Literature Review

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Todo list

Table 1: Causes and Impacts of the Reproducibility Crisis

Cause	Impact on Scientific Knowledge	Impact on Public Trust	Impact on Resource Allocation
Publication Bias	Overemphasis on positive/novel results; neglect of negative/replication studies	Distorted view of scientific progress	Wasted resources on pursuing already refuted or unlikely avenues of research
Questionable Research Practices	Skewed results; difficulty in replication; inflated effect sizes	Erosion of confidence in research findings	Inefficient use of research funding and effort
Inadequate Statistical Methods	Erroneous conclusions; challenges in verifying findings	Doubt about the validity of statistical claims in science	Misinterpretation of data leading to flawed research directions
Lack of Data Sharing	Inability to verify results; hindrance to replication attempts	Reduced transparency and accountability	Duplication of research efforts due to inaccessible data
Pressure to Publish	Prioritization of quantity over quality; rushed and less rigorous research	Perception of science driven by careerism rather than truth-seeking	Funding and career advancement based on potentially unreliable findings
Insufficient Reporting Standards	Difficulty in understanding and replicating methodologies	Lack of transparency in the research process	Increased time and effort required for replication attempts, often leading to failure
Complexity of Biological Systems (Life Sciences)	Inherent variability making consistent results challenging	–	–
Scientific Misconduct (Falsification)	Compromised integrity of the scientific record; spread of false information	Severe damage to the credibility of science	Resources wasted on research based on fabricated data
Misunderstanding of P-Values	Misinterpretation of statistical significance; inflated claims of findings	Public confusion about the reliability of statistical evidence	Funding and policy decisions potentially based on statistically insignificant or misinterpreted results

Table 2: Summary of Reviewed Articles

Article Title	**DOI**	**Source**	**Publication Date**	**Main Topics**	**Key Takeaways**	**Specific Examples/Use Cases**	**Key Challenges/Opportunities**	**Overall Perspective**
An overview of the NFAIS conference: Blockchain for scholarly publishing	10.3233/ISU-180015	Information Services and Use	2018	NFAIS conference overview; impact on researcher workflows; peer review, IP, research output	Blockchain promises structured, decentralized, secure approach; initiatives exploring use across research lifecycle	ARTiFACTS, Po-et, Knowbella Tech, decentralized citation ledgers	Opportunity for horizontal discovery, trust & transparency; need for awareness & adoption	Significant long-term potential, short-term expectations might be inflated
Blockchain and scholarly publishing could be best friends	10.3233/ISU-180016	Information Services & Use	2018	Decentralization, unbundling, creator empowerment; dominance of internet platforms; researcher recognition	Blockchain can redistribute power in content discovery, foster trust; focus on creator needs crucial	Steem, BAT, LBRY	Content accessibility & monetization challenges; opportunity for efficient economic ecosystem; shift in revenue models needed	Potential for efficient ecosystem, but new revenue models might be required
Making the unconventional conventional: How blockchain contributes to reshaping scholarly communications	10.3233/ISU-190053	Information Services & Use	2019	Advancing Garfield's vision; blockchain for platforms, open science, recog-	Blockchain can help researchers get credit for all work; ARTiFACTS secures	ARTiFACTS platform	Opportunity to make pre-published research accessible, enhance careers	Blockchain, via platforms like ARTiFACTS, can realize comprehensive researcher

Table 3: Recurring Themes and Blockchain Applications in Scholarly Communication

Recurring Theme	**Corresponding Blockchain Applications (Examples)**	**Potential Benefits**	**Key Challenges**
Peer Review Enhancement	Ants-Review (incentivized reviews), Open-Pub (transparent & private system)	Increased efficiency, transparency, quality, and incentivization of reviewers	Ensuring anonymity, preventing bias, achieving broad adoption among researchers
Open Science and Data Sharing	QPTDat project (data certification), Open Lab (sharing experiment methods & data)	Improved data integrity, provenance, accessibility, and reproducibility of research	Balancing data privacy with openness, ensuring data quality and curation
Author Recognition and Attribution	ARTiFACTS platform (provenance & attribution), Token system (validated record of contributions)	More comprehensive and validated recognition for diverse academic work, increased control over intellectual property	Establishing meaningful value for non-monetary tokens, ensuring broad acceptance of new recognition metrics
Decentralization and Transparency	Open-Pub (decentralized publication system), Decentralized citation ledgers (NFAIS conference)	Reduced reliance on intermediaries, increased openness and accountability in publishing processes	Overcoming resistance from established institutions, ensuring effective governance of decentralized systems
Emerging Applications	NFTs for digital assets, "Bitcoin for science" (concept for research funding)	New economic models for scholarly outputs, alternative funding mechanisms for research	Addressing environmental concerns of some blockchains, ensuring practical and scalable solutions

References