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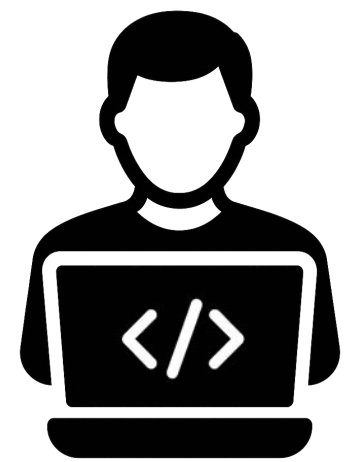
peerreviewcongress.org
2025

Characterizing Problematic Images in Retracted Scientific Articles

João Cardenuto¹, **Daniel Moreira**², Anderson Rocha¹



Scientific Integrity



CS R&D



Software
Tools



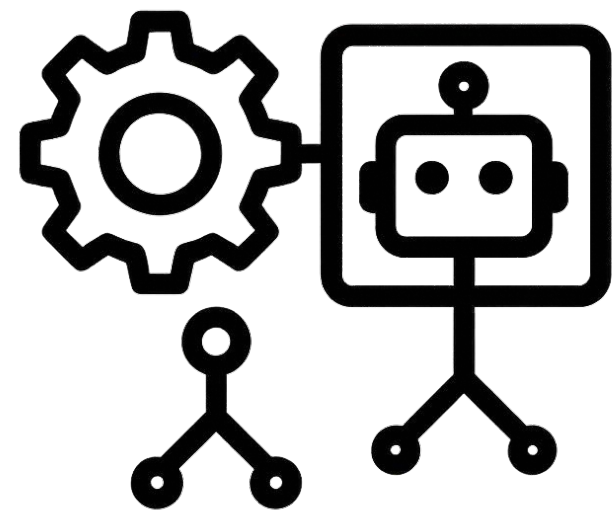
Authors



Reviewers
and Editors



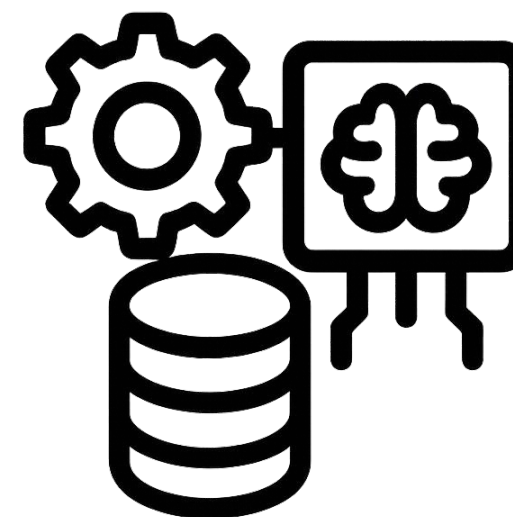
Investigators



Machine
Learning



Data-driven
Solutions



Training Data



Data
Annotation

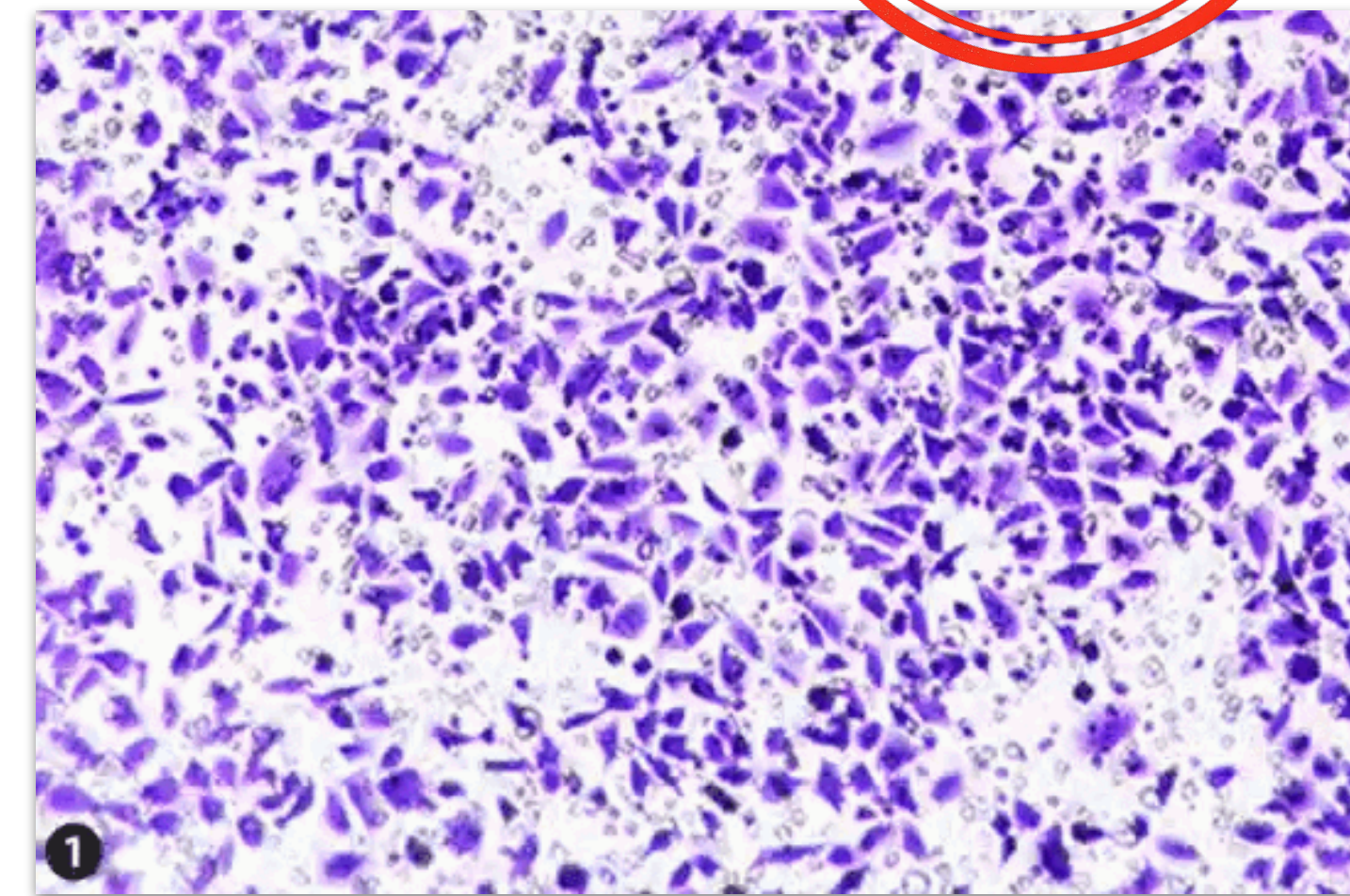
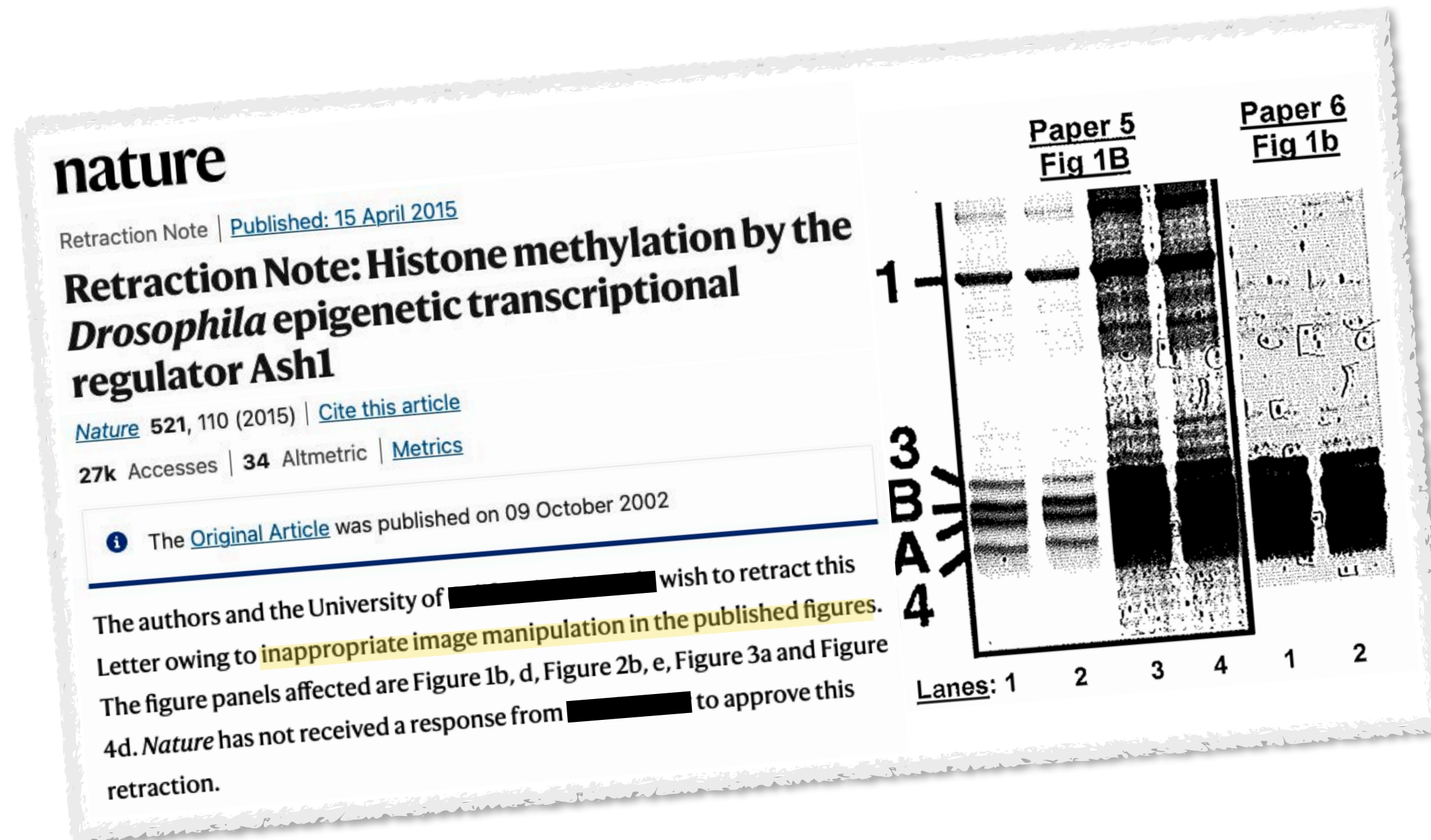


R&D
Priorities

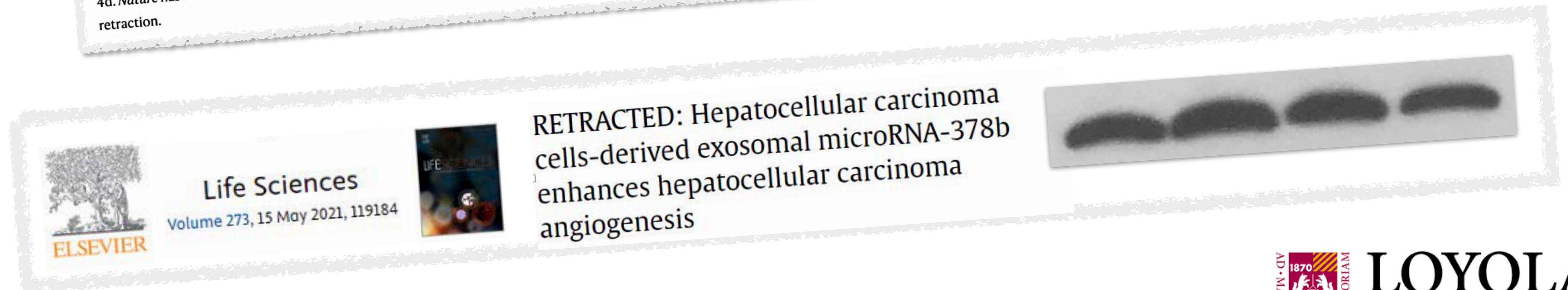


LOYOLA
UNIVERSITY CHICAGO

Scientific Images



<https://tinyurl.com/4znhmpa6>



Sources

Retraction
Watch

56,716 entries

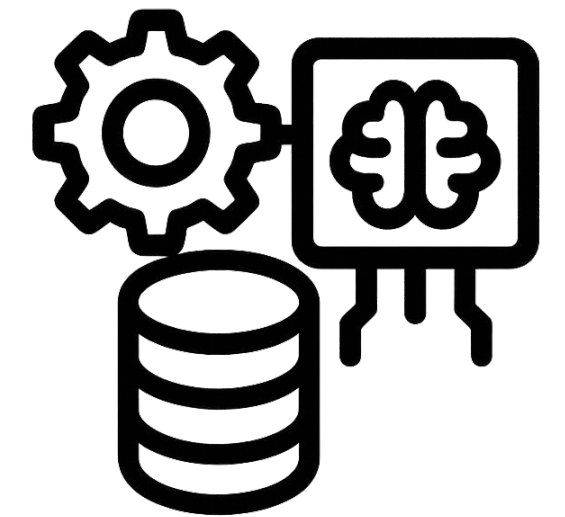


8,002 entries

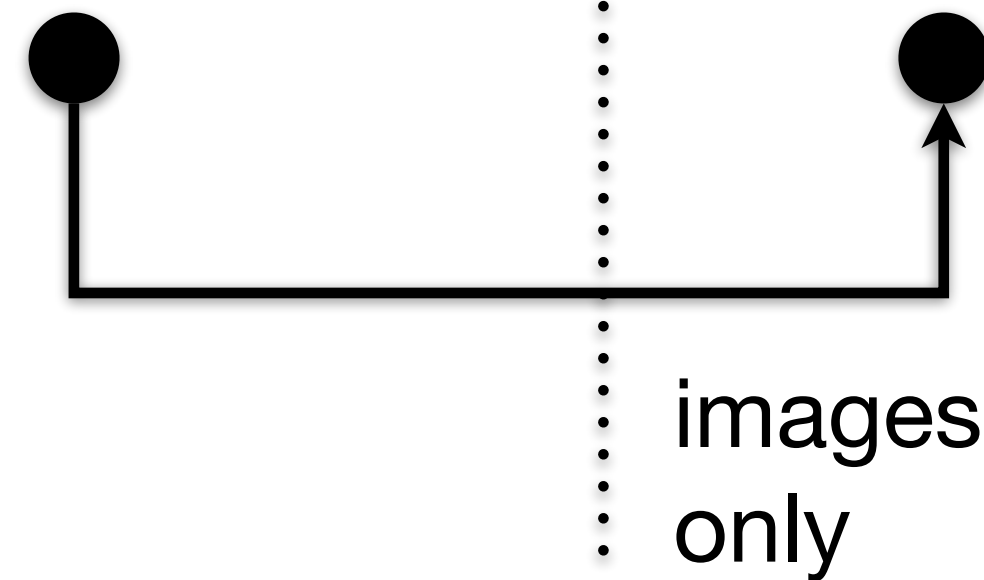


PUBPEER
The online journal club

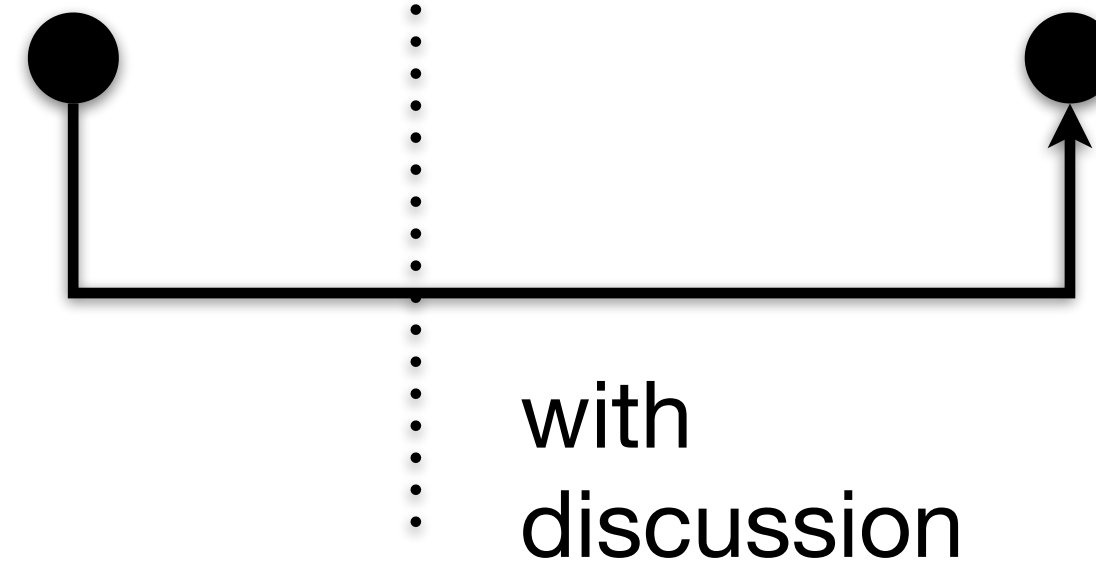
2,221 entries



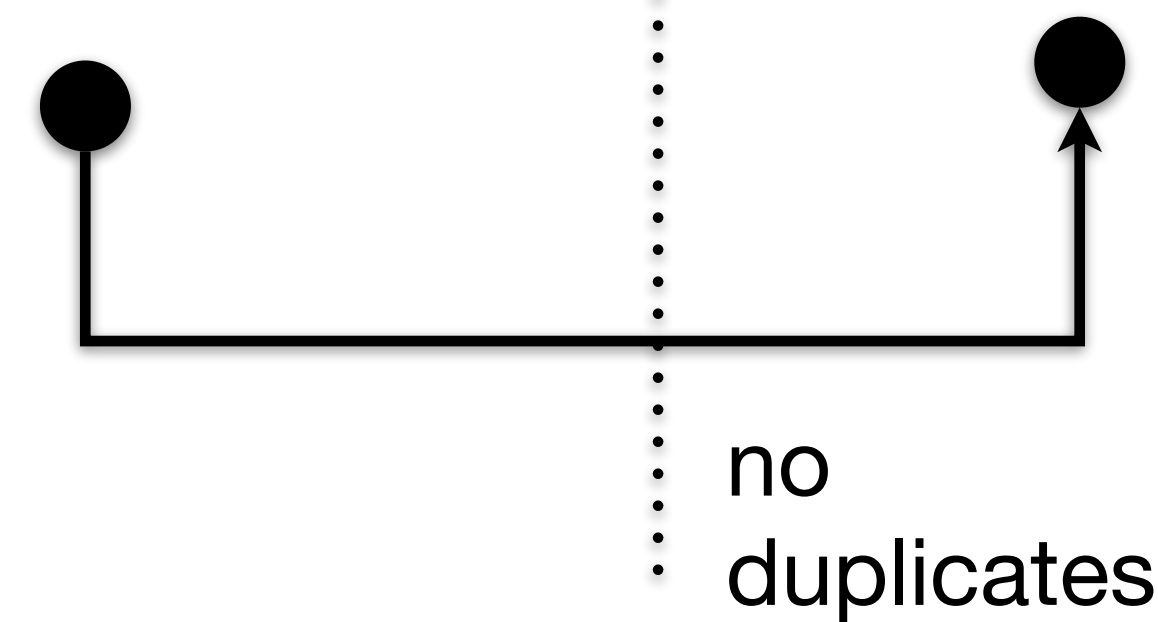
2,078 articles



images
only



with
discussion



no
duplicates

Characterizing

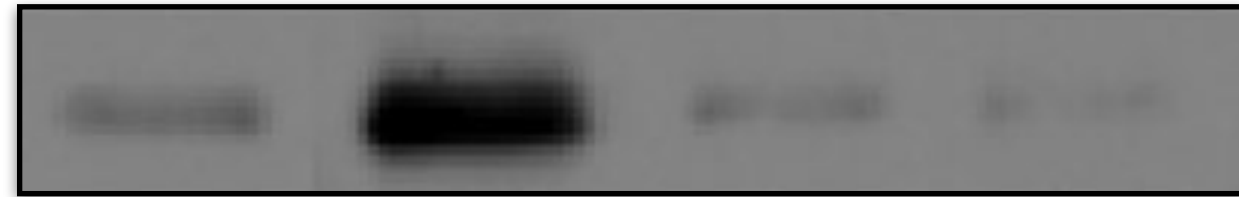


Image Type

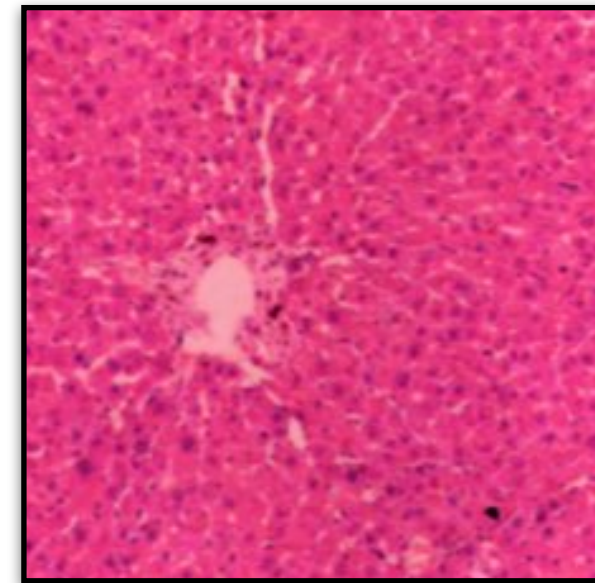
Colony Transwell
Tumor
Gel
Microscopy
blots
Fluorescent
Graphs

Image Type

pubpeer.com/storage/image-1703935628811.png

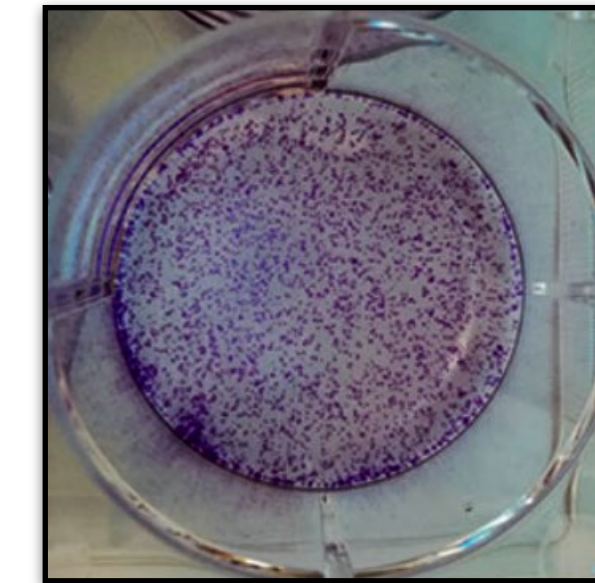


Gel Blots



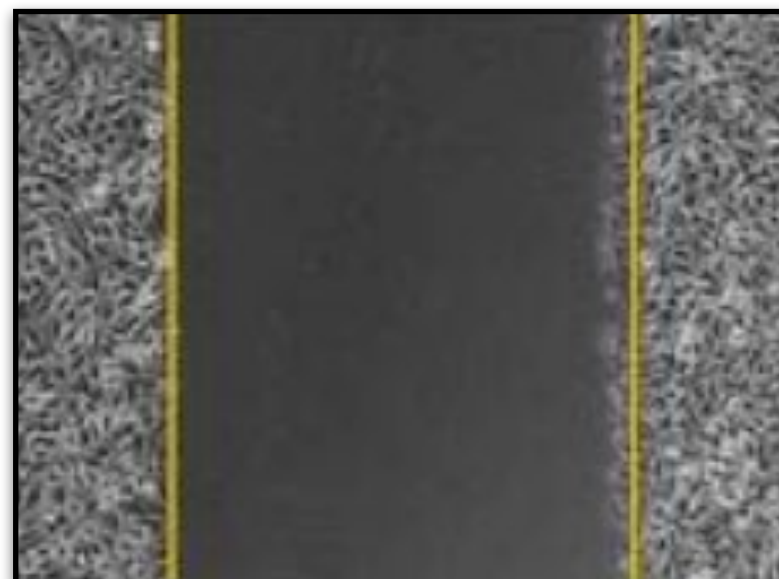
Microscopy

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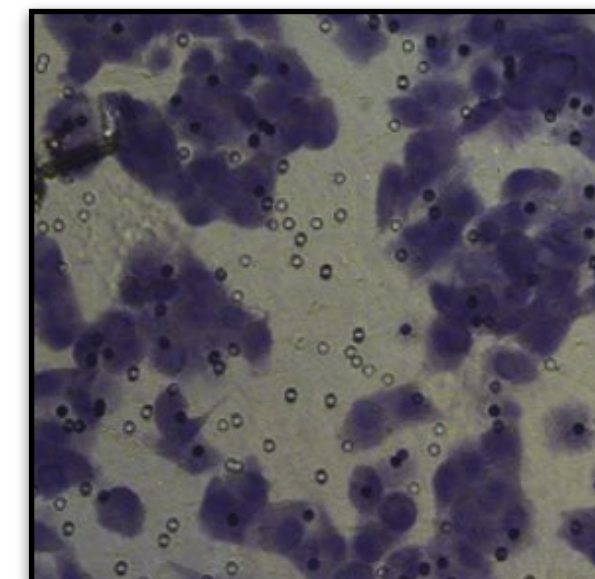
Colony

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Wounds Healing

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Transwell

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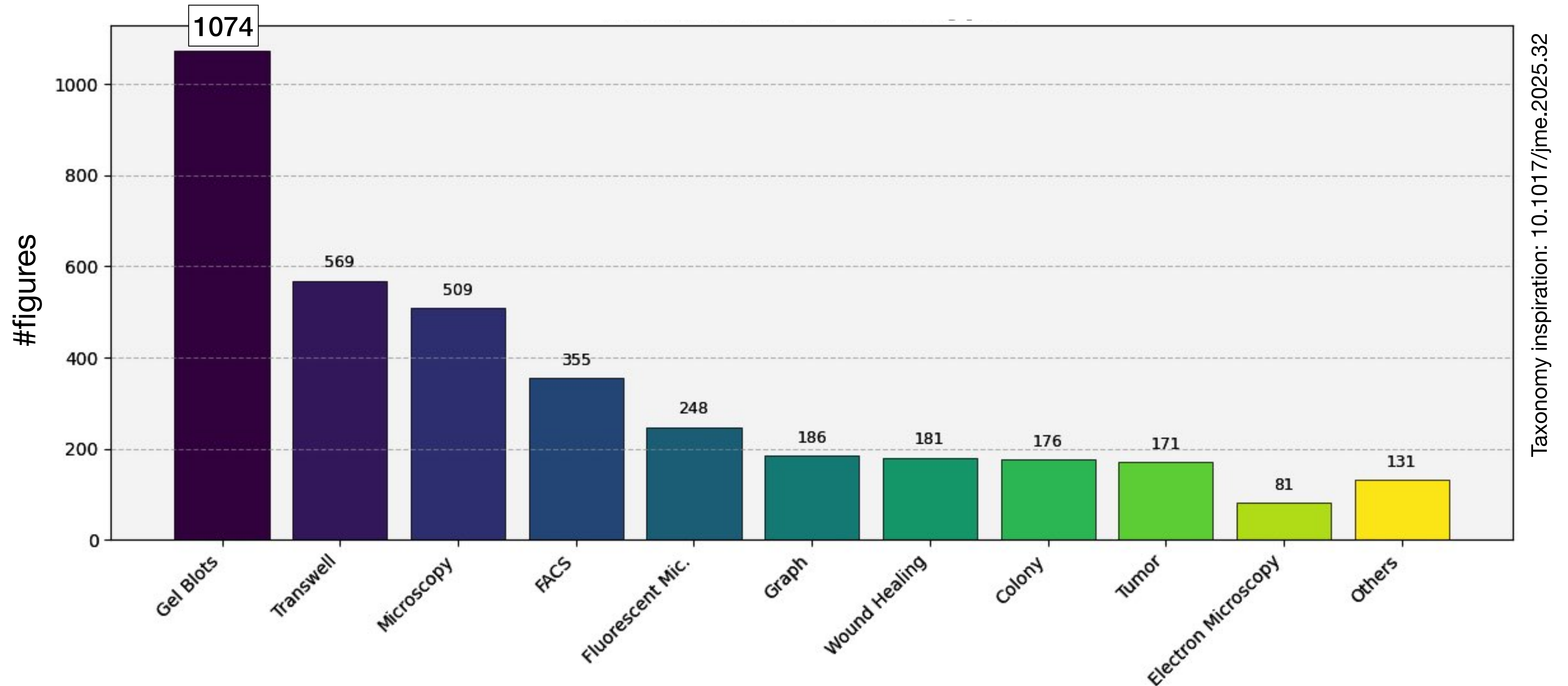
Tumor

pubpeer.com/storage/image-1668463851077.png



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Image Type



Taxonomy inspiration: 10.1017/jme.2025.32

Characterizing



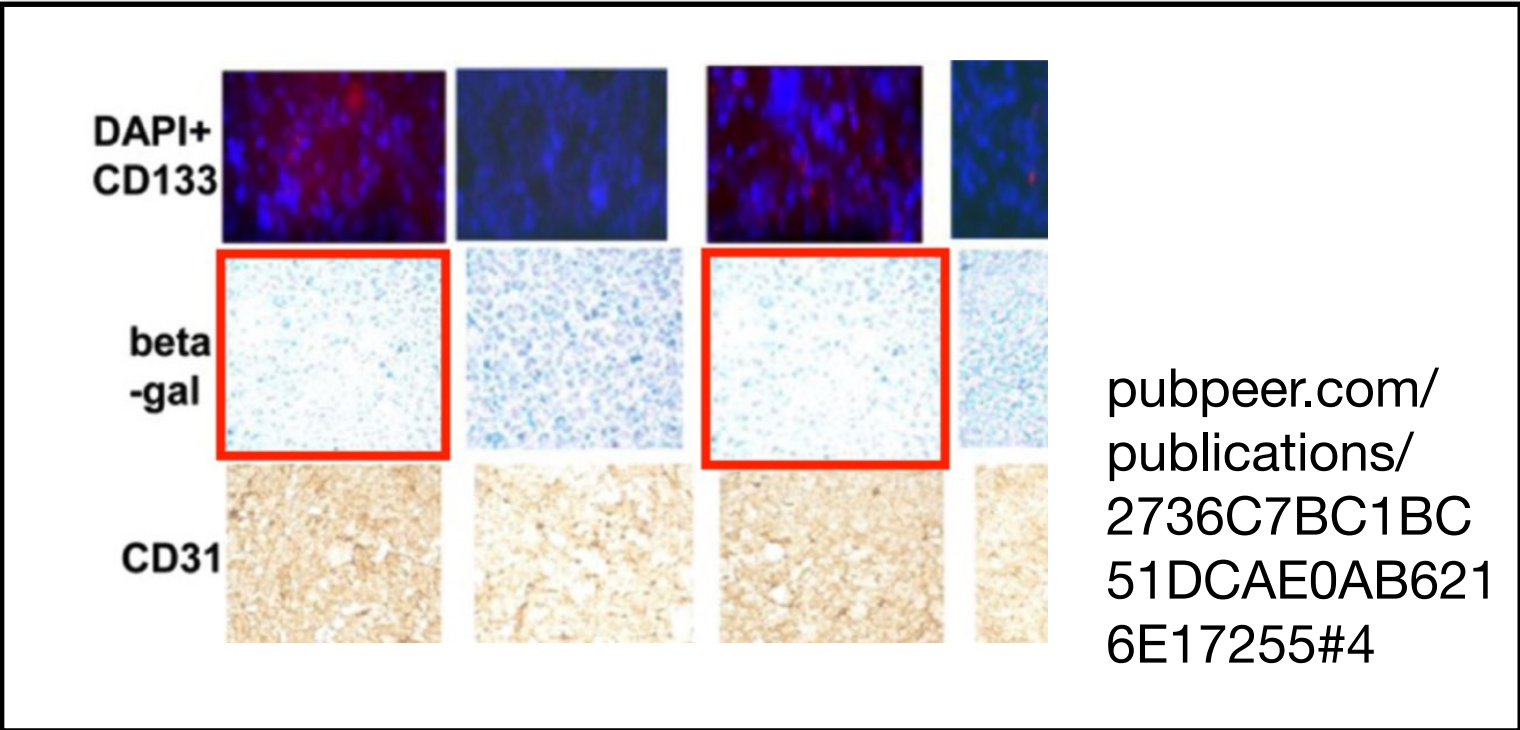
Image Type

Transwell
Tumor
Colony
Gel
Microscopy
blots
Fluorescent
Graphs

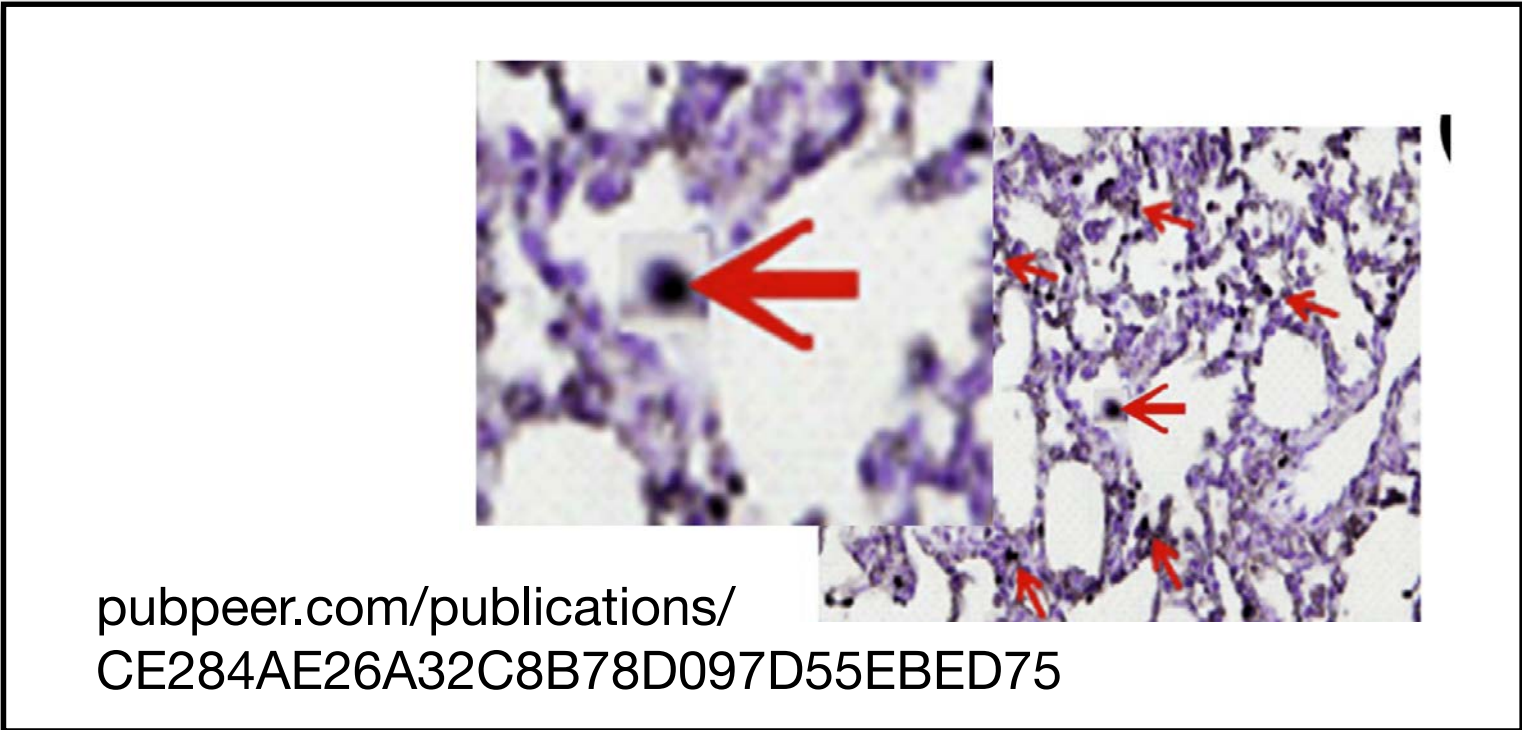
Manipulation Type

Splicing
AI-
Generation
Flipping
Resizing
Cropping
Rotation
Recoloring

Manipulation Type



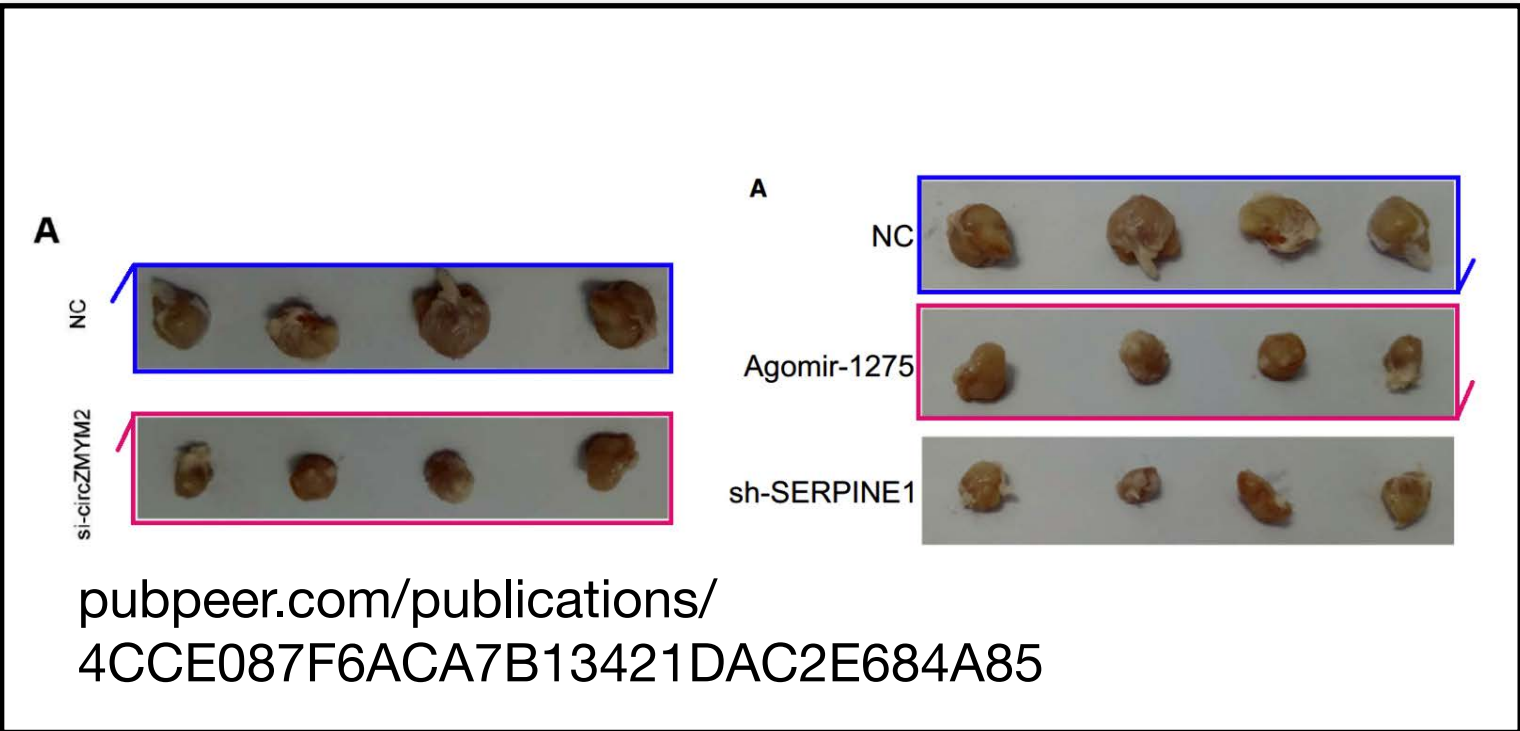
Replication



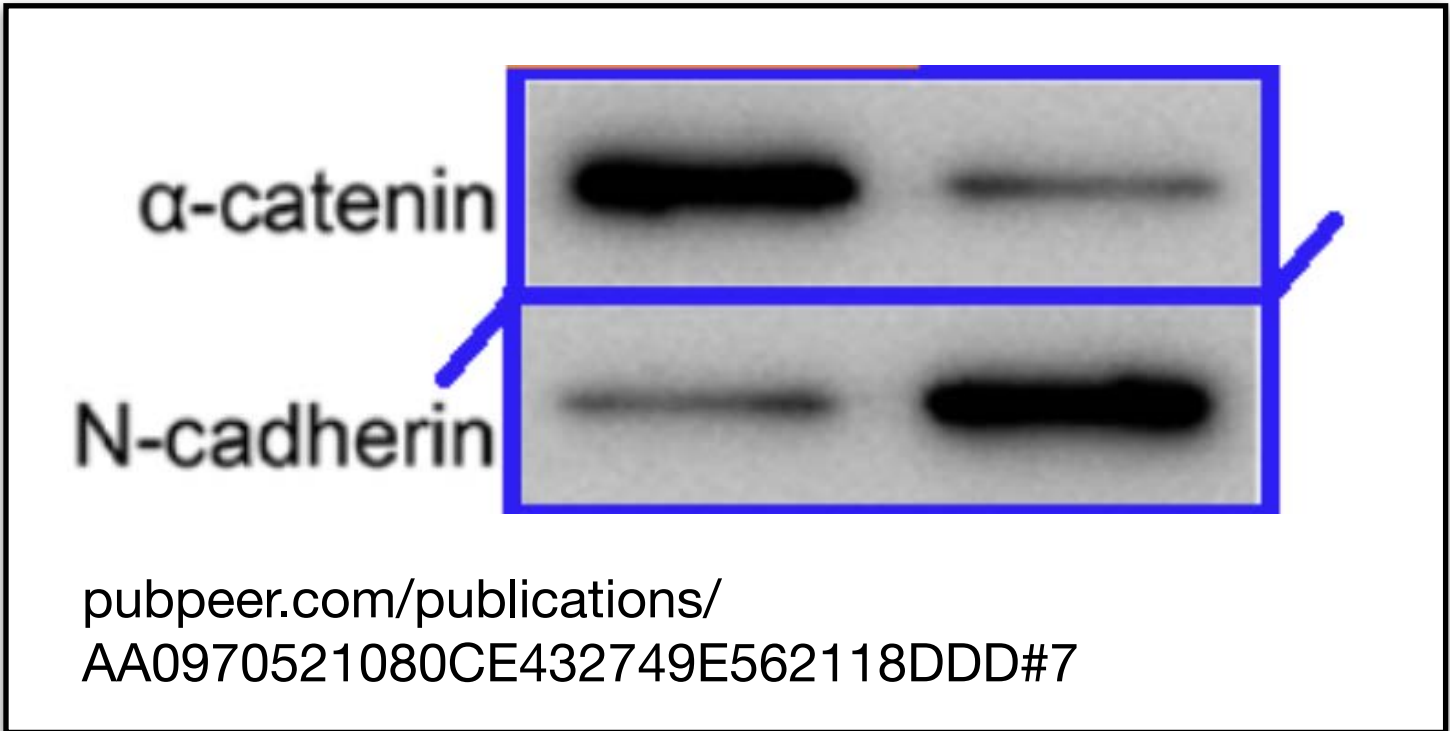
Splicing



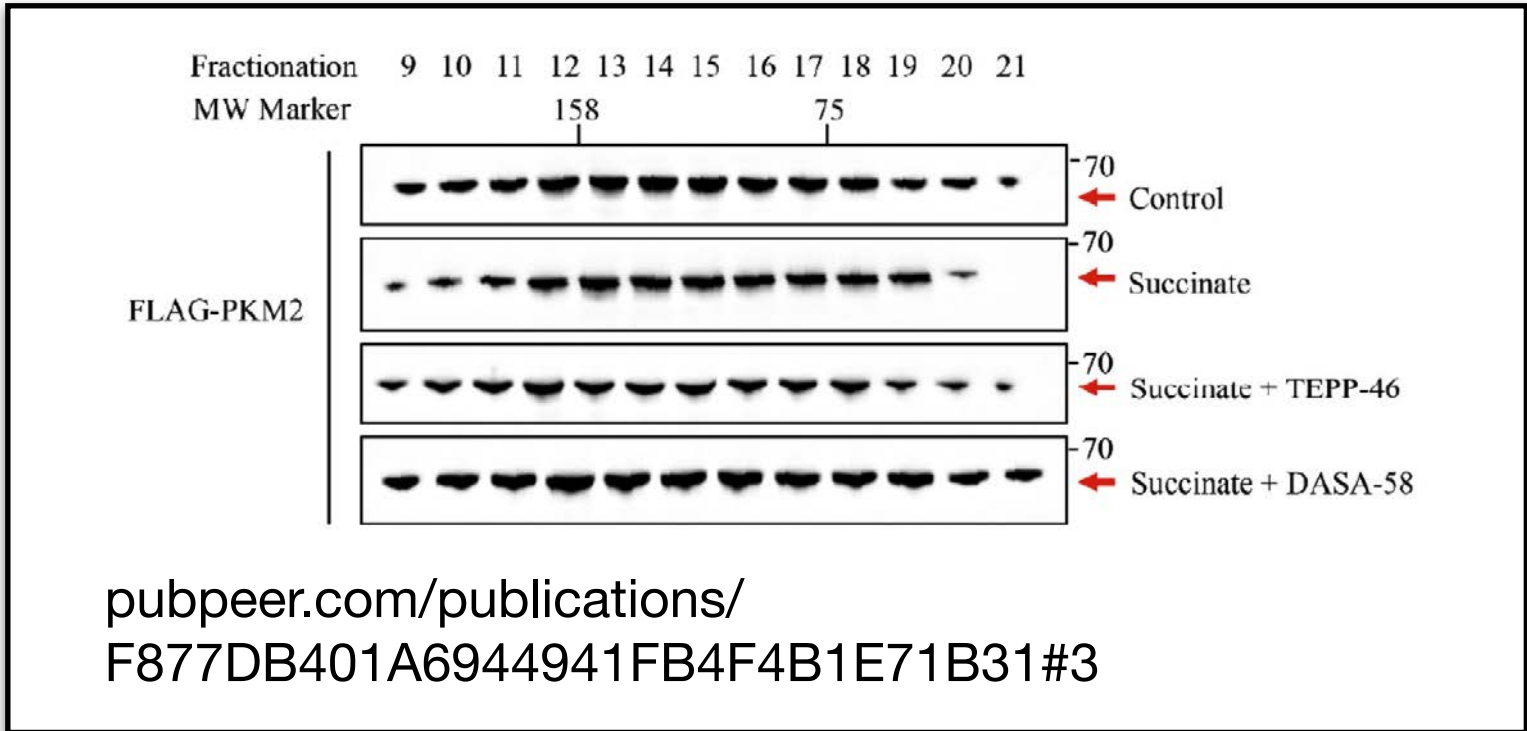
Recoloring



Rotation

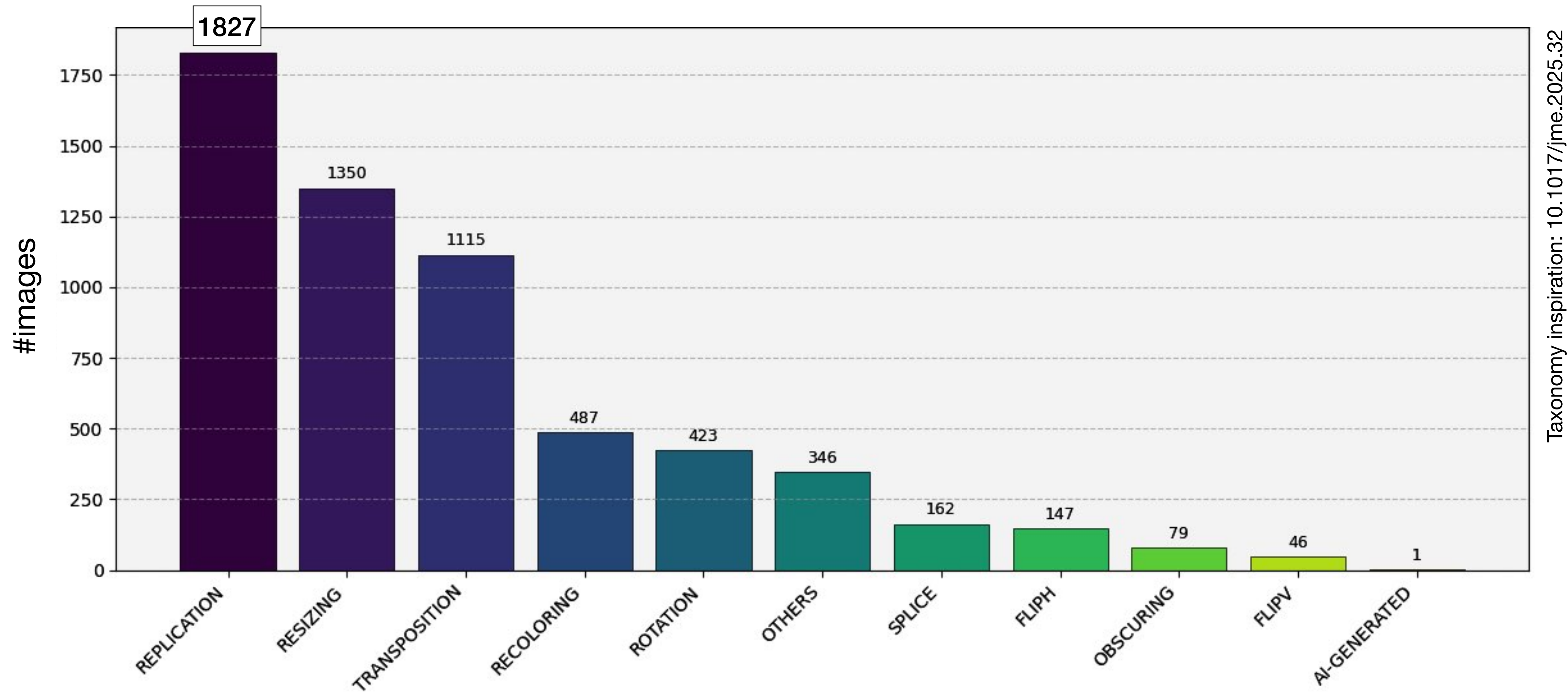


Flipping



AI Generated

Manipulation Type



Characterizing



Image Type

Transwell
Tumor
Colony
Gel
Microscopy
Graphs
blots
Fluorescent

Manipulation Type

Splicing
AI-
Generation
Flipping
Resizing
Cropping
Rotation
Recoloring

Problem Context

Single Figure

Within Image (Same Panel)
Within Figure (Different Panels)

Multiple Figures

Between Figures (Same Document)
Between Documents

Paper Mills

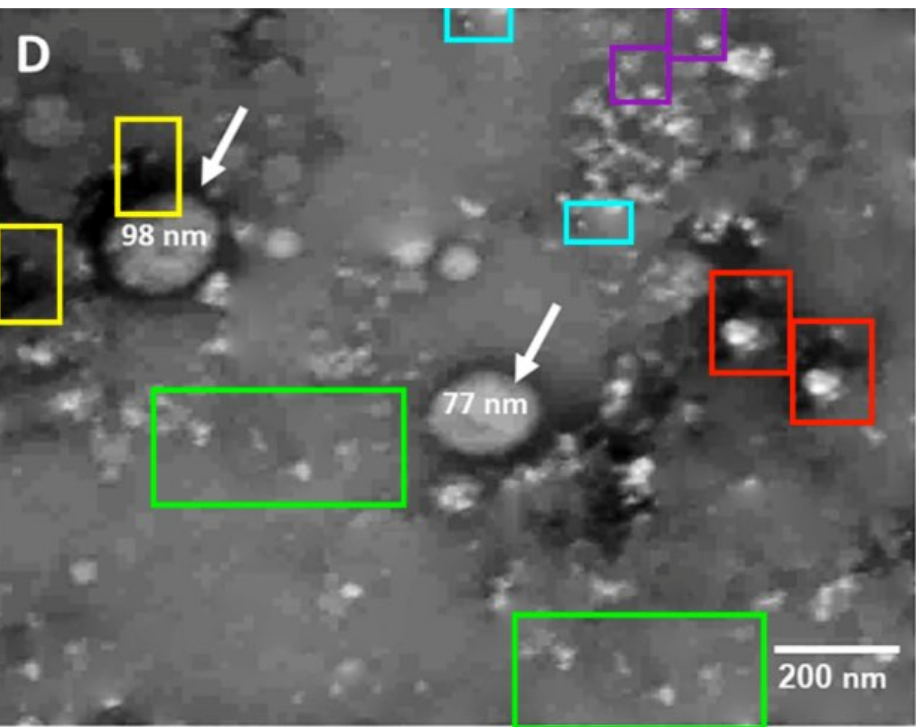


LOYOLA
UNIVERSITY CHICAGO

Problem Context

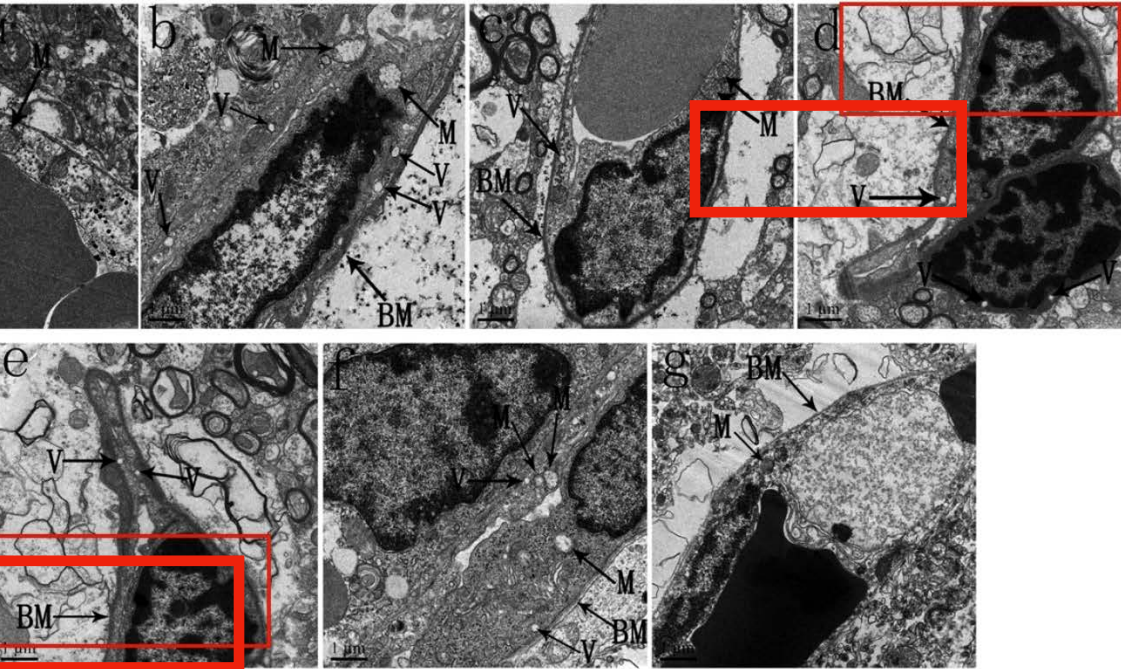
Single Figure

Within Image (Same Panel)



DOI: 10.1038/s41598-023-36929-0

Within Figure (Different Panels)



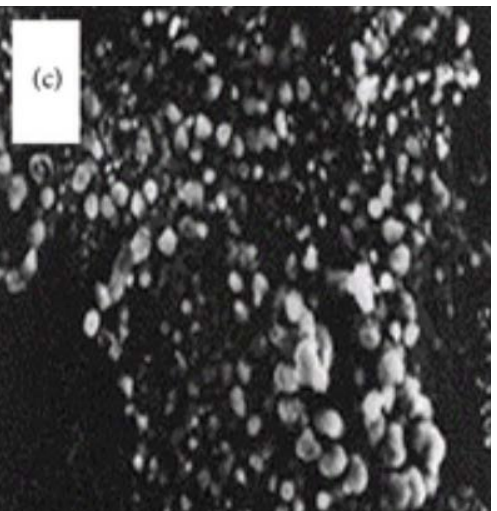
pubpeer.com/publications/
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Multiple Figures

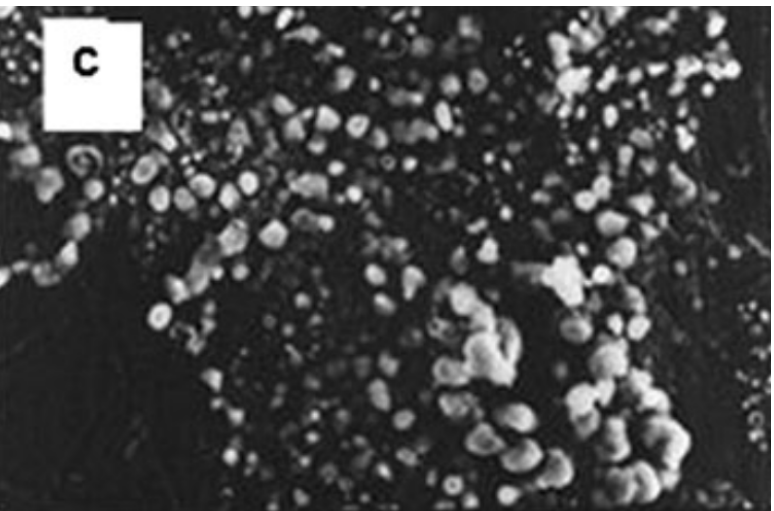
Between Figures (Same Document)

OR

Between Documents



Paper A

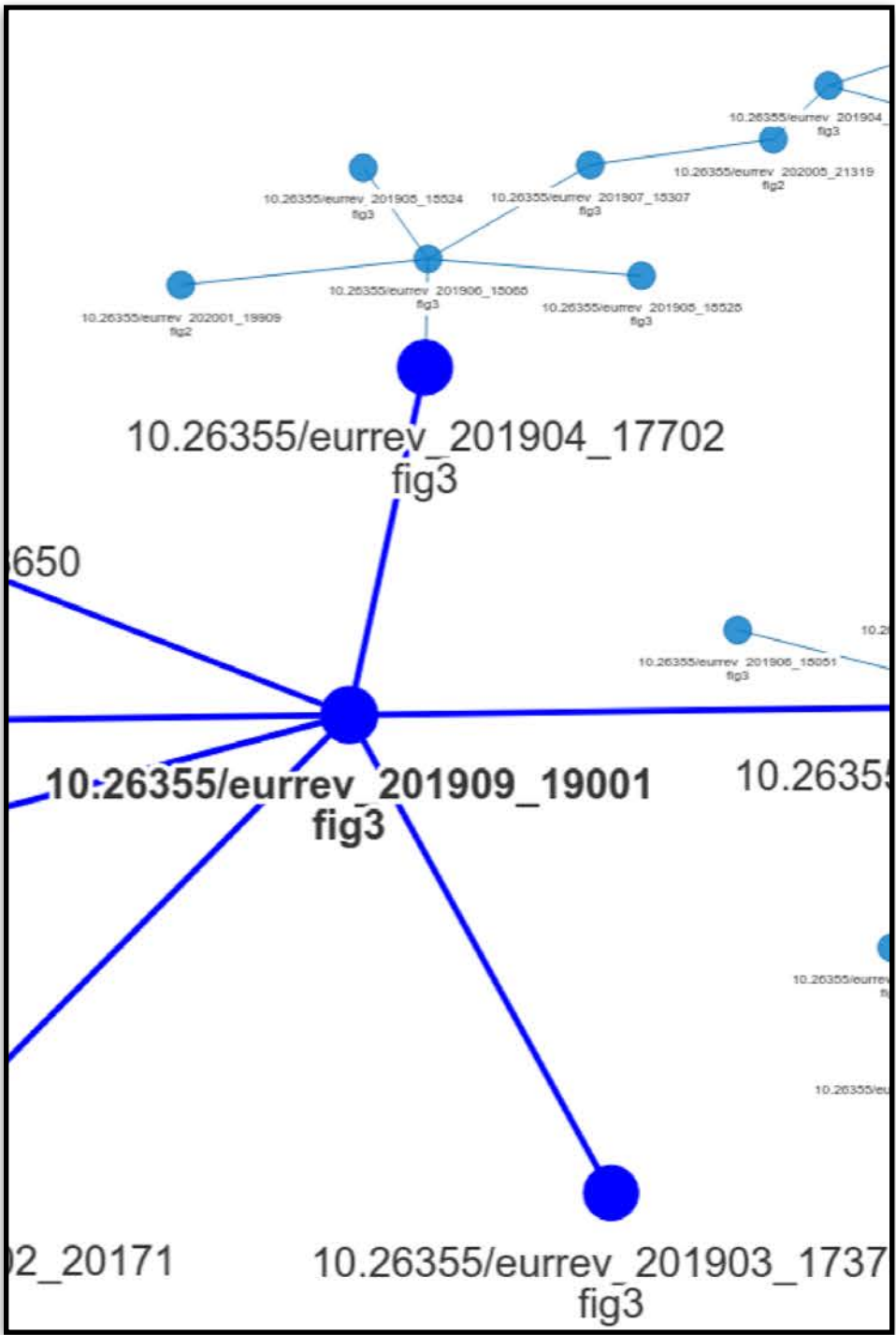


Paper B

pubpeer.com/publications/
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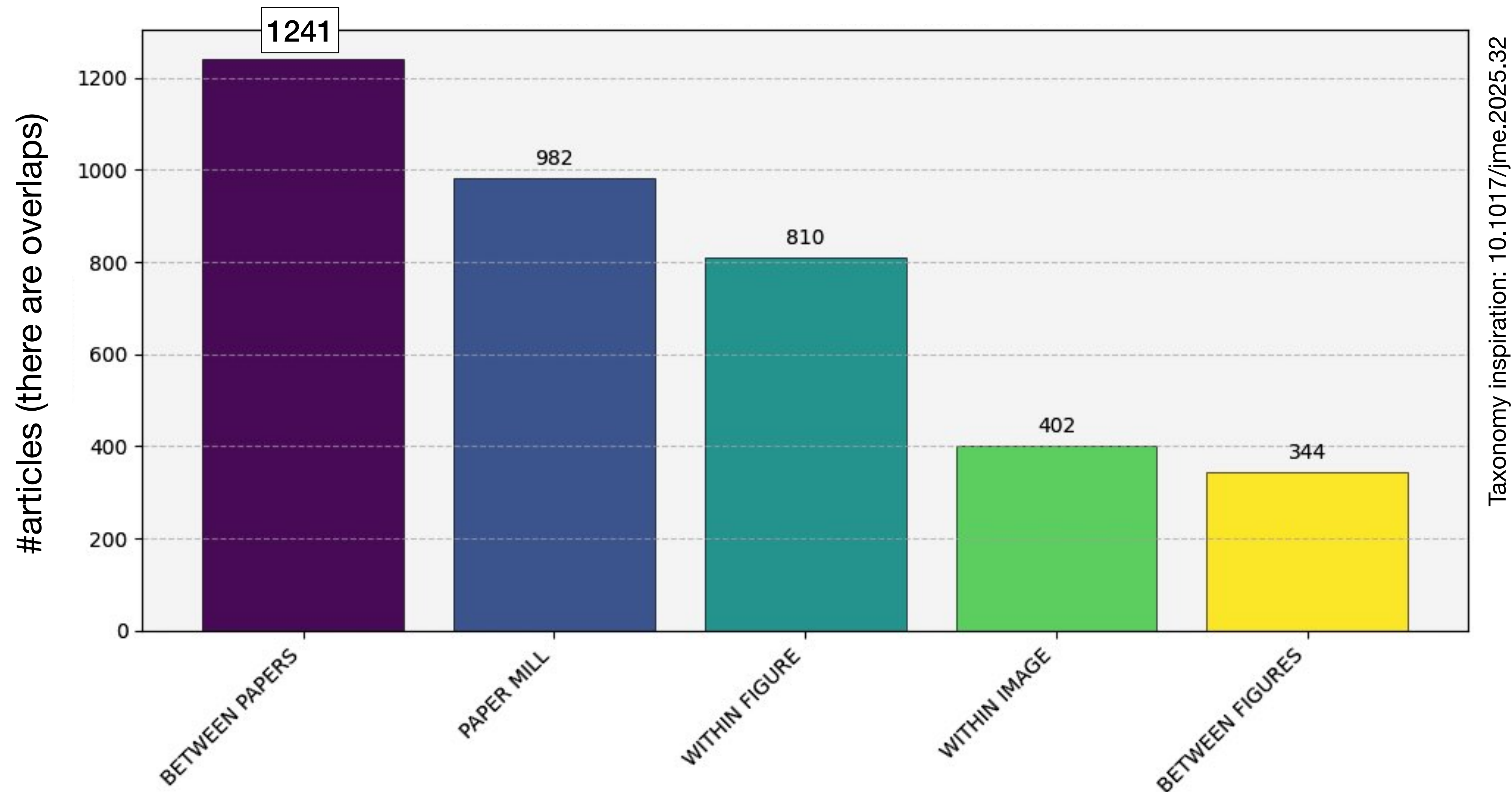
Paper Mills

Unrelated authors
Large scale



doi.org/10.1371/journal.pone.0312666

Problem Context



Discussion and Next Steps

Prevalence of problems with gel blots and between-paper image replication.

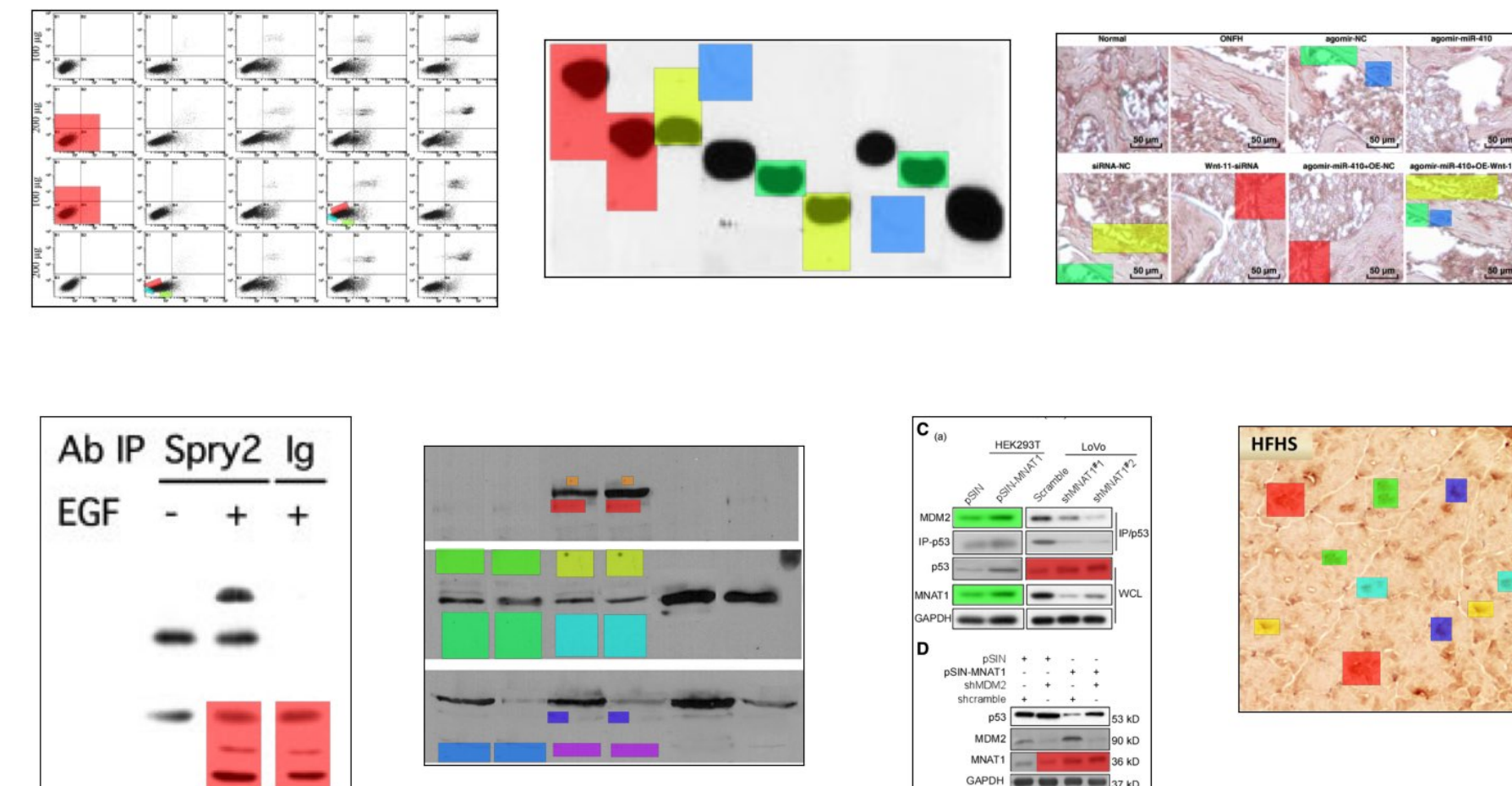
Lack of standardized information in retraction notices.

We need more comprehensive (and computational) retraction notices.

Recent Effort: Copy-move Annotation (and future challenge)

[Nature 419, 857–862 \(2002\); doi:10.1038/nature01126](#)

The authors and the University of California Riverside wish to retract this Letter owing to inappropriate image manipulation in the published figures. The figure panels affected are Figure 1b, d, Figure 2b, e, Figure 3a and Figure 4d. *Nature* has not received a response from [REDACTED] to approve this retraction.



Questions?



Thank you!

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`danielmoreira.github.io`