# GenAI – perspective of publisher

Joris van Rossum, PhD
Program Director, STM Solutions

## 140+ members

Academic publishers focused on science, technology, medicine, social sciences, and humanities

## 66% of articles

Our members collectively publish 66% of all journal articles

## 20 countries

STM spans the globe — made up of publishers of all shapes and sizes

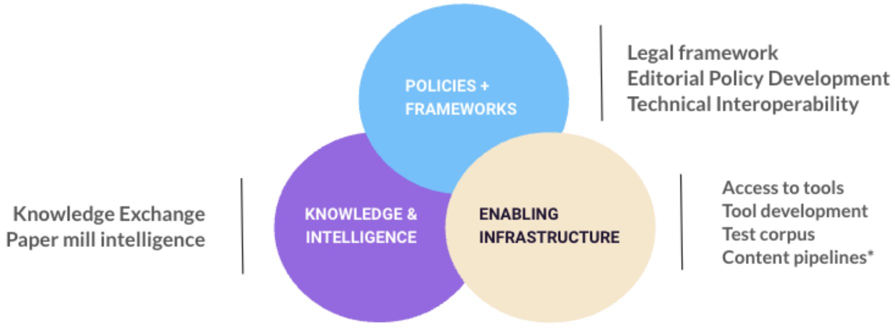
# About STM

STM is the standard bearer for the academic publishing industry, working with our members to advance trusted research worldwide. We are committed to ensuring that the great discoveries of our time are communicated with pinpoint accuracy, clarity and integrity. We champion innovation across academic research, stimulating the development of new technologies and guidance on universal standards.

STM Advancing trusted research

# STM Integrity Hub

“To equip the scholarly communication community with data, intelligence, and technology to protect research integrity”



# The STM Integrity Hub in numbers

**35** Publishers and other organizations, including editorial systems

**100** Volunteers from publishing organizations

**20** Publishers using our solutions (including **Paper Mill** checker tool and **Duplicate Submissions** checker tool)**,** currently scanning

**25K+** Manuscripts per month

**8** Integrations with external databases and tools (including PubPeer, Problematic Paper Screener, Retraction Watch database)

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# The STM Working Group on Image Alterations and Duplications

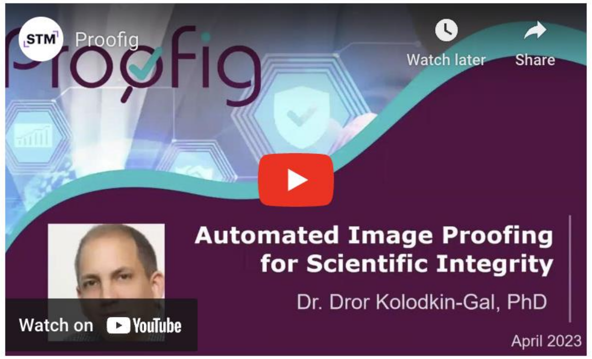
In scholarly publishing, we encounter image alterations as well as duplications. Whatever the reason is behind the submission of altered and/or duplicated images to a journal, they should be identified early in the article evaluation process, so journals can take appropriate action prior to publication and in a best-case scenario, before peer review. Opposite to text plagiarism, which usually results in the violation of the research process, image alteration and/or duplication can be much more damaging, as it corrupts actual research results, wastes research money on invalid leads, undermines society's trust in research, and can even endanger the society in which those "results" are used.

STM has appointed a working group to answer questions around automatic image alteration and/or duplication detection. It addresses topics like the minimal requirements for such tools, the current quality of them, how their quality can be measured, and how these tools can be widely, consistently, and effectively applied by scholarly publishers. It also looks at a standard classification of types and severity of image-related issues and proposes guidelines on what types of image alteration is allowable under what conditions. The working group currently operates as part of the STM Integrity Hub initiative.

Visit our Image Alterations & Duplications Resource Center to access instructional videos, recommendations and tools.

For more information, contact Joris van Rossum at rossum@stm-assoc.org.

*Explore our*
**Image Alterations & Duplications**
**RESOURCE CENTER**





**The members of the working group:**

- Jana Christopher, FEBS (Chair)
- Bernd Pulverer, EMBO
- Christina Bennett, American Chemical Society
- Christopher Rickerby, EMBO
- Eric Pesanelli, American Physiological Society
- Greta Sharpe, Springer Nature
- Helen Hardy, BMJ
- Hong Zhou, Wiley
- Jenny Crick, Canadian Science Publishing
- Joris van Rossum, STM Solutions
- Katherine Brown, The Company of Biologists
- Olivia Nippe, Elsevier
- SJ MacRae, Aries Systems
- Simone Ragavooloo, Frontiers
- Tim Spencer, Rockefeller University Press

## Instructional Videos

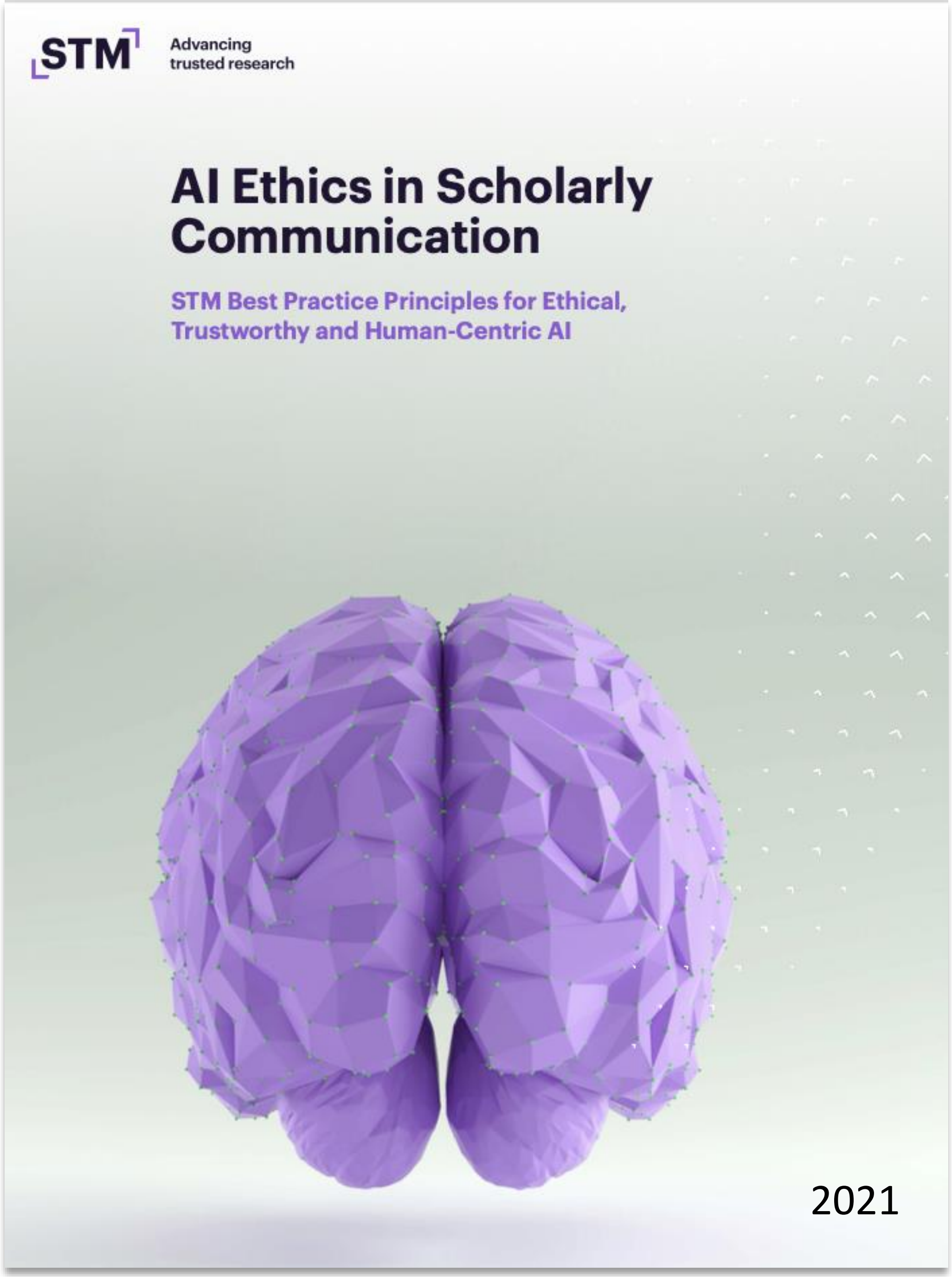
**Image Integrity in Scientific Publication | Video Series**

A series of instructional video modules intended to serve as a tool for scholarly journal editors screening for manipulated images in submitted


**MODULE 1.** This first module provides an overview of the most commonly found image aberrations in scientific publications and illustrates how they may be detected and verified. Watch the video here.

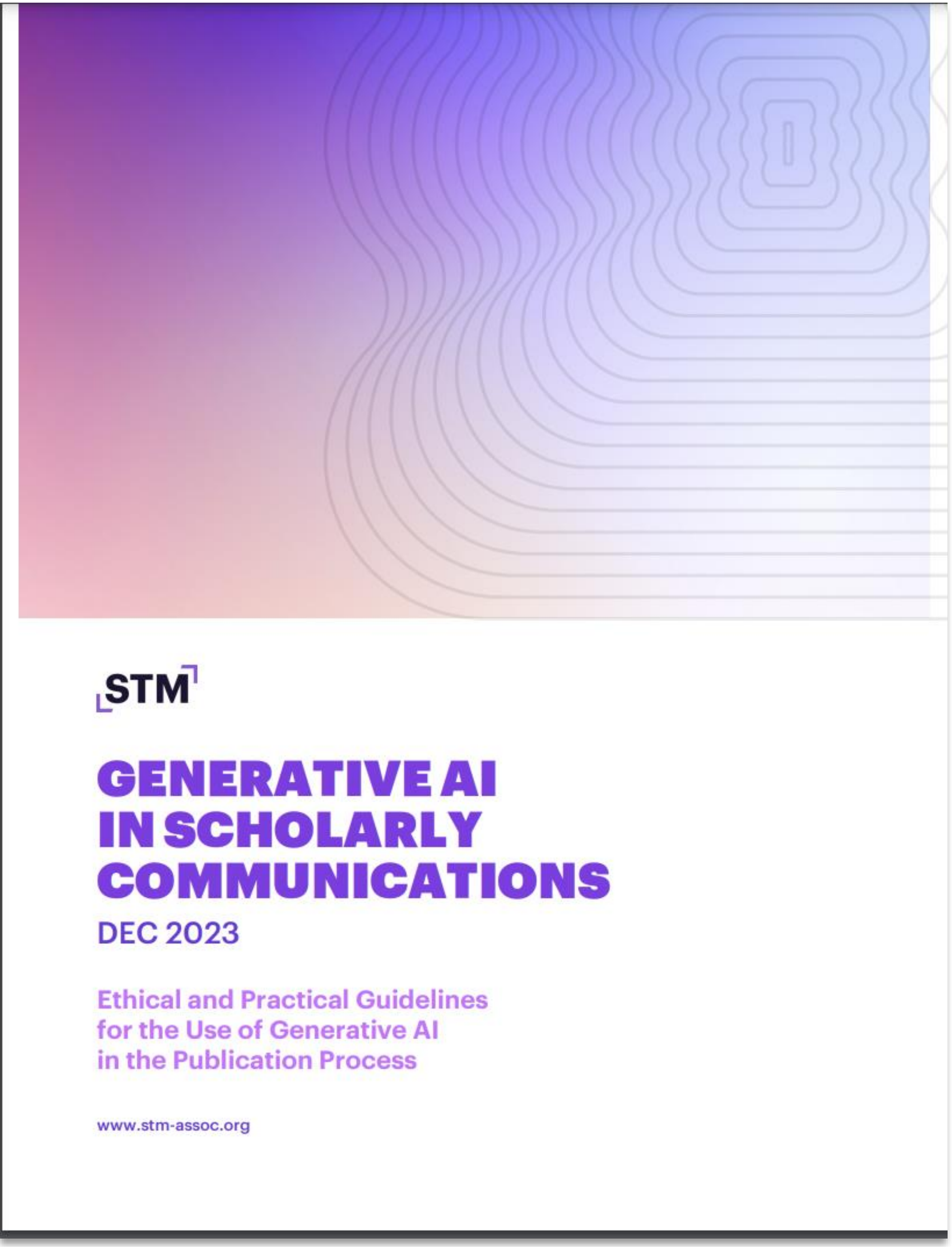

**MODULE 2.** The second module offers an overview of commonly found **image aberrations in blot images** — and provides techniques for manually detecting and verifying these types of image issues. Although examples shown are all Western blots or immunoblots, the screening techniques introduced work equally well for northern blots, southern blots and agarose (DNA/RNA) gels. Watch the video here.


*Photo by Sailko, Creative Commons Attribution-Share Alike 3.0 Unported. Source: Wikipedia*




STM’s best practice principles for ethical and trustworthy AI are grouped in five categories:

1. Transparency and Accountability
2. Quality and Integrity
3. Privacy and Security
4. Fairness
5. Sustainable Development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GENERATIVE AI IN SCHOLARLY COMMUNICATIONS

DEC 2023

Ethical and Practical Guidelines for the Use of Generative AI in the Publication Process

www.stm-assoc.org

Practical guidelines for the use of GenAI by the various stakeholders (authors, editors/editorial teams, reviewers, and vendors).

Considerations include the integrity of research, as well as privacy, confidentiality, and copyright implications.

## Uses of GenAI by Authors

| Key Indicator | Permitted—disclosure not necessary | Disclosure necessary—permission by editorial teams | Not permitted |
|---|---|---|---|
| Basic author support tool (refine, correct, edit, and format text and documents) | ✓ | | |
| Uses transcending basic author support tool | | ✓ | |
| Create, alter, or manipulate original research data and results | | | ✗ |
| Credit GenAI as an author of a published work[1] | | | ✗ |

“In a few years, AI will be able to create fake images that are undetectable for experts like me”

Photo: Michel N Co, San Jose, CA

Elisabeth Bik
WCRI, Cape Town, 2022

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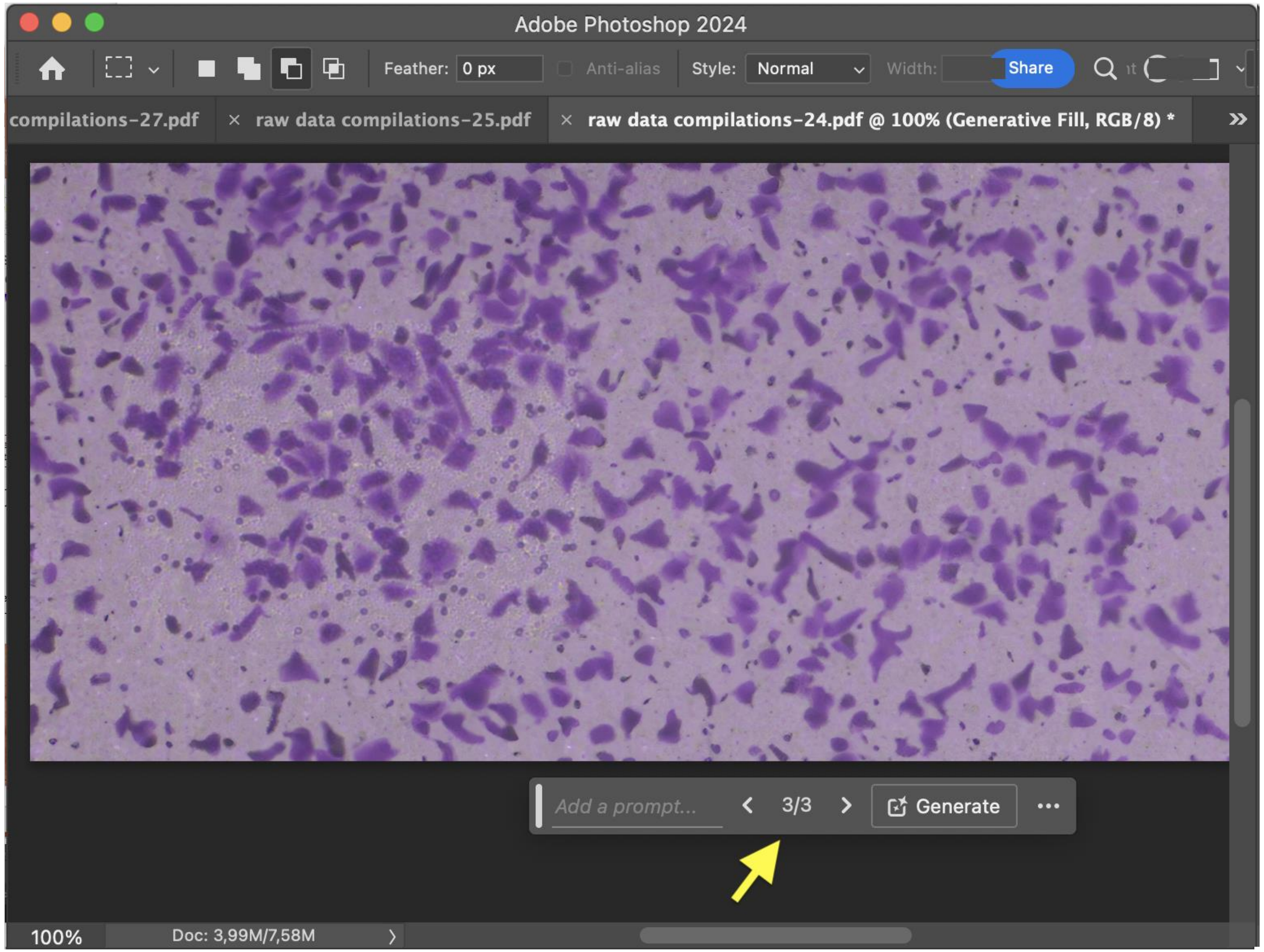
# Photoshop 24

## Generative AI function





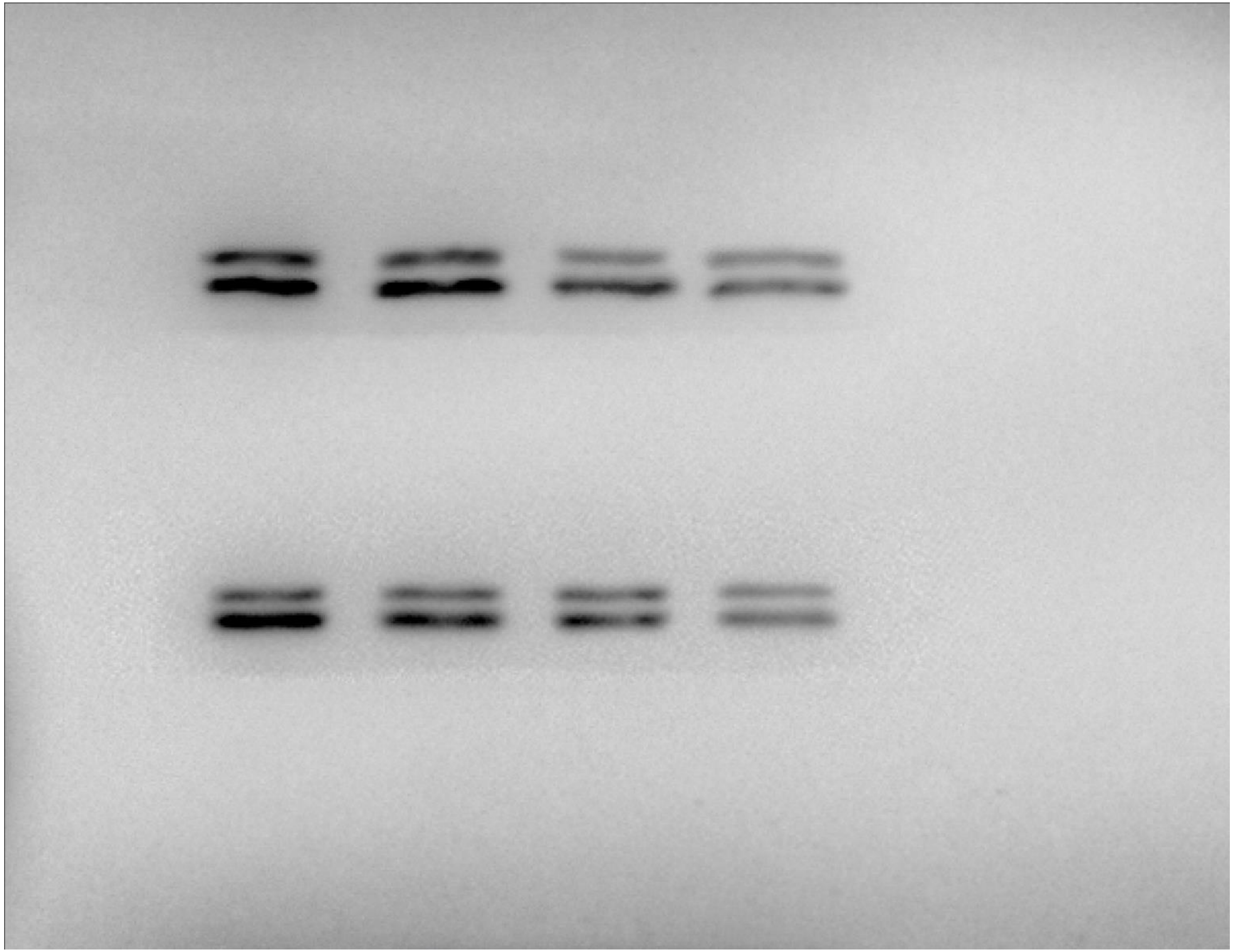
Jana Christopher

FEBS PRESS science publishing by scientists

# Photoshop 24
## Generative AI function

AI generated blot

Original image



FEBS PRESS science publishing by scientists

# Current screening tools are not able to detect GenAI

turnitin

Proofig

FigCheck

imagetwin

ImaChek
Bringing Clarity to Research

# Current screening tools are not able to detect GenAI

turnitin

Proofig

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Bringing Clarity to Research

**… and initiatives to develop GenAI detection tools have largely failed!**

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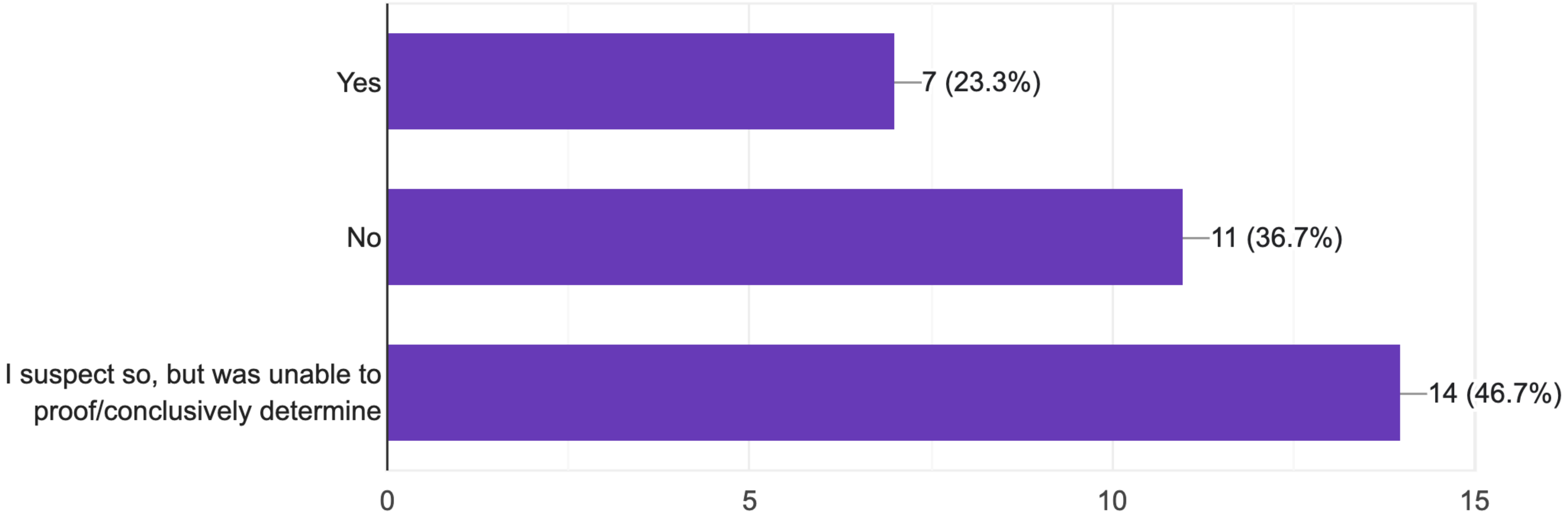
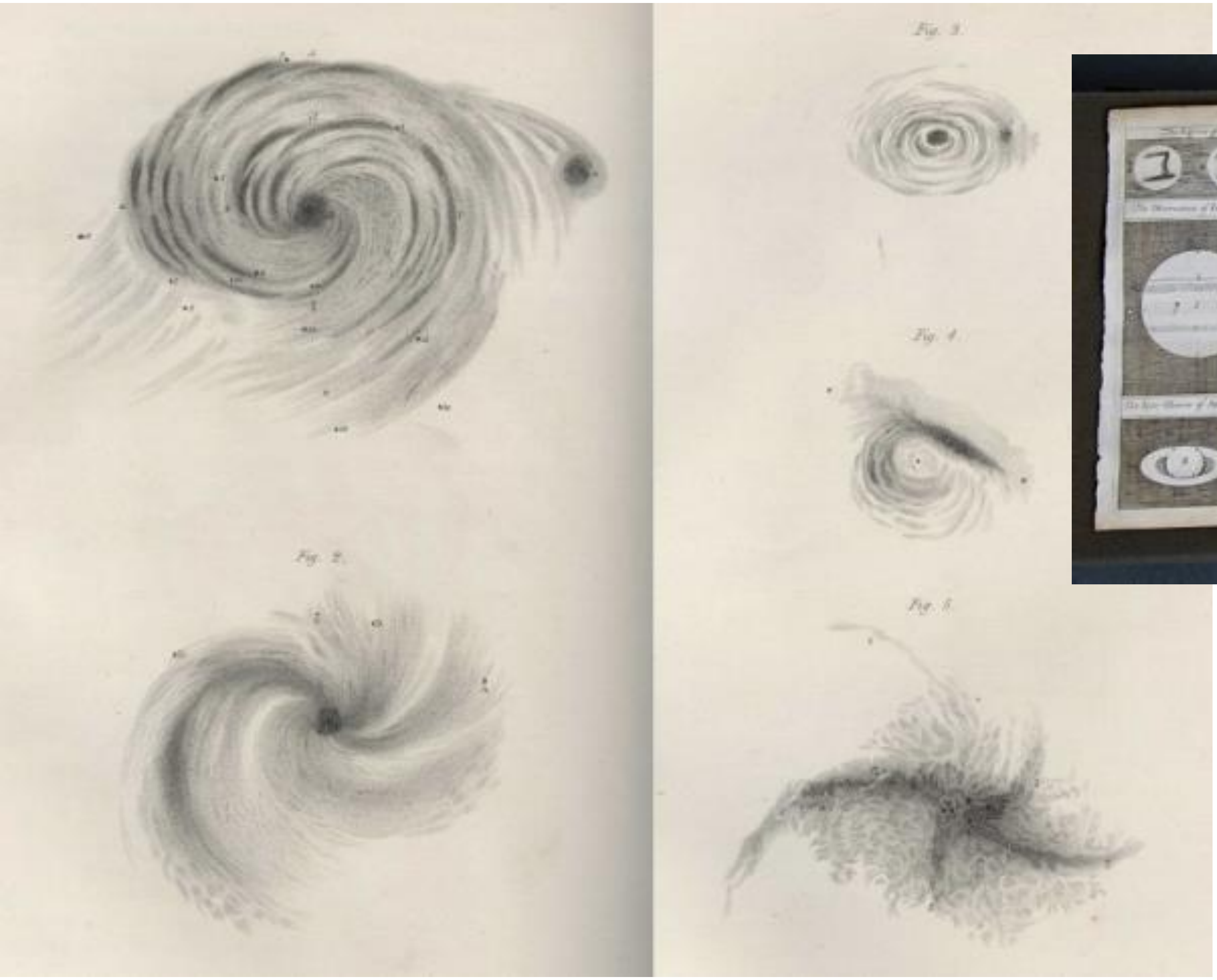
## Have you encountered any AI-generated images (i.e. images that were developed using generative AI)?

30 responses




*Survey among Image Screening experts, March 2024*

# Images were not reliable in the past either…




*Figures from 'Observations on the Nebulae' by Lord Rosse, (Phil. Trans. vol 140, 1850), including top left, the M51 spiral galaxy © The Royal Society. https://arts.st-andrews.ac.uk/philosophicaltransactions/brief-history-of-phil-trans/*

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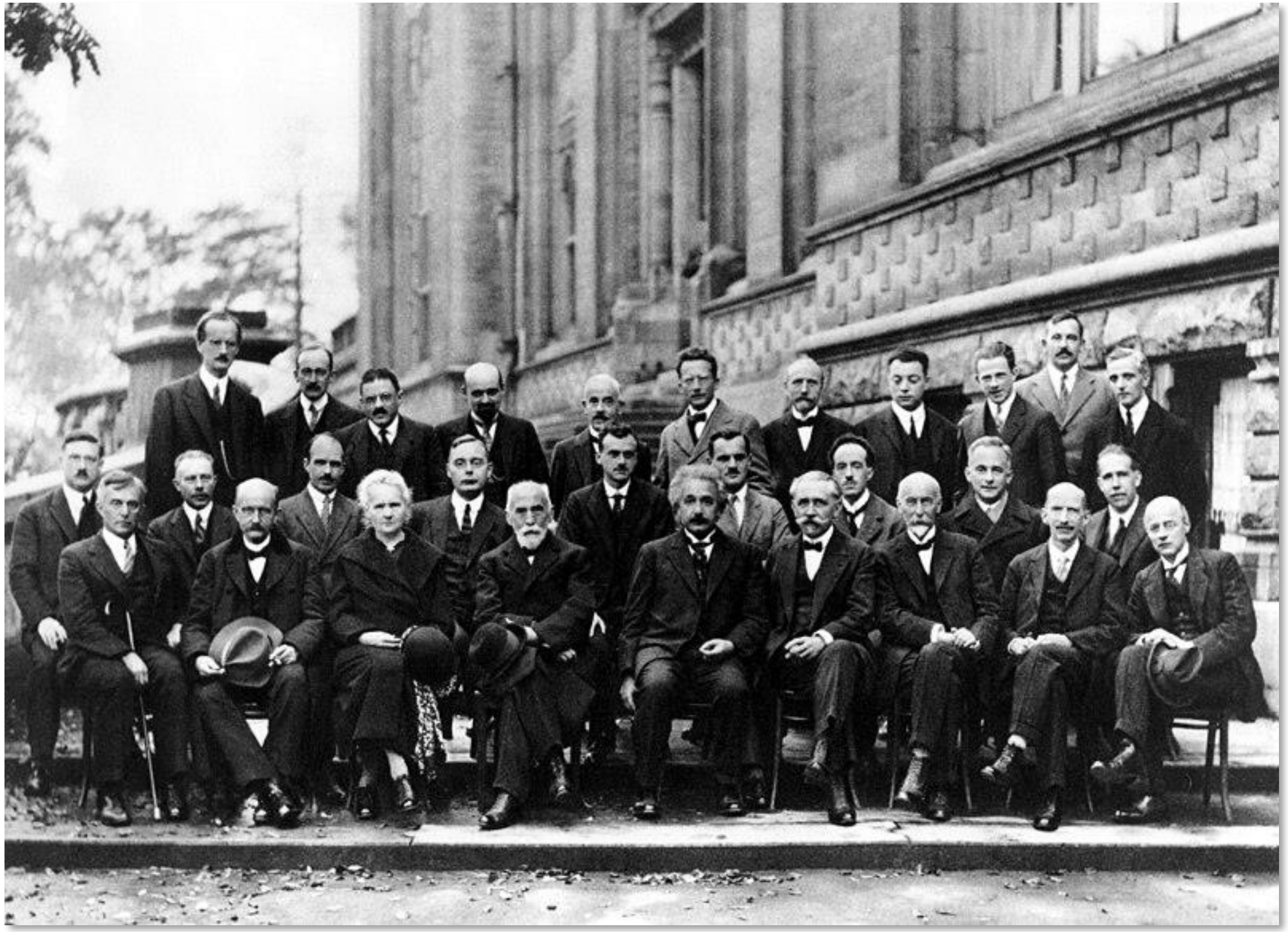
# Why was this not always a problem?

Academic communities were small with a high level of trust



*First Solvay conference, 1911. Source: Wikipedia*

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Trust
People


*Photo by Harrieta171 , CC BY-SA 3.0 DEED*
*Source: Wikipedia*


*Photo by Harrieta171 , CC BY-SA 3.0 DEED*
*Source: Wikipedia*

# Three sources of trust

People

*(Challenge: anonymous, virtual communities)*

nature > nature communications > articles > article

Article | Open access | Published: 02 April 2024

**Obesity-related T cell dysfunction impairs immunosurveillance and increases cancer risk**

Alexander Piening, Emily Ebert, Carter Gottlieb, Niloufar Khojandi, Lindsey M. Kuehm, Stella G. Hoft, Kelly D. Pyles, Kyle S. McCommis, Richard J. DiPaolo, Stephen T. Ferris, Elise Alspach & Ryan M. Teague

*Nature Communications* **15**, Article number: 2835 (2024) | Cite this article

**17** Altmetric | Metrics

# Three sources of trust

<u>People</u>

*(Challenge: anonymous, virtual communities)*

<u>Reproduction/replication</u>

*(Challenge: no time/ resources/reward)*

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**17** Altmetric | Metrics

**Methods**

Mice

All mice were housed under pathogen-free conditions in the Saint Louis University School of Medicine Department of Comparative Medicine and used in accordance with animal use protocols approved by the Institutional Animal Care and Use Committee. C57BL/6 (Strain No. 000664), OT-II (Strain No. 004194) and $Rag2^{-/-}$ (Strain No. 033526) mice were purchased from the Jackson Laboratory. Mice were housed under a 12-h dark/light cycle, and housing was maintained at an ambient temperature of 72° Fahrenheit. Mice were age-matched and sex-matched and between 2 and 10 months of age when used for experiments. Mice were randomly assigned to either a normal chow (NC) diet with 21% kcal from fat and 23% kcal from protein (Lab Diet; cat. #0047039) or western diet (WD) chow containing 40% kcal from fat and 20% kcal from protein plus added sucrose (Research Diets; cat. #D19021301), and NC and WD mice were maintained in different cages in the same animal facility room until experimentation. Atorvastatin was provided in a custom WD chow developed by Research Diets containing 0.05% (500 mg/kg) atorvastatin sourced from Millipore Sigma (cat. #1044516). Mice were placed on NC or WD upon weaning at 4 weeks of age and maintained on the assigned diet until experimentation. Semaglutide-treated mice were maintained on WD for 12 weeks and then began biweekly treatment with intraperitoneal injections of 0.1 mg/kg semaglutide for 6 weeks. Percentages of lean and fat body mass were determined by nuclear magnetic resonance using a Bruker mini spec LF50. The mini spec acquired and analyzed time-domain nuclear magnetic resonance and provided body composition results for body mass of lean, fat, and fluid in each individual mouse. Percent fat mass was calculated by dividing the fat mass from total body mass and was reported as a percentage.

# Three sources of trust

<u>People</u>
*(Challenge: anonymous, virtual communities)*

<u>Reproduction/replication</u>
*(Challenge: no time/ resources/reward)*

<u>Images & Data</u>
*(Challenge: deep fakes through GenAI)*

nature > nature communications > articles > article

Article | Open access | Published: 02 April 2024

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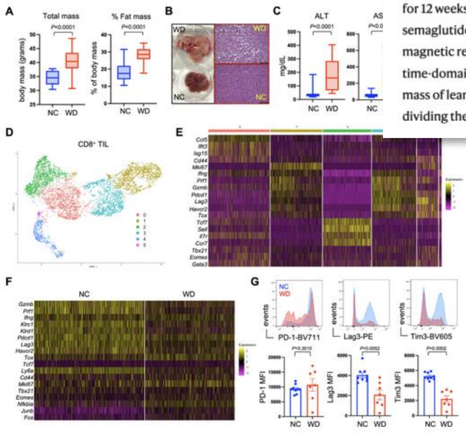
**Fig. 1: CD8⁺ T cell dysfunction in the tumor microenvironment.**




View in article                Full size image >

# Platforms and tools developed for manuscript screening will remain important….

turnitin

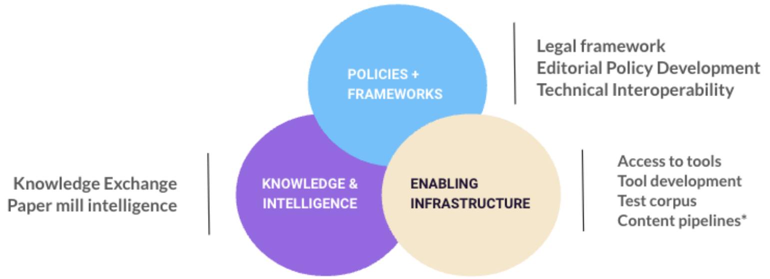
Proofig

imagetwin

Paperpal Preflight

STM Integrity Hub

Clear Skies

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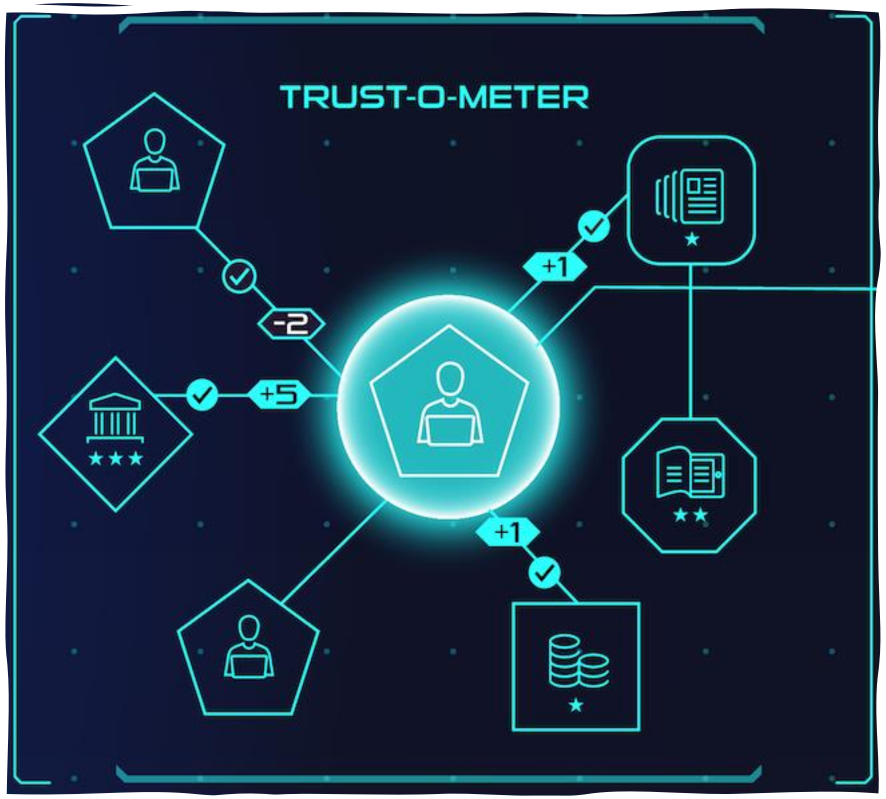
# …but we need to go ‘beyond the manuscript’

# …but we <u>need</u> to go 'beyond the manuscript'

- Leveraging existing trust networks through 'Trust Markers'

ORCID

UNITED2ACT
AGAINST PAPER MILLS

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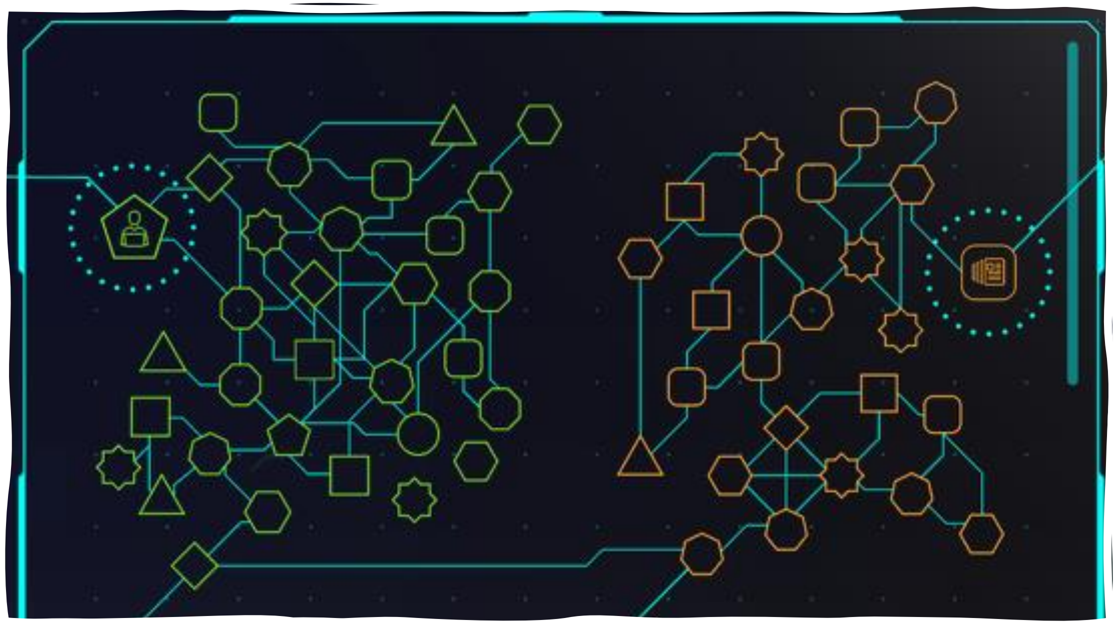
# …but we need to go 'beyond the manuscript'

- Leveraging existing trust networks through 'Trust Markers'

- Establishing 'chains of custody'



# ...but we <u>need</u> to go 'beyond the manuscript'

- Leveraging existing trust networks through 'Trust Markers'

- Establishing 'chains of custody'

- Establishing the authenticity and integrity of people, images and data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# This requires collaboration with the wider ecosystem


*CC0 1.0 Deed*
*Source: Wikipedia*

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# Thank you!

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