The Right to Investigate

Research capacity beyond institutional affiliation

A right to a route, not a right to a slot.

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Working paper — Release Candidate 1 · August 2026

Abstract

Open science has made publications, data, software and methods easier to reach from outside universities. That does not automatically make research capacity equally reachable. A person may understand a method, write competent code and formulate a legitimate project while still lacking the organizational counterparty required for contracting, billing, insurance, assurance, ethics, safety or facility execution.

This paper calls that observable condition **Organizational Wrapper Dependence (OWD)**: a research route requires a recognized organization behind the researcher. OWD is not automatically illegitimate. The organization may be carrying a real function. A stricter quantity — **Status Residual** — should be reserved for cases in which functionally equivalent alternatives are supplied or held constant and organizational-status category still changes execution.

The paper argues for a procedural **right to investigate**: a normative policy principle, informed by existing right-to-science doctrine, under which a competent person should have a meaningful, risk-proportionate route to legitimate inquiry. It is not a general legal claim to a particular instrument, unlimited scarce capacity or unrestricted experimentation.

The paper proposes a **Thin Research Institution** as one possible host and routing layer. Its purpose is not to replace universities or laboratories, but to compose recognized responsibility around projects that are scientifically ready yet organizationally stranded. A future **Matched Research Access Audit (MRAA)** is proposed to measure how common OWD is, which functions are substitutable, whether a pure Status Residual remains, and how often neutral hosting converts blocked projects into authorized execution.

Evidence Boundary

This is an institutional and policy paper, not a census of exclusion across science.

The evidence supports the existence of documented pathways in which a recognized organizational wrapper matters to eligibility or execution. It also shows that several functions commonly bundled inside universities can, in some settings, be separated: fiscal hosting, external ethics review, external biosafety review, interinstitutional assurance, shared facility access and remote laboratory execution.

The paper does **not** establish that OWD is widespread, dominant or generally unjustified. It does not establish that a pure Status Residual is common. It does not create a universal legal right to research infrastructure. It does not prove that a Thin Research Institution is cheaper or better than conventional research institutions.

Wrapper dependence is observed. Prevalence and pure Status Residual are not yet measured.

Citation-verified reader source. Main text is reader-facing; Appendices A–E preserve method, cases, models and falsification detail.

The Paper in Two Minutes

1 --- The library opened first

A growing share of the cognitive layer of research can be reached outside a university: literature, public data, software, technical communities and increasingly capable AI tools. But learning a method is not the same as reaching the instrument, permit, assurance, controlled dataset or accountable organization needed to execute it.

2 --- External is not independent

"External user" can still mean "researcher from another recognized organization." DOE user facilities, Argonne, NSF ACCESS and National Park Service rules show several ways scientific access and organizational admissibility can diverge.

3 --- Observe wrapper dependence before claiming status residual

If a route requires a university, company, laboratory or other recognized organization, it is **OWD-positive**. That requirement may be legitimate. A **Status Residual** exists only if an equivalent function is supplied by another lawful route and status still changes execution.

4 --- The institution is a bundle

Affiliation often carries real functions: legal identity, payment, insurance, grant administration, ethics, safety, records, integrity and local authority. Some functions can move. Others must remain where the work happens.

5 --- The right is a route

The paper uses "right to investigate" as a normative policy formulation informed by right-to-science doctrine. The claim is procedural: a competent person should be able to face the real requirements of legitimate inquiry. The route may end in no.

The Paper in Two Minutes — continued

6 --- Portability needs local control

The governance rule is **Portable Core + Local Delta**. Some identity, training and host records may travel. Site-specific hazards, equipment rules, permits and stop-work authority remain local.

7 --- A thin institution composes responsibility

A Thin Research Institution can act as **host · broker · verifier · coordinator**. Its first product is not a laboratory. Its first product is recognized responsibility.

8 --- Buy the missing capacity

The design hypothesis is: **own the common layer, broker the rare layer, host the responsibility layer.** But if a researcher lacks salary, mentorship, tacit training and an integrated high-risk environment, the full conventional institution may still be the better investment.

9 --- AI and saved time are context, not proof

AI can reduce the cost of parts of scientific cognition and execution while authority, liability and physical responsibility remain institutionally anchored. Released working time creates option value, not research obligation.

10 --- The paper can fail

MRAA should measure OWD, functional substitutability, Status Residual and Host Conversion. If the doors are already open enough, or neutral hosting converts almost nothing, the proposal should shrink.

Contents

Reader rule
When this paper says a research door should open, it means a route to evaluation — not automatic access to scarce or risky capacity.

Figure grammar: green = admissible / portable / constructive route; rust = boundary / stop; gray = institutional or local constraint.

1. The Library Opened First

The first institutional layer to loosen was knowledge.

A person outside a university can now reach preprints, recorded lectures, software libraries, public datasets, open-source code, technical communities and increasingly capable computational tools without first entering a campus. Access is still unequal and incomplete. The important shift is structural: more of the cognitive infrastructure of research can be separated from the institution that historically bundled it.

That was the starting point of *After the University I*. "After" did not mean that universities would disappear. It meant that teaching, sequencing, assessment, credentials, community, mentorship and knowledge access could be treated as functions rather than as one indivisible object.

This sequel asks what happens one layer further downstream.

Learning capacity is not research capacity.

A person may learn electron microscopy without being able to book an electron microscope. They may understand a nanofabrication process without being admitted to a cleanroom. They may formulate a credible high-performance-computing project while lacking the kind of organization that an allocation system accepts. They may be qualified to study a protected field site while encountering a different route as soon as observation becomes collection.

For this paper, **research capacity** means the practical ability to move a legitimate inquiry through a chain:

> ***question → method → authorization → resource → execution → evidence***

Different fields thicken different parts of that chain. Mathematics may need little beyond time and computation. Field ecology may require permits and stewardship. Nanoscience may require cleanroom training, contamination controls and contractual access. Human-subject work may require ethics review, data governance and accountable sponsorship. Higher-risk work may require an integrated institutional program that cannot safely be made thin.

The argument therefore does not begin with "outsiders are excluded from science." That is false. Independent scholars, citizen scientists, community laboratories, commercial cores and national facilities already provide many legitimate routes.

The narrower question is this:

> ***When the scientific question is legitimate and the substantive constraints can be specified, does execution still depend on having a recognized organization behind the researcher?***

That is an institutional question, not a complaint about prestige.

An organization may be carrying payment, insurance, contracting, safety, ethics, data responsibility or durable accountability. If so, deleting the organization requirement without replacing the function would not create responsible openness. It would create a missing function.

The correct endpoint is therefore not whether a website says "external users welcome."

It is execution.

Figure 1 — Research capacity is a chain, not a document

Authorized execution is the relevant endpoint. Access to literature or method alone is not research-capacity access.

2. External Is Not Independent

Research infrastructure often describes itself as open to external users. The phrase matters, but it hides a category problem.

A professor from another university is external. A company scientist is external. A government researcher is external. In each case, the person arrives with an organization behind them: a legal counterparty, billing mechanism, authorized signer, insurance arrangement or governance system.

The question for this paper is narrower:

> ***Can a competent natural person traverse the route without already belonging to an organization the facility recognizes?***

Three doors show why the distinction matters.

Door One --- Scientifically open, contractually wrapped

The U.S. Department of Energy defines its Office of Science user facilities as open to interested potential users without regard to institutional affiliation, with scarce capacity allocated through merit review. At the scientific-allocation layer, that is unusually affiliation-open. [1]

Execution adds another layer. DOE laboratory work is typically governed by a formal User Agreement. Argonne's current implementation requires non-Argonne experimental users to be covered by a Master User Agreement with their home institution before work proceeds. The agreement addresses matters such as liability, intellectual property and financial responsibility. [2,3]

The point is not that this is irrational. The point is that two gates exist:

> ***proposal openness ≠ execution openness***

Scientific merit can be evaluated broadly while execution remains organization-mediated.

Door Two --- Explicit organizational eligibility

NSF ACCESS allocates advanced computing resources through a formal allocation system. Capacity scarcity is already managed through credits, resource availability and allocation policy.

As verified on 11 August 2026, its eligibility rules state that unaffiliated or self-employed individuals are not eligible for support and cannot lead or collaborate on allocated projects. [4]

That is direct evidence of **Organizational Wrapper Dependence**. It is not yet evidence that the organizational requirement is unnecessary. ACCESS may reasonably require cybersecurity, reporting, research-security or accountability functions. Those functions have to be identified before the rule can be judged.

Door Three --- The rule changes when the intervention changes

The National Park Service offers a useful within-system comparison. A qualified individual can apply for scientific research permits, and some non-collecting research does not require institutional affiliation. When specimen collection enters the project, formal affiliation is required. [5]

The researcher's identity has not changed. The intervention has.

Collection creates additional questions about custody, repositories, impacts on public resources and long-term stewardship. The case therefore supports a risk- and intervention-sensitive architecture rather than a simple insider/outsider binary.

These three doors do not establish prevalence across science. They establish a narrower mechanism:

1. external access can remain organization-mediated;
2. proposal eligibility can differ from execution admissibility;
3. a recognized organizational wrapper can be an explicit access variable;
4. the required institutional thickness can vary with the work.

Figure 2 — Three doors, three mechanisms

DOE / Argonne	NSF ACCESS	National Park Service
Scientific allocation can be broad; execution adds an institutional agreement.	Organizational eligibility is explicit in current allocation rules.	Non-collecting research can be individually accessible; collection thickens the route.
Proposal openness ≠ execution openness	Wrapper at eligibility	Governance follows intervention

Mechanism evidence, not prevalence evidence. Each door asks for a different institutional relation.

The next question is the important one.

If a route requires an organization, what exactly is that organization doing?

3. What Is the Wrapper Doing?

A closed door is not evidence of an illegitimate barrier.

A synchrotron has finite beam time. A cleanroom can be contaminated. A protected specimen can be lost. A biological experiment can create exposure risk. An ethics committee has limited reviewer capacity. A supercomputer can be oversubscribed. A novice can damage an instrument or produce meaningless data.

The paper therefore needs decomposition before reform.

A route to execution may include:

scarcity · operating cost · queue/staff capacity · competence · hazard · law/ethics · merit · local control · contracting/liability · organizational wrapper

These categories are not additive units. They are a diagnostic checklist.

The most important correction from the adversarial audit is that the last item must be split into two concepts.

Organizational Wrapper Dependence --- observed

A route is **OWD-positive** when eligibility or execution requires a recognized organization behind the researcher.

Argonne, ACCESS, NPS specimen collection and MIT.nano provide examples of this kind of dependence. As verified on 11 August 2026, MIT.nano accepts external researchers but begins external onboarding with an institution-level user agreement and requires a purchase order from the user's company or institution. Training, safety and process review remain separate parts of the route. [6]

OWD does not tell us whether the organizational requirement is justified.

The organization may be the facility's accepted way of obtaining: - enforceable contracts; - payment assurance; - insurance; - indemnification; - ethics accountability; - research-integrity responsibility; - persistent records; - or a party that remains reachable after the individual project ends.

Those functions are real.

Status Residual --- to be measured

A stricter concept is needed for the remaining effect of status itself.

> ***Status Residual is the execution disadvantage that remains after the underlying institutional functions are held functionally equivalent or supplied through an accepted lawful substitute.***

That definition avoids a circular claim.

If a facility needs insurance and a neutral host provides insurance the facility accepts, but the same project is still rejected

because the host is not a university, the remaining difference is a candidate Status Residual.

If the facility accepts the neutral host, the barrier was OWD but not an irreducible Status Residual.

If no lawful substitute can carry the necessary function, the route may be genuinely institution-dependent.

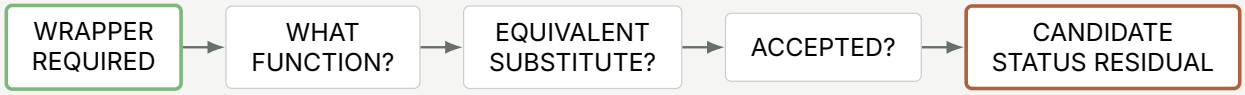
The paper therefore does **not** claim that pure Status Residual has already been measured.

It claims that wrapper dependence is observable and that the functions carried by the wrapper can be investigated directly.

That produces a better test:

> ***What function does the organization supply, can an equivalent function be supplied another way, and what remains after that substitution?***

Figure 3 — From OWD to a strict status-residual test



OWD is observable. Pure Status Residual requires functionally equivalent alternatives to be supplied or held constant.

This is also why price and scarcity must be kept separate from status. A scarce public facility may charge the approved user nothing and ration access by merit. A routinely purchasable core service may have a clear hourly price yet still require organization-level contracting. "Free" does not mean abundant, and "priced" does not mean individually admissible.

The purpose of the model is not to condemn every organizational requirement.

It is to force the requirement to explain itself.

4. The Institution Is a Bundle

A university is not only a place where researchers work.

It is also a legal person, payer, contracting party, insurer or insured entity, grant administrator, records custodian, research-integrity system, ethics layer, safety system and authority structure. It can sign, pay, preserve records, investigate misconduct, appoint officials and remain answerable after an individual researcher leaves.

The ordinary institutional researcher experiences much of this as background.

That makes affiliation look like status when it is often carrying functions.

The crucial distinction is:

> ***institutional status ≠ institutional function***

Several current systems already separate parts of the bundle.

Human-subject governance can extend beyond conventional employment

Under the U.S. human-subject protection framework, an institution holding a Federalwide Assurance can, under specified conditions, extend coverage to a collaborating independent investigator. The investigator accepts IRB authority, training, reporting and other oversight obligations without becoming independent of governance. [7,8]

The lesson is modest but important:

> ***independent employment status can coexist with institutional governance.***

Biosafety review can be external while local authority remains local

NIH permits an externally administered Institutional Biosafety Committee. But the committee must understand local laboratory conditions, and someone at the registering institution must have authority to implement its directives. [9]

> ***Review may travel farther than control.***

Animal-research functions can be split between awardee and performance site

OLAW provides an interinstitutional route in which an awardee lacking its own animal facility, animal-care program and IACUC can conduct the activity at an Assured performance site and accept that site's governance. [10]

The award and physical governance need not live in the same organization.

These examples support a **Research Capacity Stack**:

1. identity;
2. competence;
3. project definition;
4. merit review where relevant;
5. funding/payment;
6. contracting;
7. insurance/liability;
8. ethics/subject protection;
9. biosafety/environmental/welfare governance;
10. integrity/recordkeeping;
11. facility-local control.

Figure 4 — Research Capacity Stack

More portable / hostable	Identity · competence records · project definition · funding/payment · contracting · baseline insurance · integrity/records
More local / thick	Merit where scarce · ethics/safety authority · site permits · instrument/sample control · emergency procedures · local supervision · stop-work authority

The institution is a bundle. The design task is to move what can travel without pretending that local control can be made abstract.

A conventional research institution may supply most of the stack internally or through standing relationships. An independent person may supply the question, competence and method while lacking the recognized interfaces required later in the chain.

The interesting problem is therefore **composability**.

Independent ethics review exists. Fiscal hosting exists. External biosafety review exists. Shared cores exist. Remote laboratories exist. National facilities exist.

The pieces do not necessarily interoperate around the same researcher and project.

> ***The relevant functions may exist separately while no recognized route composes them from question to execution.***

That is the gap the later institutional proposal tries to address.

5. The Right to a Route

This paper uses **right to investigate** as a normative policy formulation informed by existing right-to-science doctrine. It is not presented as the name of a separately codified universal legal right to instrument access.

That distinction matters because the phrase can otherwise become irresponsible.

The argument is not that anyone may enter any laboratory, use any scarce instrument, collect any specimen or conduct any experiment merely by calling the activity research.

Existing right-to-science doctrine nevertheless provides a meaningful foundation for participation. CESCR General Comment No. 25 interprets participation in scientific progress as extending beyond professional scientists, explicitly discusses citizen science and calls for active facilitation of participation. It also identifies unjustified restrictions on access to science-related facilities, services, goods and information as a concern. [11]

UNESCO's Recommendation on Open Science similarly treats open-science infrastructure as including physical shared facilities, major scientific equipment, open laboratories and accessible research facilities, not only publications and repositories. [12]

The EU Charter protects freedom of scientific research, but its field of application is bounded. This paper therefore does not use it as a general entitlement to laboratory infrastructure. [13,14]

The policy principle developed here is narrower:

> ***A competent person should have a meaningful, risk-proportionate route through which a legitimate inquiry can be evaluated.***

A route can ask: - Is the project coherent? - Is the researcher competent? - Is training required? - Is there capacity? - Who pays? - Is ethics review required? - Is a permit required? - Who accepts liability? - Who preserves records? - Who can stop the work?

A route can end in **no**.

A no because the beamline is full is a scarcity decision. A no because the proposal loses merit review is an allocation decision. A no because the work exceeds containment capability is a safety decision. A no because the activity is unlawful is a legal decision.

The relevant policy question is whether access rules track those functions and risks rather than relying on unexplained organizational categories.

This paper therefore proposes a rights ladder:

R1 — freedom to inquire
R2 — opportunity to participate
R3 — functionally justified public access rules
R4 — procedural routes to scarce or governed capacity
R5 — guaranteed entitlement to a particular scarce resource — rejected
R6 — unrestricted experimentation — rejected

Figure 5 — Rights ladder: route, not slot

1	Freedom to inquire	SUPPORTED
2	Opportunity to participate	SUPPORTED
3	Functionally justified public access rules	POLICY
4	Procedural route through qualification/review	CORE
5	Guaranteed particular scarce slot	REJECTED
6	Unrestricted experimentation	REJECTED

The paper's normative claim is deliberately bounded: a legitimate route to evaluation, not an unconditional resource entitlement.

The result is a burden of explanation, not an automatic claim on equipment.

If the constraint is scarcity, ration scarcity. If it is competence, qualify competence. If it is insurance, specify insurance. If it is ethics, route through ethics. If it is local safety, leave authority local.

A right to a route that cannot specify its controls is only rhetoric.

6. Governance Without Fiction

Removing affiliation without replacing the functions carried by affiliation would create a governance vacuum.

The objective is therefore not "less governance."

It is governance attached to the actual risk and execution context.

This paper proposes a five-level taxonomy:

R0 --- Open inquiry

Mathematics, theoretical work, lawful analysis of open data, literature synthesis, software and similar activities with little controlled-resource or external-risk burden.

R1 --- Qualified direct access

Shared resources or permits where direct qualification, payment, training and facility supervision can reasonably govern the activity.

R2 --- Hosted governed research

Projects that require a legal or organizational function — contract, insurance, ethics, data responsibility, grant administration or accountable host — without necessarily requiring full conventional employment or enrollment.

R3 --- Institutionally thick research

Projects that depend on an integrated local program: substantial containment, clinical governance, complex animal-care systems or continuous specialized supervision.

R4 --- Restricted or exceptional

Projects subject to prohibition, special licensing, security control or other restrictions outside ordinary open-access routes.

Figure 6A — Proposed R0–R4 governance taxonomy

R0	Open inquiry	No controlled resource or material external risk.
R1	Qualified direct	Training, payment, site rules, direct facility control.
R2	Hosted governed	Missing institutional function supplied by a host/specialist.
R3	Institutionally thick	Integrated clinical, biosafety, animal-care or similar program.
R4	Restricted / exceptional	Prohibited, specially licensed or security-controlled work.

Risk class follows the work. Affiliation may supply governance, but affiliation is not itself the hazard.

The governing principle is that the route should follow the work. An unaffiliated person does not become high-risk because they are unaffiliated; an affiliated professor does not make a high-risk project low-risk by title.

Intervention is one useful risk dimension, but it is not the whole model. Data privacy, cyber risk, dual-use information, security and other non-physical externalities can also require thick governance.

Portable Core + Local Delta

Some trust can travel: - verified identity; - general training; - competence evidence; - host/insurance status; - relevant prior approvals; - research-integrity commitments.

But site-specific control cannot be wished away.

The **Local Delta** includes: - local hazards; - current equipment configuration; - sample compatibility; - local permits; - access zones; - emergency procedures; - cybersecurity; - waste handling; - local supervision; - stop-work authority.

NIH's externally administered IBC model captures the principle well: review can be external, but local knowledge and local implementation authority remain necessary. [9]

> ***Portability should prevent safe trust from being rebuilt unnecessarily. It should not force a facility to accept trust decisions made elsewhere.***

The operational validity test is simple:

> ***Who can stop the work?***

If a governance diagram cannot answer that question, it is incomplete.

Figure 6B — Portable Core + Local Delta

PORTABLE CORE	LOCAL DELTA
Identity	Site-specific hazards
General training	Instrument configuration
Competence evidence	Samples/materials
Host / insurance status	Local permits/cyber controls
Prior approvals	Emergency procedures
Research history	Supervision + stop-work authority

Portability reduces duplicated trust-building; it does not force facilities to outsource local control.

Some functions will remain non-portable: physical containment, patient-facing clinical responsibility, animal-care authority, direct instrument control, controlled-material custody, required site licenses and emergency response.

A thin host cannot pretend to provide these from a policy document.

It can only route the researcher to a performance institution that actually has them.

7. A Thin Institution

What is the thinnest institution capable of completing the research chain without pretending to replace the facilities that must remain thick?

The proposal is a **Thin Research Institution (TRI)**.

Thin describes scope, not weak governance.

A TRI is a durable research host and routing institution that supplies or composes project-specific institutional functions so that a qualified researcher can cross funding, governance and facility boundaries without requiring conventional university employment or enrollment.

Its work can be separated into four roles:

Host

Provide durable organizational identity where needed: legal counterparty, grant receipt, accounting, insurance arrangements, recordkeeping, baseline integrity procedures and authorized signatories.

Broker

Maintain reusable relationships with external capacity providers: master facility agreements, service contracts, ethics-review relationships, insurance templates and referral routes to thick institutions.

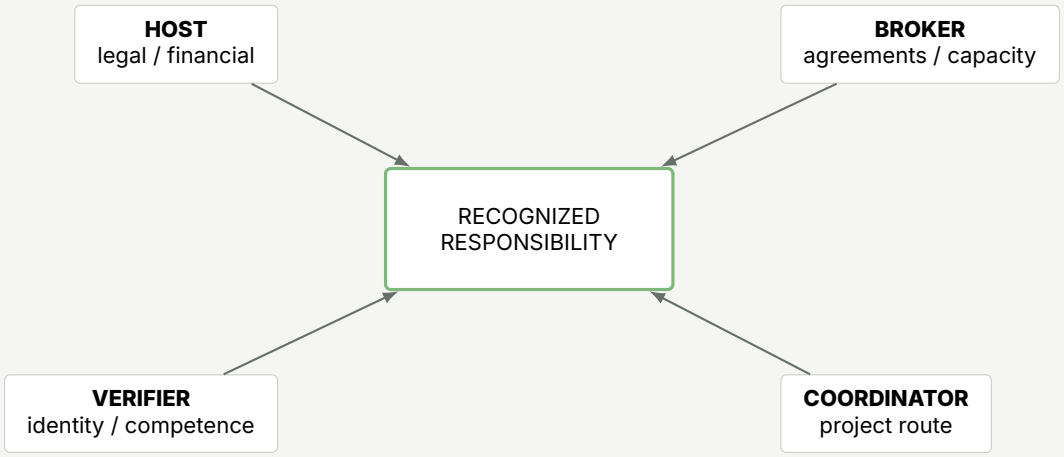
Verifier

Maintain portable evidence that can safely travel: identity, general training, prior qualifications, host status, approvals and versioned project records.

Coordinator

Assemble the actual route and decide when not to proceed. Classification should identify required review, permits, insurance, facilities, local actors and stop-work chain. Some projects should be referred to universities, hospitals or regulated laboratories; some should stop entirely.

Figure 7 — Thin Research Institution as interoperability layer



TRI is a proposed host/router, not a miniature university. Its first product is recognized responsibility around a legitimate project.

The pieces already exist separately.

IGDORE's published model demonstrates distributed affiliation and grant management, although new affiliation applications are currently suspended. Rapid Science demonstrates fiscal sponsorship. IREC offers ethics review to independent researchers. Emerald Cloud Lab demonstrates remote wet-lab execution. Ronin Institute is a useful caution: scholarly affiliation alone does not create the legal, financial, ethics and compliance infrastructure required to host research. [15–19]

The novelty claim is therefore not "invent a research institute."

It is **composability**.

Can these functions be recognized together around one project?

A facility may accept a fiscal sponsor for payment but not as the counterparty to its user agreement. An ethics body may approve a study without supplying insurance or data-controller responsibility. A neutral host may exist but not satisfy a particular facility's organizational category.

The TRI's first product is therefore not a laboratory.

> ***Its first product is recognized responsibility.***

One potential institutional advantage is reuse. A facility negotiating with one unknown individual faces a one-off contracting problem. A durable host representing many researchers can potentially negotiate baseline terms once, while every researcher still satisfies the scientific and local requirements of each project.

This mechanism should be called **Host Conversion** only when it is observed: a project that is scientifically and materially ready but organizationally stranded reaches execution after an appropriate neutral host supplies the missing functions.

No Host Conversion Rate is currently known.

And sometimes a TRI is unnecessary. If a facility can contract directly with a natural person, verify identity, take payment, require insurance, train the user and maintain local control, the facility itself can act as the host.

The broader principle is:

> ***Put each function where it can be performed with the least duplication without breaking accountability.***

8. Buy the Missing Capacity

A logically elegant institution can still be economically foolish.

The TRI should not reproduce a university's physical infrastructure for people who are not at universities. Many expensive capabilities already exist as shared cores, national facilities, cloud services or commercial laboratories.

The economic question is therefore:

> ***What capacity is missing for this project, and is it cheaper to own, buy, share, host or refer?***

Observed service prices show that substantial research capacity can already be metered. External academic NMR, cryo-EM and cloud GPU capacity can be purchased in bounded units, even when access conditions remain organization-specific. [20–22]

The point of those prices is not that advanced research is cheap.

It is that at least part of the infrastructure problem can be treated as buy-versus-own.

The design hypothesis is:

> ***Own the common layer. Broker the rare layer. Host the responsibility layer.***

A local commons might sensibly own ordinary computing, electronics benches, standard low-risk equipment, training space or secure workstations where utilization is high.

Cryo-EM, advanced nanofabrication, specialized mass spectrometry, national facilities and other rare capabilities will often be better approached as services or partner capacity until sustained utilization justifies ownership.

The third layer is institutional overhead itself: accounting, legal review, insurance, audit, grant administration, integrity and governance. Thin institutions still have fixed costs. IGDORE's published grant-management overhead and Ronin's current inability to provide fiscal sponsorship illustrate opposite sides of that reality. [15,19]

Even governance has capacity limits. IREC can price independent ethics review, but its subsidized independent-researcher category is volume-limited. [17]

The full Gate 9 scenario model is moved to Appendix D because exact pilot dollar totals create false precision in the reader argument. Its structural result is enough here:

- vouchers can be cheap but fail when money is not the missing function;
- a host can solve some organizationally stranded projects;
- local commons capacity can reduce repeated low-level purchasing;
- rare capacity is expensive to duplicate;
- a hybrid architecture is plausible enough to pilot, not proven optimal.

The conventional institution remains a positive countercase

Sometimes the researcher does not lack a purchase order or 20 hours on an instrument.

They lack salary, mentorship, tacit apprenticeship, collaborators, daily technical supervision and an integrated safety environment.

In that case, the full conventional research position may be the better investment.

The decision rule is therefore:

If the missing bundle is instrument time + compute + bounded review + contracting + hosting → **buy the missing capacity.**

If the missing bundle is salary + sustained mentorship + tacit training + integrated high-risk environment → **fund the conventional institution.**

The point is not to move research out of universities.

It is to compare the price of the missing component with the price of the entire bundle.

Figure 8 — Buy the missing capacity

OWN
Common, high-use local capacity.

BROKER
Rare, capital-intensive or technician-heavy capacity.

HOST
Legal, financial and governance functions a neutral host can carry.

REFER
Thick/high-risk work requiring a real hospital, university or regulated local program.

The economic hypothesis is conditional: purchase the missing bundle rather than automatically reproducing the entire institutional bundle.

If neutral hosting proves expensive, facilities rarely recognize it, governance cannot be shared and target researchers usually need the whole institutional environment, TRI should shrink to a niche mechanism.

That is an economic failure condition, not a reason to change the definition until the proposal wins.

9. AI, Time and the Demand Side

The core argument does not require AI.

If current AI systems disappeared tomorrow, OWD would still be an institutional question.

AI matters because it changes what an individual can plausibly bring to the door.

ERA, reported in *Nature* in 2026, generated and iteratively improved scientific software across several scorable empirical tasks, with expert-level performance in bounded settings. Robin, also reported in *Nature*, linked literature search, hypothesis generation, experiment proposal and result interpretation in a semi-autonomous biological discovery loop while humans still performed the physical experiments. A 2026 agentic X-ray system demonstrated autonomous sample-alignment actions on a synchrotron instrument. [23–25]

These examples do not establish a general autonomous scientist. A 2025 scenario-grounded preprint benchmark across biology, chemistry, materials and physics reported a consistent gap relative to general science benchmarks and systematic weaknesses shared across leading models. [26]

The narrower implication is that research capability is becoming more divisible.

AI can lower the marginal cost of some bounded scientific software, analysis, hypothesis and protocol work. Institutional authority remains different. A model that proposes an experiment does not thereby become the legal user of a facility, the insured party, the data controller, the ethics sponsor or the local person with stop-work authority.

Capability can move faster than admissibility.

Figure 9 — Capability can move faster than admissibility

CAPABILITY	Literature · software · analysis · hypotheses · protocol generation · bounded instrument control
ADMISSIBILITY	Contracting · liability · ethics authority · accountable organization · permits · physical safety · stop-work authority

AI can lower the cost of some research tasks without automatically carrying the legal and local relations required for authorized execution.

That may create **bottleneck migration**: when cognition becomes cheaper, the relative importance of instruments, controlled data, permits, technicians, ethics, contracts and accountable hosting can increase. This is a hypothesis, not a measured macro trend.

Time is not a conversion factor

The Saved Hours Doctrine asks what happens if productivity gains are returned partly as human time. This paper does not assume that released time becomes research time.

A large four-day-workweek intervention found improvements in well-being, fatigue and sleep-related outcomes. A Belgian additional-leave study found intended use concentrated in family, rest, hobbies, household tasks, care and travel. [27,28]

That is not unproductive use.

It means the time belongs to the person.

> ***Saved time creates option value, not research obligation.***

The zero-conversion claim is also too strong. Retirement studies find increases in volunteering in some populations, and citizen-science systems show that some participants contribute sustained effort. Participation is strongly heavy-tailed: a relatively small fraction of users can perform a large fraction of the work. [29,30]

Citizen science is not a clean proxy for independent investigator demand. It does show that non-professionals do not only consume science.

The demand-side model is therefore a funnel:

> ***time released → more options → most time goes elsewhere → some choose inquiry → fewer sustain it → fewer need governed research capacity***

The numerical sensitivity example is moved to an appendix. The main point does not depend on a population forecast.

Existing independent researchers, retired professionals, community laboratories, inventors, freelance scholars and researchers between institutions already create a non-zero demand population.

Future AI capability or future saved time may increase it.

They do not create the right.

10. How This Paper Could Be Wrong

The paper has demonstrated **Organizational Wrapper Dependence as a mechanism class**.

It has not measured its prevalence, its functional substitutability or a pure Status Residual.

That is the central empirical limitation.

A future **Matched Research Access Audit (MRAA)** should therefore be built in two stages rather than pretending that the same researcher can always occupy unaffiliated, hosted and affiliated states cleanly.

MRAA-A --- Facility Rule & Route Audit

Sample facilities and capacity systems across materially different domains: HPC, controlled data, fabrication, nanofabrication, microscopy, spectroscopy, chemistry services, BSL-1 biology, field research, human-subject governance, national facilities and remote laboratories.

For each route: 1. capture public policy and onboarding; 2. trace the path to actual execution; 3. ask standardized, non-deceptive questions about natural-person access and neutral-host access; 4. code the exact function for which an organization is required; 5. ask what lawful substitutes are accepted.

Primary outputs:

- **OWDR — Organizational Wrapper Dependence Rate**
- **FSR — Functional Substitutability Rate**
- **PEG — Proposal–Execution Gap**

This stage measures the rules, not TRI performance.

MRAA-B --- Prospective Host-Conversion Cohort

Recruit real unaffiliated researchers with legitimate R0–R2 projects, documented competence, genuine intent to execute and a documented OWD barrier.

Then: 1. record the unaffiliated route and failure reason; 2. determine whether a neutral host can lawfully carry the required functions; 3. where appropriate, supply the host; 4. measure whether the project reaches authorized execution; 5. code time, cost, Local Delta and remaining failure mechanism.

Primary output:

- **HCR — Host Conversion Rate**

An H-fail is not automatically a "real substantive barrier." It may reflect scientific merit, capacity, hazard, law, local-control needs, host-capability gaps, host-recognition rules, contracting problems or mixed causes.

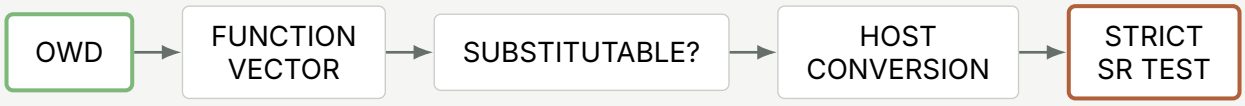
Status Residual becomes the strict test

A **Status Residual Rate (SRR)** should be estimated only in cases where functionally equivalent lawful substitutes are supplied or held constant.

That creates three possible outcomes:

1. **The wrapper is required and non-substitutable.** Legitimate institution dependence.
2. **The wrapper is required, but a neutral host can supply it.** Strong TRI use case.
3. **Equivalent function is supplied, yet status still blocks execution.** Candidate pure Status Residual.

Figure 10 — MRAA separates five measurements



Wrapper prevalence, functional substitutability, host utility and pure Status Residual are separate empirical quantities.

A conventional-affiliation comparator can still be useful, but mostly as an observational benchmark or natural experiment rather than an assumed within-person randomized state.

Kill criteria

The access hypothesis should shrink if OWD is rare across the target sample or almost entirely explained by non-substitutable functions.

The pure Status Residual hypothesis should fail if equivalent substitutes remove nearly all status differences.

The TRI mechanism should fail if Host Conversion is low among genuine OWD cases it was designed to solve.

The distributed architecture should lose default status if contracting, travel, Local Delta, queue and retraining costs make brokered projects materially worse than owned or conventional capacity at relevant utilization.

The full project should collapse to a narrower article if direct individual routes are already routine, substitutes are widely accepted, Host Conversion is negligible and thin hosting adds more transaction cost than research capacity.

> ***A theory of open research capacity should be able to survive an open door — and die if the doors are already open enough.***

11. What Should the Door Ask?

The library can open before the laboratory does.

A person may gain access to knowledge, methods, software and increasingly capable computational assistance without gaining access to the physical, legal or organizational capacity required to turn inquiry into evidence.

That difference is not automatically unjust.

Research has real constraints.

Before organizational status is accepted as the answer, the system should be able to identify the question it is answering.

Scarcity? Ration capacity.
Merit? Review the proposal.
Competence? Qualify the researcher.
Hazard? Contain, supervise or refuse.
Law or ethics? Preserve the permit, prohibition or review.
Cost? Price or subsidize it explicitly.
Contracting or liability? Require a recognized counterparty.
Local control? Leave authority with the facility.

Figure 11 — The Door Test

Scarcity?	ration capacity
Merit?	review the proposal
Competence?	qualify the researcher
Hazard?	contain, supervise or refuse
Law / ethics?	preserve permit, prohibition or review
Cost?	price or subsidize explicitly
Contracting / liability?	require a recognized counterparty
Local control?	leave authority with the facility
Then ask	**Can the required function be supplied another lawful way?**

The principle does not erase constraints. It asks that the real constraint be named before status is used as its proxy.

Only then does the next question make sense:

> ***Can the required function be supplied another way?***

Sometimes the answer will be no. Some research really is institutionally thick.

Sometimes the facility itself can provide the route directly to individuals.

Sometimes a neutral host may be able to supply the missing legal, financial or governance layer without requiring the researcher to become a conventional employee or student.

And sometimes an equivalent function may be supplied while an organizational category still blocks execution. That is where a true Status Residual would begin to appear.

The question is therefore no longer “university or no university?”

It is:

> ***Which functions must exist, where must they live, and which of them truly require conventional affiliation?***

That is the institutional meaning of *After the University*.

The university does not disappear. Its role as a default bundled route can weaken where functions become technically, legally and economically separable. It remains indispensable where training, physical governance, tacit knowledge or integrated responsibility cannot be safely split.

The policy sequence should be conservative:

1. **measure OWD before building around it;**

2. **allow direct individual routes where facilities can safely carry the functions themselves;**
3. **test neutral hosting where a wrapper is the missing component;**
4. **keep thick research thick;**
5. **buy rare capacity before duplicating it without utilization evidence.**

The next stage is therefore not a stronger essay.

It is measurement.

If MRAA finds that OWD is rare, functionally irreducible and almost never host-convertible, this proposal should shrink.

If it finds repeated cases where legitimate projects become executable when a neutral host supplies the missing functions, the institutional problem becomes concrete.

The right to investigate is not a guaranteed slot.

It is not unrestricted experimentation.

It is not an exemption from accountability.

It is a right to face the real constraint.

The final policy question is not whether every research door should open.

It is:

What should the door ask before it opens?

The answer should begin with the work.
Not with where the person belongs.

Claims & Boundaries

Claim	Status	Reader-safe formulation
External access can remain organization-mediated	**Supported**	"External" is not necessarily affiliation-independent
OWD exists	**Supported**	Recognized organizational wrappers are explicit eligibility/execution requirements in documented pathways
OWD prevalence	**Unknown**	Must be measured across a defined sample
Pure Status Residual	**Unknown / testable**	Requires functionally equivalent substitution before status effect can be isolated
Institutions are functional bundles	**Supported**	Affiliation can carry legal, financial, ethics, safety and accountability functions
Some functions are separable	**Supported with limits**	Partial real-world arrangements already separate hosting, review and execution functions
Right to investigate	**Normative policy formulation**	A meaningful risk-proportionate route, not a guaranteed resource
R0–R4	**Proposed taxonomy**	Governance should track work and risk rather than identity alone
TRI	**Proposed architecture**	Host/broker/verifier/coordinator; not proven end-to-end
Host Conversion	**Unknown**	Must be measured prospectively
Hybrid economics	**Modeled design hypothesis**	Own common, broker rare, host responsibility; not proven optimal
AI	**Supported, bounded**	Lowers some research-task costs without automatically carrying authority
Saved Hours	**Demand-side context**	Creates option value, not research obligation
MRAA	**Proposed method**	Designed to measure OWD, substitution, SR and host conversion

APPENDIX A

Method Route / Gates

How the paper was narrowed before drafting. Gate results are preserved as method history, not presented as empirical findings in themselves.

Gate	Question	Result	Revision that survived
0	Vocabulary freeze	PASS	Separate open science, external access and affiliation-independent research capacity.
1	Does an access gap exist?	PASS / revised	External access is not necessarily independent access; proposal and execution must be separated.
2	What does the institutional wrapper do?	PASS / major revision	Institutional function is not identical to institutional status; functions can sometimes be delegated.
3	Does AI dissolve the problem?	PASS / causal revision	Cognitive capability can become portable faster than authority, liability and physical responsibility.
4	Does the thesis survive across domains?	PASS	Access architecture varies by domain and intervention; expensive facilities can be scientifically open while ordinary cores remain organization-mediated.
5	Do partial analogues already exist?	PASS	Affiliation, fiscal hosting, ethics review, external safety governance and remote execution already exist as separate modules.
6	Are we mislabeling scarcity as gatekeeping?	PASS	Name scarcity, cost, competence, hazard, law, merit and local control before measuring organizational effects.
7	Is there a defensible “right to investigate”?	PASS / narrowed	Right to a legitimate route, not an entitlement to a scarce slot or unrestricted experimentation.
8	Can post-affiliation governance be real?	PASS	Portable Core + Local Delta; stop-work authority must remain real and local where necessary.
9	Is a new public-lab layer economically plausible?	PASS / hybrid	Own common capacity, broker rare capacity, host responsibility; do not duplicate every instrument.
10	Do Saved Hours create researchers?	PASS / demoted	Released time creates option value, not research obligation; demand effect is optional context.
11	How can the thesis be killed?	PASS	Pre-register access metrics and allow the project to collapse if direct routes are already open enough.
12	Does the project deserve a paper?	PASS TO PAPER	Bounded institutional/policy paper; existence/mechanism first, prevalence explicitly unknown.

Method boundary. The Gate process is adversarial design history. It documents how claims were narrowed; it is not a substitute for the MRAA prevalence study proposed in Appendix C.

APPENDIX B

Case & Analogue Register

Observed access mechanisms and partial institutional modules used in the paper. "Role" identifies what the case demonstrates, not what it proves universally.

Case	Role in argument	Observed boundary / use
DOE user facilities [1–2]	Scientific allocation vs execution	Affiliation-neutral language at the scientific-allocation layer coexists with formal user-agreement infrastructure.
Argonne APS [3]	OWD / contracting	Experimental work by non-employees requires a Master User Agreement with the user's home institution.
NSF ACCESS [4]	Explicit eligibility OWD	Current policy excludes unaffiliated/self-employed individuals from supported allocations and collaboration.
National Park Service [5]	Intervention gradient	Qualified individuals can conduct some non-collecting research without affiliation; specimen collection thickens the institutional requirement.
MIT.nano [6]	External core / payment-contract layer	External users enter through institution-level agreements and a purchase order while training and local safety remain separate.
OHRP IIA [7–8]	Governance without employment	Independent investigators can under specified conditions accept IRB/institutional authority without conventional employment. Current IIA reviewed March 2026; FAQ under FWA transition.
NIH external IBC [9]	Portable review + local authority	IBC administration can be external, but local knowledge and implementation authority remain required.
OLAW Interinstitutional Assurance [10]	Split governance	Award and physical animal-research governance can sit at different institutions while the performance site remains thick.
IGDORE [15]	Distributed affiliation / grant home	Partial analogue; new affiliation applications were suspended when reverified in August 2026.
Rapid Science [16]	Fiscal sponsorship	Model C sponsorship separates grant-receipt/fiscal functions from full research governance.
IREC [17]	Independent ethics review	Demonstrates ethics review as a specialist service available to independent/freelance researchers.
Emerald Cloud Lab [18]	Remote execution	Separates experiment design from physical presence in a wet laboratory; does not supply every sponsor/governance function.
Ronin Institute [19]	Cautionary analogue	Scholarly affiliation alone does not create fiscal, IRB/IACUC or compliance capacity.
Harvard cores / AWS [20–22]	Meterability	Advanced capacity can be sold in bounded units; price visibility does not imply natural-person admissibility.

Register inference: the pieces of a post-affiliation research system already exist in partial form. The empirical question is whether they can compose around the same legitimate project with a responsibility chain facilities will recognize.

APPENDIX C

Matched Research Access Audit Protocol

A two-stage study to distinguish wrapper prevalence, functional substitutability, host conversion and a strict Status Residual.

C.1 Measurement objects

Metric	Name	Question
OWDR	Organizational Wrapper Dependence Rate	How often does eligibility or execution require a recognized organizational wrapper?
FSR	Functional Substitutability Rate	Among OWD-positive routes, how often can the underlying function be supplied through another lawful mechanism?
HCR	Host Conversion Rate	Among genuine OWD-blocked projects offered an appropriate neutral host, how often is authorized execution reached?
SRR	Status Residual Rate	Among functionally matched cases, how often does organizational-status category still independently block execution?
PEG	Proposal–Execution Gap	How often can a user reach scientific/proposal eligibility but not authorized execution for organizational reasons?
LDB	Local Delta Burden	What facility-specific training/governance remains after portable elements are accepted?
TCR	Transaction Cost Ratio	How large is non-scientific transaction cost relative to the direct research-capacity cost?

C.2 MRAA-A — Facility Rule & Route Audit

Stratify a facility sample across HPC, controlled data, fabrication, nanofabrication, microscopy, spectroscopy/mass spectrometry, chemistry services, BSL-1 biology, field permits, human-subject governance, national facilities and remote laboratories.

For each route:

1. capture public policy and onboarding requirements;
2. trace the route through application, contracting, billing, training, governance and execution;
3. use standardized, non-deceptive questions about natural-person contracting, neutral-host recognition and accepted substitutes;
4. code the exact function that requires an organization.

C.3 MRAA-B — Prospective Host-Conversion Cohort

Recruit real unaffiliated researchers with legitimate R0–R2 projects, documented competence, genuine intent to execute and a documented OWD barrier. Record the unaffiliated route, introduce a neutral host only where it can lawfully supply the required function, and follow the project to authorized execution or a coded failure. No fake affiliations, fabricated credentials or deceptive scientific identities are used.

C.4 Failure taxonomy

An H-fail is coded as one or more of: scientific/merit; capacity; hazard; law/ethics; local-control requirement; host-capability gap; host-recognition/status rule; contracting/payment; researcher competence; unknown/mixed. H-fail is **not** automatically a substantive barrier.

C.5 Preregistration / kill logic

Pre-register the sampling frame, R0–R4 coding, execution endpoint, material delay/cost thresholds, commercial-alternative treatment, geographic rules and missing-data rules.

Shrink the access hypothesis if OWDR is low or wrappers are mostly non-substitutable; reject TRI if HCR is low; reject a strict Status Residual claim if equivalent substitutes remove the status difference.

APPENDIX D

Economics / Scenario Model

The paper's economic numbers are explicit scenarios, not observed budgets. Their purpose is to test architecture, not to forecast a national program.

D.1 Four modeled pilot architectures

Architecture	Annual cost	Projects served	Cost / served
New public research commons	$1.625m	78 / 95	$20.8k
Vouchers / credits only	$0.788m	62 / 95	$12.7k
Thin Research Institution + master agreements	$1.130m	84 / 95	$13.5k
Hybrid: small commons + brokered high-end capacity	$1.420m	95 / 95	$14.9k

MODELED SCENARIO. Assumes 100 applications, 95 legitimate R0–R2 projects and five correctly referred/rejected R3/R4 projects. The values are design assumptions, not observed institutional budgets.

D.2 Observed meterability anchors

As reverified for MB9, advanced research capacity can appear as a service price: Harvard external-academic NMR rates span roughly $36–52/hour [20]; Harvard FY27 external-academic cryo-EM lists $84/hour for Talos Arctica and $100/hour for Titan Krios [21]; selected U.S. AWS H100 Capacity Blocks were approximately $5.191/GPU-hour in the August 2026 snapshot [22]. These anchors show meterability, **not** universal natural-person access.

D.3 Illustrative own-vs-buy threshold

At a deliberately simplified $200,000 annual fixed ownership cost, service-price division produces crude break-even utilizations:

External-service anchor	Illustrative hours/year
$52/hour NMR	3,846
$100/hour Titan Krios	2,000
$5.191/GPU-hour H100	38,528

These are not equipment-purchase recommendations. They ignore capex structure, staffing, consumables, depreciation, utilization limits, service quality and the provider expertise bundled into an external rate.

Economic design rule: own the common layer; broker the rare layer; host the responsibility layer; refer work that genuinely requires institutional thickness.

APPENDIX E

AI & Saved Hours Evidence

Demand-side context deliberately kept outside the core access proof. AI may change individual capability; released time may create options. Neither establishes mass independent-research demand.

E.1 Evidence classification

Evidence	What it supports	Boundary
ERA [23]	Bounded AI scientific-software generation / optimization	Does not establish general autonomous scientific judgment or legal authority. A recent re-analysis [31] challenges one retrospective COVID-19 forecasting gain because of data-revision leakage; this paper does not rely on that result.
Robin [24]	Multi-agent hypothesis / experiment / interpretation loop	Published loop still uses human physical experimentation/-validation.
Agentic X-ray scientist [25]	Bounded instrument-control capability	Specific task autonomy is not facility admissibility or governance autonomy.
Discovery benchmark [26]	Counterweight to capability demos	Preprint; current models retain systematic weaknesses on discovery-grounded tasks.
Four-day workweek [27]	Released time can improve well-being	Not a research-participation study; recovery is a legitimate first use of time.
Belgian additional leave [28]	Discretionary time has many destinations	Planned uses centered on family/rest/hobbies/care/travel in the studied case.
Retirement / volunteering [29]	Rejects zero-conversion hypothesis	Volunteering is not equivalent to investigator-led research.
Citizen-science distribution [30]	Participation is heavy-tailed	Platform contribution patterns do not estimate independent-research prevalence.

E.2 Saved-Hours sensitivity model

The Gate 10 model is arithmetic, not a forecast:

annual investigation hours = population × saved hours/week × weeks × investigator share × share of saved time used for investigation

For a population of one million receiving four additional discretionary hours per week:

Investigator share	Time share used	Annual hours	FTE @ 1,800 h
0.1%	10%	20,800	11.6
0.1%	25%	52,000	28.9
0.5%	10%	104,000	57.8
1.0%	10%	208,000	115.6

MODELED SENSITIVITY. The conversion parameters are not empirical estimates. The model only shows that a small, heavy-tailed demand fraction could become institutionally visible without implying that most people will use released time for research.

Demand-side conclusion: Saved time creates option value, not research obligation. The right to a route is prior to the prediction that people will use it.

References

Source-date note. Web-based facility policies, organizational service pages and live pricing pages were reverified on **11 August 2026**. They are treated as policy/pricing snapshots and may change after publication. The OHRP Assurance FAQ currently states that it is being revised following a March 2026 FWA-form update; the current Individual Investigator Agreement [7] remains the controlling example used here. OLAW's Interinstitutional Assurance page now resolves to NIH Grants & Funding, and the canonical URL is used below.

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