

# How I started my science integrity career

Elisabeth Bik, PhD

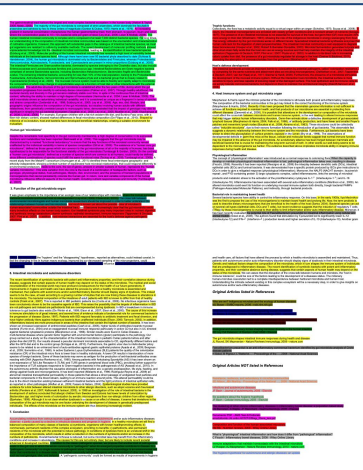
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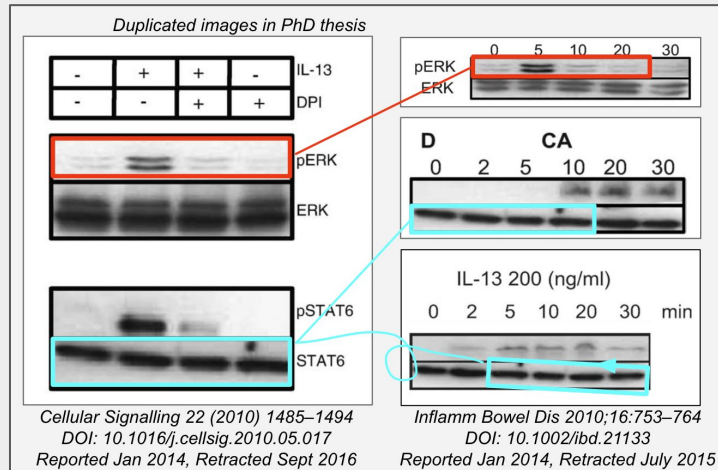
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## Plagiarism



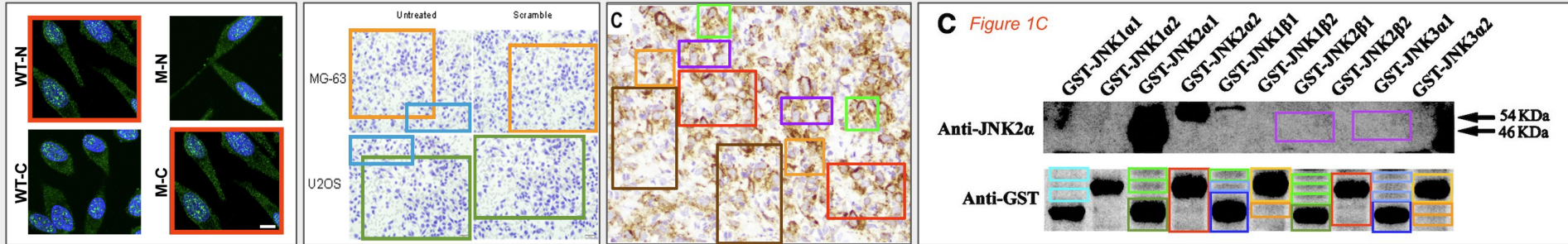
## Image duplication



## Conflicts of Interest:

- Free access to ImageTwin, Profig, iThenticate, Stanford Library
- Consultant / speaker for publishers/universities/conferences
- Patreon donations

# 4% image problems; journals slow to act



2016: 20,621 papers scanned

4% had duplications  
2% possibly fraudulent

782 reported in 2015

2020: 35% corrected/retracted  
2025: 59% corrected/retracted

9,451 problematic  
articles found  
1,682 retractions  
1,256 corrections

*mBio*, 2016, DOI: 10.1128/mbio.00809-16

# Problems: Paper Mills and GenAI

Paper Mills generate low-quality/fake papers and sell authorships

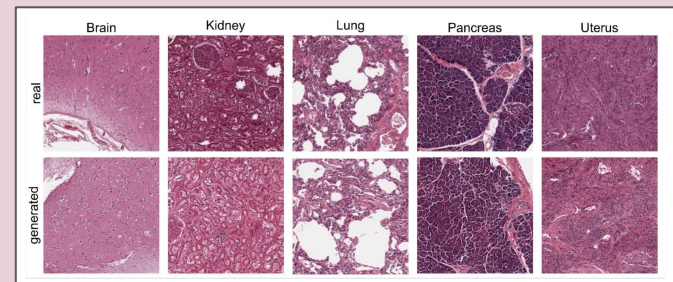
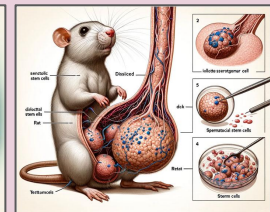
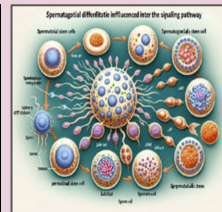
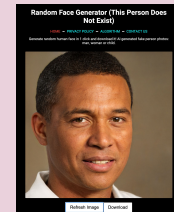
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**The New York Times**  
**Disinformation Researchers Raise Alarms About A.I. Chatbots**  
By Tiffany Hsu and Stuart A. Thompson  
Researchers used ChatGPT to produce clean, convincing text that repeated conspiracy theories and misleading narratives.

**nature**  
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COMMENT | 27 January 2025  
**'Stamp out paper mills' – science sleuths on how to fight fake research**  
A group of scientists who are experts at spotting fraudulent research outline five essential steps to combat industrialized scientific misconduct.  
By Anna Abalkina, René Aouaricus, Elisabeth Bik, David Rimler, Dorothy Bishoo, Jennifer Byrne, Guillaume Cabanas, Adam Day, Cyril Labbe & Nick Wise

GenAI can/will be used to generate fake papers, data, and images

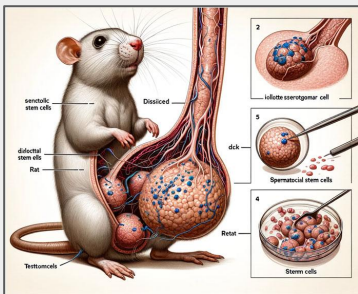


# Scientific misconduct: rising, rewarded, and costly



## Rising

- Paper Mill: high-throughput low-quality or fake papers
- GenAI makes fraud easier
- ~10% of cancer papers look paper-mill-like



## Rewarded

- Faster, easier, better results
- Better metrics, longer CV
- Almost no consequences



## Costly

- For scientists: false leads
- For science critics: lawsuits
- For science: '*all science is fraudulent*'



Credit: Sheila Terry / Science Photo Library

# Fixing scientific misconduct

## Reward reproducibility (not metrics)

- Fund replication studies/ scientists
- Value quality, not quantity
- Credit negative results



## Verify the science

- Require raw data, code
- Preregistration
- Check ethics and data authenticity



## Enforce consequences

- Faster corrections / retractions
- Sanctions for systematic fraud
- Protect, support, and empower whistleblowers



Current system:  
Rewards speed + volume



Better system:  
Rewards accuracy + integrity