

**PEER REVIEW  
IS BROKEN.**

**CAN AI HELP  
SAVE IT?**

**Dr. Ken Milne**

**RESQI Symposium**

**June 2, 2026**



# DISCLOSURES:

- ★ NO GRANTS OR CONSULTING FEES
- ★ SENIOR EDITOR OF AEM
- ★ NO FUNDING FROM PHARMA OR MEDICAL DEVICE INDUSTRY
- ★ FACULTY FOR CCME & EMRAP
- ★ EXPERT FOR MEDICAL MALPRACTICE
- ★ PEDIATRIC RESUSCITATION DEVICE PATENT

***Dr. Ken Milne***



# TODAY'S JOURNEY

1

WHY PEER REVIEW MATTERS



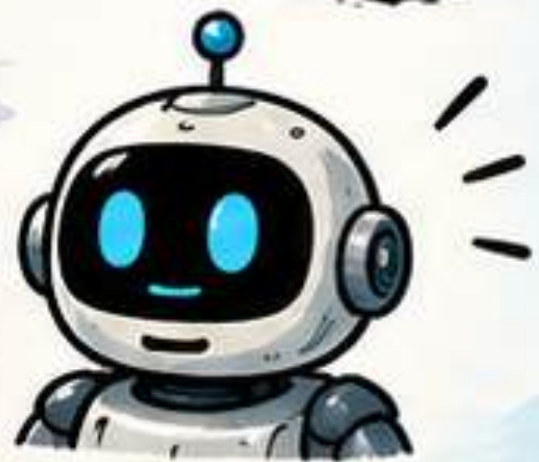
2

THE CURRENT STATE:  
UNDER STRAIN



3

AI HAS ALREADY ARRIVED



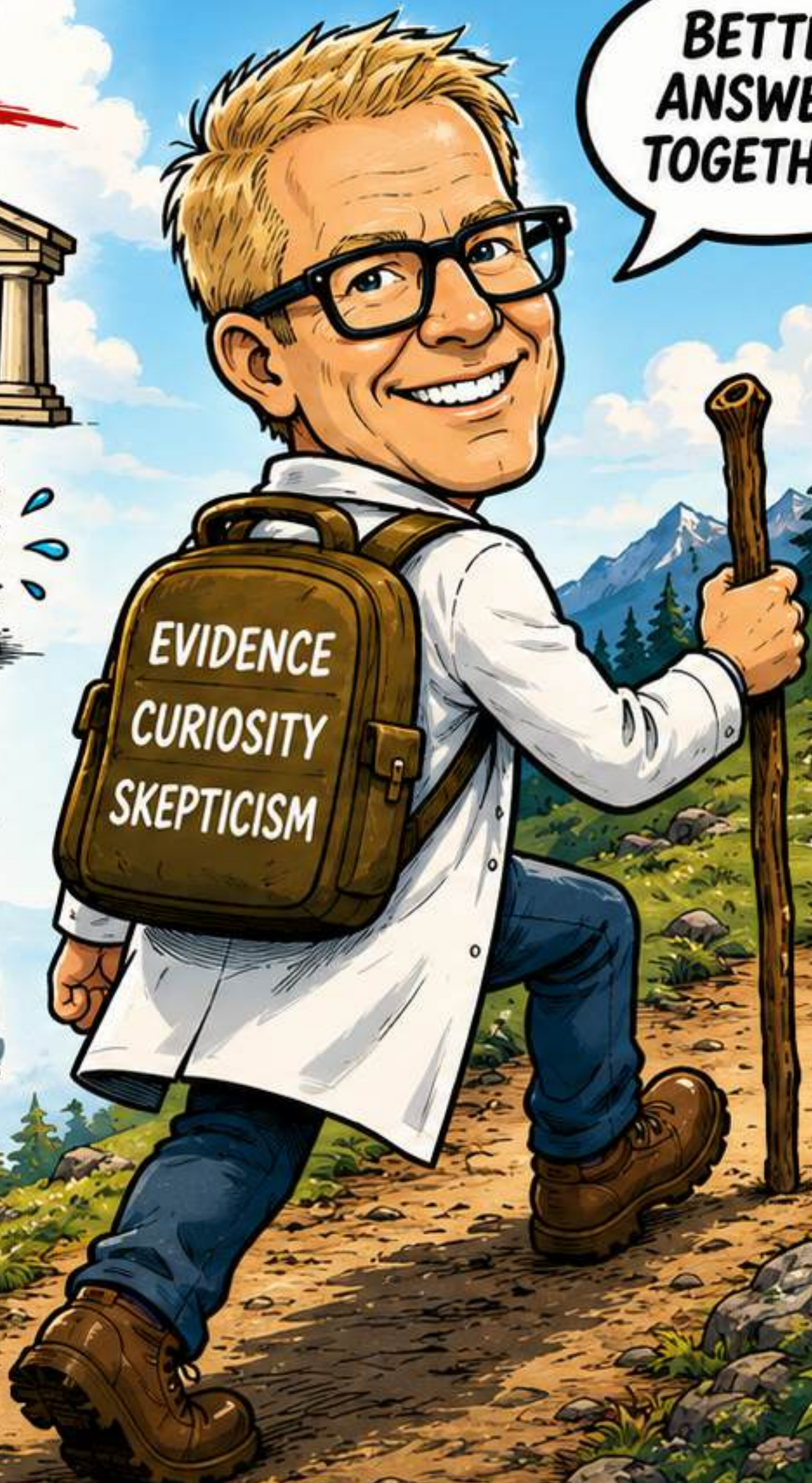
4

AI AS AUGMENTATION,  
NOT REPLACEMENT



5

THE REAL QUESTION  
IS TRUST



BETTER ANSWERS TOGETHER!



# WHY PEER REVIEW MATTERS

BECAUSE IT IS THE FOUNDATION OF SCIENCE.



Not Perfect.



Not Old.



But Essential.

# A BRIEF HISTORY

PEER REVIEW EVOLVED.  
IT CAN EVOLVE AGAIN.

**1665**

The Myth  
of the Royal  
Society



**19th CENTURY**

Structured  
Review  
Emerges



**1950s**

Institutionalization  
& Accountability  
(Cold War Era)



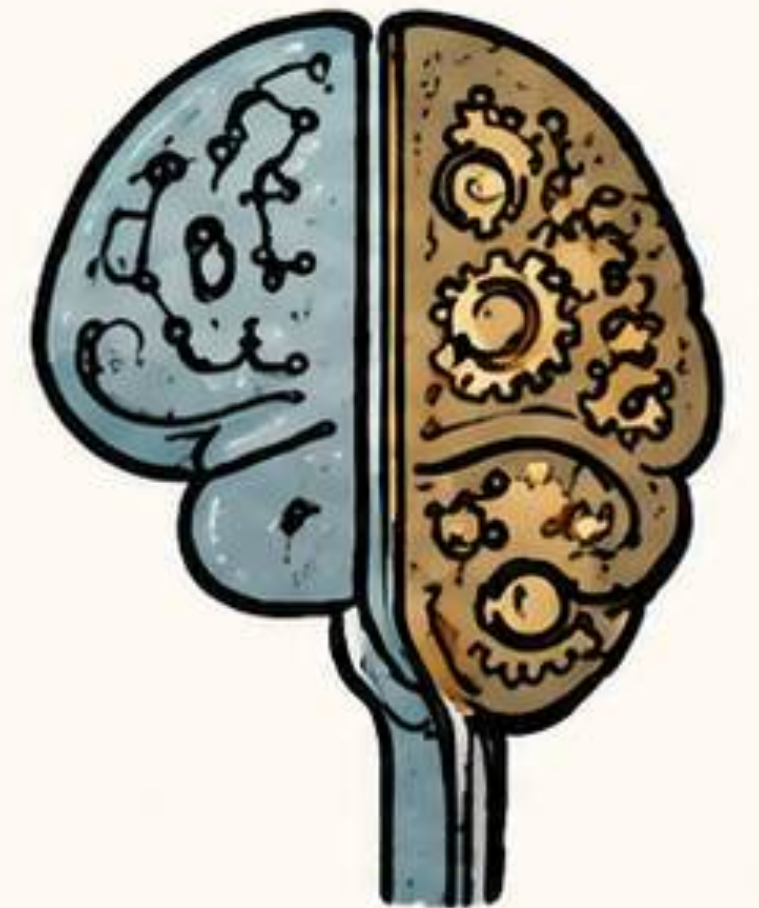
**1970s**

Term "Peer  
Review"  
Coined



**2025+**

AI Era



# THE PROBLEM IN ONE SLIDE

**~1.5 MILLION  
BIOMEDICAL  
PAPERS / YEAR**



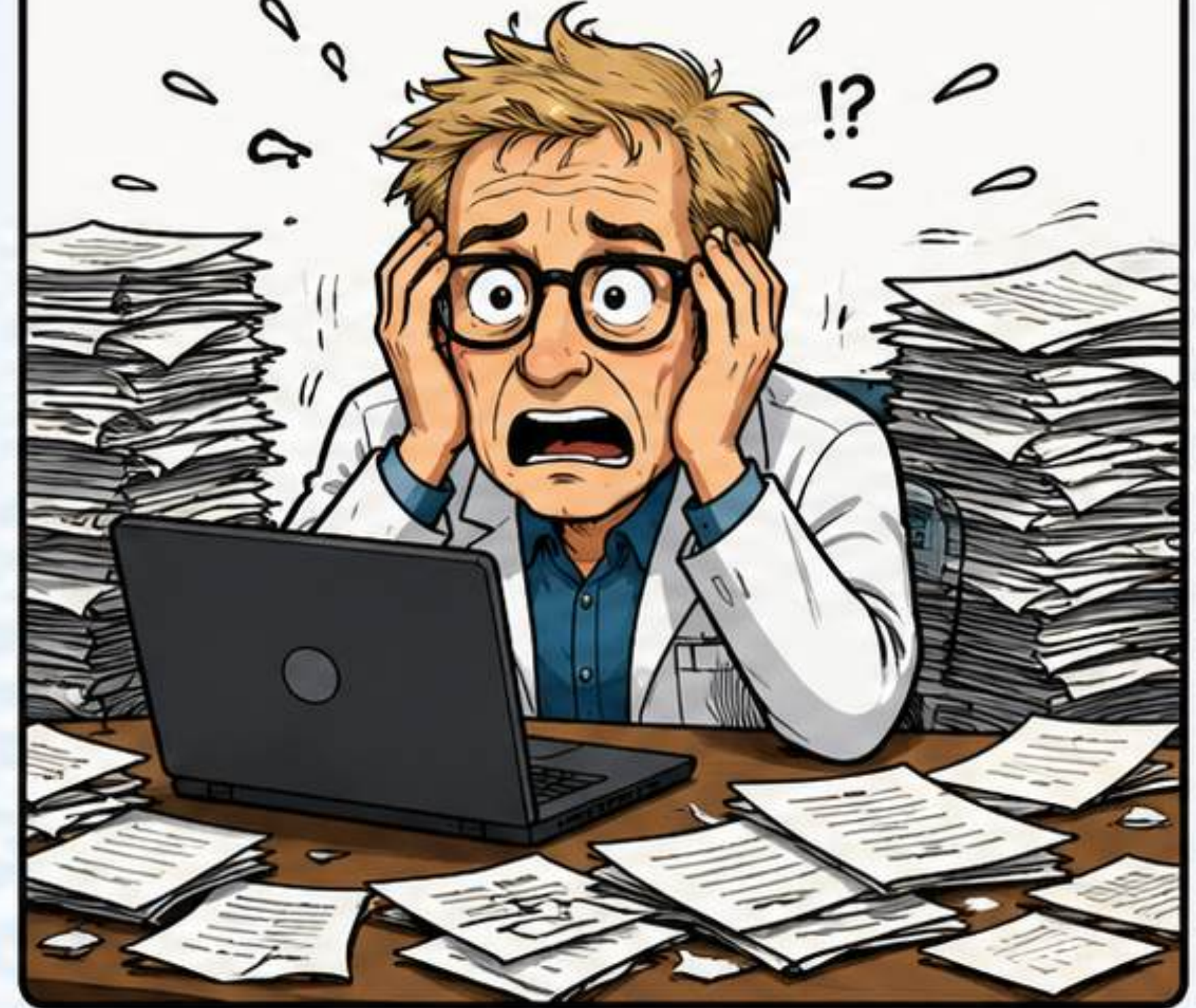
**VOLUME.**

**> 10,000  
RETRACTIONS  
IN 2023**



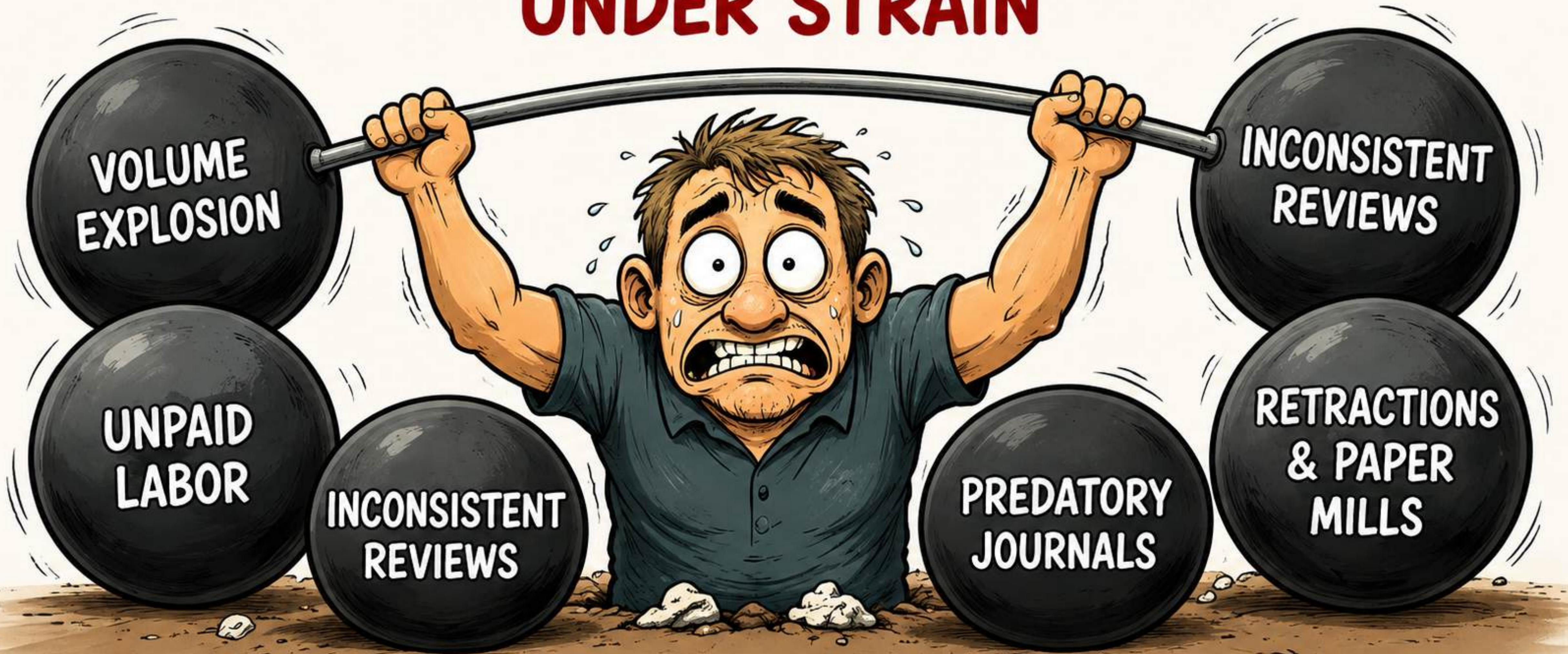
**VELOCITY.**

**OVERWHELMED  
HUMAN  
REVIEWERS**



**VULNERABILITY.**

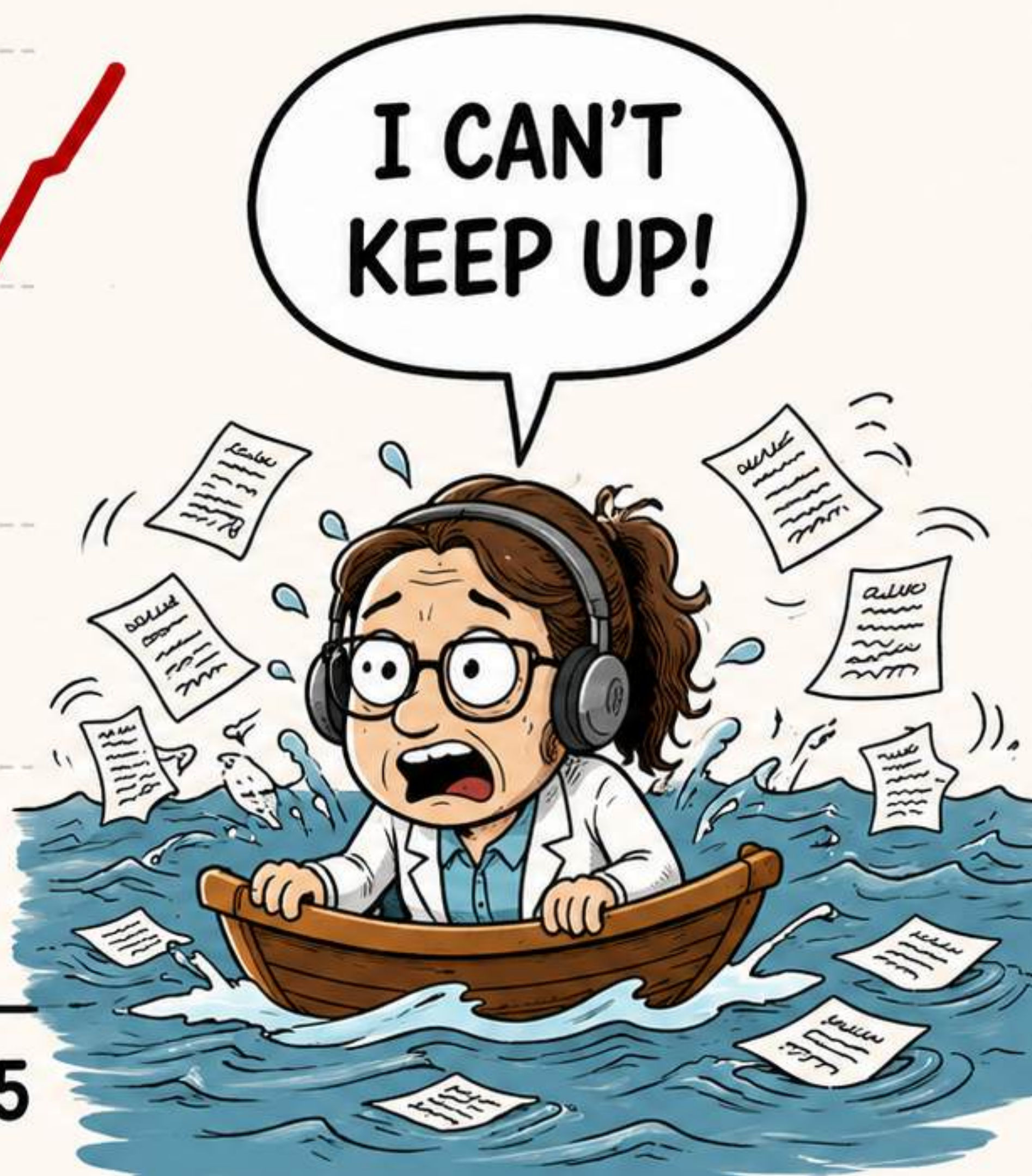
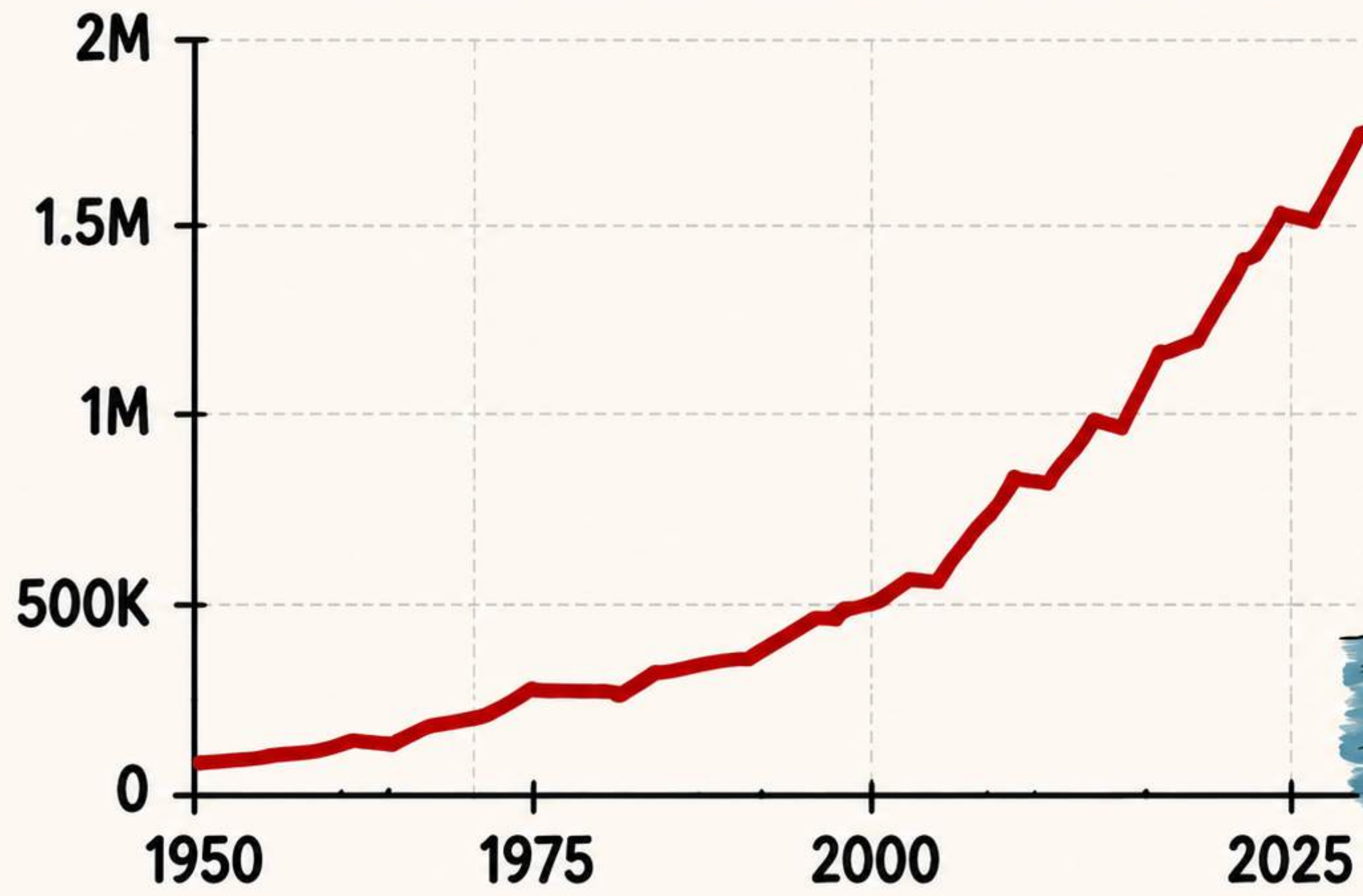
# THE CURRENT STATE: UNDER STRAIN



OUR 20TH CENTURY SYSTEM IN A 21ST CENTURY TSUNAMI.

# VOLUME EXPLOSION

## BIOMEDICAL PUBLICATIONS PER YEAR



# THE BUSINESS OF ACADEMIC PUBLISHING

## 1. RESEARCHERS

- WRITE PAPERS
- CONDUCT STUDIES
- **UNPAID**



WE DO THE WORK...

## 2. PEER REVIEWERS

- VET MANUSCRIPTS
- CHECK METHODS
- **USUALLY UNPAID**



PEERS DO THE QUALITY CONTROL...

## 3. PUBLISHERS

- PACKAGE CONTENT
- BRAND JOURNALS
- CONTROL ACCESS



PUBLISHERS PACKAGE & CONTROL ACCESS...

## 4. REVENUE STREAMS

 **UNIVERSITIES & LIBRARIES**  
• SUBSCRIPTION FEES

 **AUTHORS**  
• APCs / OPEN ACCESS FEES

 **INDUSTRY**  
• ADVERTISING & SPONSORSHIP

OPERATING MARGINS HISTORICALLY HIGHER THAN MANY TECH COMPANIES. 

**HIGH MARGINS!**



RESEARCHERS CREATE IT. | REVIEWERS VET IT. | PUBLISHERS SELL IT.



# THE UNPAID ENGINE



THOUSANDS OF HOURS.



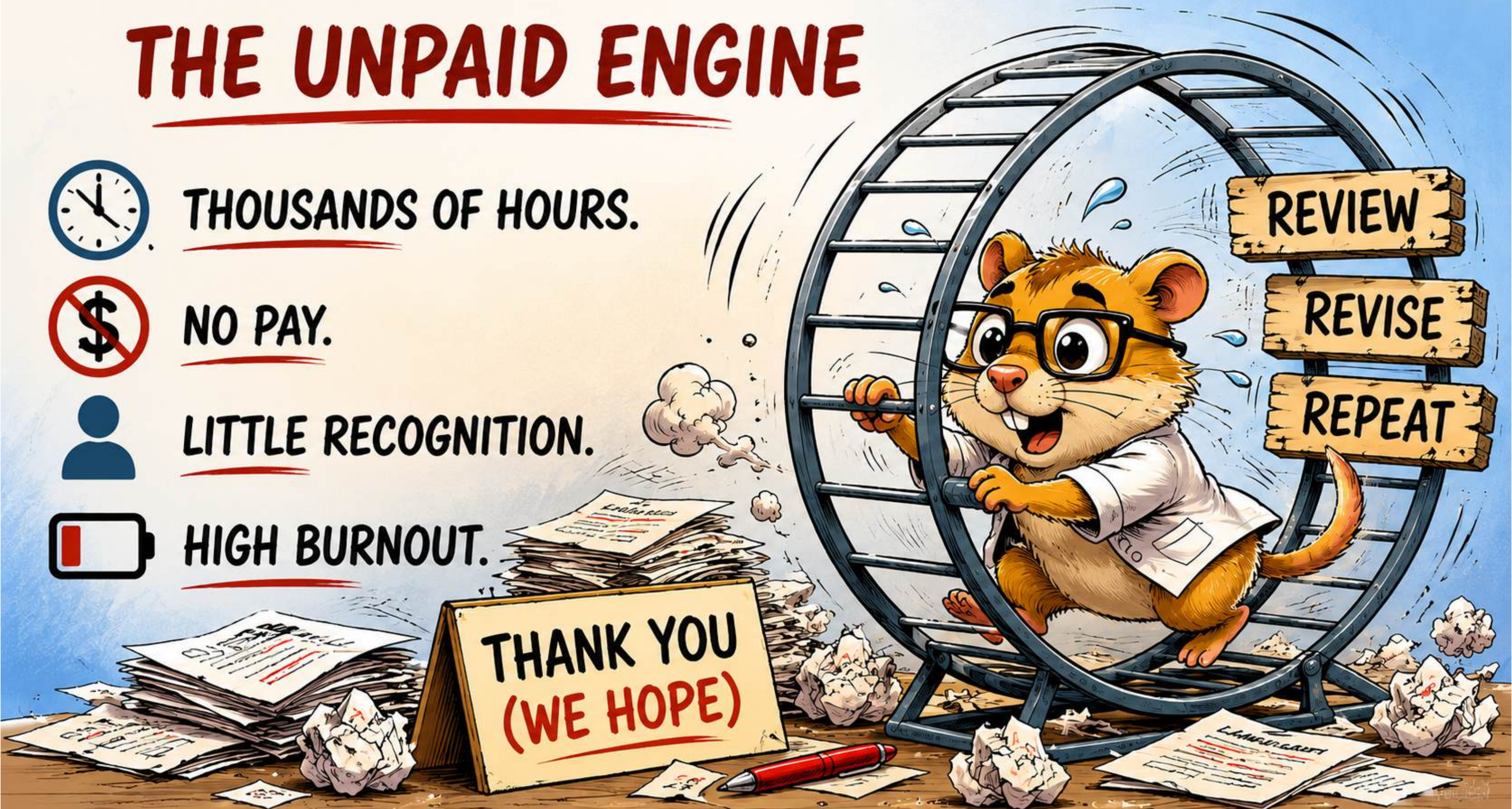
NO PAY.



LITTLE RECOGNITION.



HIGH BURNOUT.



**THANK YOU  
(WE HOPE)**

# INCONSISTENT QUALITY

**SAME PAPER. WILDLY DIFFERENT REVIEWS.**

**REVIEWER #1**



**“Excellent study.  
Minor issues.”**

**VS.**

**REVIEWER #2**



**“Flawed, unpublishable.  
Major concerns.”**

# **PREDATORY JOURNALS**

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**LOW STANDARDS.  
HIGH FEES.  
FAST ACCEPTANCE.**



# THE TSUNAMI OF RETRACTED STUDIES & PAPER MILLS

**UNRELIABLE RESEARCH**

**SEPARATE SIGNAL FROM NOISE.**

**TRUSTED EVIDENCE**



**PAPER MILL FACTORY**

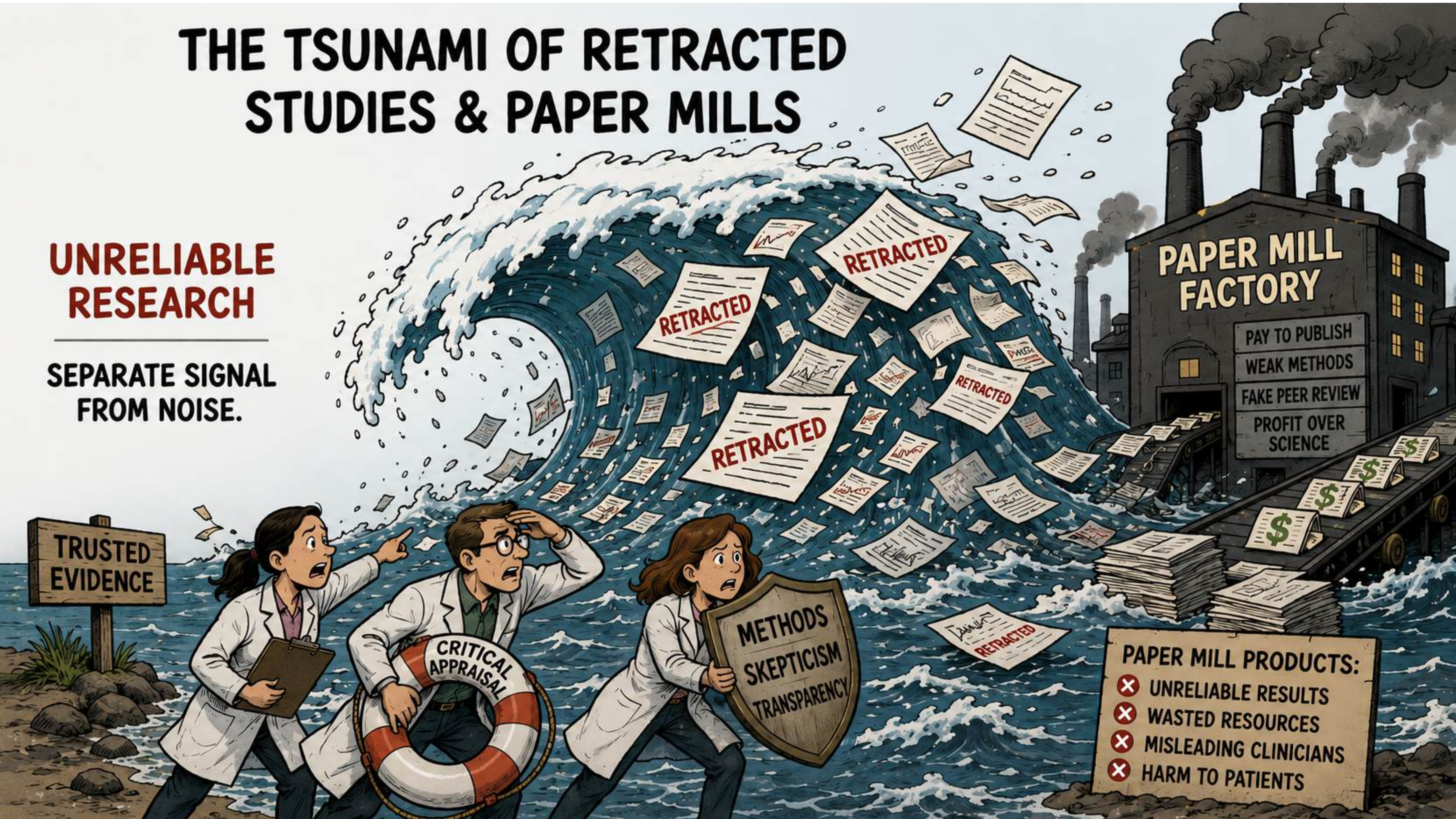
PAY TO PUBLISH  
WEAK METHODS  
FAKE PEER REVIEW  
PROFIT OVER SCIENCE

**CRITICAL APPRAISAL**

**METHODS  
SKEPTICISM  
TRANSPARENCY**

**PAPER MILL PRODUCTS:**

- ✗ UNRELIABLE RESULTS
- ✗ WASTED RESOURCES
- ✗ MISLEADING CLINICIANS
- ✗ HARM TO PATIENTS



# TRADITIONAL FIXES HAVEN'T WORKED.

- Reviewer Training
- Checklists
- Blinding
- Statistical Reviewers
- Open Peer Review

**= INCREMENTAL GAINS,  
NOT A SCALABLE SOLUTION**

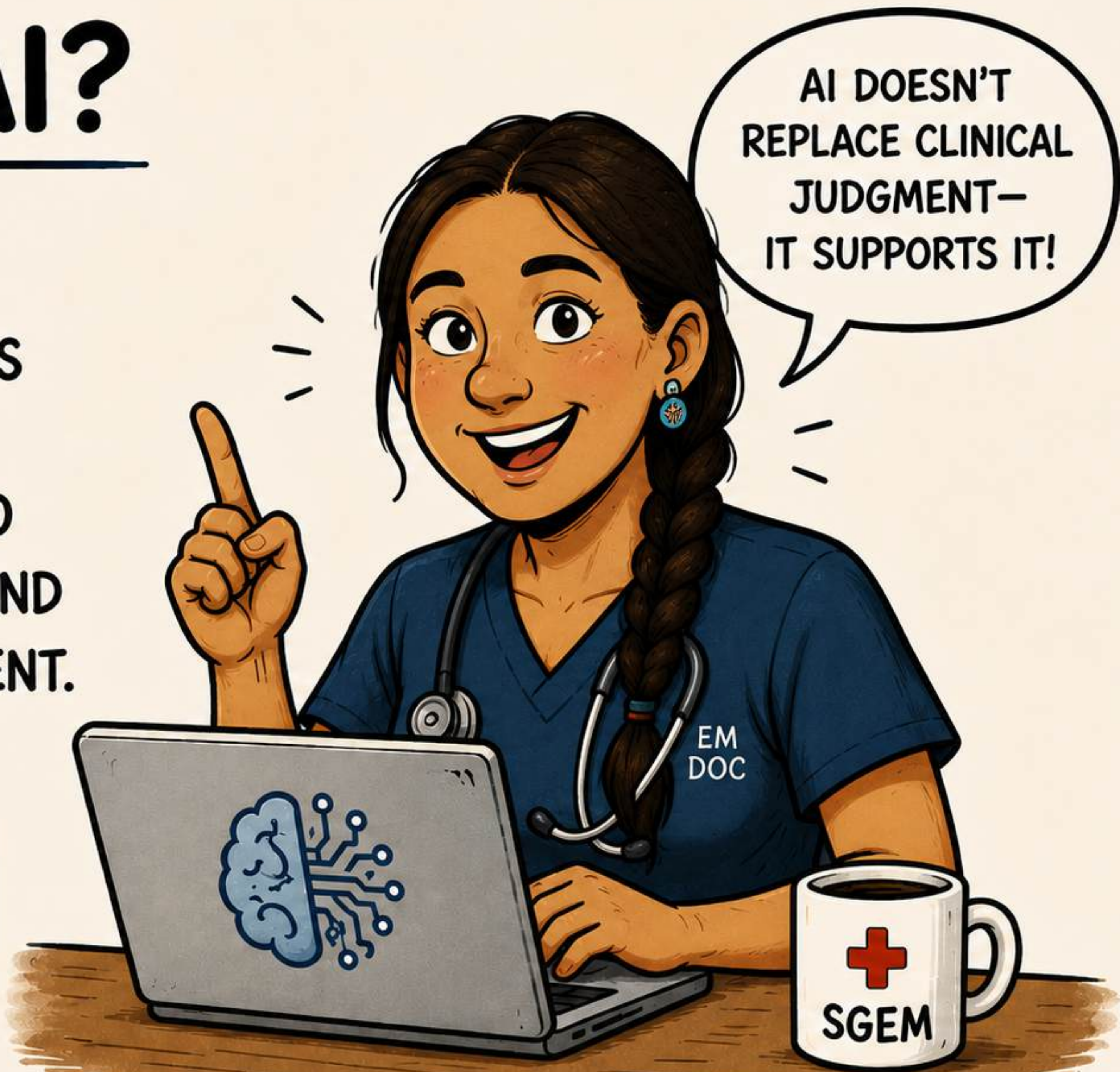


# WHAT IS AI?

AI (ARTIFICIAL INTELLIGENCE) REFERS TO COMPUTER SYSTEMS THAT CAN LEARN PATTERNS FROM DATA AND USE THEM TO MAKE PREDICTIONS, RECOMMEND ACTIONS, OR GENERATE CONTENT.



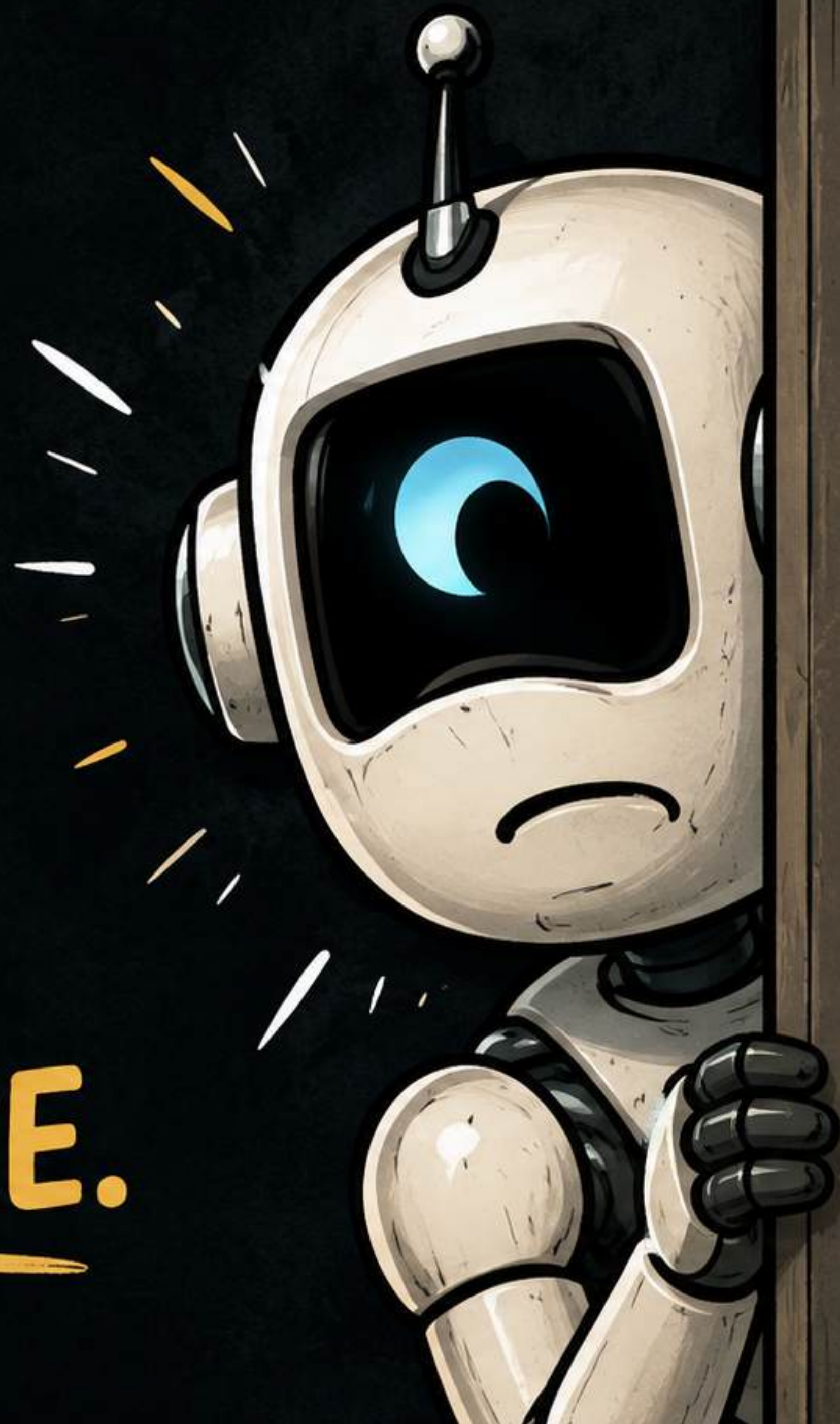
**BOTTOM LINE:**  
AI IS A TOOL.  
YOU ARE THE EXPERT.



**THE FUTURE TENSE  
IS WRONG.**

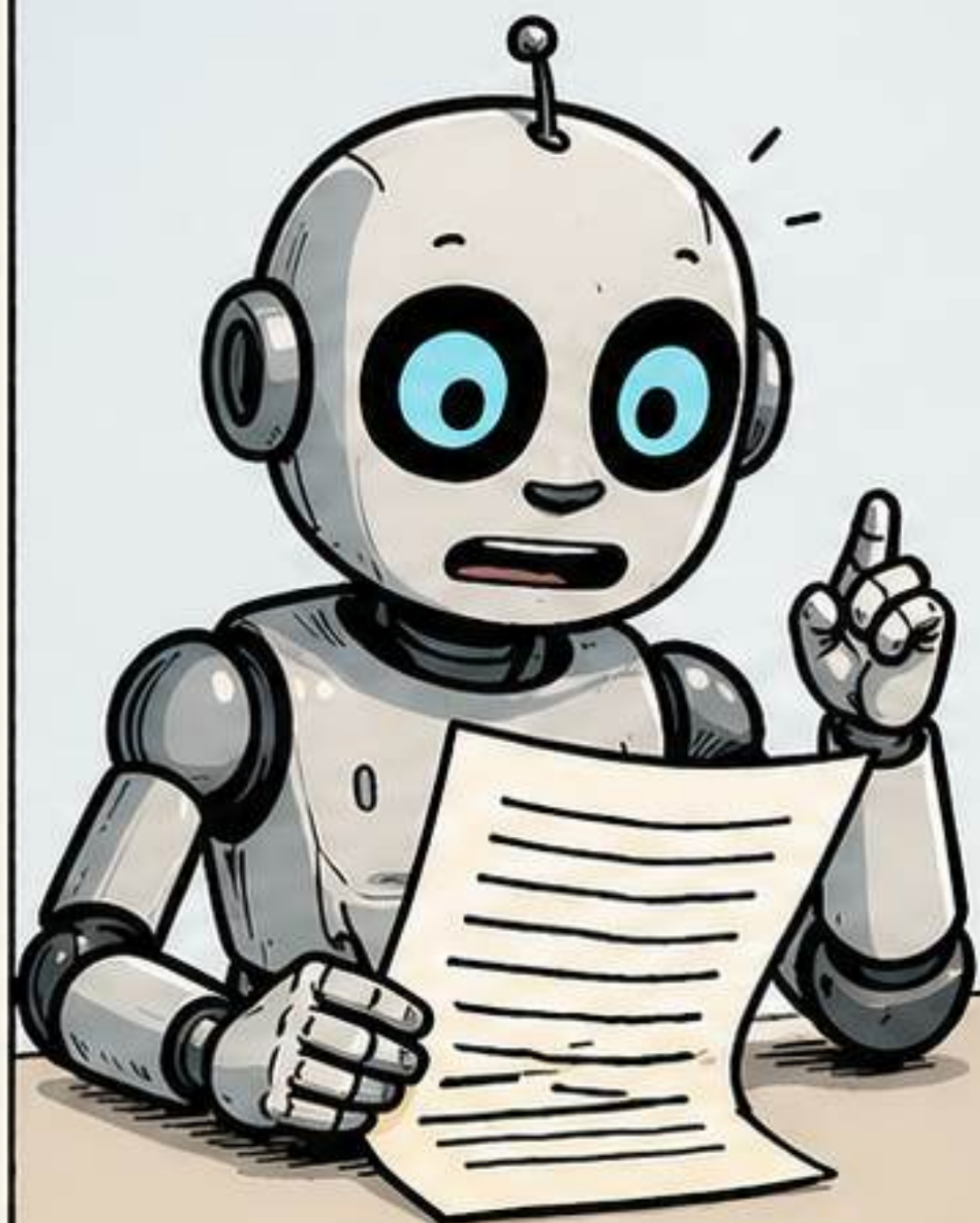
**AI IS NOT COMING TO  
PEER REVIEW.**

**IT IS ALREADY HERE.**

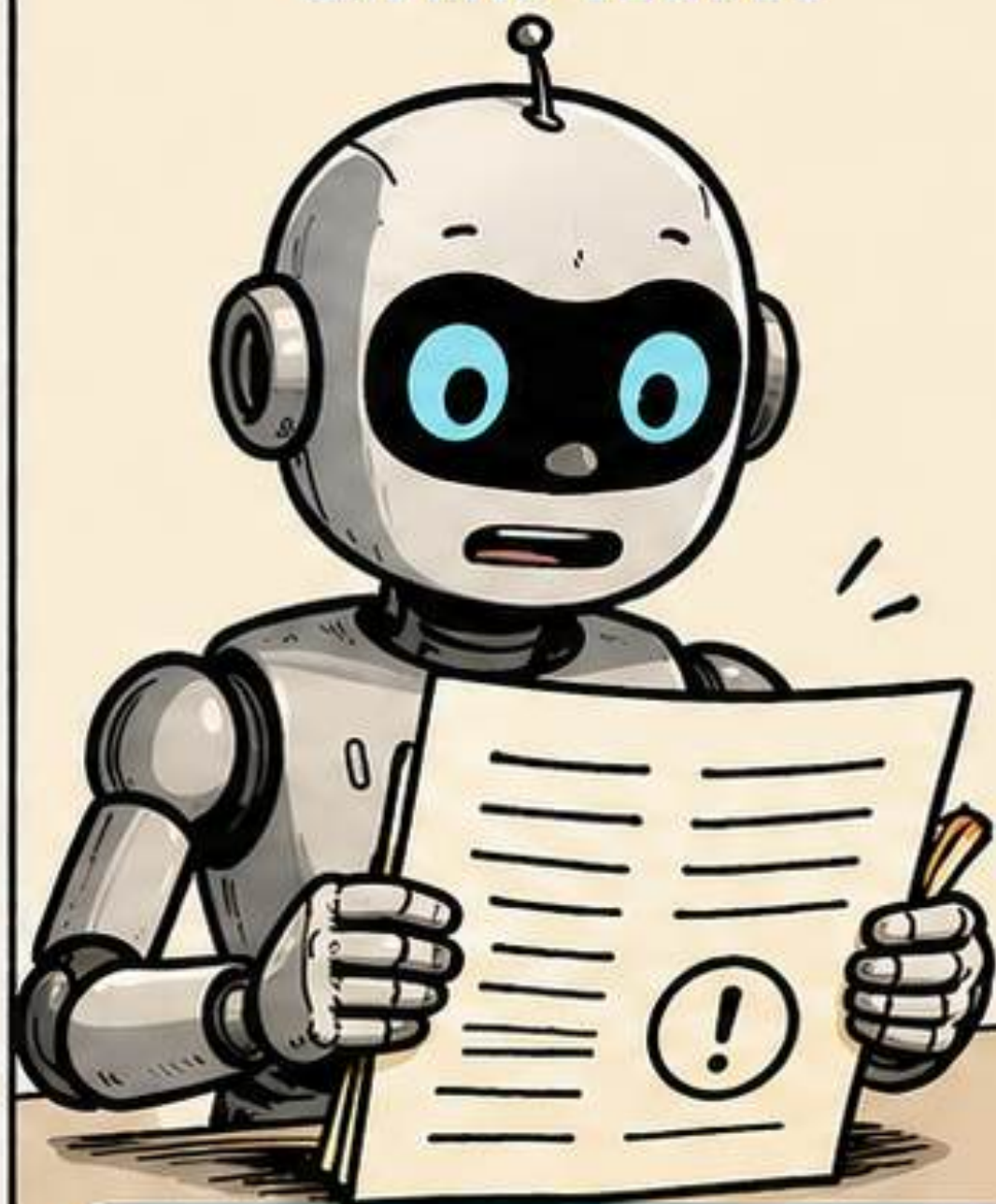


# AI IS ALREADY IN SCIENTIFIC PUBLISHING

**~13.5% OF 2024  
PUBLISHED ABSTRACTS  
SHOW AI MARKERS**  
(NATURE, 2025)

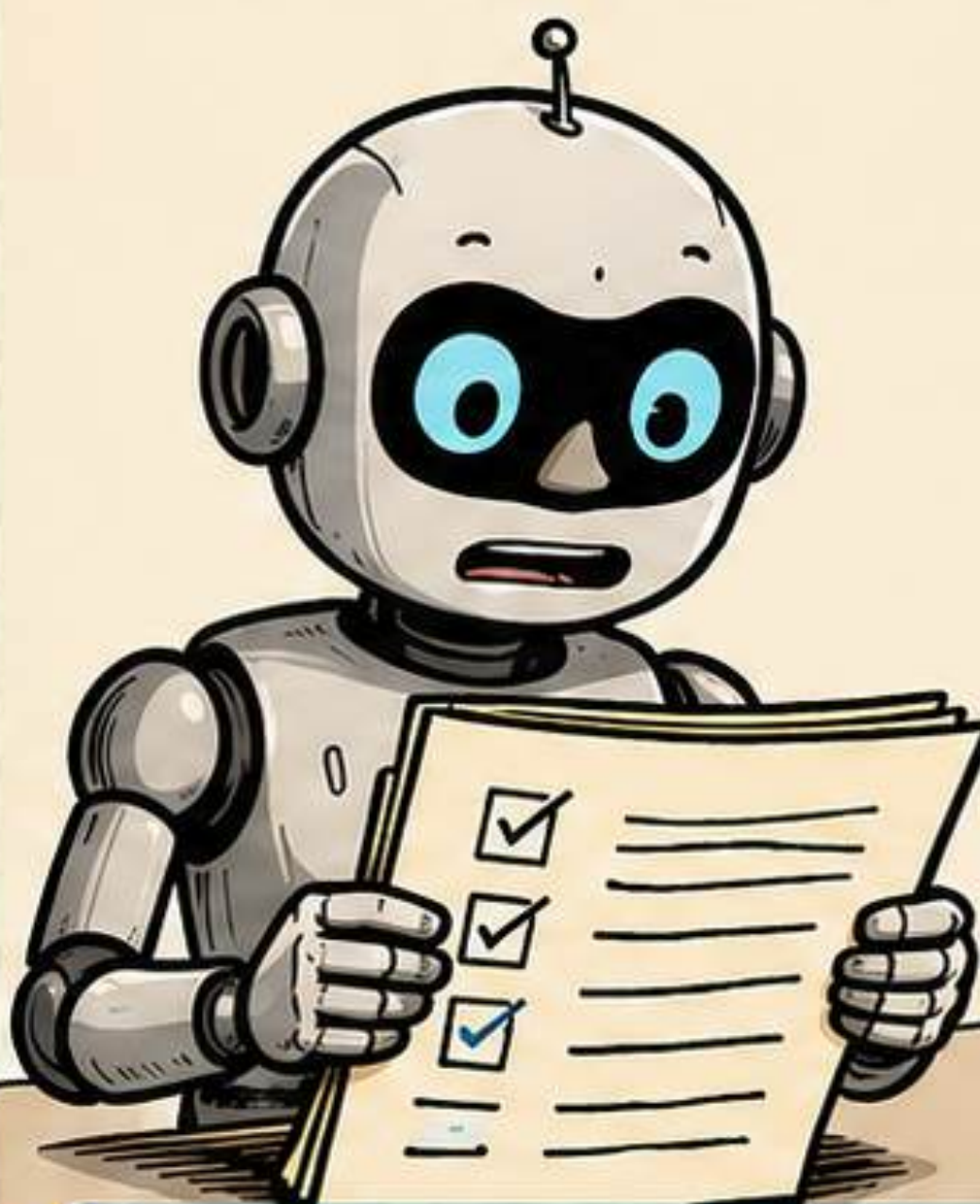


**AI  
SCREENERS**  
PRIORITIZE SUBMISSIONS  
& FLAG ISSUES



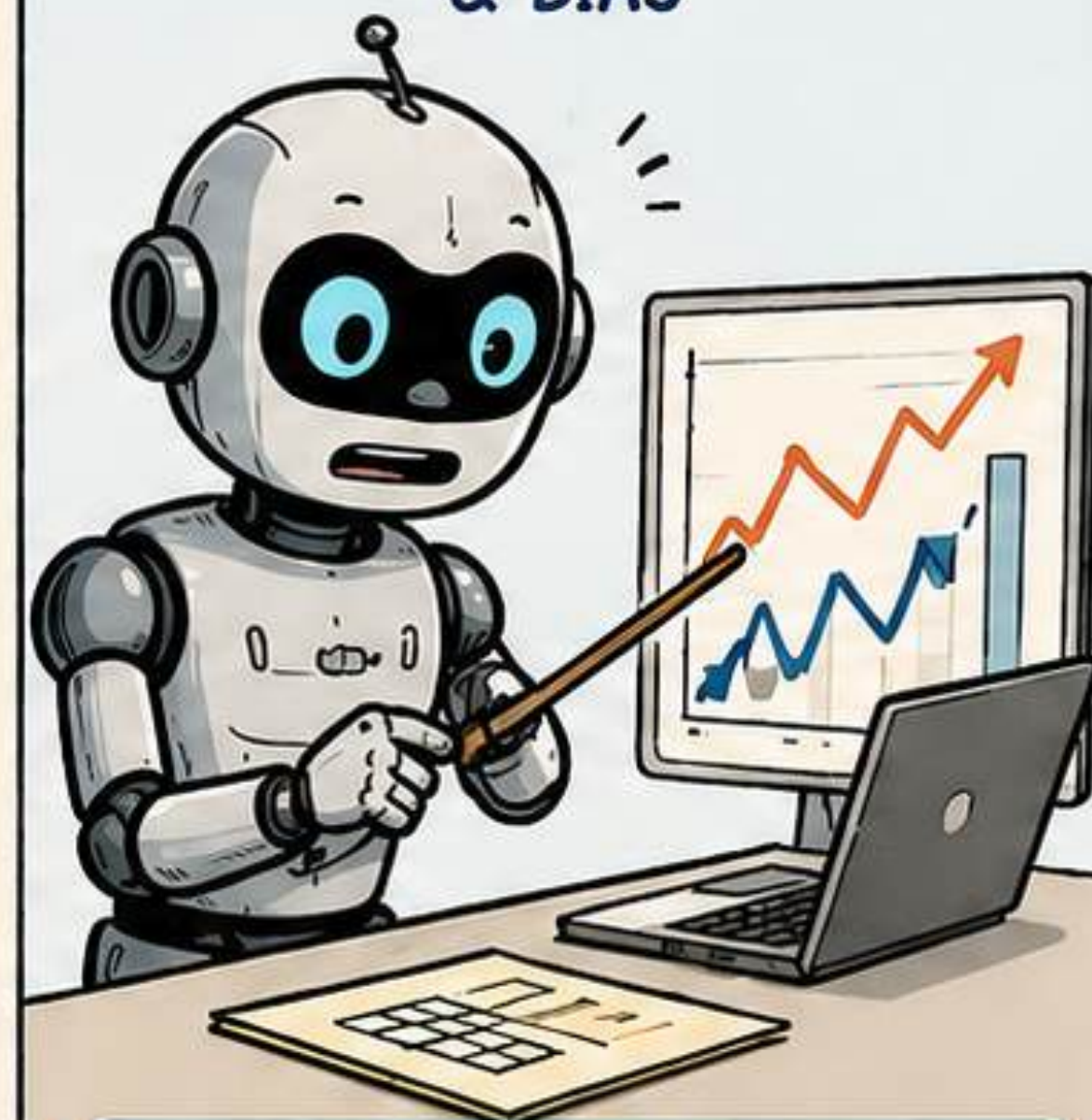
**FASTER TRIAGE,  
FEWER MISSED PROBLEMS**

**STRUCTURED  
PEER REVIEW**  
AI SUMMARIZES, CHECKS  
& SUPPORTS REVIEWERS



**CONSISTENCY,  
CLARITY, & EFFICIENCY**

**STATISTICAL  
REVIEW TOOLS**  
AI DETECTS ERRORS,  
INCONSISTENCIES,  
& BIAS



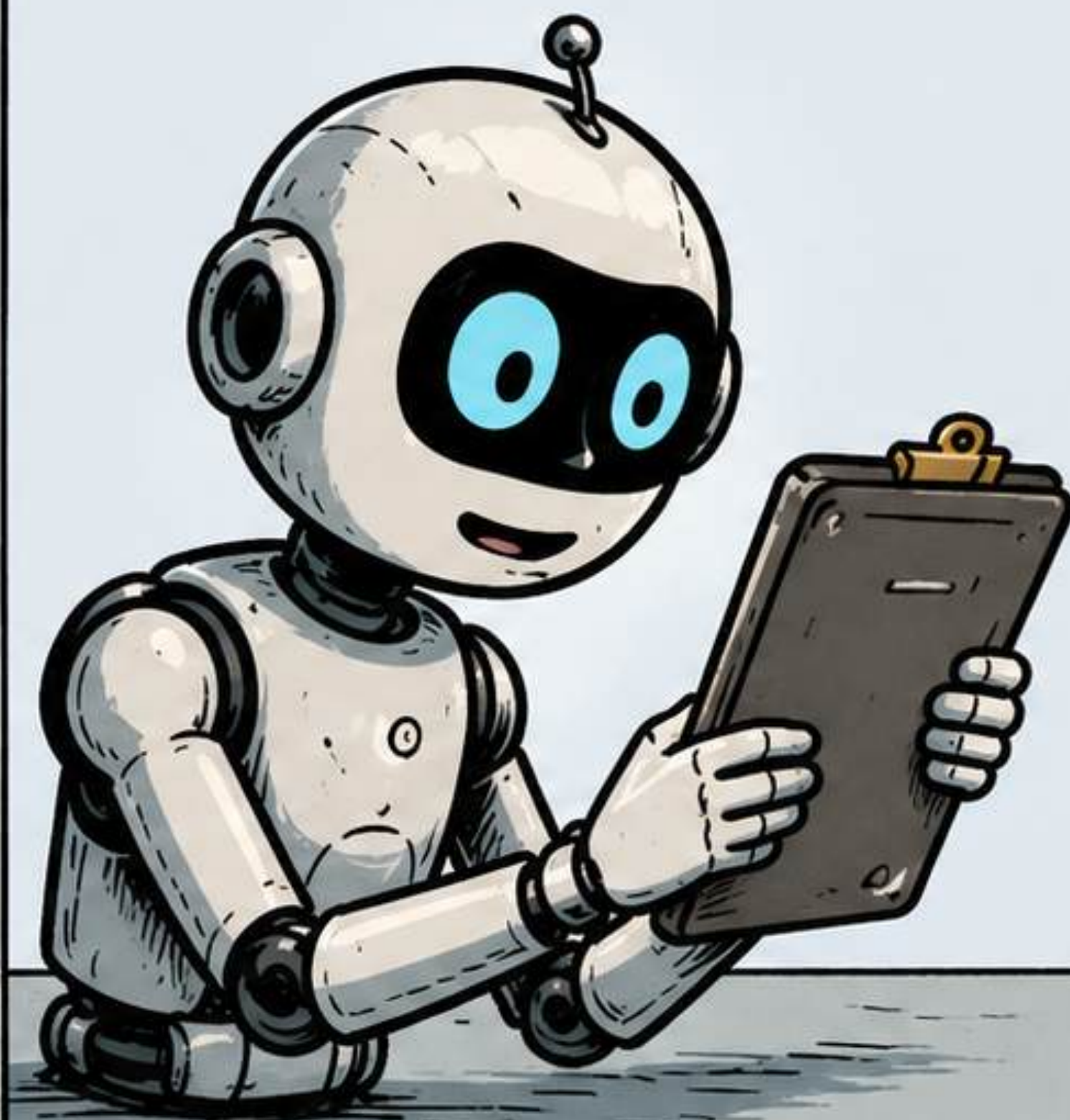
**STRONGER ANALYSIS,  
MORE RELIABLE RESULTS**



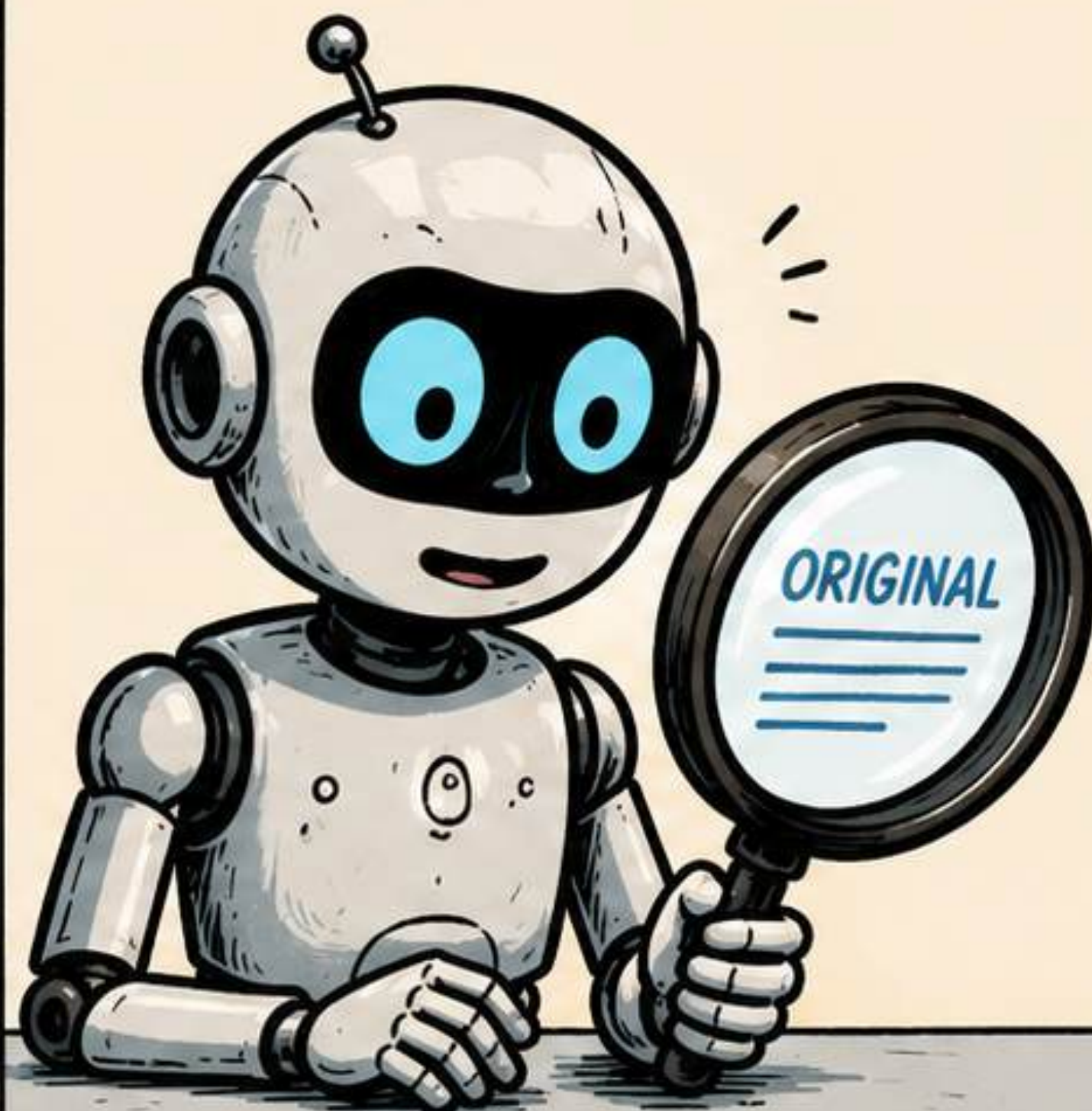
**AI ISN'T REPLACING SCIENTISTS. IT'S AUGMENTING SCIENCE.**

# MORE EXAMPLES

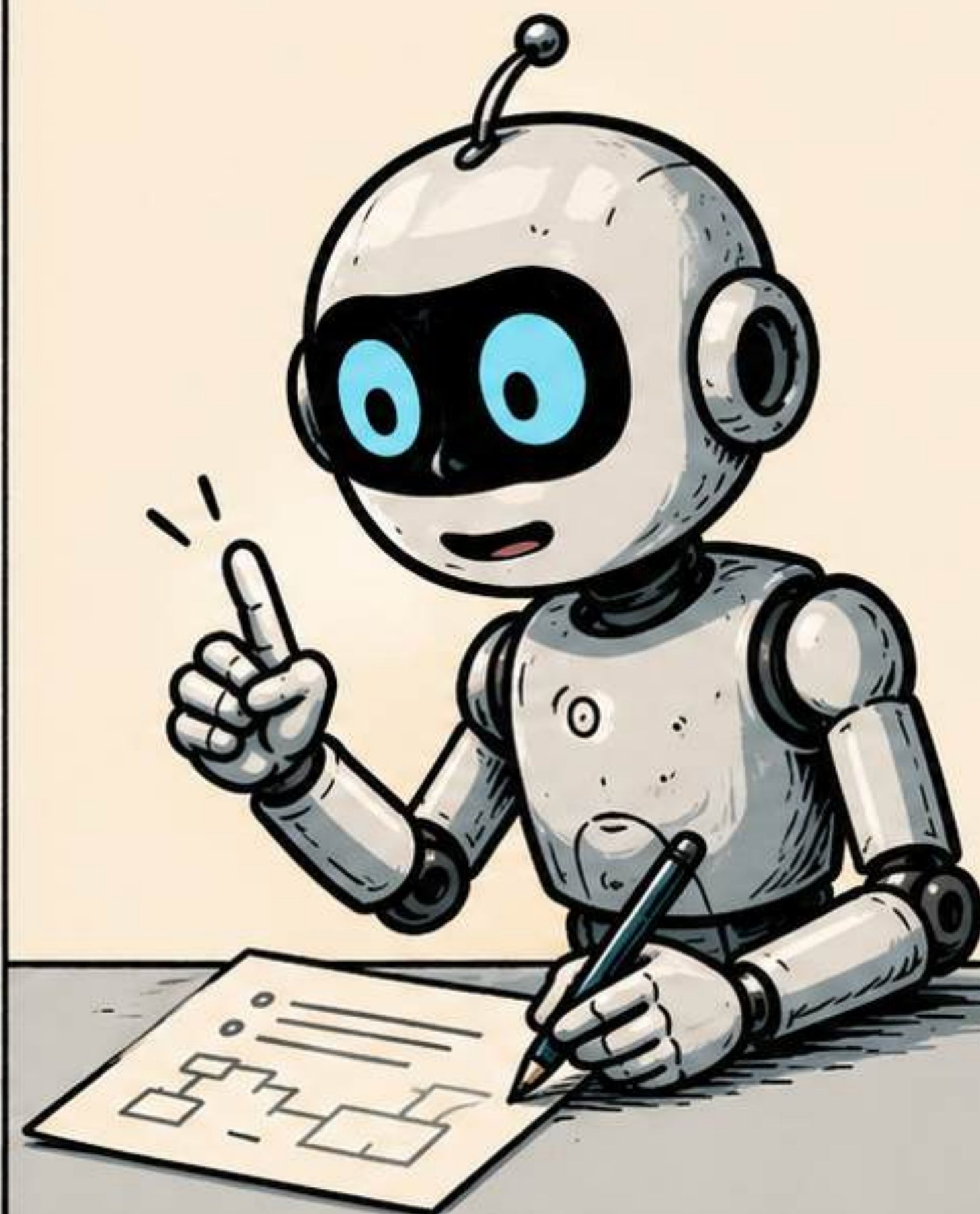
## IMAGE MANIPULATION DETECTION



## PLAGIARISM DETECTION

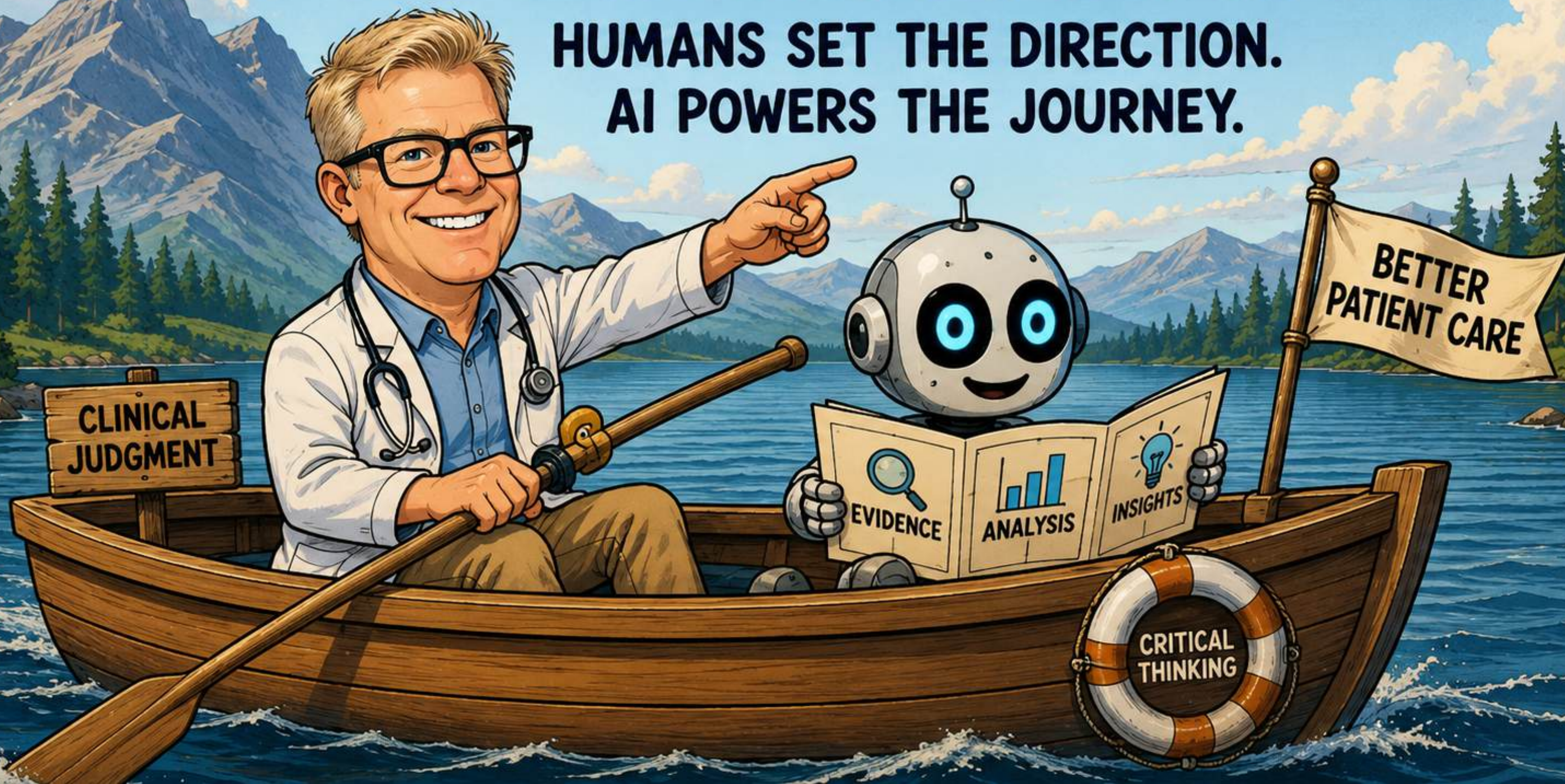


## SUMMARIZATION & SYNTHESIS

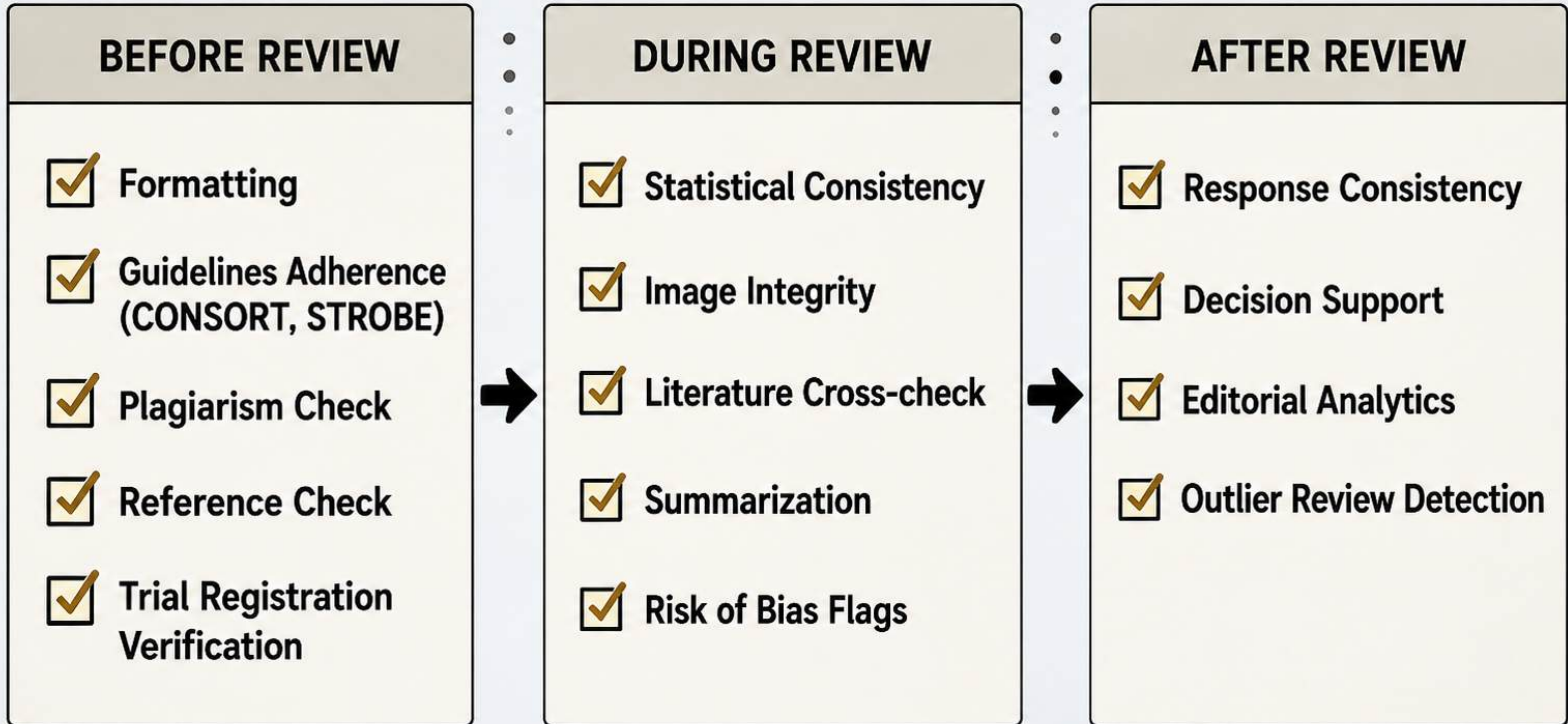


# AI AS AUGMENTATION, NOT REPLACEMENT

HUMANS SET THE DIRECTION.  
AI POWERS THE JOURNEY.



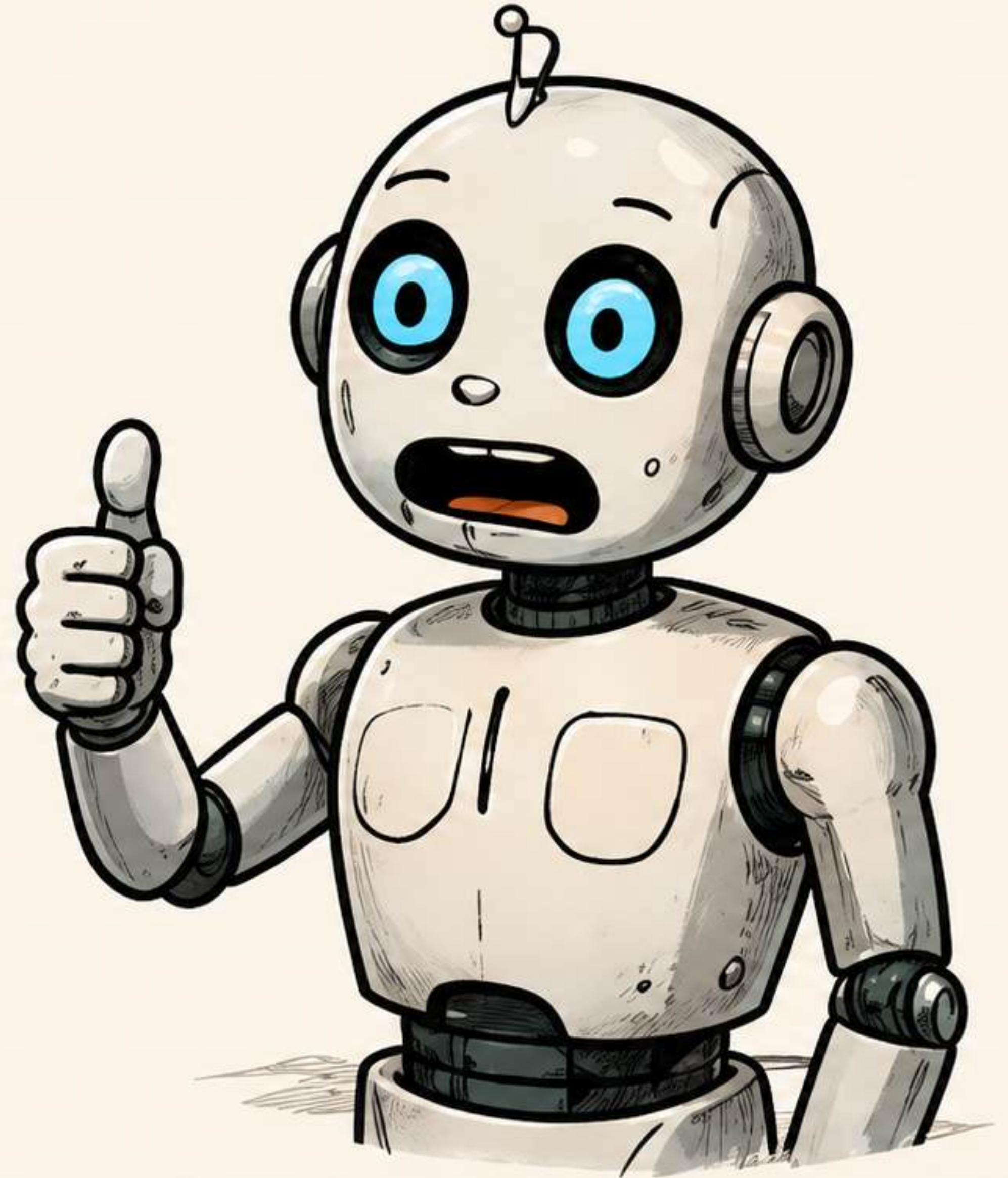
# A HYBRID WORKFLOW FOR PEER REVIEW



**AI HANDLES SCALE. HUMANS HANDLE JUDGMENT.**

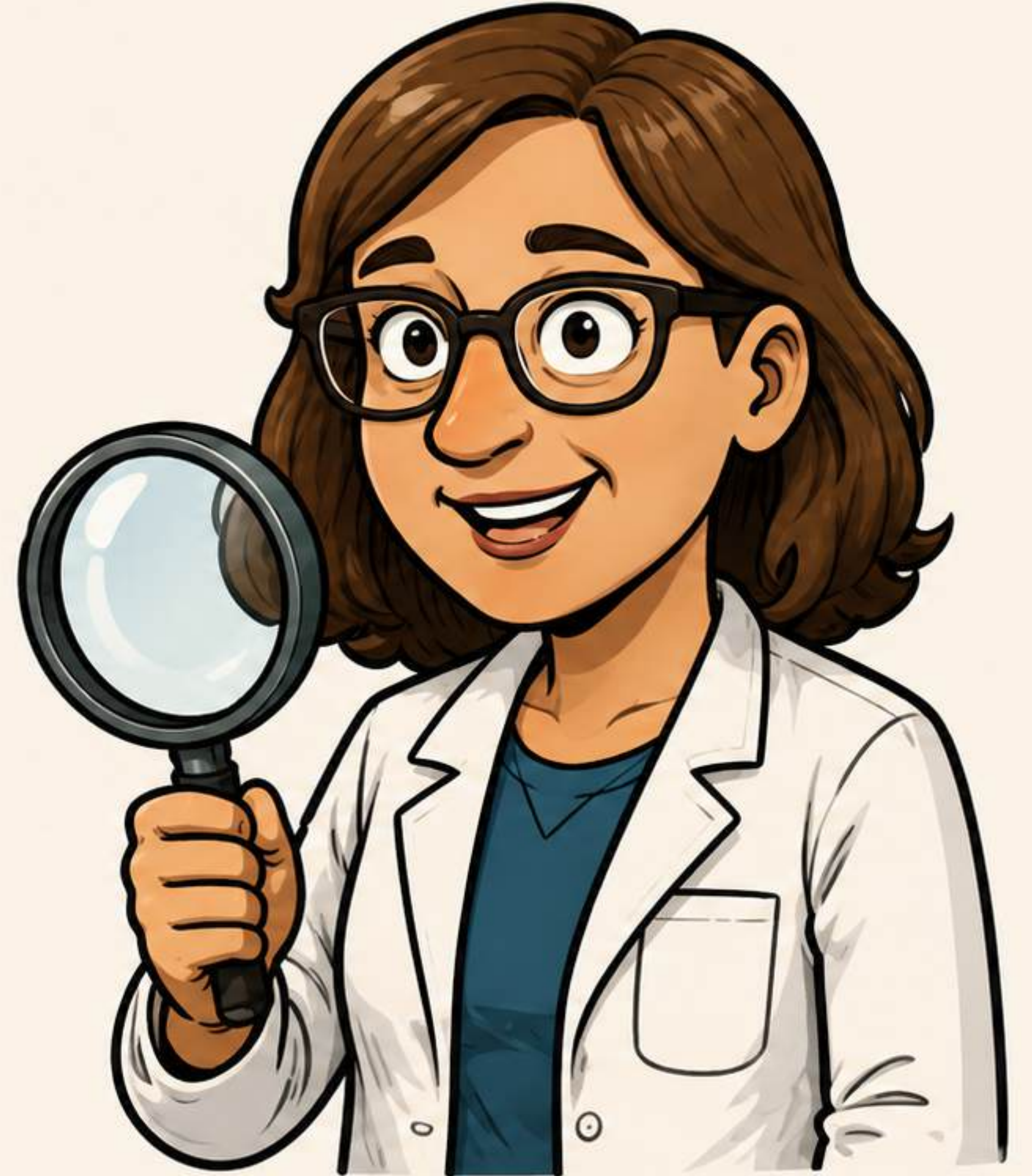
# WHAT AI CAN DO WELL

- Process Large Volumes
- Detect Patterns
- Check Consistency
- Find Red Flags
- Reduce Administrative Burden
- Improve Efficiency



# WHAT HUMANS DO BEST

- Assess Novelty & Importance
- Provide Context & Nuance
- Judge Clinical Relevance
- Make Ethical Decisions
- Exercise Scientific Wisdom
- Mentor & Build Community



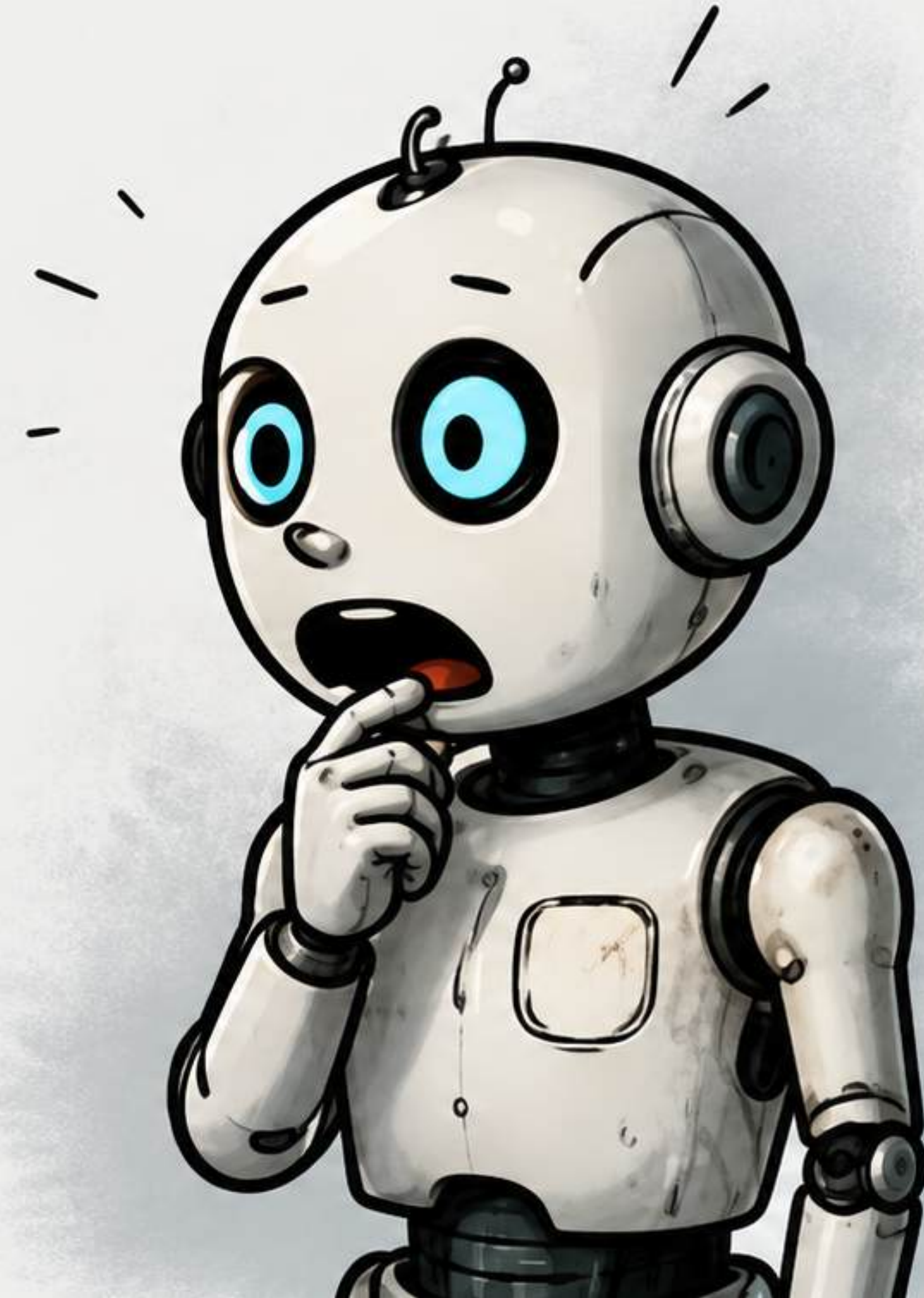
# THE GOLDBLOCKS ZONE

## HUMAN + AI



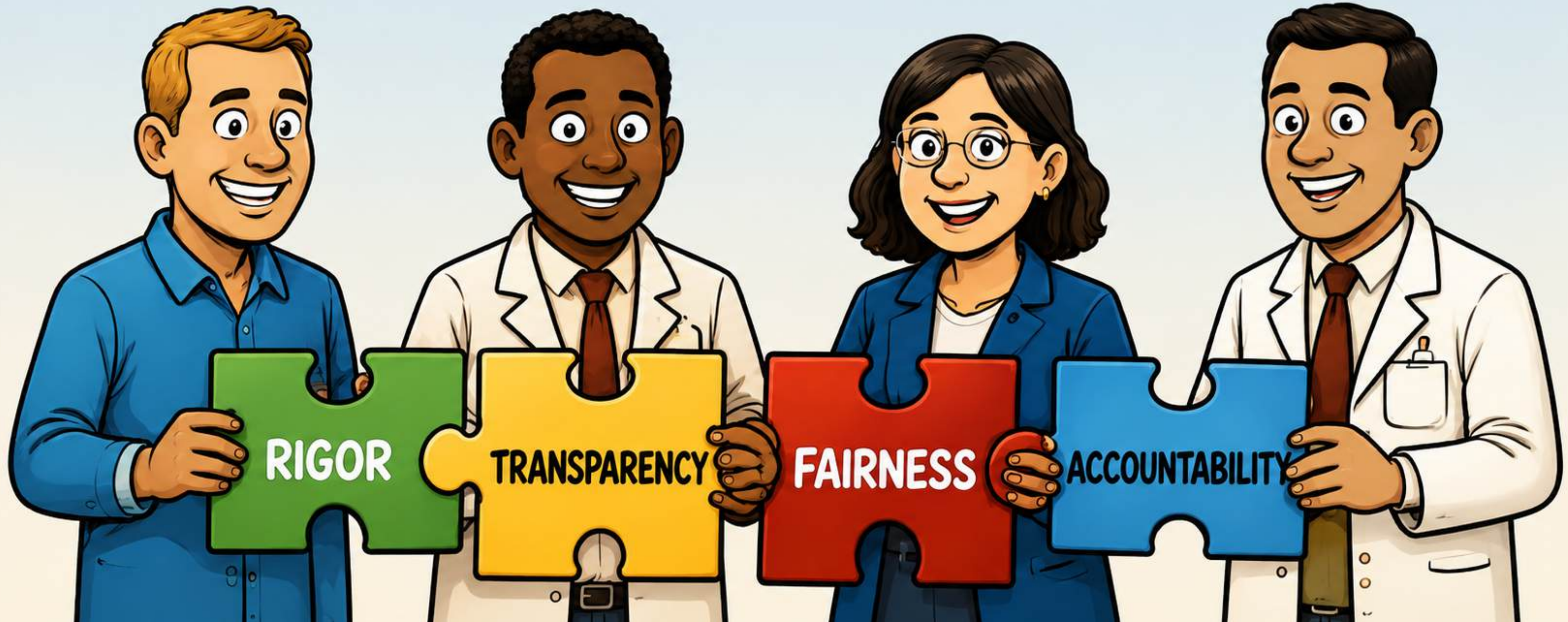
# RISKS AND ETHICAL CONCERNS

- ⚠️ **Algorithmic Bias**  
(garbage in, garbage out)
- ⚠️ **Hallucinations & Errors**
- ⚠️ **Opacity & Lack of Explainability**
- ⚠️ **Overreliance & Deskilling**
- ⚠️ **Confidentiality & Data Security**
- ⚠️ **Power & Equity Concerns**



# THE REAL QUESTION IS **TRUST**

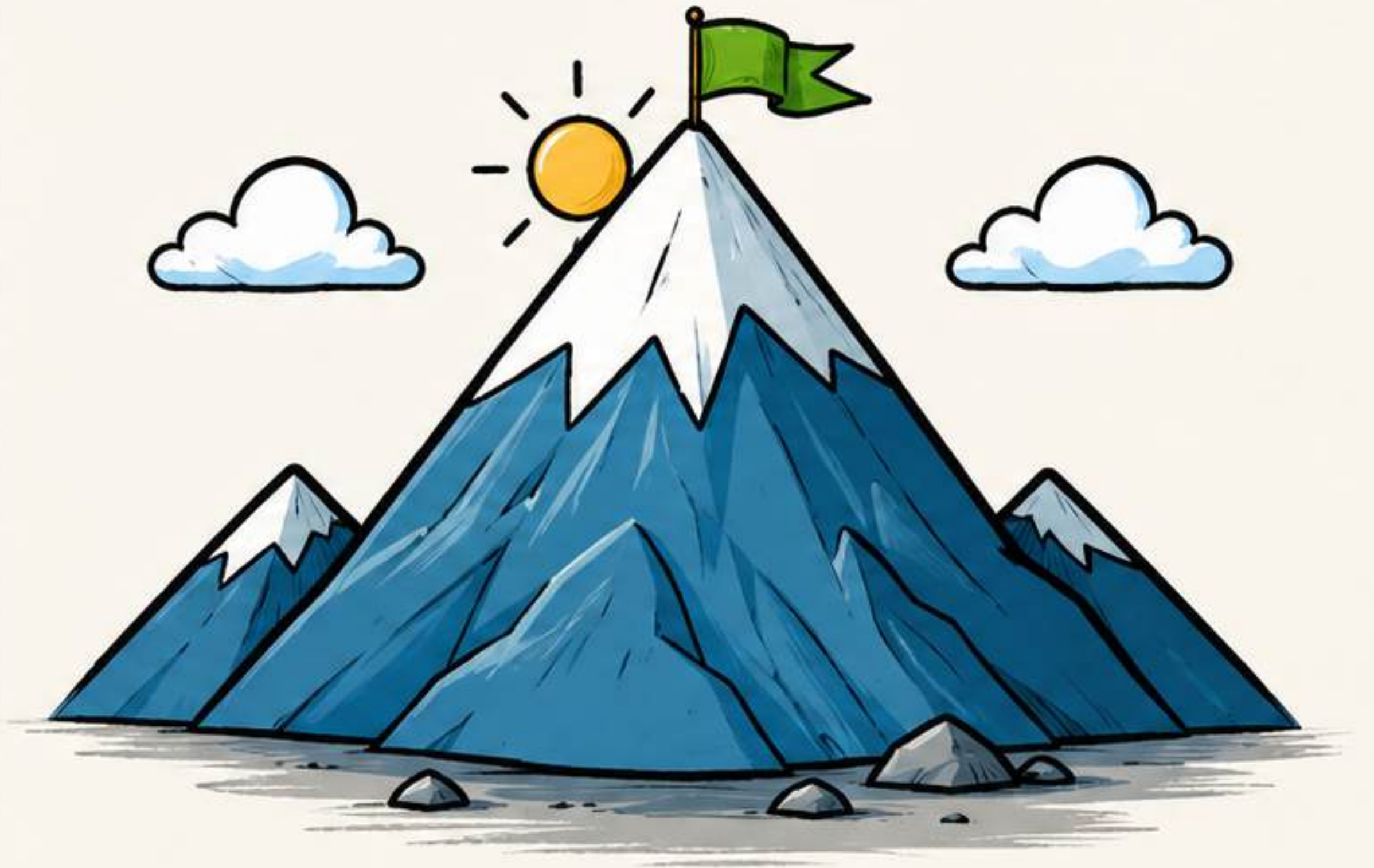
SCIENCE ADVANCES WHEN WE CAN  
TRUST WHAT WE BUILD TOGETHER.



**“THE ENEMY  
OF GOOD IS  
PERFECT.”**



**RISK THE  
NIRVANA FALLACY.**



# THE GOAL



FASTER REVIEWS



HIGHER QUALITY



LESS BIAS



MORE TRANSPARENCY



GREATER IMPACT

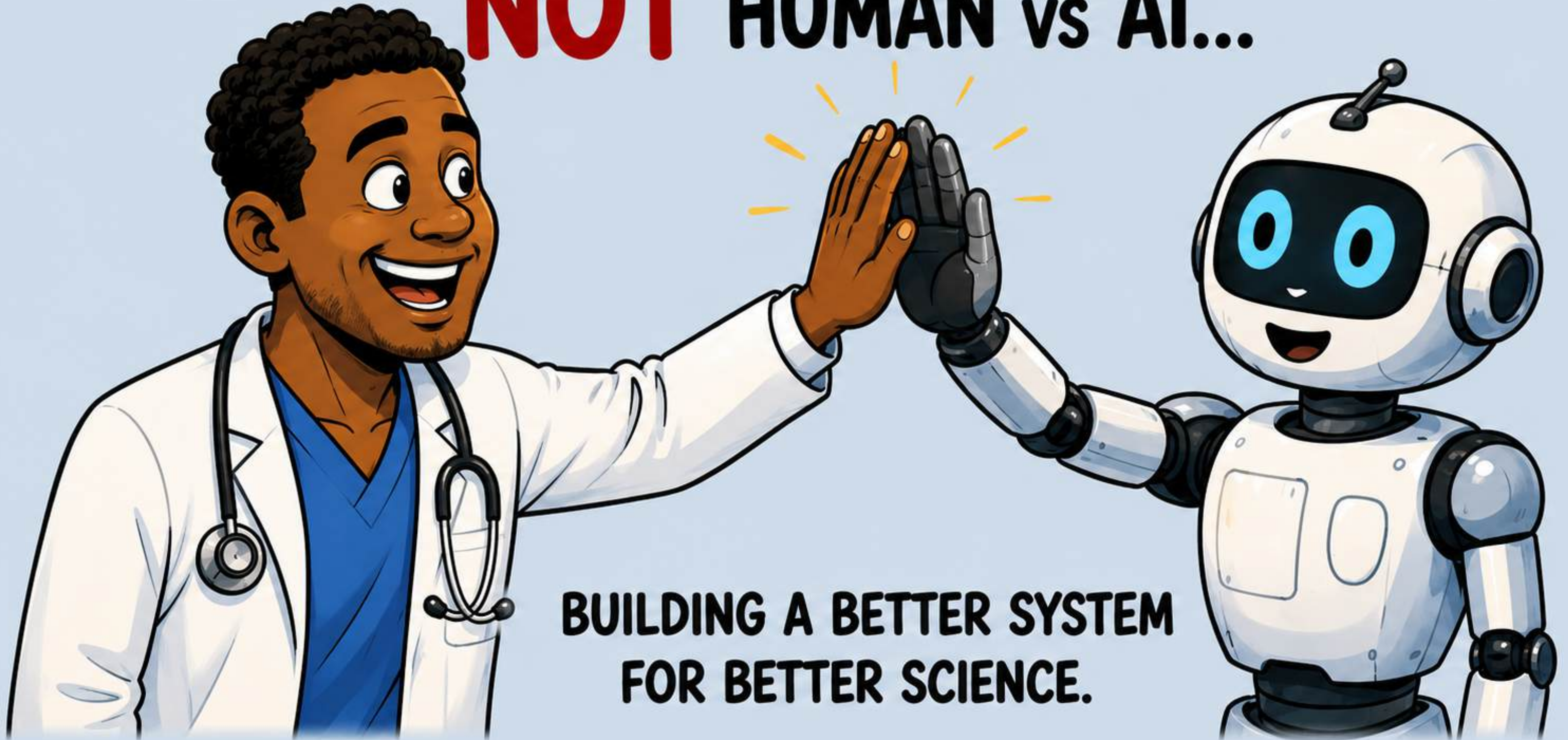


RESTORED TRUST



# THE FUTURE OF PEER REVIEW

**NOT** HUMAN vs AI...



**BUILDING A BETTER SYSTEM  
FOR BETTER SCIENCE.**

# REVIEWER #2 (WISE AT LAST)



I STILL THINK.  
AI JUST  
DOES THE  
GRUNT WORK.

I ❤️  
SGEM

# A FINAL REMINDER

**BE SKEPTICAL OF  
ANYTHING YOU LEARN...**

**EVEN IF YOU HEARD IT ON  
THE SKEPTICS' GUIDE TO  
EMERGENCY MEDICINE!**

