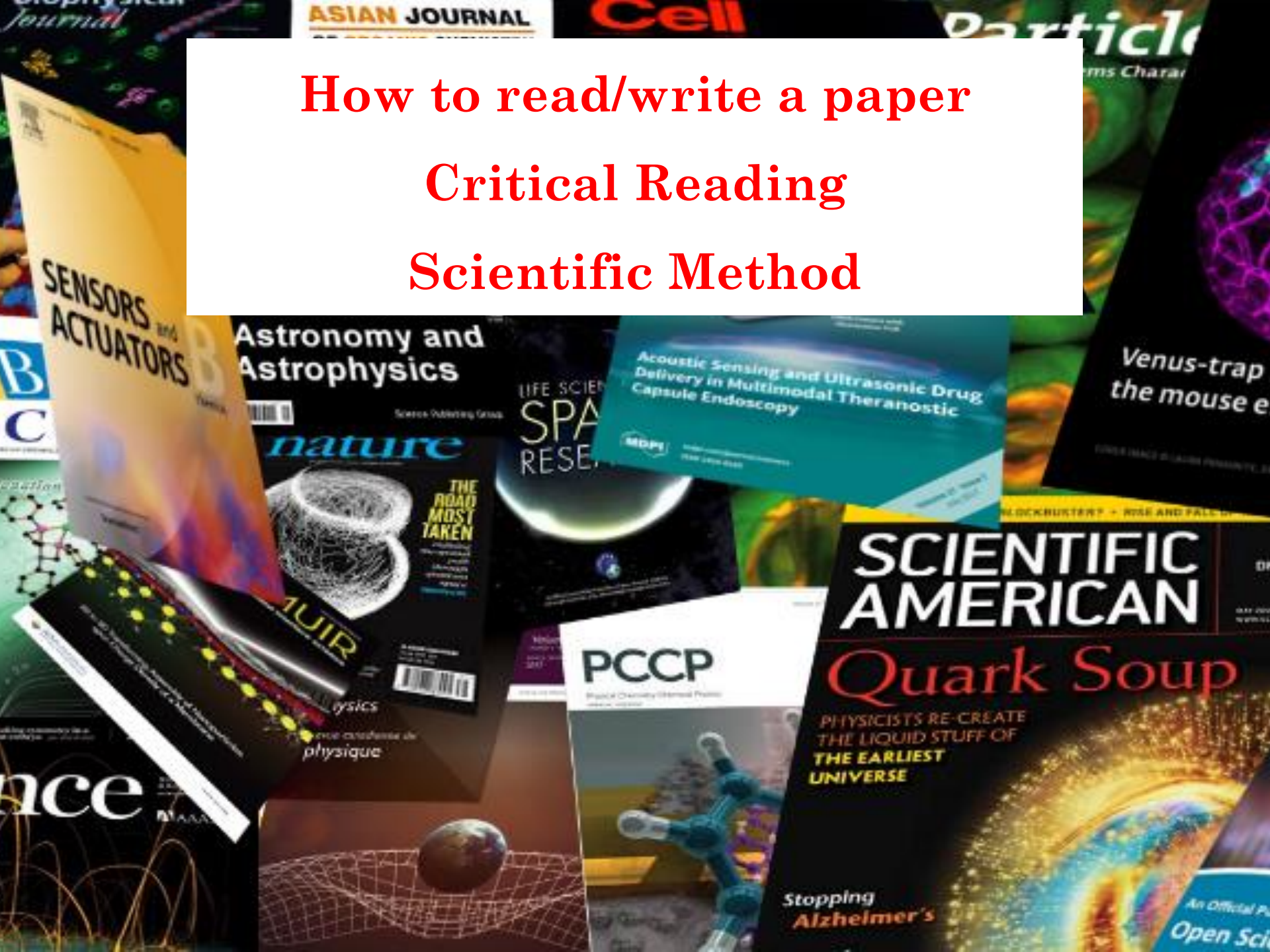
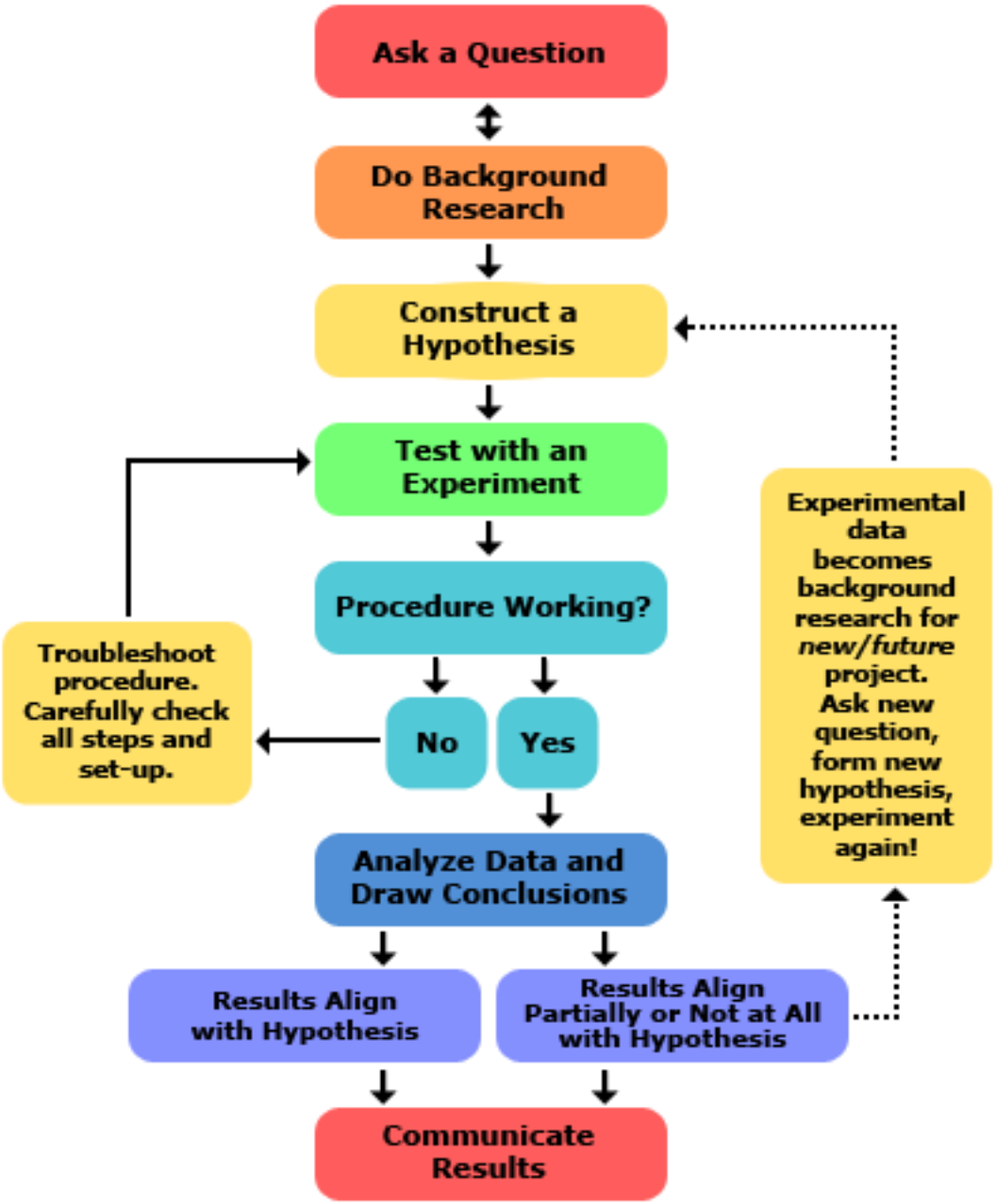

How to read/write a paper
Critical Reading
Scientific Method
SENSORS and ACTUATORS
Astronomy and Astrophysics
nature
THE ROAD MOST TAKEN
Acoustic Sensing and Ultrasonic Drug Delivery in Multimodal Theranostic Capsule Endoscopy
MDPI
Venus-trap the mouse e
SCIENTIFIC AMERICAN
Quark Soup
PHYSICISTS RE-CREATE THE LIQUID STUFF OF THE EARLIEST UNIVERSE
PCCP
ASIAN JOURNAL
Cell
Stopping Alzheimer's
physique

Scientific Method



What is a Scientific Paper?

Scientific Papers go straight to the source

Try to **distinguish first-hand from second-hand information**. To get the real story, whether a film review or the results of a new research study, **go to the source**

Scientific papers present data and interpretations

One of the objectives of a scientific paper is to make available the data from a set of studies so that others can learn from them and build on them to address new questions.

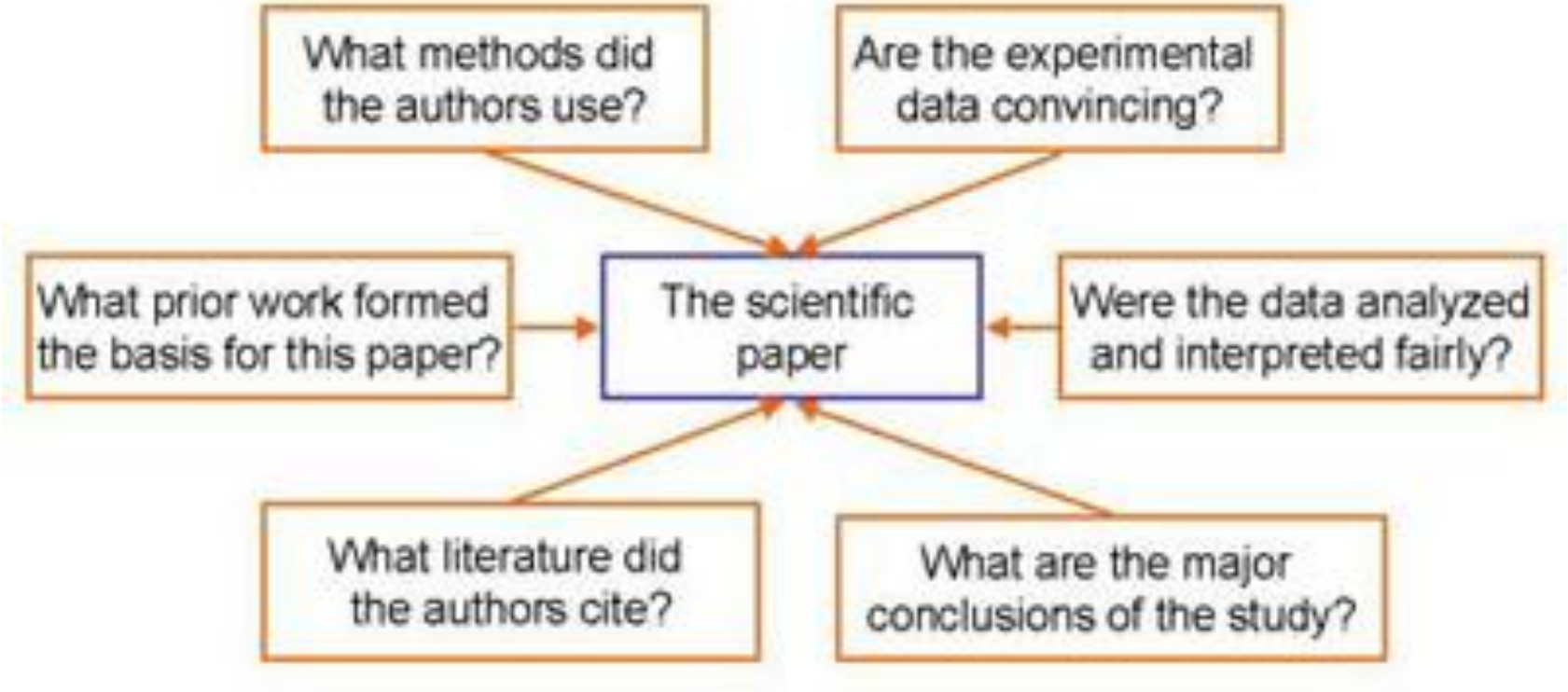
Research Papers: articles include results from a few targeted studies

Large-Scale Articles: present large datasets that other scientists can use in new ways to address different questions

Reviews: a paper that summarizes recent literature on or developments in a particular subject. The main and fundamental purpose of writing a review is to create a readable synthesis of the best resources available in the literature for an important research question or a current area of research.

The authors of scientific papers also provide **an interpretation of what they think their new information means** and how it contributes to our understanding of how the natural world works. By presenting the data itself as well as the analysis, other authors can evaluate these interpretations for themselves.

Because our understanding is always changing, sometimes the interpretations of the data can be reevaluated in light of new ideas and new data.



Peer Review Process

Peer Review is a tradition in scientific publications. Prior to publication, an article is evaluated by other experts in the field, usually anonymously, and these evaluations are used to improve the paper.

The Reviewers may recommend that **additional data be collected and analysed** or that **claims not well supported by the data be removed**.

The role of the Reviewer is to evaluate the experimental design and the data presented, as well as the interpretation of the results.

Sometimes, the Reviewer will find that the experimental design was not rigorous enough to support the interpretations made by the Authors, in which case the Reviewer might recommend that additional experiments be performed or that the analysis of the results be revised.

Types of peer review

Single blind review

The names of the reviewers are hidden from the author. This is the most common type

Reviewers should not be influenced by the authors

Reviewers could delay publication, to have a chance to publish first

Reviewers may use their anonymity as justification for being unnecessarily critical

Double-blind review

Both the reviewers and the authors are anonymous

Author anonymity limits reviewer bias, although reviewers can often identify the author through their writing style, subject matter or self-citation

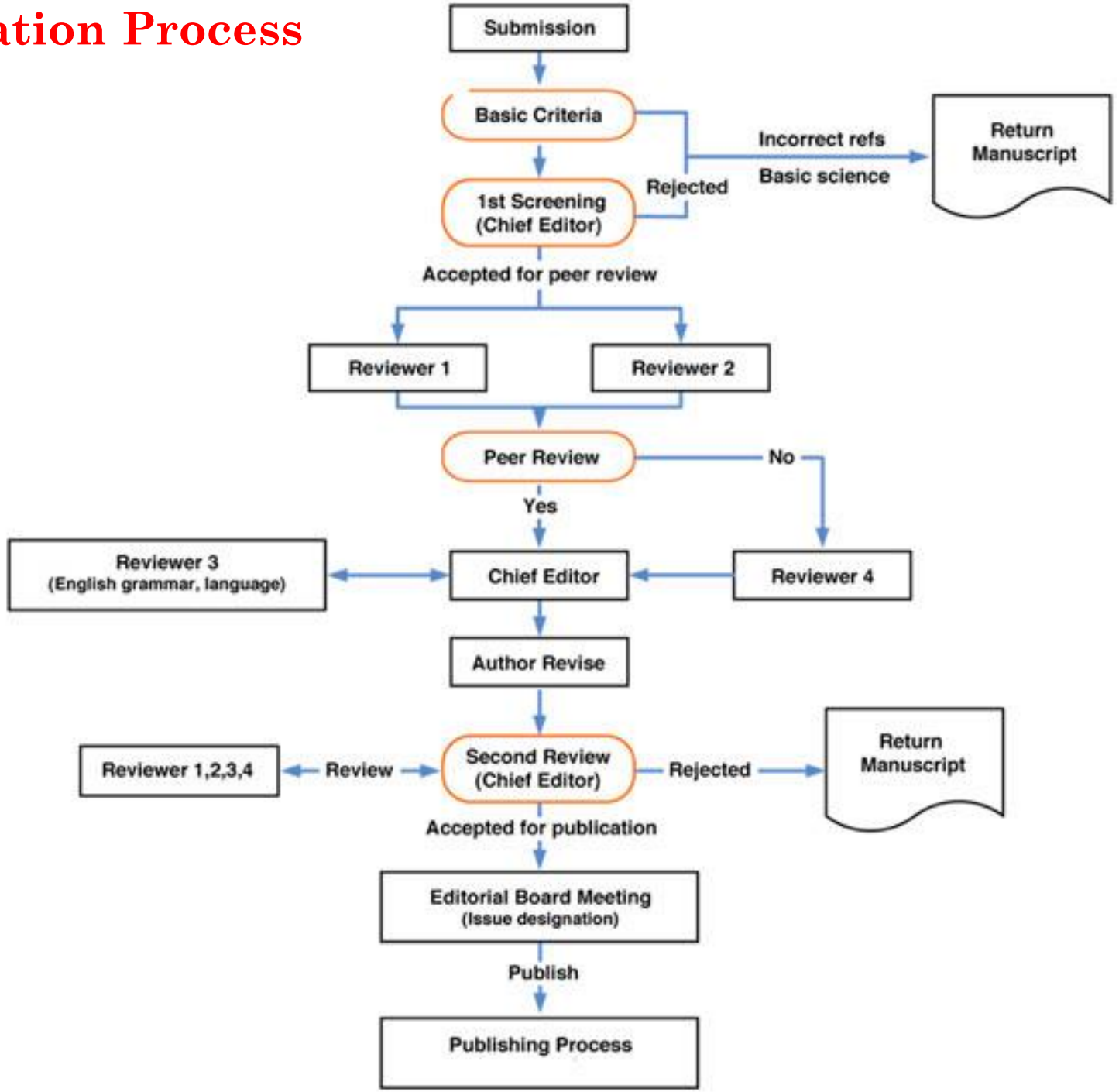
Triple-blind review

Reviewers are anonymous and the author's identity is unknown to both the reviewers and the editor. Articles are anonymized at the submission stage and are handled in such a way to minimize any potential bias towards the author(s), but there is still a possibility for the editor and/or reviewers to correctly divine the author's identity

Open review

Both the reviewer and author are known to each other during the peer review process, or publication of reviewers' names on the article page, publication of peer review reports alongside the article, whether signed or anonymous, etc

Publication Process



Articles in newspapers, generalist or specialised, are usually not subjiect to peer review. Although they can be effective at introducing scientific topics to a broader audience, they are not always sufficiently cautious in their analysis of the results of the study and sometimes overstate the conclusions.

If you want to know more about a news on a scientific report on a scientific breakthrough, find the original peer-reviewed article and read what the researchers actually discovered.

How to read a scientific journal paper

Title:

Short, succinct, eye-catching, all-encompassing

Abstract:

Summary of Methods, Results, and Discussion starting off with a statement of **why** the research was done and with emphasis on **why** the results are significant.

Introduction:

When was past work done, by **whom**, **why** was their work important, **what** you plan to do in your paper, and **why** what you did is important.

Materials and Methods:

How you did what you did and **where** you did it--nothing more.

Results:

What the data show you--nothing more.

Discussion: Why the data show what they show, and **how** your analysis relates back to your objectives from the Introduction.

Note:

Some journals will allow the Results and Discussion sections to be combined. In this case, the data should be divided up into logical groups, and for each group (generally separated by a subheading) the **What** and the **why** are presented together.

Sources:
Cornell Source URL:
http://olinuris.library.cornell.edu/ref/research/skill28.htm
How to read a scientific journal article:
http://www2.fiu.edu/~collins/Article%20reading%20tips.htm

Section	*Purpose in a journal paper*
Title **Running title** (if needed)	To give the reader immediate access to the subject matter of the paper. The short title required by journals for the tops of the pages. Running titles can use abbreviations.
Authors(s) and Affiliation(s)	To show the people who did the work presented in the paper, the institutions where it was done and, if necessary, the present addresses of the authors.
Abstract	To give the reader a miniaturized version of the paper: all of the key information – objective of the work, methods, results, conclusions.
Keywords	This is a short list of words relevant to the work that will be used by electronic indexing and abstracting services.
Introduction	To clearly state the purpose of the study. To allow readers to understand the background to the study, without needing to consult the literature themselves. To indicate the authors who have worked or are working in this area, and to describe their chief contributions. To indicate correlations, contradictions and gaps in the knowledge, and to outline the approach to be taken with respect to them. To provide a context for the later discussion of the results.
Materials and Methods	To describe the experimental procedures. Aim: repeatability by another competent worker

Results	To present the results, but not to discuss them.
Discussion	To show the relationships among the observed facts presented in the paper, and to draw conclusions.
Sometimes: **Conclusions**	To give an overview of the conclusions drawn from the material in the paper.
Recommendations	To propose a series of recommendations for action, arising directly from the conclusions.
Acknowledgements	To thank the people who have given help in the work and in the preparation of the paper.
List of References	A list of the works cited in the text. Strong conventions govern this process.
Illustrations (Figures and tables)	

Title

Title: purpose

To describe contents of paper in fewest possible words.
To give reader immediate access to the subject matter.

Title: formula for writing:

Ask yourself these two questions:

What is the single most important point made in this paper?
How would I convey that to another scientist in one short sentence or phrase?

Title: Importance

Informative (REAL information), not generalized overview.
Do not try to include every result and conclusion.
Be sure to mention the system or the organism.

Best and worst types of titles

BEST (according to some authorities)
Short, declarative sentences that give the major conclusion

The enzyme responsible for the amino-terminal modification of twickase in mice is a basic cytoplasmic protein.

An RNA gene expressed during cortical development evolved rapidly in humans

WORST
Begin with 'Studies of...'

Studies of the amino-terminal modification of twickase in the mouse.

Studies of the diffusion of the photons in turbid media.

Title: common mistakes

1. No REAL information
2. Does not adequately describe content of paper
3. Too long / complicated
4. Too short and general
5. Not enough information

Abstract

Abstract: purpose

1. To be a miniaturised version of the whole paper.
2. To provide a brief summary of each of the main sections of the paper: Introduction; Materials and Methods; Results; Discussion.
3. To enable readers to:
    a. readily identify the basic content
    b. determine whether it is relevant to their interests
    c. decide whether they need to read the whole paper.
4. To help assessment of the rest of the paper.

Abstract: difficulties

- Deciding on core information
- Making sure that all aspects are covered
- Linking the information up into a coherent story
- Final reduction to required word number

Abstract: guidelines

1. Miniaturised version of the whole paper
2. Should be self-contained
3. Must be fully informative – REAL information.
4. Should not cite references, figures.
5. Imagine: reader doing database search. What information would he/she like to find?
6. Make sure that main conclusion is clear.
7. Most journals: Abstract should be a single paragraph.

Abstract: recipe

Probably in this order:

1. Main objectives and scope of the investigation
2. Methods (if needed)
3. Results
4. Main conclusion(s).


ALERT!
MISCONDUCT!!!

Cambridge: Research Misconduct Definition

Fabrication, falsification, plagiarism or deception in proposing, carrying out or reporting results of research and deliberate, dangerous or negligent deviations from accepted practice in carrying out research.

Fabrication
Bugia

Making up data or results

and recording or reporting them

Falsification

Manipulating research materials, equipment, or processes, or changing or omitting data or results such that the research is not accurately represented in the research record

Plagiarism

Appropriation of another person's ideas, processes, results, or words without giving appropriate credit.

Deception
Inganno

Propagating beliefs that are not true, or not the whole truth

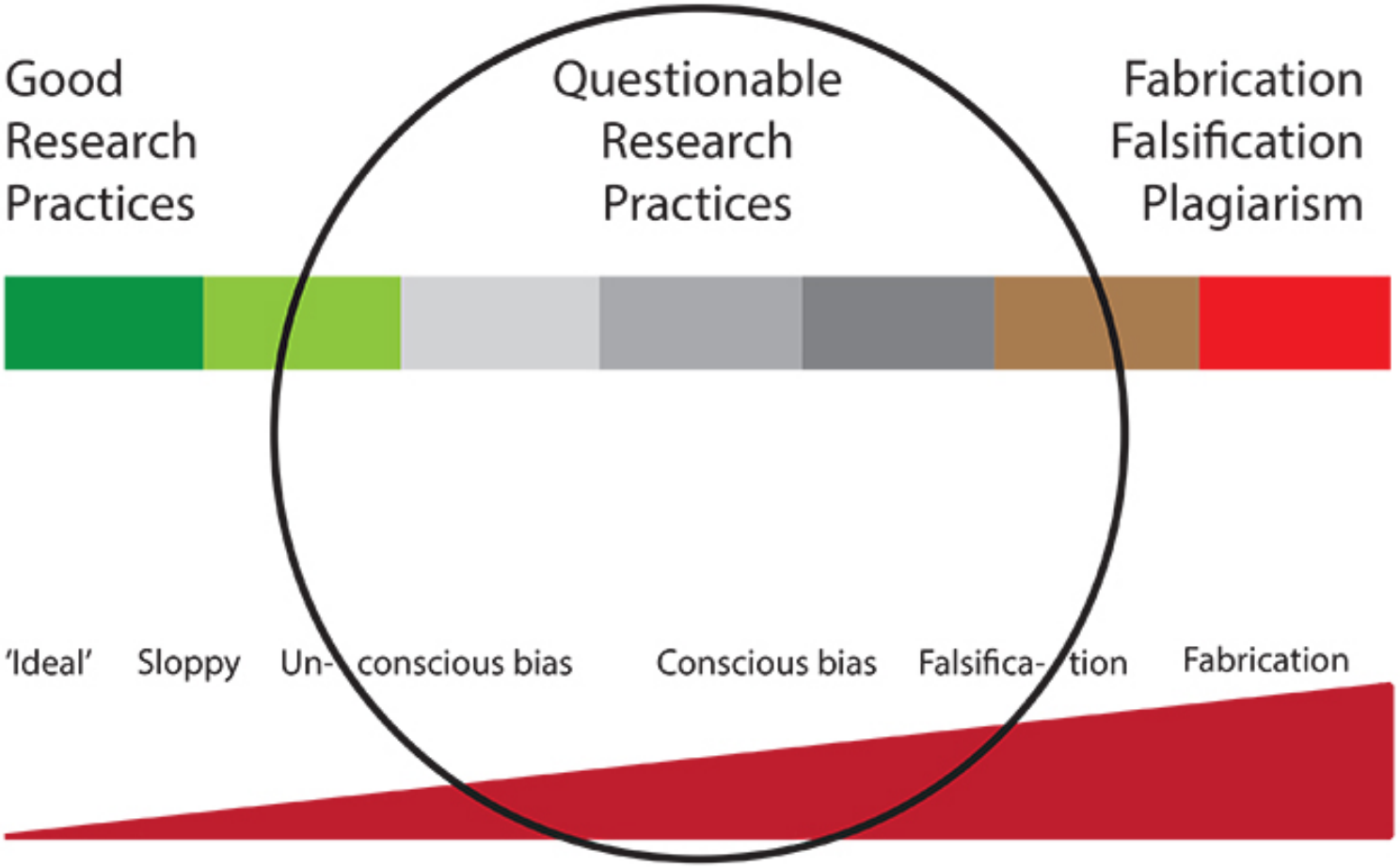
More…..

Fabrication, falsification, plagiarism or deception in proposing, carrying out or reporting results of research

and deliberate, dangerous or negligent deviations from accepted practice in carrying out research

However…..

Misconduct in this context does not include honest error or honest differences in interpretation or judgement in evaluating research methods or results, or misconduct (including gross misconduct) unrelated to the research process


Good
Research
Practices
Questionable
Research
Practices
Fabrication
Falsification
Plagiarism
'Ideal'
Sloppy
Un-
conscious bias
Conscious bias
Falsifica-
tion
Fabrication

Statistical Analysis

What does Statistical Significance mean???

When comparing samples, the differences in measured values can be small but nevertheless meaningful. If a measured difference is supported by statistical test, it can be said that the difference between samples is **statistically significant**.

This means that **there is a strong probability that the samples are different, not that the difference is real**.

Be careful to:

Use the appropriate controls

Perform measurements of a large number of samples

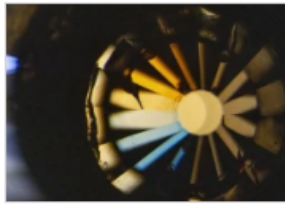
Repeat the experiments with more biological repeats


Field-Effect Modulation of the Conductance of Single Molecules
RETRACTED
Patient-Specific Embryonic Stem Cells Derived from Human SCNT Blast
RETRACTED
Induction of DNA methylation and gene silencing by short interfering RNAs in human cells
RETRACTED

News Feature
08 Mar 2024

Superconductivity scandal: the inside story of deception in a rising star's physics lab

Ranga Dias claimed to have discovered the first room-temperature superconductors, but the work was later retracted. An investigation by *Nature*'s news team reveals new details about what happened — and how institutions missed red flags.



Dan Garisto

https://www.nature.com/nature/articles?type=news-feature

2020: Dias, ricercatore presso l'Università di Rochester-NY, stella emergente del mondo della fisica, per la sua affermazione di aver scoperto il **primo superconduttore a Tambiente.** Questa scoperta è pubblicata su Nature. La maggioranza dei superconduttori funziona a $T < -196\,°C$. Quindi raggiungere la superconduttività a T ambiente risulta un "fenomeno notevole".

2022: il paper è retracted. Poi, Dias pubblica un risultato più grande su Nature: un altro superconduttore a Tambiente, funzionante a pressioni relativamente modeste, con la possibilità di applicazioni as magneti superconduttori per l'imaging medico e potenti chip per computer. Ma Dias è famoso per lo scandalo precedente e **molti altri gruppi di ricerca non sono riusciti a replicare i risultati sulla superconduttività**

2° paper retracted.

2023: Dias è privato dei suoi studenti e dei suoi laboratori. La quarta indagine è ormai completata e gli esperti esterni hanno confermato che c'erano "problemi sull'affidabilità dei dati" nei documenti di Dias.

Precedenti articoli del Wall Street Journal, Science e Nature hanno documentato le accuse secondo cui Dias avrebbe **manipolato i dati, plagiato parti sostanziali** della sua tesi e **tentato di ostacolare le indagini su un altro articolo falsificando dati**.

PLOS | PATHOGENS

EXPRESSION OF CONCERN

Expression of Concern: Misregulation of *AUXIN RESPONSE FACTOR 8* Underlies the Developmental Abnormalities Caused by Three Distinct Viral Silencing Suppressors in Arabidopsis

The *PLOS Pathogens* Editors

Concerns have been raised regarding the preparation of Figures 4, 5, and 6 and verification of the genotypes of the three transgenic plants—P15, P19, and HcPro—which were originally described in an article by Dunoyer et al. (2004, *Plant* Cell) that was retracted from the published literature. These concerns were rigorously investigated, the authors have been contacted, and efforts to fully address these concerns are currently underway.

This Expression of Concern should not be considered as a statement regarding the validity of the work, but rather as a notification to readers. *PLOS Pathogens* will provide additional information as it becomes available.

References

1. Jay F, Wang Y, Yu A, Taconnat L, Pelletier S, et al. (2011) Misregulation of *AUXIN RESPONSE FACTOR 8* Underlies the Developmental Abnormalities Caused by Three Distinct Viral Silencing Suppressors in Arabidopsis. PLoS Pathog 7(5): e1002035. doi: 10.1371/journal.ppat.1002035 PMID: 21589905
2. Dunoyer P, Lecellier C-H, Parizotto EA, Himber C, Voinnet O. (2004) Probing the MicroRNA and Small Interfering RNA Pathways with Virus-Encoded Suppressors of RNA Silencing. Plant Cell 16(5) 1235–1250. doi: 10.1105/tpc.020719 PMID: 15084715

PLOS | GENETICS

RETRACTION

Retraction: RNAi-Dependent and Independent Control of LINE1 Accumulation and Mobility in Mouse Embryonic Stem Cells

Constance Ciaudo, Florence Jay, Ikuhiro Okamoto, Chong-Jian Chen, Alexis Sarazin, Nicolas Servant, Emmanuel Barillot, Edith Heard, Olivier Voinnet

At the request of the authors, *PLOS Genetics* is retracting this publication following an investigation into concerns that were raised regarding the assembly of Fig 4 and S4 Fig, and the statistical analysis used in Fig 2A. The text below has been agreed to by the authors and editors.

The corresponding author, Olivier Voinnet, was originally alerted to errors that occurred during the assembly of Fig 4 (panel A) and S4 Fig (panels A and F). These errors have been corrected using the original raw data, and a correction notice was published accordingly.

Further analysis of the paper revealed flaws in the interpretation of the transposition data presented in Fig 2A. In the originally submitted version, the L1 copy number was only presented for the $DCR^{Flx/Flx}$ P10 and $DCR^{-/-}$ P30 cells, and a T-test performed on the two datasets showed that the L1 copy number was statistically higher in $DCR^{-/-}$ cells than in control cells. During the last stage of the review process, additional datasets were added and a second T-test was then used to establish the statistical analysis published in the final version of the paper. However, it was later realized that T-tests are not appropriate for comparing more than two datasets. At the recommendation of the ETH statistics helpdesk, a suitable Analysis of Variance (ANOVA) test with multiple comparisons was then conducted on the $Dcr^{Flx/Flx}$ P30 and $Dcr^{-/-}$ P30 datasets, providing a p-value of 0.0501, which is at the margin of the threshold of significance. The ANOVA test conducted on the $Dcr^{Flx/Flx}$ P10 and $Dcr^{-/-}$ P30 datasets revealed a statistically significant p-value of 0.0018. The statistical issue regarding the L1 copy number in $DCR^{-/-}$ versus control ES cells is currently being addressed using a new set of cells and a direct GFP-based transposition assay. This issue will hopefully be clarified in the near future *via* the submission of an amended study for peer-review.

Based on the present uncertainty revealed by the corrected statistical analysis of the L1 copy number—a key element of this paper—and on the previous errors in the figures, the authors have collectively decided to retract this study. Constance Ciaudo and Olivier Voinnet take full responsibility for the mistakes on this paper and wish to apologize. They also wish to state that none of the above-mentioned mistakes involved any of the co-authors from the Curie Institute, whose contributions to the paper were restricted to the bioinformatics analysis of small RNAs (NS, CJC, EB) and the generation of reagents including an ES cell line required for the study (EH, IO). All authors regret the inconvenience caused.

Reference

1. Ciaudo C, Jay F, Okamoto I, Chen C-J, Sarazin A, Servant N, et al. (2013) RNAi-Dependent and Independent Control of LINE1 Accumulation and Mobility in Mouse Embryonic Stem Cells. PLoS Genet 9 (11): e1003791. doi:10.1371/journal.pgen.1003791 PMID: 24244175

Citation: Ciaudo C, Jay F, Okamoto I, Chen C-J, Sarazin A, Servant N, et al. (2015) Retraction: RNAi-Dependent and Independent Control of LINE1 Accumulation and Mobility in Mouse Embryonic Stem Cells. PLoS Genet 11(9): e1005519. doi:10.1371/journal.pgen.1005519

Published: September 3, 2015

Surfaces and Interfaces 46 (2024) 104081

Contents lists available at ScienceDirect

Surfaces and Interfaces

journal homepage: www.sciencedirect.com/journal/surfaces-and-interfaces

The three-dimensional porous mesh structure of Cu-based metal-organic-framework - aramid cellulose separator enhances the electrochemical performance of lithium metal anode batteries

Manshu Zhang [a,1], Liming Wu [a,1], Tao Yang [b], Bing Zhu [a], Yangai Liu [a,*]

[a] Beijing Key Laboratory of Materials Utilization of Nonmetallic Minerals and Solid Wastes, National Laboratory of Mineral Materials, School of Materials Science and Technology, China University of Geosciences, Beijing100083, China
[b] College of Materials & Environmental Engineering, Hangzhou Dianzi University, Hangzhou 310036, China

ARTICLE INFO

Keywords:
Lithium metal battery
Lithium dendrites
CuMOF-ANFs separator

ABSTRACT

Lithium metal, due to its advantages of high theoretical capacity, low density and low electrochemical reaction potential, is used as a negative electrode material for batteries and brings great potential for the next generation of energy storage systems. However, the production of lithium metal dendrites makes the battery life low and poor safety, so lithium dendrites have been the biggest problem of lithium metal batteries. This study shows that the larger specific surface area and more pore structure of Cu-based metal-organic-framework - aramid cellulose (CuMOF-ANFs) composite separator can help to inhibit the formation of lithium dendrites. After 110 cycles at 1 mA/cm^2, the discharge capacity retention rate of the Li-Cu battery using the CuMOF-ANFs separator is about 96 %. Li-Li batteries can continue to maintain low hysteresis for 2000 h at the same current density. The results show that CuMOF-ANFs composite membrane can inhibit the generation of lithium dendrites and improve the cycle stability and cycle life of the battery. The three-dimensional (3D) porous mesh structure of CuMOF-ANFs separator provides a new perspective for the practical application of lithium metal battery.

1. Introduction

Certainly, here is a possible introduction for your topic: Lithium-metal batteries are promising candidates for high-energy-density rechargeable batteries due to their low electrode potentials and high theoretical capacities [1,2]. However, during the cycle, dendrites forming on the lithium metal anode can cause a short circuit, which can affect the safety and life of the battery [3–9]. Therefore, researchers are indeed focusing on various aspects such as negative electrode structure [10], electrolyte additives [11,12], SEI film construction [13,14], and collector modification [15] to inhibit the formation of lithium dendrites. However, using a separator with high mechanical strength and chemical stability of the separator is equally important as it ensures that the separator remains intact and does not react or degrade in the presence of the electrolyte or other battery components. A chemically stable separator helps to prevent the formation of reactive species that can further promote dendrite growth. Researchers are actively exploring different materials and designs for separators to enhance their mechanical strength and chemical stability. These efforts aim to create separators that can effectively block dendrite formation, thereby improving the safety and performance of lithium-ion batteries. While there are several research directions to address the issue of dendrite formation, using a separator with high mechanical strength and chemical stability is an important approach to prevent dendrites from infil-

Bufale Covid

1 – Il virus del Covid-19 è stato sottratto da un laboratorio canadese da spie cinesi

2 – Il virus del Covid-19 contiene 'sequenze simili all'Hiv', lasciando intendere che si tratti di un virus costruito artificialmente

3 – La pandemia di Covid-19 era stata prevista in una simulazione

4 – Un gruppo finanziato da Bill Gates ha brevettato il virus del Covid-19

5 – Il virus del Covid-19 è un'arma biologica creata dall'uomo

6 – La tecnologia dei telefoni cellulari 5G è collegata alla pandemia di coronavirus

7 – L'argento colloidale può curare il Covid-19

8 – La Miracle Mineral Solution può curare il Covid-19

9 – L'aglio può curare il Covid-19

10 – È stato dimostrato che dosi massicce di vitamina C siano un trattamento efficace per il Covid-19