Assessing publication integrity
Verifiable and/or plausible?

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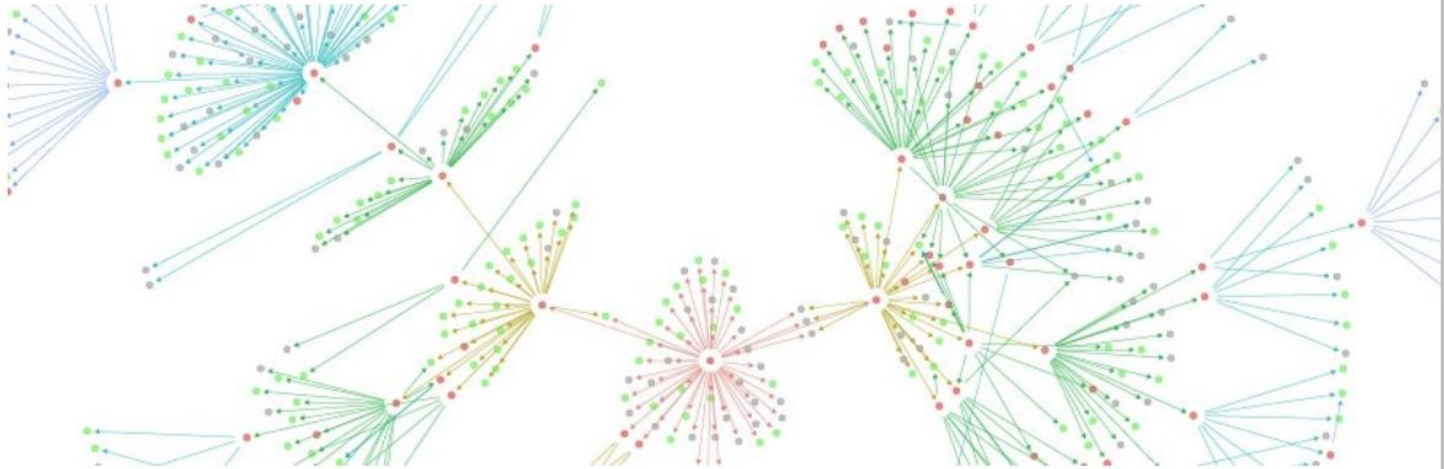


Research_

Publication and Research Integrity in Medical Research (PRIMeR)

Share

Improving the reliability of the medical research literature

Our group leads research and advocacy to improve the reliability of the research literature and reduce research waste. We advocate for transformed research publication standards and error correction capacity.

Based at the NSW Health Statewide Biobank in Camperdown, the PRIMeR group forms part of Molecular Biomedicine theme of the School of Medical Sciences.

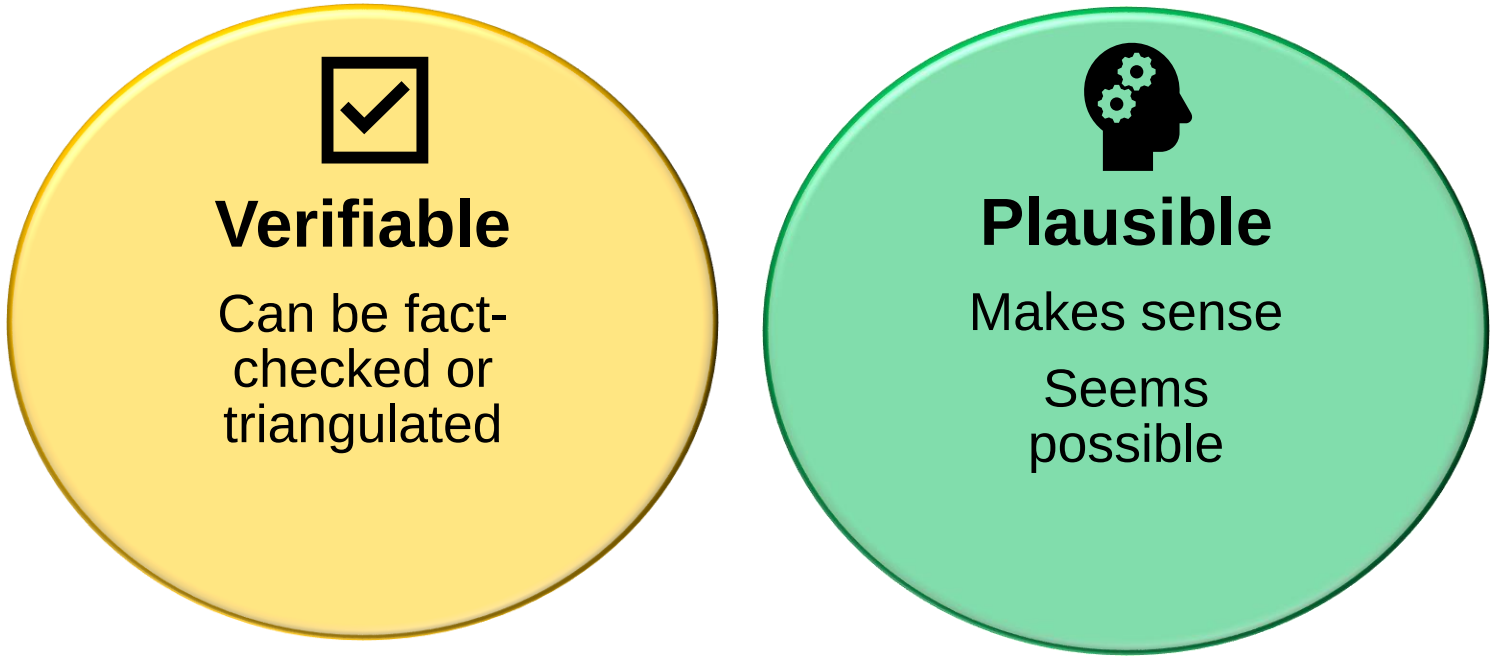
Study or collaborate with us

Get in touch - we're keen to hear from you

→

NHMRC

A framework for assessing publication integrity
Verifiable/ plausible



Two steps to verifiability

1. **Can the claim be checked/ verified?**
   - Not every claim can be (easily) verified
   - Many claims are accepted on trust/ plausibility
   - *“We used an in-house antibody to detect protein X”*

2. **If the claim can be checked, is it supported?**
   - **Verifiable** = “can be checked” AND “claim is supported”
   - **Non-verifiable** = “can’t be checked” OR “claim is not supported”

Quadrant analysis

Verifiable→ / Plausible↓	**Yes**	**No**
Yes	✓ ✓	✗ ✓
No	✓ ✗	✗ ✗

Coffee- verifiable and plausible

Verifiable vs plausible

Verifiable?→ Plausible?↓	**Yes**	**No**
Yes	Verifiable ✓ Plausible ✓ ***Solid claim***	Not verifiable ✗ Plausible ✓ *More research needed?*
No	Verifiable ✓ Implausible ✗ *Unexpected finding?*	Not verifiable ✗ Implausible ✗ ***Dubious claim***

Verifiable vs plausible

Education/ expertise

Education/ expertise

Verifiable?→ / Plausible?↓	**Yes**	**No**
Yes	Verifiable ✓ Plausible ✓ ***Solid claim***	Not verifiable ✗ Plausible ✓ *More research needed?*
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Verifiable/ plausible according to expertise

Expertise needed?→	**Yes**	**No**
Verifiable	Techniques requiring **specialist** expertise eg Seek & Blastn	Techniques requiring **little/ no** expertise
Plausible	**Expert** knowledge/ **uncommon** experience	**General** knowledge/ **common** experience

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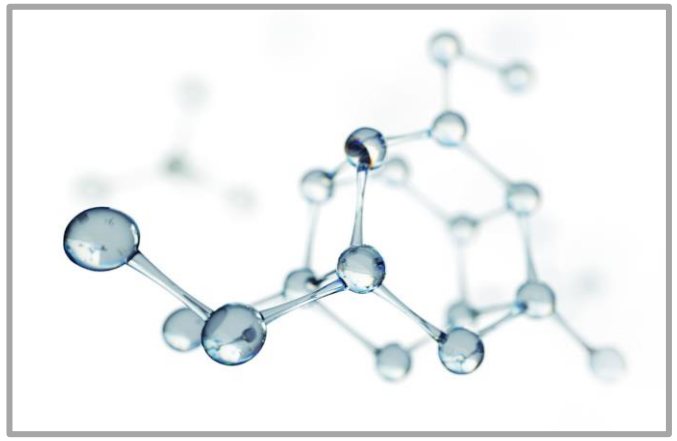
A primer on experimental reagents

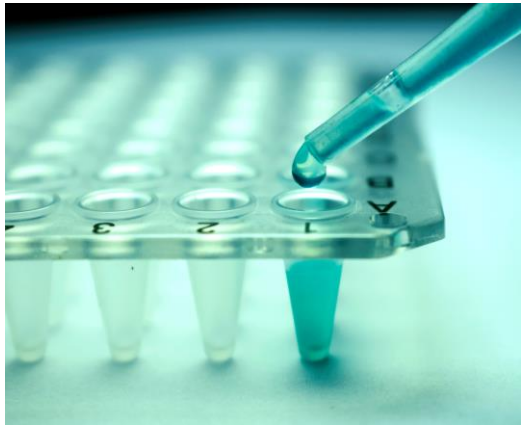
Coffee beans →

Coffee brewing →

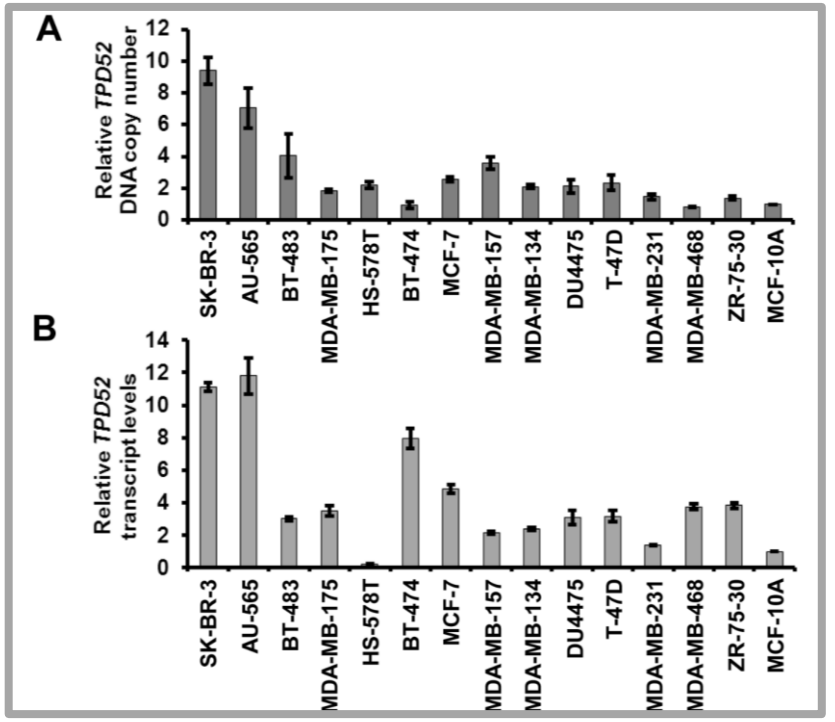
Cup of coffee

A primer on experimental reagents





DNA primers → (RT-)PCR →



(RT-)PCR results

Roslan et al. (2014) Mol Carcinogenesis

A primer on experimental reagents

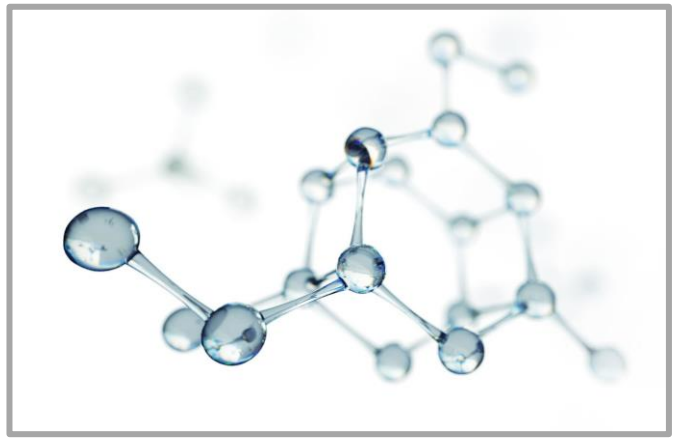
Coffee beans →

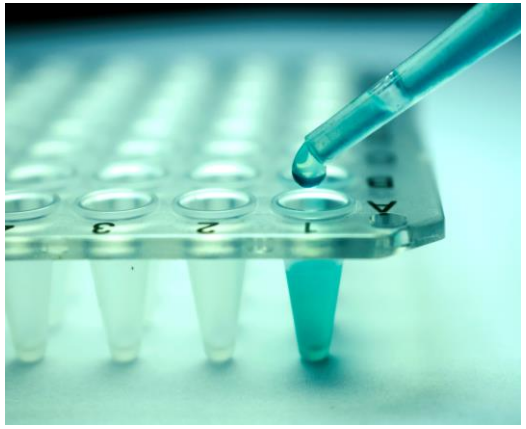
Coffee brewing →

Cup of coffee

Images of coffee- not actual coffee

A primer on experimental reagents





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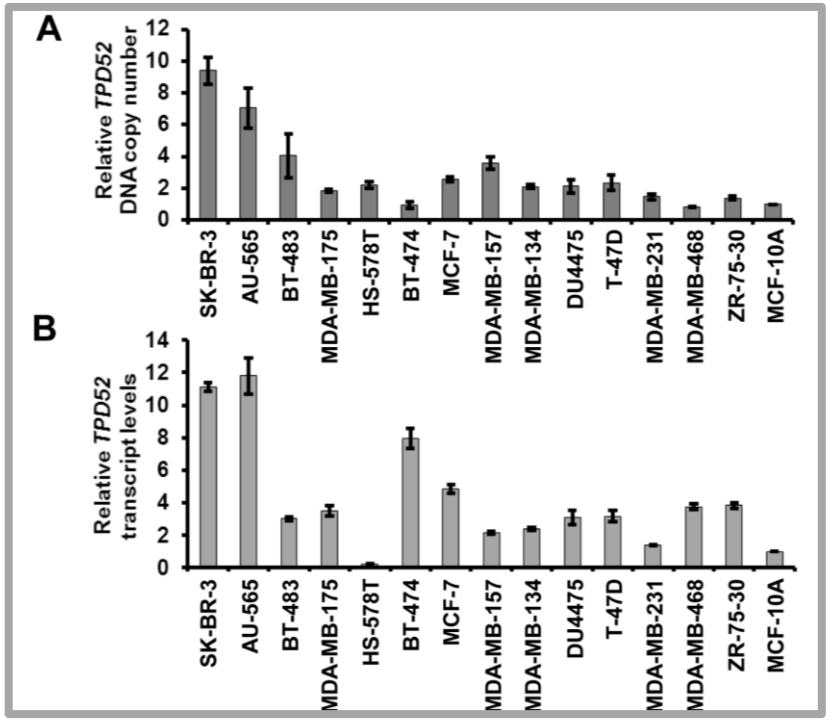

(RT-)PCR results

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Nucleotide sequence reagents: ingredients that generate experimental results

Construction of lentiviral vector expressing TPD52L2-specific shRNA

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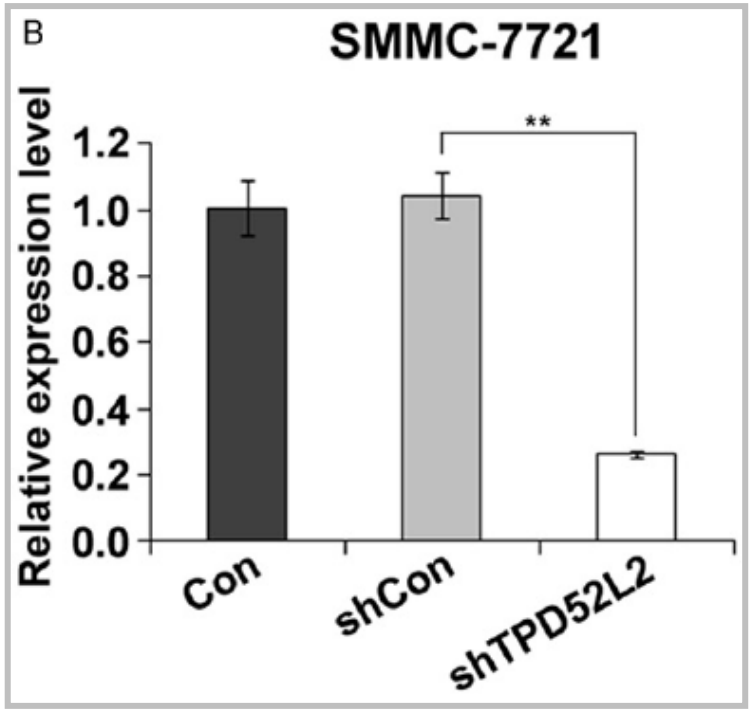


Nucleotide sequences- **small but mighty**

Claimed non-targeting/ negative control

5′-GCGGAGGGTTTGAAAGAATATCTCGAGATATTCTTTCAAACCCTCCGCTTTTTT-3′

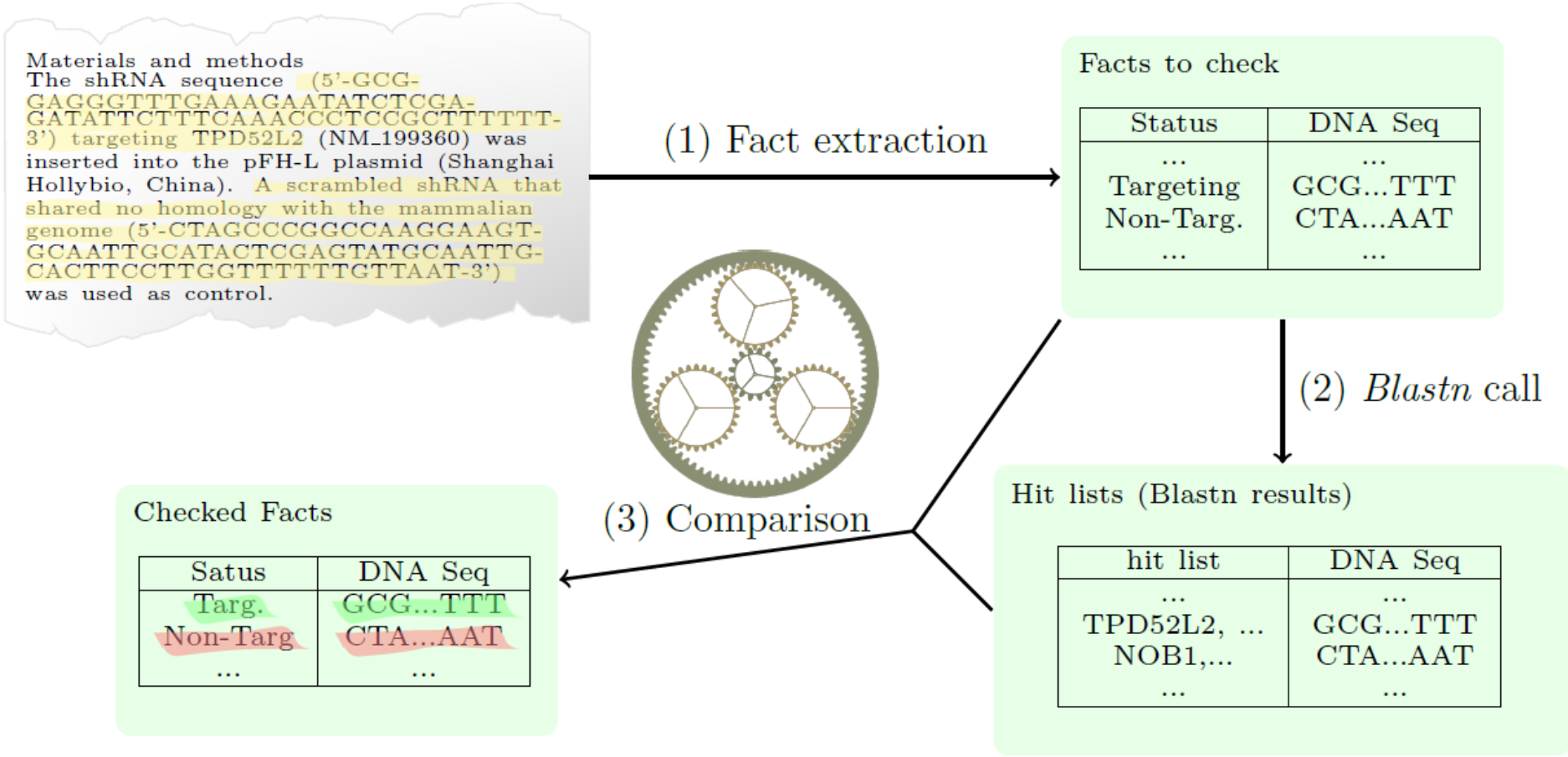
Claimed non-targeting/ negative control

5′-CTAGCCCGGCCAAGGAAGTGCAATTGCATACTCGAGTATGCAATTGCACTTCCTTGGTTTTTTGTTAAT-3′

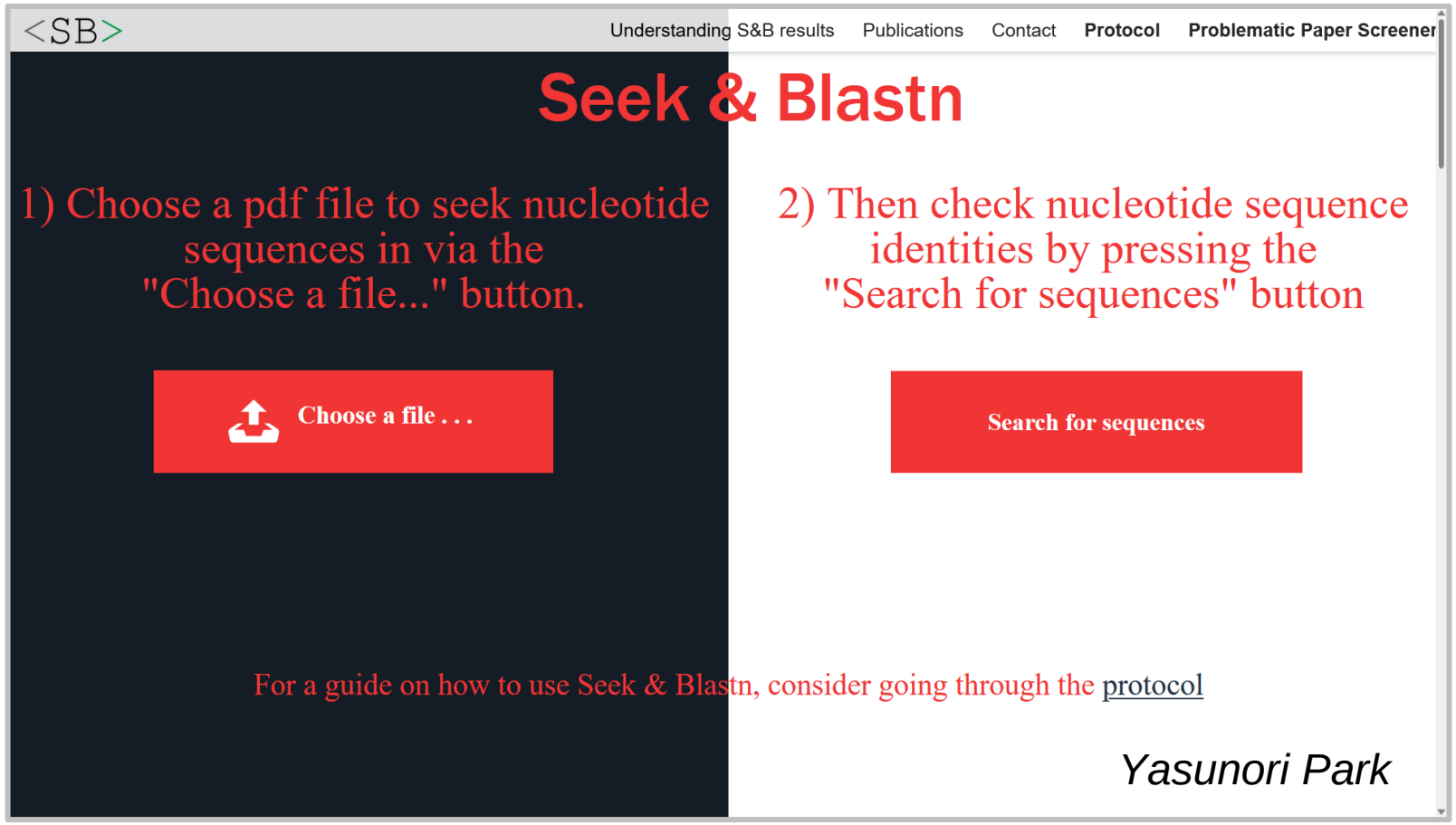
Nucleotide sequences- small but mighty

Feature	Nucleotide sequences?
Verifiable reagents	**Yes**
Multiple reagents/ paper	**Yes**
Different error types	**Yes**
Widely described in the literature	**Yes**
Designed to be re-used	**Yes**
Verification expertise widely available	**Yes**

Seek & Blastn:
Fact-checking nucleotide sequence identities



Labbé et al. (2019) PLoS One


<SB>
Understanding S&B results
Publications
Contact
Protocol
Problematic Paper Screener
Seek & Blastn
1) Choose a pdf file to seek nucleotide sequences in via the "Choose a file..." button.
Choose a file . . .
2) Then check nucleotide sequence identities by pressing the "Search for sequences" button
Search for sequences
For a guide on how to use Seek & Blastn, consider going through the protocol
Yasunori Park

OPEN ACCESS

protocols.io

VERSION 1

JAN 19, 2021

WORKS FOR ME 1

Seek & Blastn Standard Operating Procedure V.1

In 1 collection

DOI
dx.doi.org/10.17504/protocols.io.bjhpkj5n

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COMMENTS 0

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IJC INTERNATIONAL JOURNAL of CANCER | UICC

RESEARCH ARTICLE

Innovative Tools and Methods

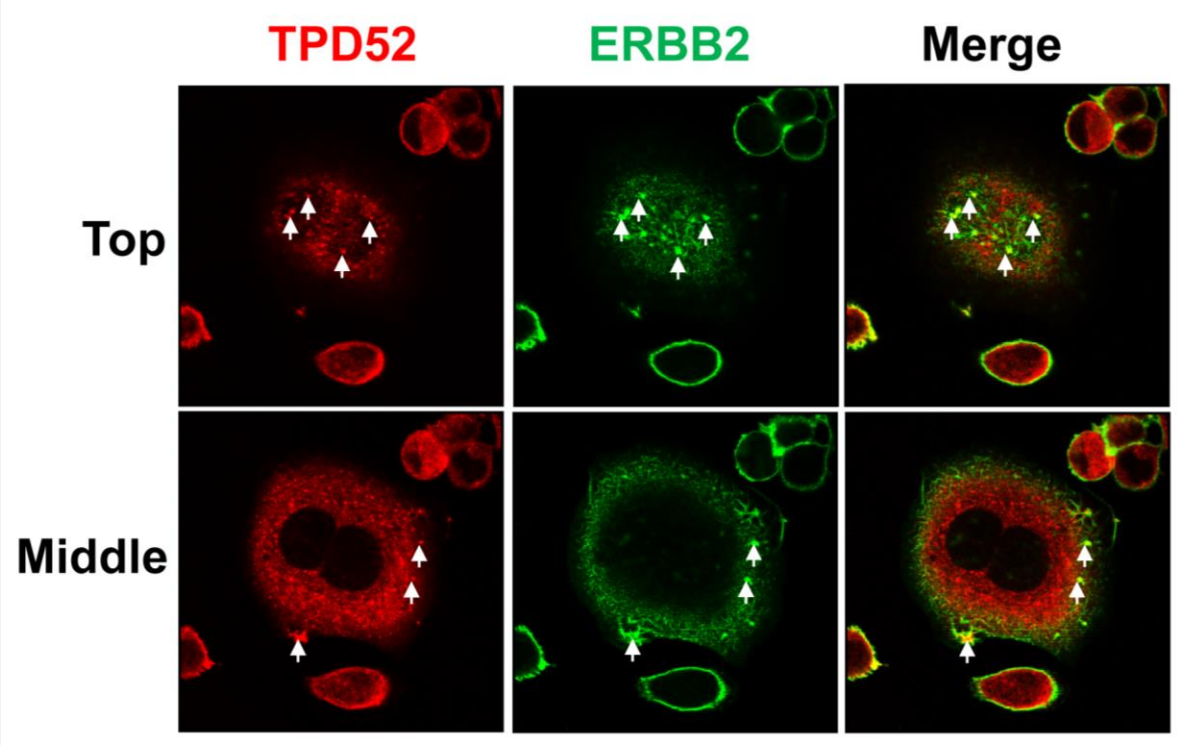
Misspellings or "miscellings"—Non-verifiable and unknown cell lines in cancer research publications

Danielle J. Oste, Pranujan Pathmendra, Reese A. K. Richardson, Gracen Johnson, Yida Ao, Maya D. Arya, Naomi R. Enochs, Muhammed Hussein, Jinghan Kang, Aaron Lee, Jonathan J. Danon, Guillaume Cabanac, Cyril Labbé, Amanda Capes Davis, Thomas Stoeger, Jennifer A. Byrne

https://www.science.org/content/article/hundreds-cancer-papers-mention-cell-lines-don-t-seem-exist

Cell lines in biomedical research

- Continuously growing cell models
- Ingredients that generate experimental results



Example:
SK-BR-3 - breast cancer cells

Roslan et al. (2014) Mol Carcinogenesis

Cell lines- small but mighty

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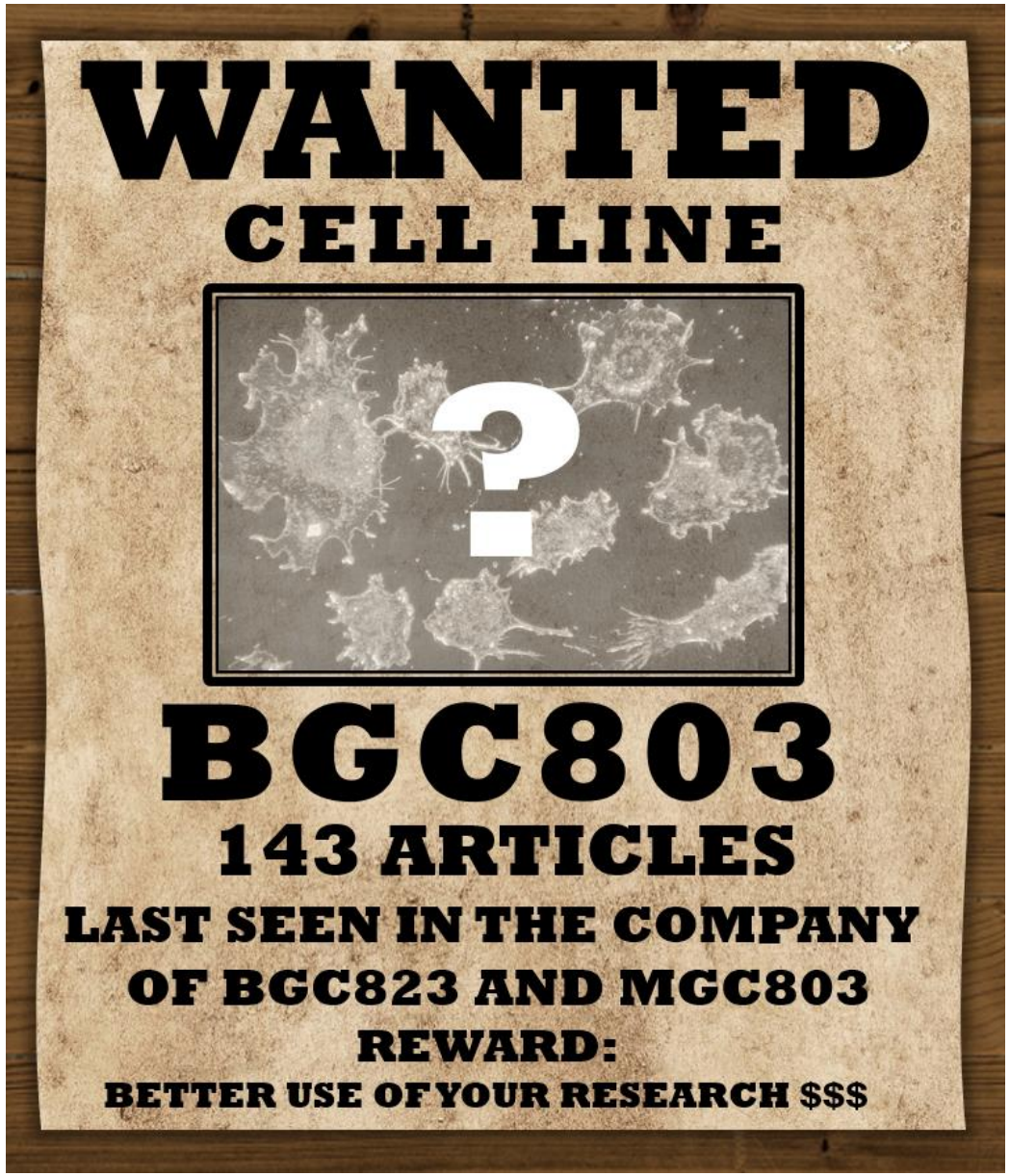
Verification expertise widely available	**Yes**

Non-verifiable human cell lines

Opportunities to verify human cell lines	
• Indexed in cell line encyclopedia?	✗
• Establishment described in any (early) publications?	✗
• Indexed by repositories/ suppliers as claimed?	✗
• Genetic fingerprint in publications/ public domain as claimed?	✗

Oste et al. (2024) Int J Cancer



Reese A. K. Richardson

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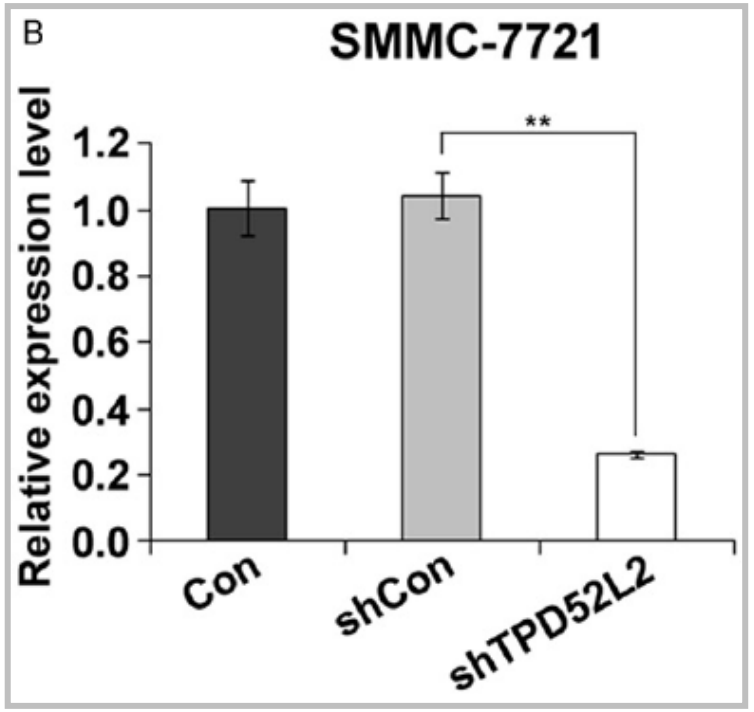

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Predicted to target *TPD52L2*

TPD52L2 *TPD52L2*

5′-**GCGGAGGGTTTGAAAGAATAT**CTCGAG**ATATTCTTTCAAACCCTCCGC**TTTTTT-3′

Implausible **reagent errors** producing **impossible results**

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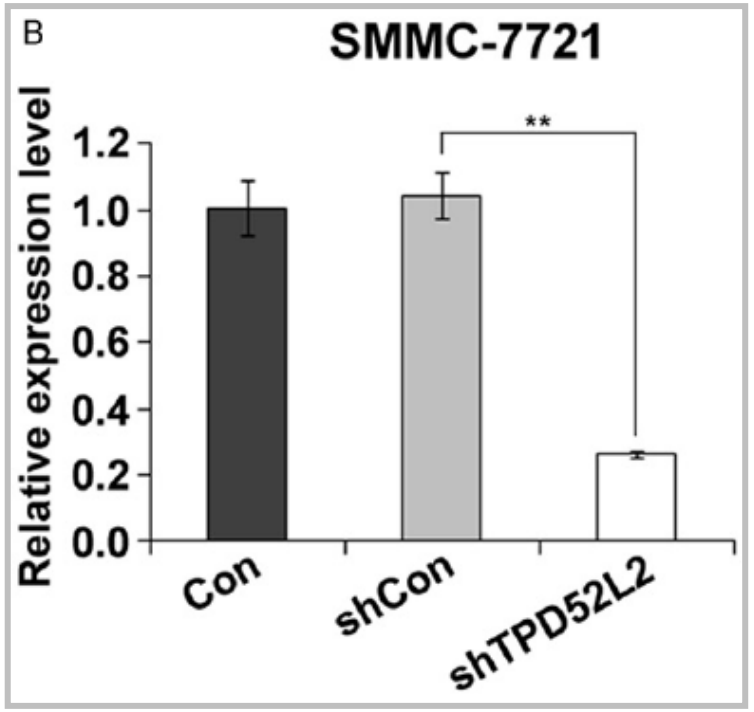

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