Commentary

Publishing Test-Ready Hypotheses When Experiments Are Out of Reach

Maxwel Adriano Abegg[1]

1. Institute of Exact Sciences and Technology (ICET), Graduate Program in Science, Technology and Health (PPGCTS), Federal University of Amazonas (UFAM), Brazil

Many promising research ideas never reach experimentation, especially where laboratories, collaborators, or funding are scarce. Written from the practical experience of a researcher working under resource constraints, this article systematizes existing practices and emerging proposals for publishing structured *test-ready hypotheses*: single, falsifiable propositions accompanied by a concrete experimental design that third parties could execute. A central distinction is drawn between speculative conjecture and grounded hypotheses that meet explicit quality criteria and are, in principle, ready for empirical testing; the discussion is delimited to hypothesis-driven experimental and observational sciences. Comparing existing formats—Registered Reports, modular-publication platforms, and dedicated hypothesis sections in journals—the article outlines a pathway that combines preprints (for priority and feedback) with defensive publication and open licensing as alternatives to patent-based strategies. It also examines equity implications in low- and middle-income countries (LMICs), including APC barriers, reputational biases, and the exclusion of non-invited authors from opinion and hypothesis sections in mid-to-high-impact journals, and considers the transparent use of generative AI as a practical equalizing instrument. Well-selected hypotheses can accelerate evidence generation, register precedence, and offer a credible path of contribution for resource-limited researchers. The goal is to foster broader discussion—among journals, editorial boards, funding agencies, and evaluation committees, across open-access, subscription-based, and hybrid models—about how structured hypothesis contributions can be better recognized and assessed.

Corresponding author: Maxwel Adriano Abegg, maxwel.abegg@ufam.edu.br

 doi.org/10.32388/C2YEE6.3

Introduction

In several fields, valuable ideas often stall before experimentation. Metascience has shown that, when researchers' careers depend heavily on publishing "positive" results, the system favors studies with low statistical power and selective reporting, distorting the body of evidence available in the literature [1][2][3]. This diagnosis contrasts with the ideal conception of science as a cumulative process in which each study —including negative or partial results—should serve as a brick for building collective knowledge [4]. In practice, editorial conventions continue to assign almost all credit to the "complete" empirical article with positive results, reinforcing the same distortion metascience has been describing.

This dynamic creates an asymmetry: researchers with high conceptual capacity but limited resources—a common scenario in LMICs and smaller institutions—have difficulty converting theoretical work into citable publications. Preprints and open-science tools facilitate the circulation of ideas [5][6][7][8], but the dominant model still subordinates hypotheses to empirical articles rather than recognizing them as autonomous intellectual products.

The problem is compounded by the editorial practices of subscription-based and mid-to-high-impact journals, where hypothesis articles, opinion pieces, and perspective contributions are frequently reserved for invited authors. While understandable as a curation mechanism, this convention can deepen the asymmetry: researchers already well-established and well-connected gain additional venues for idea dissemination, whereas those outside established networks face greater difficulty accessing them.

Peer-reviewed publication—through any workable channel—is decisive for ideas that would otherwise remain dormant, determining whether a concept is lost in obscurity or evolves into a testable program. Scientific contribution transcends laboratory management: a researcher proficient in problem definition and hypothesis formulation can, in many cases, contribute more by generating clear, falsifiable ideas than by managing day-to-day operations, provided these ideas meet rigorous standards and are made available for others to test. This article is offered in a spirit of opening and organizing a conversation rather than settling it. It is a hypothesis/opinion piece with no primary data, and it should not be interpreted as empirical evidence.

The publication of pre-empirical ideas is not itself a novelty; several platforms and initiatives already support this practice in various forms. What is arguably less developed is a systematic discussion of the quality standards, editorial workflows, equity considerations, and institutional recognition mechanisms that could help such contributions achieve their full potential.

In light of this, the article systematizes existing practices and emerging proposals for a structured editorial pathway for test-ready hypotheses, positioning this format upstream from Registered Reports [9]. Whereas a Registered Report commits a specific team to collecting data along a reviewed protocol, a test-ready hypothesis contribution makes the operationalized hypothesis itself the unit of scholarly credit, decoupled from the commitment of any particular team to execute it. The framework seems most directly applicable to disciplines in which hypotheses can be operationalized through empirical protocols—experimental, observational, or computational—yielding outcomes interpretable against pre-specified falsification criteria: much of the natural sciences, biomedical research, and quantitative social sciences. Other disciplines have their own traditions for advancing theoretical contributions, and the present discussion does not claim applicability to those.

What Should Be Publishable Without New Data?

An idea-centered article (without new data) should not be a promotional document, but rather a structured contribution. Drawing on the philosophical tradition of falsificationism [10] and research programs [11], a test-ready hypothesis can be understood as a contribution that satisfies the Popperian requirement of specifying conditions under which it could be refuted, while also being embedded within a broader research program that lends it theoretical coherence. To this end, it would be expected to contain: (1) the clear specification of a problem or gap; (2) a plausible mechanism or rationale, anchored in the literature; (3) explicit, testable predictions, with defined falsification criteria; (4) one or more viable test designs executable by third parties; (5) a brief assessment of risks and ethical considerations, including dual-use potential; (6) an explicit open license (such as CC BY), with time-stamped registration guaranteed by a DOI; and (7) a realistic assessment of novelty and translational plausibility, detailing how the search for similar work was carried out (whether manually or AI-assisted) [12][13][14]. Authors should also include a concise “reasons why this might be wrong” subsection listing plausible modes of failure, boundary conditions, and key assumptions. The abstract should include a brief statement of the state of evidence (for example: “Hypothesis/Opinion; no primary data; proposed test design”) to orient the reader.

These elements are not unique to idea-centered articles—they arguably represent good practice for the upstream phase of any research cycle [12][13][14]. The specific contribution of the test-ready hypothesis format lies in recognizing that this upstream phase can itself constitute a publishable, citable scholarly output when the author is unable to proceed to empirical testing. The pathway is clearly inadequate when: (a) immediate proprietary protection is essential and feasible; (b) high dual-use risks cannot be

mitigated through non-enabling disclosure; or (c) the proposal lacks specificity and falsifiable predictions. As a concrete ethical/dual-use illustration for the present article: no primary data or materials are presented; risks include premature clinical extrapolation and dual-use misuse (e.g., exacerbating antimicrobial resistance), mitigated by (i) the explicit "hypothesis" label and non-recommendation language; (ii) omission of detailed enabling protocols or materials; (iii) declaration of clear limits and plausible modes of failure; and (iv) alignment with applicable biosafety and regulatory norms.

Assessment may prioritize internal coherence, evidential anchoring, and testability over speculative impact. A plausible, clearly refutable hypothesis—even one addressing a modest gap—can be more valuable than a grandiose conjecture that is practically untestable, and at times more useful for the cumulative advancement of science than fragile or poorly contextualized empirical reports. By requiring authors to make hypotheses, predictions, and failure conditions explicit before data collection, this format helps separate genuinely a priori reasoning from practices such as HARKing (Hypothesizing After the Results are Known) and "satisficing" (stopping at the first plausible narrative) in hypothesis generation [15][16].

Reducing Friction for Testable Ideas

The open-access movement has reduced barriers to reading results; the challenge now is to reduce friction for access to testable ideas—to establish legitimate, indexable channels through which qualified teams can discover, credit, and test ideas that their originators cannot execute.

Preprints with DOIs already play a vital role in this ecosystem, concentrating attention and feedback in a citable venue and avoiding dispersion through personal websites or poorly indexed repositories. Evidence indicates that preprinted articles receive more attention and that their DOIs enhance tracking and subsequent publication [7][8]; altmetrics offer complementary indicators of engagement [5][6]. However, most preprints still adhere to the full-article format. An editorial pathway explicitly labeled as idea-centered would be a natural extension: for authors, it legitimizes the transformation of a mature hypothesis into a citable object; for readers and potential testers, it signals a conceptual sketch ready for validation, not a completed study. Large journals could explicitly include such formats in their scopes, with review criteria that emphasize plausibility, falsifiability, and implementability.

This pathway strategically uses preprints as a Stage 0 to outline the hypothesis before peer review. An implementing team can then adopt a published test-ready hypothesis to develop a Stage 1 Registered Report—the format that submits theory and methods to peer review before data collection, with the manuscript accepted for publication regardless of the final result [9], thereby correcting incentives and mitigating selective reporting [1]. Such contributions can feed preregistered protocols and global themes, functioning as conceptual incubators. Complementary open-science artifacts—dated research notes or preregistered protocols—can host methodological sketches, linking to the idea's DOI without exaggerating its evidential status. The final challenge is procedural: journals need clear triage criteria; authors need realistic expectations. Referentially, this flow can be seen as the cultivation of "forests of hypotheses" [17], articulating multiple research possibilities from a common conceptual core. The overall workflow is summarized in Figure 1.

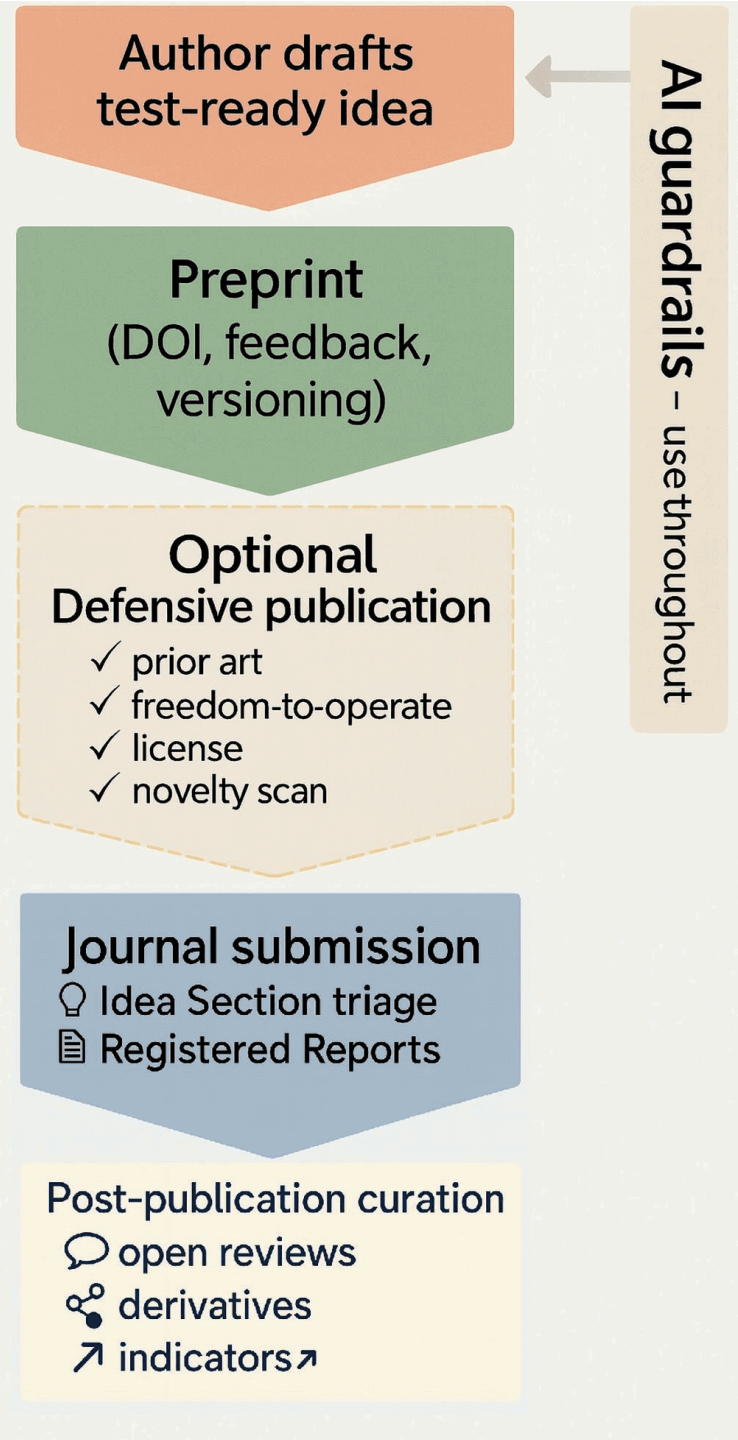

Figure 1. Open-idea workflow. Draft → Preprint (DOI, feedback, versioning) → [Optional] Defensive publication (prior art; freedom-to-operate; license; novelty scan) → Journal submission (Idea Section triage; Registered Reports) → Post-publication curation

(open reviews, derivatives, indicators). AI guardrails apply throughout the workflow.

Public Domain vs. Proprietary: Defensive Publication as a Civic Option

Patents remain strategically important, but many innovators are not in a position to file or legally defend them. Defensive publication (also called “defensive disclosure”) offers an ethical and practical alternative: disclosing sufficient technical detail for an idea to become part of the prior art, preserving freedom to operate and discouraging exclusive appropriation. Historically, this role has been played by technical bulletins and, more recently, by digital repositories.

Unlike a patent, defensive publication does not generate royalties; its value lies in registering precedence, enabling broad implementation, and aligning with a public-interest ethos when patenting is unfeasible. By establishing the idea as prior art, it preserves freedom to operate—the possibility of using the concept without infringing future third-party patents—and, although it does not nullify rights already granted, it tends to prevent later blocking.

Why Patent Primacy Can Stall Ideas Under Constraint

The patenting process demands significant time and resources. For groups with limited funding, maintaining secrecy while “waiting to patent” suppresses collaboration and interrupts research momentum. Even when granted, patents may expire or remain underexplored without resources for development and legal defense. In Brazil, for example, initial filing costs may be manageable, but the technical data normally required for a robust definitive filing—especially for complex devices—often demand experiments and prototypes that are financially inaccessible. Combining an open idea-centered article with defensive publication presents a strategic alternative: it can move promising concepts into capable hands more quickly, preserving attribution to the original author and keeping future implementations in an open regime. A suggested checklist is provided in Table 1.

Step	Action	Purpose
1	Descriptive title with DOI and date	Priority timestamp
2	Clear structure: problem → technical principle → explicit predictions → viable tests for third parties	Reproducibility and testability
3	Main variants and parameter ranges defining the scope	Prior-art breadth
4	Limitations, “reasons why this might be wrong,” and concise note on ethics and dual use	Transparency and risk mitigation
5	Open license (e.g., CC BY) and non-recommendation disclaimer	Maximize reuse; prevent appropriation

Table 1. Suggested defensive publication checklist.

APC Inequalities, Reputational Control, and Gaps in Discovery

Article Processing Charges (APCs) and academic prestige hierarchies perpetuate global inequalities. Although waivers for LMICs exist, access is unequal and opaque [18][19]. Even when APCs are covered, reputational biases favor incremental work from established centers, reflecting the concentration of funding and output in high-income countries [4][20]. Discovery is another barrier: ideas disseminated on platforms poorly indexed by researchers with limited infrastructure become invisible to potential implementers. Theoretical models of science show that highly competitive environments select for methods that maximize apparent productivity rather than veracity [3][21][22][23], marginalizing high-risk conceptual work originating in regions with little infrastructure.

As a practical response, combining preprints (as an initial DOI-bearing deposit with cost-free feedback) with the acceptance, by reputable journals, of rigorously reviewed hypothesis articles could ensure indexing and discovery. Reforms such as the Leiden Manifesto and the Hong Kong Principles already advocate more responsible assessment [20][24]; a well-structured editorial pathway can complement them by recognizing conceptual work as a legitimate contribution. To avoid reproducing inequalities, such pathways should integrate transparent APC waivers, incentives for submissions from underrepresented regions, and criteria that emphasize rigor and testability [4][20][24]. Crowdsourcing models suggest that

well-defined ideas can focus distributed testing communities [25], but require recognition structures that reward both originators and implementers. Effectiveness should be monitored using simple indicators: the proportion of accepted articles from LMICs, citations in empirical work, progression to Registered Reports, and possibly the interval until the first test. Without such monitoring, equity discourse remains rhetorical. On the access side, progressive fee policies—tiered APCs based on national income levels, solidarity funds supported by publishers, and institutional waivers—could reduce barriers for LMIC-based researchers [18][19] and could be extended or adapted for hypothesis-specific tracks.

Generative AI as a Tool for Democratization (with Safety Barriers)

For isolated or resource-limited researchers, formulating and structuring robust hypotheses is a significant additional challenge. Large language models (LLMs) emerge as tools with considerable equalizing potential: they can substantially reduce the effort needed to transform preliminary intuitions into testable hypotheses, assisting with literature organization, mapping analogies across fields, exploring conceptual variants, structuring outlines, and prioritizing ideas with greater testability. No epistemological claims about these models are intended here; their value for the present discussion lies solely in their demonstrated utility for reducing conceptual labor, particularly for researchers lacking collaborative support networks.

The use of LLMs, however, introduces risks such as fabrication of references and dilution of responsibility [26][27]. Editorial guidelines are clear: AI cannot be an author, its use must be declared, and humans retain full responsibility for the content [28][29][30]. Within these limits, considering LLM suggestions for methodological alternatives can be valid, provided their viability is critically assessed. Four safeguards appear fundamental: (1) declaring the tools and versions used; (2) verifying all claims and references in primary sources; (3) keeping human authorship explicit; and (4) never using AI to fill evidentiary gaps. Verification of AI-assisted novelty scans could involve requiring authors to submit their search queries and model outputs as supplementary material. Journals could also develop standardized AI-assisted novelty-check protocols using freely accessible tools (e.g., Semantic Scholar API, open-weight models), reducing dependence on proprietary platforms. The digital divide in AI tool availability is a legitimate concern: while commercial LLMs offer powerful capabilities, open-weight models and free-tier options can partially bridge the gap, and scientific societies could support equity by providing institutional access for LMIC-based researchers. With these safeguards, generative AI can effectively contribute to democratizing systematic scientific exploration [27][31].

Role Specialization: The Conceptual Scientist Assisted by AI

Contemporary science already recognizes specialized roles—theoretical, computational, methodological [4]. Even so, hypothesis generation often remains implicit, tied to highly resourced laboratories, and researchers with conceptual aptitude but without access to such resources see their contributions undervalued. Can a "conceptual scientist assisted by AI" be considered a scientist in the conventional sense? Under the approach discussed here, the answer is affirmative: if the outcome is a testable hypothesis with explicit predictions and falsification criteria, anchored in the literature and subjected to peer review, this is a legitimate specialization. Idea-centered publication, with transparent use of AI as a drafting and conceptual exploration tool, could formalize this role [12]. The goal is not to create a class of "armchair" thinkers but to offer a legitimate pathway for periods of infrastructural scarcity or isolation—complementary, not substitutive, to empirical research.

Incentives and Adoption: Why Would a Laboratory Test an Externally Originating Idea?

Because established groups prioritize internal agendas, external adoption requires low friction and clear benefits. Well-structured hypotheses offer savings in conceptual effort, diversify the portfolio, and support funding proposals, serving as focal points for collaboration—and, once public, for crowdsourced testing [25]. Two mechanisms seem essential: clear quality signals, provided by journals with dedicated "Ideas" or "Hypotheses" sections and rigorous triage; and assured credit, guaranteed by mandatory citation of the original hypothesis DOI and explicit recognition of testers, following a logic compatible with Registered Reports.

Direct incentives may be needed to catalyze adoption. Funding agencies can create specific lines for testing published hypotheses, and scientific societies can formally recognize these contributions. Realistically, many hypotheses will not be tested, and among those that are, a significant share may yield negative results; the value of the pathway lies in creating a structured route so that, when interests and capacities align, collaboration becomes feasible, fair, and productive. Incentive structures should be scrutinized carefully: if hypothesis publications count toward academic evaluation metrics, a rational actor might prioritize generating numerous speculative hypotheses over painstaking empirical work. To mitigate this, evaluation frameworks could weight hypothesis articles differently from empirical contributions, recognizing them as complementary rather than equivalent outputs, and funding agencies

could require that applicants who publish hypothesis articles demonstrate engagement with subsequent empirical follow-up (through collaborations or advisory roles). The goal is to reward genuinely useful ideas without creating a parallel track that devalues empirical labor.

Collaboration Pathways: From Hypothesis to Joint Execution

To facilitate matchmaking between hypothesis originators and potential executors, journals or platforms (such as ResearchEquals or dedicated hypothesis registries) could provide opt-in directories where originators signal availability for collaboration and specify preferred engagement levels. Funding agencies could incentivize such collaborations through dedicated "hypothesis-testing" grant lines rewarding partnerships between LMIC-based originators and well-resourced executors. Three additional layers of institutional change are worth discussing. First, funding agencies could recognize test-ready hypothesis DOIs as legitimate research outputs in grant applications and progress reports, paralleling the growing recognition of datasets, software, and preregistrations. Second, institutional evaluation frameworks, or tenure-and-promotion committees—could develop, as stated above, explicit criteria for assessing hypothesis contributions, weighted as complementary to empirical work. Third, a cultural shift may be needed: adopting, testing, and citing externally originated hypotheses should be normalized and rewarded, analogously to how replication studies are increasingly valued. Unless at least some of these levels align, hypothesis articles risk becoming orphaned contributions.

Risks: Literature Inflation, Misinterpretation, and Reputational Cascades

Three distinct risks are worth highlighting. The first is literature inflation and noise: reducing friction for the publication of ideas could overload an already saturated review system. Reviewer availability is a growing concern [32][33], and generative AI tools may further intensify submission flow. Acceptance criteria for hypothesis articles should therefore be exceptionally selective. Concrete safeguards may include: (i) annual quotas for hypothesis-only submissions (e.g., no more than 5-10% of total published articles), ensuring the primary portfolio remains empirically anchored; (ii) a structured desk-rejection protocol filtering submissions lacking core elements [12]; and (iii) a "sunset clause"—hypothesis articles not linked to at least one registered empirical protocol within a defined period (e.g., five years) would receive an editorial annotation flagging dormant status, maintaining the signal-to-noise ratio. To

incentivize reviewer participation, journals could offer recognition through acknowledgment in annual reviewer lists, APC discounts, micro-credentialing (e.g., ORCID-linked peer-review badges), and priority access to submit their own hypothesis articles. Hypothesis submissions, being generally shorter and more focused than full empirical articles, may also require less reviewer time, partially offsetting the additional demand.

The second risk is misinterpretation of untested ideas as consolidated evidence—a danger aggravated when hypothesis articles are amplified on social media as if they were empirical findings. The labeling, state-of-evidence, and communication safeguards introduced earlier serve a central epistemic function here, distinguishing conjecture from empirical fact in both the published record and its downstream diffusion.

The third risk concerns reputational cascades and the concentration of recognition in already-prestigious actors. A new article category can amplify academic inequalities, such as the Matthew Effect, through which established researchers and institutions accumulate disproportionate credit [34]. This risk would materialize if journals prioritize manuscripts from established authors to the detriment of rigorous but less visible contributions [4][20], or if well-resourced groups engage in strategic hypothesis flooding to occupy the emerging space. To counteract these dynamics, structural safeguards may be considered: per-author or per-group annual caps on hypothesis-only submissions (e.g., a maximum of two per research group per year per journal); editorial weighting that prioritizes proposals from authors who can credibly demonstrate resource constraints (as a factor in triage, not an absolute filter); and blind review of hypothesis articles, masking institutional affiliation, to reduce prestige bias.

With explicit equity policies, however, the effects can be positive. By turning private hypotheses into citable public goods, their silent appropriation is made more difficult. The hypothesis article guarantees a lasting record of precedence, even if greater prestige falls on subsequent empirical research. For this purpose, editors should monitor authorship patterns and actively seek diverse contributions [20][24]. Funding lines that reserve resources to test hypotheses from underrepresented regions can close the cycle, channeling knowledge spillovers back to originating authors and their regions.

Historical and Contemporary Examples

The publication of testable hypotheses as autonomous contributions has its historical value attested by examples ranging from broad theories—such as the endosymbiotic theory [35] and the operon model [36]

—to more focused proposals such as Strachan's on hygiene and allergies [37] and Smith's "macrophage theory of depression" [38], both of which generated robust lines of investigation [39][40]. In contemporary science, a more structured workflow is emerging, though it remains difficult to identify recent cases that clearly close the full arc from hypothesis publication to adoption and testing by independent groups within a short timeframe. The work of Kass, Friedman, and collaborators serves as illustration of the upstream portion of this flow: a preprint outlining the idea and test plans for biodiversity monitoring [41] was followed by peer-reviewed publications that consolidated the conceptual proposal [42] [43]. Other recent examples, such as AI models that generate hypotheses (e.g., C2S-Scale), also follow this logic of formalization and availability for external validation [27][44]. I have deliberately structured prototypes—such as a microbubble system for infectious therapy and a platform for in situ cultivation [45] [46]—trying to follow this test-ready hypothesis format. Examples are therefore not lacking; the challenge is to systematize and make explicit the quality standards and editorial infrastructure that channel and formalize these contributions into an accessible and equitable pathway.

Relation to Existing Publication Formats

The publication of hypotheses as discrete scholarly contributions is not unprecedented. Several platforms already support the disaggregation of the traditional research article into modular components: ResearchEquals (researchequals.com) allows publication of individual research steps—hypotheses, methods, analyses—as independent, citable modules [47]; Octopus (octopus.ac) similarly structures scientific output into linked stages from problems to hypotheses to methods to results [48]; microPublication Biology publishes brief, peer-reviewed findings and observations, though its current scope does not explicitly include standalone hypothesis articles—illustrating that even within the micropublication ecosystem the space for pre-empirical ideas remains unevenly developed. These initiatives share a commitment to recognizing contributions beyond the monolithic empirical article. The test-ready hypothesis pathway discussed here differs in emphasis: it foregrounds the integration of equity-focused editorial policies and defensive publication strategies, along with the transparent, optional use of AI-assisted tools, into a discussion framework for hypothesis-driven experimental and observational sciences. The pathway is therefore complementary to these existing infrastructures—an attempt to systematize scattered practices and ideas that could be adopted or adapted by modular platforms, traditional journals, or new initiatives. Table 2 offers a structural comparison.

Format	Data required	Peer review	Protocol specified	Open license	Priority registered	Key distinction
Registered Report	No	Yes	Yes	Varies	At acceptance	Commits to data collection
Theoretical preprint	No	Usually no	Rarely	Varies	At posting	Typically lacks operationalized test design
ResearchEquals module	No	Community	Optional	Yes (CC-BY)	At publication	Modular; any research step; less prescriptive on rigor
Octopus hypothesis stage	No	Community	Expected later	Yes (CC-BY)	At publication	Linked to subsequent stages; platform-specific
microPublication Biology	Yes (minimal)	Yes	N/A	Yes	At publication	Focused on small empirical findings, not standalone hypotheses
Review/Opinion (traditional)	No	Yes	Rarely	Varies	At publication	Broader scope; often invited; no testability requirement
Grant proposal	No	Yes (panel)	Yes	No (confidential)	Not publicly	Not publicly citable; restricted access
Test-ready hypothesis (discussed here)	**No**	**Yes**	**Yes**	**Recommended**	**At preprint + publication**	**Integrates quality criteria, equity focus, and defensive publication**

Table 2. Structural comparison of hypothesis-related publication formats.

Policy Suggestions for Journals and Peer-Review Venues

Drawing on the considerations above, journals and peer-review venues could:

i. recognize test-ready hypothesis submissions as a distinct contribution type when in-house or collaborative experimentation is not viable, evaluated using criteria such as those outlined in Box 1;
ii. recognize idea DOIs, preregistrations, and defensive publications as legitimate, citable research outputs—including by offering an optional deposit pathway to prior-art repositories—and invite funding agencies and career-progression bodies to do the same;
iii. adopt differentiated, fit-for-purpose quality assessment instruments, avoiding overinterpretation of altmetrics as direct substitutes for scientific quality [5][6][7][8][20][24];
iv. reduce access barriers through progressive fee policies and waivers for authors from LMICs and early-career researchers [18][19];
v. publish AI-use policies in machine-readable format, including automated checks to identify unverifiable claims and citations [28][29][30][49];
vi. broaden editorial scope so that reputable journals—including those using subscription or hybrid models—welcome hypothesis/concept work under rigorous review, with guaranteed retrievability, indexing, and visibility.

#	Criterion	Suggested action if absent
1	Does the manuscript identify a specific, well-defined problem or gap?	Desk-reject
2	Is the rationale anchored in current literature, with adequate citation?	Desk-reject
3	Are predictions explicit and falsifiable?	Desk-reject
4	Is the proposed experimental design detailed enough for independent execution?	Desk-reject
5	Are the constraints preventing the author from testing the hypothesis clearly stated and credible?	Major revision
6	Does the manuscript include a “reasons to be wrong” section?	Major revision
7	Has a novelty scan been conducted and documented?	Major revision
8	Are ethical and dual-use risks assessed?	Major revision
9	If AI is used, is its use declared transparently (tools, versions, tasks)?	Major revision
10	Does the abstract include an evidence-status statement?	Major revision

Box 1. Peer-Review Checklist for Test-Ready Hypothesis Submissions

Suggested editorial workflow. *(1) Author submits to a dedicated “Ideas/Hypotheses” track, including a structured abstract with evidence-status statement. (2) Editor-in-chief or section editor performs desk triage against a checklist such as the one suggested above; submissions not meeting criteria 1-4 are desk-rejected with guidance. (3) Submissions passing triage are sent to two reviewers selected for expertise in the relevant domain and in research methodology. (4) Reviewers evaluate using Box 1, focusing on coherence, testability, and novelty rather than results. (5) Editorial decision follows standard accept/revise/reject logic. (6) Accepted articles are published with a “Hypothesis” label, open license, and link to the preprint DOI. (7) Post-publication, the journal tracks whether empirical follow-up occurs and annotates the article accordingly.*

Conclusion

For scientists working under persistent constraints, there is moral and practical value in formulating and publishing testable hypotheses through structured, transparent workflows. Disseminating a test-ready

concept transforms a private intuition into a public good: it guarantees precedence, allows verification by others, and increases the likelihood of contributing to knowledge. Idea-centered pathways—supported by rigorous editorial filters, ethical safeguards, concrete collaboration mechanisms, multi-level policy alignment, and equity-focused incentives—can convert dormant hypotheses into citable, trackable projects. This article has attempted to systematize the elements of such a conversation; it is offered as a contribution to an ongoing discussion that will ultimately require input from editors, publishers, metascience researchers, funding agencies, and, most importantly, the researchers who navigate these constraints daily. For them, the question is ultimately practical: is it better to devote limited time and resources to formulating testable hypotheses with real transformative potential, or to pursuing experimental work under severe limitations that may yield results of limited scientific increment—or, better still, to do both whenever possible? Devoting effort to this elaboration when direct experimentation is unfeasible constitutes both an act of altruism and a legitimate, necessary path of scientific contribution.

Statements and Declarations

Funding

No specific funding was received for this work.

Potential Competing Interests

The author declares no conflict of interest.

Ethics Statement

Not applicable (no human participants, animals, or proprietary datasets).

Data and Materials Availability

Not applicable. All sources mentioned are publicly accessible.

AI-Assistance Statement

Large language models—used under the author's direction for literature organization, reference searching, drafting assistance, language editing, and consistency checks—included Claude Opus 4.7, GPT-

5.4 Thinking, Gemini 3.1 Pro, Grok 4.20, and DeepSeek V3.2. All conceptual content was verified by the author.

Author Contributions

MAA conceived the viewpoint, integrated literature and community practices, wrote the manuscript with AI assistance for literature organization, drafting, textual connections, and language editing, and edited and approved the final version.

References

1. ^a, ^b*Ioannidis JPA (2005). "Why Most Published Research Findings Are False." PLoS Med. **2**(8):e124. doi:10.1371/journal.pmed.0020124*.
2. ^*Fanelli D (2012). "Negative Results Are Disappearing From Most Disciplines and Countries." Scientometrics. **90**(3):891–904. doi:10.1007/s11192-011-0494-7*.
3. ^a, ^b*Smaldino PE, McElreath R (2016). "The Natural Selection of Bad Science." R Soc Open Sci. **3**(9):160384. doi:10.1098/rsos.160384*.
4. ^a, ^b, ^c, ^d, ^e*Fortunato S, Bergstrom CT, Börner K, et al. (2018). "Science of Science." Science. **359**(6379):eaao0185. doi:10.1126/science.aao0185*.
5. ^a, ^b, ^c*Priem J, Taraborelli D, Groth P, Neylon C (2010). "Altmetrics: A Manifesto." doi:10.5281/zenodo.12684249*.
6. ^a, ^b, ^c*Bornmann L (2015). "Alternative Metrics in Scientometrics." Scientometrics. **103**(3):1123–44. doi:10.1007/s11192-015-1565-y*.
7. ^a, ^b, ^c*Abdill RJ, Blekhman R (2019). "Tracking the Popularity and Outcomes of All BioRxiv Preprints." eLife. **8**:e45133. doi:10.7554/eLife.45133*.
8. ^a, ^b, ^c*Fu DY, Hughey JJ (2019). "Releasing a Preprint Is Associated With More Attention and Citations." eLife. **8**:e52646. doi:10.7554/eLife.52646*.
9. ^a, ^b*Chambers CD (2013). "Registered Reports: A New Publishing Initiative at Cortex." Cortex. **49**(3):609–10. doi:10.1016/j.cortex.2012.12.016*.
10. ^*Popper KR (1959). The Logic of Scientific Discovery. London: Hutchinson.*
11. ^*Lakatos I (1978). The Methodology of Scientific Research Programmes. Cambridge University Press.*

12. ^ a, b, c, d Gasparyan AY, et al. (2019). "Scientific Hypotheses: Writing, Promoting, and Predicting Implications." J Korean Med Sci. **34**(45):e300. doi:10.3346/jkms.2019.34.e300.

13. ^ a, b Chikina M, Pegden W (2022). "The Paradoxical Nature of Easily Improvable Evidence." arXiv. doi:10.48550/arXiv.2205.14016.

14. ^ a, b Buzbas EO, Devezer B, Baumgaertner B (2023). "The Logical Structure of Experiments." R Soc Open Sci. **10**(3):221042. doi:10.1098/rsos.221042.

15. ^ Garst J, et al. (2002). "Satisficing in Hypothesis Generation." Am J Psychol. **115**(4):475–500. doi:10.2307/1423524.

16. ^ Rubin M (2017). "When Does HARKing Hurt?" Rev Gen Psychol. **21**(4):308–20. doi:10.1037/gpr0000128.

17. ^ Rosen J (2016). "Research Protocols: A Forest of Hypotheses." Nature. **536**(7615):239–41. doi:10.1038/nj7615-239a.

18. ^ a, b, c PLOS (2025). "Publication Fee Assistance." PLOS. https://plos.org/fees/.

19. ^ a, b, c BMC/Springer Nature (2025). "APC Waivers and Discounts." BMC/Springer Nature. https://www.biomedcentral.com/getpublished/article-processing-charges/open-access-waiver-fund.

20. ^ a, b, c, d, e, f Hicks D, et al. (2015). "The Leiden Manifesto for Research Metrics." Nature. **520**(7548):429–31. doi:10.1038/520429a.

21. ^ McElreath R, Smaldino PE (2015). "Replication, Communication, and the Population Dynamics of Scientific Discovery." PLoS One. **10**(8):e0136088. doi:10.1371/journal.pone.0136088.

22. ^ Felgenhauer M, Xu F (2021). "The Face Value of Arguments With and Without Manipulation." Int Econ Rev. **62**(1):323–51. doi:10.1111/iere.12479.

23. ^ Stewart AJ, Plotkin JB (2021). "The Natural Selection of Good Science." Nat Hum Behav. **5**(11):1510–18. doi:10.1038/s41562-021-01111-x.

24. ^ a, b, c, d Moher D, et al. (2020). "The Hong Kong Principles for Assessing Researchers." PLoS Biol. **18**(7):e3000737. doi:10.1371/journal.pbio.3000737.

25. ^ a, b Callaghan CW (2019). "A New Paradigm of Knowledge Management: Crowdsourcing as Emergent Research." South Afr Bus Rev. **20**:1–28. doi:10.25159/1998-8125/6041.

26. ^ van Dis EAM, et al. (2023). "ChatGPT: Five Priorities for Research." Nature. **614**(7947):224–26. doi:10.1038/d41586-023-00288-7.

27. ^ a, b, c Cohrs K-H, et al. (2025). "Large Language Models for Causal Hypothesis Generation in Science." Mach Learn Sci Technol. **6**(1):013001. doi:10.1088/2632-2153/ada47f.

28. ^ a, b International Committee of Medical Journal Editors (ICMJE) (2024). "Defining the Role of Authors and Contributors: AI and AI-Assisted Technologies." International Committee of Medical Journal Editors (ICMJE).
29. ^ a, b Committee on Publication Ethics (COPE) (2023). "Authorship and AI Tools: COPE Position Statement." Committee on Publication Ethics (COPE).
30. ^ a, b Thorp HH (2023). "ChatGPT Is Fun, But Not an Author." Science. **379**(6630):313. doi:10.1126/science.adg7879.
31. ^ Sourati J, Evans JA (2023). "Accelerating Science With Human-Aware Artificial Intelligence." Nat Hum Behav. **7**(10):1682–96. doi:10.1038/s41562-023-01648-z.
32. ^ Adam D (2025). "The Peer-Review Crisis." Nature. **644**(8075):24–7. doi:10.1038/d41586-025-02457-2.
33. ^ Huh S (2024). "The Emergence of Generative AI Platforms in 2023." J Educ Eval Health Prof. **21**:9. doi:10.3352/jeehp.2024.21.9.
34. ^ Merton RK (1968). "The Matthew Effect in Science." Science. **159**(3810):56–63. doi:10.1126/science.159.3810.56.
35. ^ Margulis L (1981). Symbiosis in Cell Evolution. San Francisco: W.H. Freeman.
36. ^ Jacob F, Monod J (1961). "Genetic Regulatory Mechanisms in the Synthesis of Proteins." J Mol Biol. **3**(3):318–56. doi:10.1016/S0022-2836(61)80072-7.
37. ^ Strachan DP (1989). "Hay Fever, Hygiene, and Household Size." BMJ. **299**(6710):1259–60. doi:10.1136/bmj.299.6710.1259.
38. ^ Smith RS (1991). "The Macrophage Theory of Depression." Med Hypotheses. **35**(4):298–306. doi:10.1016/0306-9877(91)90272-Z.
39. ^ Perkin MR, Strachan DP (2022). "The Hygiene Hypothesis for Allergy." Front Allergy. **3**:1051368. doi:10.3389/falgy.2022.1051368.
40. ^ Leonard BE (2018). "Inflammation and Depression." Acta Neuropsychiatr. **30**(1):1–16. doi:10.1017/neu.2016.69.
41. ^ Kass JM, et al. (2021). "Idea Paper: Improving Forecasts of Community Composition." EcoEvoRxiv. doi:10.32942/osf.io/mxg6q.
42. ^ Friedman NR (2022). "Idea Paper: An Envelope Model of Ecological Disturbance." Ecol Res. **37**(4):455–60. doi:10.1111/1440-1703.12292.
43. ^ Kass JM, et al. (2022). "Improving Forecasts of Community Composition." Ecol Res. **37**(4):466–70. doi:10.1111/1440-1703.12294.

44. ^Azizi S, et al. (2025). "C2S-Scale 27B: A Foundation Model for Single-Cell Biology." Google DeepMind.

45. ^Abegg MA (2025). "A Perspective on Microbubble Systems for Infectious Microenvironment Restoration." Qeios. doi:10.32388/VLYNRO.2.

46. ^Abegg MA (2025). "ANP-TRAP: A Conceptual Platform for In Situ Microbial Cultivation." Front Nat Prod. **4**: 1617079. doi:10.3389/fntpr.2025.1617079.

47. ^ResearchEquals. "Publish Your Research Step by Step." ResearchEquals. https://www.researchequals.com/.

48. ^Octopus. "A New Way to Publish Your Scientific Work." Octopus. https://www.octopus.ac/.

49. ^Nature Editorial (2023). "Tools Such as ChatGPT Threaten Transparent Science." Nature. **613**(7945):E1–E2. doi:10.1038/d41586-023-00191-1.

Declarations

Funding: No specific funding was received for this work.

Potential competing interests: No potential competing interests to declare.