

# **UPTICK INSIGHT SERIES**

## **10 WAYS DSCIENCE IS POWERING THE NEXT WAVE OF OPEN RESEARCH**

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Ever since the earliest days of scientific inquiry, whether it was Newton sharing his theories with the Royal Society, or the Human Genome Project coordinating efforts across continents, science has always moved forward on new ideas and collective problem-solving.

The problem we have today is that the systems that were built to support research haven't really kept up, and most data ends up trapped in private systems, with publishing taking months to complete, and meaningful access typically reserved for a narrow circle, shutting out those positioned to make real contributions.

Web3 is now making its way into research and data workflows through decentralized science, or dScience as it's now more commonly known, with attention turning from simple dissemination of findings to genuine openness, inclusive participation, and empowering more people to drive discovery.

For any of this to work though, we need infrastructure that's purpose-built for research, with essential components like identity, attribution, data, and governance sitting at the foundation and acting as core elements from the start. This is exactly the approach Uptick takes, addressing these needs directly within

its infrastructure and supporting decentralized research as open science originally intended.

In this article, we explore ten ways dScience is advancing open research, the importance of solid infrastructure for each workflow, and highlight Uptick's role in making these transitions achievable at scale.

## TOKENIZED PROVENANCE FOR SCIENTIFIC DATASETS

**For years, scientific data has been spread across private servers, forgotten laptops, and institutional archives.**

There has never been much consistency in labeling or documentation, and as a result, it can be difficult to verify who created or updated a dataset, which version is original, or how different pieces of research connect. This results in valuable data going undiscovered, or cited incorrectly, and it basically disappears as people move on. Even when data is shared, tracking its history and edits is rather challenging, which leaves irreproducibility as a big risk.

dScience takes a new approach by turning datasets into digital assets on-chain, with each piece of data becoming part of a connected record, with authorship, updates, and changes time-stamped and linked. Researchers can mint raw data, cleaned sets, and analysis-ready versions as NFTs, creating an incredibly clear record of provenance. When data is corrected, forked, or merged, those changes are captured on-chain as

visible events, so anyone can review who contributed, when, and how a dataset evolved, which keeps data accessible for citation and further use.



Uptick is designed to support this workflow with programmable NFT metadata that records contributors and data relationships. Projects could model version history by linking updates and related records, so when researchers mint or update data, on-chain metadata captures contributor IDs and timestamps, tied to DIDs.

Uptick's Web3 API then makes it possible to trace the lifecycle of an asset, connect new analyses to earlier datasets, and keep data relationships completely transparent. Provenance is built in from the start, large files stay off-chain, but a content hash or CID is connected on-chain so any tampering can be detected.

## NFT-POWERED OPEN ACCESS PUBLISHING

**Traditional scientific publishing relies heavily on paywalls, embargoes, and slow manual review, which essentially keeps knowledge out of reach for most researchers.**

Even when work is ready to share, months can pass before publication, and once articles appear, they're usually locked behind subscriptions or massively high fees. This means that important details, like raw data, and corrections may be spread around in supplemental files or omitted entirely, leaving knowledge disconnected and quite costly to access.

dScience opens this process by letting any researcher mint a preprint, dataset, or workflow as an NFT, making it instantly available and easy to cite. Metadata for authorship, contributor roles, and links to supporting materials brings everything together in a single record, so updates, revisions, and peer review can be logged on-chain, and readers can follow the full evolution of a publication.



Uptick's infrastructure is built to support this model with publication NFTs that carry unique identifiers, detailed metadata, and links to supplementary files or code.

Updates can appear as new versions or linked records, and domain-appropriate schemas can be used to tailor the process for different fields. In theory, licensing terms can be set at the NFT level, contributors can receive on-chain recognition, and supplementary data or reviews can be connected directly to the publication.

Essentially, Uptick provides the tools to make publishing much more open and transparent, but integration and indexing with outside services do depend on those platforms and their support for open metadata.



**Peer review is meant to guarantee scientific quality, but the system often falls short, and it ultimately depends on anonymous effort, inconsistent standards, and limited transparency.**

Reviewers very rarely receive recognition, authors can't point to clear evidence of rigorous review, and journals usually keep the process hidden. As a result, meaningful contributions can go unnoticed, disputes lack clear records, and early-career researchers basically miss opportunities for recognition.

With dScience, peer review becomes open and reputation-building, with each review able to be minted as a credential and attached to both the reviewer's identity and the work itself. Reviewers gain credit for their input, with details on expertise, depth, and endorsements visible, and authors, readers, and funders can audit the entire process, following comments, recommendations, and credentials in one place. Researchers can build their profile on both publications and peer review contributions, with reputational capital that moves across projects and disciplines.



Uptick supports this approach with decentralized identity, allowing reviewer identities to be connected on-chain. Review attestations could be linked to DIDs or issued as verifiable credentials, and indexed by applications for communities to review.

Funding bodies and organizations could verify reviewer activity through the Web3 API, and DID-linked records keep peer review as a visible, persistent part of each researcher's profile.

**DECENTRALIZED  
GRANT FUNDING**

**Securing research funding is quite often a very long process with lots of paperwork, unclear criteria, and slow administration.**

Centralized committees decide which proposals move forward, but the reasoning behind these decisions is very rarely transparent. Early-stage or unconventional ideas struggle for attention, and a lot of researchers spend more time on forms than on their actual work, with collaboration and innovation being held back by the oh so common theme of bureaucracy.

With dScience, research funding moves to a collective and transparent model, so that any group, whether that's researchers, funders, or community members, can form a DAO focused on a scientific goal.

Proposals get submitted, discussed, and voted on openly, with decision-making and resource allocation visible to everyone. Grant protocols, research priorities, and expense approvals are set on-chain, so anyone can join, suggest new directions, and see exactly how the budget is used, and teams from different institutions can pool funds, track progress, and adapt project roles as the work evolves.



Uptick is designed to support governance tools that enable this approach, which means that communities can create DAOs, define rules, and record proposals, votes, and funding allocations on-chain.

Treasury activity could be tracked with analytics, and once a proposal passes, funds move directly, and most importantly, transparently, to recipient addresses linked to decentralized identities, following the DAO's logic and any compliance needs the community defines. DAOs can also use NFTs and credentials to issue project badges, track deliverables, and log achievements, with changes in team roles or permissions recorded on-chain for absolute transparency.



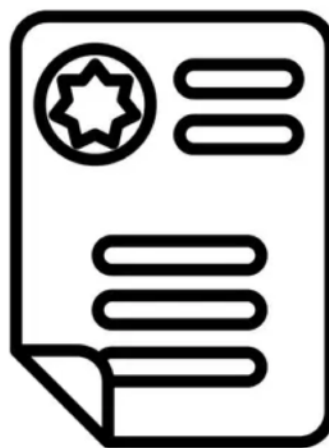
**Sharing research data between teams is a lot of the time complicated by legal paperwork, review boards, and very unclear policies.**

Datasets get passed around via email attachments or hidden in archives, with usage terms either missing or difficult to interpret. This results in data getting reused without proper attribution, and other valuable resources staying locked behind restrictions or bureaucracy. This delays cross lab work, blocks reuse in tools and meta analyses, and basically it wastes everyone's time.

dScience makes licensing and access programmable from the start, so that researchers can set rules in code that define who can see their data, how it can be used, and for how long. Sensitive datasets can be limited to certain people or groups, and open

data stays available for anyone to analyze or reuse.

Licensing terms are visible and standardized, which helps reduce a lot of the confusion and makes it much easier for others to access important resources, all the while data owners remain fully in control.



license

Uptick is structured in such a way so that license and access terms can be written into NFT metadata using machine readable fields. Permissions can reference decentralized identities, and transactions are recorded on-chain, which means datasets could be embargoed, opened for collaboration, or published for public use, with terms that applications can read and check.

External platforms can connect through the Web3 API to respect these terms, and access controls manage permissions at a technical level, but copying data off-chain is still possible, so legal licenses are still needed to define rights and obligations.

## AUTOMATED ATTRIBUTION AND RESEARCH ROYALTIES

**Scientific discoveries are usually built on the efforts of lots of different people, far beyond the main author list.**

Data curators, engineers, lab staff, and volunteers often contribute as much as principal investigators, but they rarely receive matching recognition or compensation. Even when credited, there is little room for detailed attribution or fair rewards, and as data and tools are reused over time, original contributors can lose visibility and have no ongoing record of their impact.

dScience addresses this by making attribution and compensation part of the infrastructure, so that contributors and their roles are recorded directly in the metadata, and the full chain of input is visible when an asset is reused or adapted. Programmable royalty rules let value flow automatically to everyone involved, which encourages sharing and collaboration, as each participant has a lasting



stake in their work and benefits from future reuse across the network.

Uptick is designed to support this model with NFT metadata that records contributor identities, royalty intent, and links to versions and related records. Any research asset, from datasets to software, could record contributor identities in the NFT metadata, and terms for recognition or revenue sharing can be expressed for tools that implement them, with integrators able to read these fields using the Web3 API. As split support is added, smart contract hooks can handle payouts automatically, and attribution can be updated in later versions or linked records as teams change.

Uptick aims to support transmitting copyright and attribution metadata when NFTs move between networks using IBC and the Uptick Cross Chain Bridge, which makes it possible for marketplaces and partner platforms on supported chains to reference on-chain records for licensing, attribution, or payout logic, as long as they recognize and implement compatible metadata standards.

## COMPOSABLE COLLABORATION ACROSS LABS AND BLOCKCHAINS

A lot of the time, scientific breakthroughs depend entirely on collaboration between universities, research centers, companies, and government labs.

Despite this, partnerships are complicated by incompatible systems, mismatched data standards, and the big, ongoing challenge of managing permissions and credit across teams. Trust is difficult to maintain, as groups worry about data misuse and struggle to keep track of ownership and contributions. As a result, coordination slows to a snail's pace when progress depends on back and forth e-mail and manual processes.

dScience makes collaborative workflows programmable and transparent from the very start, which means that research groups can jointly manage data, assign co-authorship, and track every contribution without relying on a single gatekeeper.

Assets can be co-owned, with rules that define access, editing rights, and distribution of results. Teams set their own permissions, so some collaborators may only view data, and others handle updates or licensing, so that trust happens inside of shared, verifiable rules, and coordination happens through infrastructure instead of backchannels. Essentially, cross-chain support lets researchers connect their work across Web3 networks, linking to new communities and tools beyond any single ecosystem.



Uptick provides a programmable NFT and smart contract stack designed for shared ownership and rights management. Datasets and publications can include multiple labs, DAOs, or researchers, with IBC integration enabling assets to move between Cosmos chains and the Uptick Cross-chain Bridge connecting to EVM-based ecosystems. However, metadata fidelity depends on standards and integration.

Smart contracts can implement multi-signature controls and role-based permissions, with all actions recorded on-chain for transparency. These features support collaborative workflows that span previously closed-off repositories, offering a much more reliable foundation for cross-organization research projects.

## ON-CHAIN PROOF OF REPRODUCIBILITY

***Verifying published scientific results is still a huge challenge because most studies lack enough detail for others to reproduce the findings, and there's little agreement on how to share methods, data, or code.***

Even when replication does occur, it rarely receives recognition or is made visible, which leaves a lot of doubt and readers and funders become unsure which results are reliable, which ultimately weakens trust in the scientific record.

dScience brings reproducibility and auditability into the core of the research process so that researchers, auditors, or automated systems can attach verification badges or certificates directly to datasets and publications, with each credential confirming that a result has been independently reproduced or reviewed.

Readers can immediately see the level of scrutiny a result has received, and researchers gain credit when their work is validated by others. So, instead of dispersing audit evidence in footnotes, the system keeps it attached to the research asset, making verification visible and permanent.



Uptick enables this with support for attestations that are time-stamped and linked to the issuer's decentralized identity and the research NFT. Structured metadata can record criteria, methods, and limitations for each verification, and applications can index and filter these attestations using the Web3 API, making reproducibility status visible.

Trusted partners and external verifiers could add assessments to Uptick-based assets, and

## PRIVACY-FIRST SHARING OF SENSITIVE DATA

communities could then decide which issuers and standards to recognize.

**Research in fields like healthcare, genomics, and social science involves highly sensitive data, and protecting privacy is incredibly important, but traditional systems depend on manual compliance and inconsistent policies.**

Sharing data requires extensive paperwork and personal trust, with even small mistakes putting participants at risk. This means that progress depends on finding ways to share insights, all while meeting privacy requirements.

dScience provides fine grained, programmable privacy controls, giving researchers direct control over their data, with access permissions set in code and updated as needed, collaborators approved for specific analyses, time frames, or usage conditions, and requests and access events recorded for



audit and compliance. This means that sensitive data can stay protected as collaboration grows, letting research move forward without delays or added risk. Uptick is designed to support this with NFTs that reference encrypted data and carry access policies enforced by smart contracts. Datasets can remain off-chain in decentralized storage, such as IPFS or institutional repositories, with authorized access managed through cryptographic keys and decentralized identities.

On-chain records log permissions and access, and Uptick's Decentralized Data Service (UDS) offers privacy controls and cross-chain indexing. Applications can show permission overviews and usage history. However, once data is decrypted, policy and agreements still matter alongside technical safeguards, so audits and compliance processes are still important.

## GRASSROOTS BOUNTIES AND COMMUNITY SCIENCE

**Scientific progress is no longer limited to formal institutions or elite research groups, because communities, citizen scientists, and independent analysts now drive new projects, collect unique datasets, and challenge established thinking.**

However, much grassroots work stays unrecognized and unsupported, as dependable systems for coordination, tracking, and rewarding participation are still lacking, and without these tools, many

promising projects lose momentum or stay disconnected.

dScience makes community-driven research open, accountable, and rewarding, and organizers can set clear goals, invite anyone to contribute, and offer transparent incentives such as recognition, tokens, or both, with basic criteria for quality and participation. Contributors track their involvement, build visible portfolios, and unlock new opportunities, which creates an ecosystem where anyone can participate, regardless of background or location, and genuine progress emerges from collective effort rather than traditional hierarchies.



Uptick provides DAO tooling and programmable NFTs so organizers can define tasks, call for participation, and set up transparent reward logic. Each contribution, whether data, analysis, or a bug fix, could be validated and logged on-chain, with NFT badges and token rewards distributed by smart contract.

DAOs manage bounties, proposals, and submissions openly, and NFT records help recognize each contributor, with bounty terms, eligibility, and payout rules embedded in contracts, reducing disputes and uncertainty. Applications can then display participant activity and project progress using on-chain

## CLOSING THOUGHTS

and UDS data, giving grassroots science real structure and visibility.

Science works best when research is open and accessible, rather than kept behind closed doors, and dScience is now starting to make that shift possible, moving beyond old bottlenecks and slow-moving systems that keep new ideas out of reach. Uptick is building tools like NFTs for data and publishing, DIDs for identity, DAOs for funding, composable data layers for collaboration, and programmable access controls for privacy, enabling researchers and communities to be in a position to leave legacy habits behind and take part in a much more open, accountable way of working.

The gap between closed research and open science will keep shrinking as platforms like Uptick roll out new tools and turn collaboration into the standard, and the next wave of science will be shaped by shared effort and transparency, as opposed to hidden processes or paywalls.

As these systems are built out, anyone can get involved, and progress becomes something everyone can see, use, and build on.



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