

In order to remove supernatant, cells were pelleted gently without lysing cells.

Without lysing, cells were pelleted gently in order to remove supernatant.

In order to remove supernatant without lysing cells, cells were pelleted gently.

## TIP 1: make novelty claims sparingly

- Unless you've read every paper, you don't really know if you're the first to discover something
- A surprising result: unanticipated, or against common dogma, but not unprecedented
- Appropriately qualified, there are certain "firsts" you do know...

## TIP 2: varying sentence length can help your reader to stay engaged

TAR DNA-binding protein of 43 kDa (TDP-43) is an ubiquitous protein crucial to RNA processing. TDP-43 aberrant mislocalization to and aggregation in the cytoplasm is a common feature in many neurodegenerative diseases, including amyotrophic lateral sclerosis (ALS), and Alzheimer's disease (AD), making it an appealing therapeutic target. However, chemical probes directly targeting TDP-43 at a high affinity are lacking. Their discovery would prove useful to better elucidating mechanism to study the disease pathway of TDP-43, or perhaps to prevent TDP-43 aggregation. Here, we show that compound 95877382, a putative small molecule binder of TDP-43 identified by small molecule microarray (SMM) screening, appears to increase aggregation of TDP43-RRM12 in plate and can potentially alter endogenous TDP-43 localization to favor either the nucleus or the cytoplasm depending on dosage.

**New/important knowledge – shorter sentences**

Known/less critical knowledge – longer sentences

# TIP 3: verb tense changes throughout abstract

Present Tense

Past Tense

## Abstract

It is currently thought that life-long blood cell production is driven by the action of a small number of multipotent haematopoietic stem cells. Evidence supporting this view has been largely acquired through the use of functional assays involving transplantation. However, whether these mechanisms also govern native non-transplant haematopoiesis is entirely unclear. Here we have established a novel experimental model in mice where cells can be uniquely and genetically labelled in situ to address this question. Using this approach, we have performed longitudinal analyses of clonal dynamics in adult mice that reveal unprecedented features of native haematopoiesis. In contrast to what occurs following transplantation, steady-state blood production is maintained by the successive recruitment of thousands of clones, each with a minimal contribution to mature progeny. Our results demonstrate that a large number of long-lived progenitors, rather than classically defined haematopoietic stem cells, are the main drivers of steady-state haematopoiesis during most of adulthood. Our results also have implications for understanding the cellular origin of haematopoietic disease.

Current/existing knowledge – **present tense**

New work done to add to knowledge – **past tense**

# What if your story doesn't seem conclusive?

- Tell your story in a different way:
  - focus on the technology?
  - what did you learn?
- Convey negative results

*A Raf-Competitive K-Ras Binder  
Can Fail to Functionally  
Antagonize Signaling.*

Brief Communications Arising | 19 September 2018  
Evidence that CD32a does not mark the  
HIV-1 latent reservoir

- Make a descriptive title that's clear and interesting



# Further reading on strategies for scientific writing

“The Science of Scientific Writing” by George Gopen and Judith Swan

<https://www.americanscientist.org/blog/the-long-view/the-science-of-scientific-writing>

*discusses common reader expectations for where information appears, including concepts such subject-verb separation, topic vs. stress positions, etc.*