

Epistemic Antibodies: A Technical Implementation of Semantic Immunity for Conceptual Lineage Protection

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Abstract. The open scientific record faces a paradox. The same digital infrastructures that promised to democratize knowledge have also enabled new forms of systematic intellectual appropriation. An original conceptual framework, once published in open text, can be harvested, terminologically rebranded, and relaunched as a novel contribution by actors within the networks of power and influence that control a given field of knowledge. The original author is then rendered invisible not through explicit rejection, but through a combination of *epistemic erasure* (the omission of the original source) and *epistemic dilution* (the accumulation of derivative publications that bury it). Existing defensive measures, such as cryptographic timestamping or persistent identifiers, establish temporal priority. They do not, however, bind the derivative framework to its origin in a way that travels with the data through the semantic web. A timestamp proves that something existed earlier. It does not automatically expose a later plagiarism as plagiarism. This article introduces a new defensive layer: *Epistemic Antibodies*. These are active semantic structures—instantiated as RDF/JSON-LD graphs—that bind to derivative frameworks and expose their true lineage. They do not establish the relation of derivation; they encode, identify, and persist a determination that has already been produced by an epistemic procedure. The system is grounded in an immunological metaphor and organized around three distinct epistemic functions. The CLEO Protocol performs *recognition*: it evaluates a candidate framework against the constitutive conceptual signatures of an original sovereign framework and determines whether the candidate is structurally derivative. The CLEO Determination performs *registration*: it records the result of that evaluation, with its date, protocol, and supporting documentation. The Epistemic Antibody performs *semantic persistence and exposure*: it binds to the derivative framework and makes the determination machine-readable and recoverable across changing information environments. The system is formalized in the epimsys ontology (version 3.0), which integrates the W3C PROV-O vocabulary to provide a formal provenance layer for the determination process. This paper presents the technical architecture of epistemic antibodies, their formal implementation, and a first deployment case against a real-world derivative framework: the “Platonic Space” framework introduced by Michael Levin.

1 Introduction

The open scientific record is undergoing a structural transformation. The legacy system of validation, centered on the university and the peer-reviewed journal, is losing its monopoly over the certification of knowledge. At the same time, the open web has become an extraction environment in which original conceptual work can be absorbed, renamed, and recirculated without attribution.

This environment enables a specific mode of appropriation. Once a theoretical architecture is expressed in plain text, it becomes available to actors within the networks of power and influence that control the workings of a given field of knowledge. These actors can ingest the architecture, translate its terminology, and attach it to publication venues in which they participate—either directly or indirectly through their influence networks—thereby presenting it as a novel framework. The original author is neither refuted nor debated; he is simply erased. The mechanism operates through two basic procedures: *epistemic erasure*, in which the original source is neither mentioned, acknowledged, nor cited; and *epistemic dilution*, in which the derivative framework is reproduced across numerous media outlets within the network until the original theory is buried beneath the sheer volume of its reformulations. The result is not a debate over priority. It is a structural power asymmetry: the capacity to erase and dilute is distributed unequally, and the actors who possess this power

are not held accountable by the institutions that depend on those very networks of power and influence.

Existing defenses offer partial protection. Cryptographic timestamping, through services such as OpenTimestamps or storage in IPFS and Arweave, establishes that a document existed at a given time. Persistent identifiers, such as DIDs and w3id identifiers, decouple the naming of a resource from the infrastructure of a specific publisher. These tools prove priority. They do not, however, actively label the derivative work as derivative.

The present article introduces a complementary layer: *epistemic antibodies*. An epistemic antibody is an active semantic structure, expressed in RDF and embedded in a public web page, that binds to a derivative framework and exposes its relationship to the original source. It is not a complaint. It is a formal, machine-readable declaration of lineage, subordination, and responsibility.

The article proceeds as follows. Section 2 describes the immunological architecture of the system and its three epistemic functions. Section 3 presents the formal ontology. Section 4 describes the structure of a single antibody. Section 5 presents a case study involving the “Platonic Space” framework. Section 6 discusses validation and deployment. Section 7 concludes.

2 The Immunological Architecture

The epistemic immune system described here has three distinct epistemic functions: *recognition*, *determination*, and *persistence*. These functions are performed by three distinct entities: the CLEO Protocol, the CLEO Determination, and the Epistemic Antibody. Understanding the separation of these functions is essential to understanding the architecture.

2.1 CLEO Protocol as the MHC: The Function of Recognition

The CLEO Protocol performs the function of *recognition*. It verifies structural conceptual identity. It does not rely on access, intent, or textual similarity; it compares conceptual signatures. Its decision is binary: a framework either reproduces the constitutive architecture of an original sovereign framework, or it does not.

This function is analogous to the Major Histocompatibility Complex (MHC) in jawed vertebrates. The MHC presents peptide fragments to T cells, allowing the immune system to distinguish self from non-self. The CLEO Protocol evaluates a candidate framework against the conceptual signatures of a sovereign framework and determines whether the candidate is *Derivative* (non-self, antigenic) or *Sovereign* (self, protected).

The protocol is the recognition mechanism of the system. It is not a document and not a determination; it is the formal procedure by which the determination is produced. Its specification is public and citable at <https://www.evolutio.ar/observatory/cleo>.

2.2 CLEO Determination: The Function of Registration

When the CLEO Protocol is applied to a specific case, it produces a *CLEO Determination*. The determination performs the function of *registration*: it records the result of the evaluation. It has a date, a result, an associated protocol, an authorizing agent, and the documentary evidence that supports it.

The determination is the object that triggers the immune response. It is not the antibody itself, and it is not the evidence. It is the epistemic event that establishes that a framework is structurally derivative.

2.3 Derivative Framework as Antigen

Once the CLEO Protocol determines that a framework is structurally derivative, that framework is classified as an antigen: a `epim:DerivativeFramework`. This is not an “alleged” or “disputed” entity. Within the system, it is a framework whose derivative status has been determined by a formal epistemic procedure.

2.4 Epistemic Antibody: The Function of Semantic Persistence

The epistemic antibody performs the function of *semantic persistence and exposure*. It is not a conventional docu-

ment; it is a structured semantic entity (`epim:EpistemicAntibody`) that binds to a specific derivative framework and persists the record of its subordination.

The antibody does not establish the relation of derivation; it encodes, identifies, and exposes a determination that has already been produced. The distinction is essential:

CLEO performs epistemic determination; the Epistemic Antibody performs semantic persistence and exposure of that determination.

This separation of functions is the theoretical core of the architecture. It clarifies that the antibody is not an instrument of adjudication but an instrument of representation and circulation.

2.5 Semantic Ligands

The term *semantic ligand* is used metaphorically for the machine-readable relations through which the antibody and its target framework are connected to the evidentiary lineage. In the current ontology, the primary semantic ligands are `epim:isSubordinatedTo`, `epim:appropriatedFromOriginalSource`, `epim:hasDetermination`, `epim:infringingDocument`, `epim:hasTemporalPriorityOver`, and `epim:authoredBy`. These relations are the binding sites of the antibody. Because they are represented as RDF triples, they are machine-readable. Any system that ingests the page carrying the antibody also ingests the determination, the lineage, and the supporting documentation as formal, structured data.

The term *ligand* designates a functional analogy, not an ontological category. Some relations, such as `hasDetermination` and `isSubordinatedTo`, bind the antibody directly to its target and to the sovereign framework. Others, such as `authoredBy`, provide contextual information about the framework. The distinction is functional, not hierarchical.

2.6 Exposure: The Fc Region with a Fluorescent Tag

In humoral immunity, the Fab region binds the antigen, while the Fc region recruits effector cells. In this system, the Fab equivalent is the set of semantic ligands binding to the derivative framework. The Fc equivalent is public exposure: the antibody, once bound, makes the derivative’s true identity visible across the semantic web.

The immunofluorescence analogy describes the exposure function. The antibody is conjugated to a marker composed of public, linked, machine-readable triples that declare: the derivative is subordinated to the sovereign; the determination is recorded; the original source is identified; and the supporting documentation is explicit. Any future system that ingests and preserves the relevant semantic graph can recover the declared lineage without requiring the original prose to be rediscovered manually.

The system increases the machine-readable persistence and recoverability of the declared lineage. It does not guarantee that any specific crawler, knowledge graph, or artificial intelligence system will act upon this information. The

claim is one of availability and structural persistence, not of guaranteed recognition.

tegrates the W3C PROV-O ontology to provide a formal provenance layer for the determination process.

3 Ontological Implementation

The ontology epimsys (version 3.0) provides the formal vocabulary for the epistemic immune system. It in-

3.1 Classes

Table 1 summarizes the classes of the ontology.

Table 1. Classes of the epimsys ontology (v3.0).

Class	Immunological role	Function
SovereignFramework	Self	Original conceptual architecture with temporal priority.
DerivativeFramework	Antigen	Framework determined by CLEO as structurally derivative.
AssessmentProtocol	MHC	Formal protocol that evaluates a framework (CLEO).
CLEODetermination	Epistemic event	The application of the protocol to a case; triggers the antibody.
EpistemicAntibody	Defense	Active semantic structure that binds to and exposes a derivative.
SupportingDocument	Documentation	Scholarly work that supports the determination.

3.2 Object Properties

Table 2 summarizes the object properties.

Table 2. Object properties of the epimsys ontology (v3.0).

Property	Type	Domain → Range	Function
evaluates	—	Protocol → Framework	The framework a protocol evaluates.
hasDetermination	—	Framework → Determination	Links a framework to its CLEO determination.
hasProtocol	—	Determination → Protocol	The protocol that produced the determination.
triggersAntibody	—	Determination → Antibody	Activates the immune response.
supportedBy	—	Determination → Document	The document that supports the determination.
targets	—	Antibody → TargetEntity	The entity an antibody targets.
isSubordinatedTo	Transitive	Derivative → Sovereign	Hierarchical and historical dependency.
appropriatedFromOriginalSource	Asymmetric	Derivative → Sovereign	Origin of the derivative from the sovereign.
hasTemporalPriorityOver	—	Sovereign → Derivative	Temporal precedence of the sovereign.
authoredBy	—	Framework → Person	Author of a framework (factual attribution).
infringingDocument	—	Derivative → Entity	The document carrying the appropriation.
originalDocument	—	Sovereign → Entity	The document of first publication.

The property `isSubordinatedTo` is defined as transitive: if A is subordinated to B , and B to C , then A is subordinated to C . The property `appropriatedFromOriginalSource` is defined as asymmetric: if X is appropriated from Y , then Y cannot be appropriated from X . These logical types allow future reasoners to infer additional consequences of the graph.

A key architectural distinction separates the fact of authorship from the conclusion of appropriation. The prop-

erty `authoredBy` records who wrote a framework. The determination records the conclusion that the framework is derivative. This separation ensures that the ontology does not conflate a factual attribution with an evaluative conclusion.

3.3 Data Properties

Table 3 summarizes the data properties.

Table 3. Data properties of the epimsys ontology (v3.0).

Property	Domain → Range	Function
determinationResult	Determination → xsd:string	Records the result (DerivativeFramework(HighFidelity)).
determinationDate	Determination → xsd:date	Records the date of the determination.
datedAs	Framework → xsd:gYear	The year associated with a framework.

3.4 Provenance Integration

The ontology imports PROV-O and uses it to provide a formal provenance layer for the determination process. The `CLEODetermination` class is a subclass of `prov:Activity`. The `SupportingDocument` class is a subclass of `prov:Entity`. The determination carries the property `prov:wasAssociatedWith` to record the agent responsible for its production. This integration provides machine-readable provenance information for the determination and its supporting documentation, from the antibody, through the determination, to the supporting document and the original source.

The implementation does not currently model the full PROV-O chain (used, wasGeneratedBy, wasDerivedFrom). It establishes the core entities and the principal attribution relation. Future versions may extend the provenance layer to include the complete chain.

4 Semantic Antibody Architecture

An epistemic antibody is a JSON-LD `@graph` embedded in the page of a conceptual, forensic or technical publication. The graph contains the following nodes:

1. **CLEO Protocol node** — typed as `epim:AssessmentProtocol`, which `epim:evaluates` the candidate framework.
2. **Derivative Framework node** — typed as `epim:DerivativeFramework`, carrying the semantic ligands and the `epim:hasDetermination` edge.
3. **CLEO Determination node** — typed as `epim:CLEODetermination`, with `epim:hasProtocol`, `epim:determinationResult`, `epim:determinationDate`, `prov:wasAssociatedWith`, `epim:triggersAntibody`, and `epim:supportedBy`.
4. **Epistemic Antibody node** — typed as `epim:EpistemicAntibody`, which `epim:targets` the derivative framework.
5. **Supporting Document node** — typed as `epim:SupportingDocument`, the forensic investigation that supports the determination.
6. **Sovereign Framework node** — typed as `epim:SovereignFramework`, with `epim:hasTemporalPriority`

`yOver`, `epim:authoredBy`, `epim:datedAs`, and `epim:originalDocument`.

The structural core of the pattern is the chain that connects the protocol to the determination, and the determination to the antibody. The first edge (`evaluates`) establishes that a protocol was applied to a framework. The second edge (`triggersAntibody`) establishes that the resulting determination produced an active immune response. Once both triples exist in the same graph, the publication is no longer merely a text; it is an active agent of semantic persistence.

5 A Case Study: The “Platonic Space” Framework

The first deployment of the epistemic antibody system targets a framework introduced in 2025 under the name “Platonic Space” (1), and published in peer-reviewed form in 2026 (2). Under the CLEO Protocol, this framework was compared against the Evolutio Unfolding Theory (EUT), originally published in 2020 (3). The comparison was architectural rather than textual. It compared the constitutive conceptual signatures of the EUT against the candidate framework and found structural identity under terminological substitution.

The determination was recorded in the paper that introduces the concept of *Epistemic Chameleonism* (5). The forensic chronology was documented in the corresponding forensic analysis (7). The methodological foundations of the CLEO Protocol and the concept of *Epistemic Immunity* were developed in a separate methodological paper (6). The result was binary: “Platonic Space” is a `epim:DerivativeFramework`. Its determination result is *Derivative Framework (High Fidelity)*.

5.1 The Derivative Framework and Its Antigenic Structure

Within the epimsys ontology, the derivative framework is represented as a single node with `@id` <https://www.evolutio.ar/observatory/cleo#platonic-space>. This node carries the semantic relations that bind it to the original source, to the author, to the infringing document, and to the CLEO determination.

Table 4 lists the relations applied in the case study.

Table 4. Semantic relations applied to the “Platonic Space” derivative framework.

Semantic relation	Target	Meaning
hasDetermination	#platonnic-space-determination	The CLEO determination.
isSubordinatedTo	canon#eut	Ontological subordination to the sovereign.
appropriatedFromOriginalSource	canon#eut	Origin from the EUT (2020).
authoredBy	#platonnic-space-author	Michael Levin as author.
datedAs	2025	Year of the derivative framework.
infringingDocument	#platonnic-space-reference	The preprint and published paper (DOI).

5.2 The Determination and the Antibody

The CLEO determination is represented as a single node with @id <https://www.evolutio.ar/observatory/cleo#platonnic-space-determination>. It carries the protocol, the result, the date, the responsible agent, the supporting document, and the antibody it triggers:

- epim:hasProtocol → #cleo-protocol
- epim:determinationResult → “Derivative Framework (High Fidelity)”
- epim:determinationDate → “2026-05-27”
- prov:wasAssociatedWith → Agustín Ostachuk [DID]
- epim:supportedBy → #platonnic-space-supporting-document
- epim:triggersAntibody → #platonnic-space-antibody

The epistemic antibody is represented as a single node with @id <https://www.evolutio.ar/observatory/cleo#platonnic-space-antibody>. It carries a single relation: epim:targets → #platonnic-space.

5.3 Distributed Semantic Deployment

The antibody is deployed across multiple publications. Each publication carries the same antibody graph, with identical @id values. This implements a deliberate architectural decision: **a single persistent antibody identity per framework**.

Because RDF is a set of triples, and because identical triples are consolidated when graphs are merged, the deployment across multiple publications does not produce multiple antibody individuals or multiple assertions of the same relation. It produces a single set of triples, distributed across multiple documents. This distinction is essential and is captured by two complementary notions:

- **Documental redundancy:** the same semantic graph is embedded in multiple publications addressing the same case.
- **Ontological identity:** when those documents are aggregated, the triples are consolidated under the same persistent identifiers, producing a single coherent set of relations.

The current implementation therefore distinguishes *semantic persistence* from *semantic multiplicity*. It prioritizes persistence and identity coherence over the artificial creation of multiple antibody instances for the same framework.

The publications that carry the antibody graph include:

EM43145180 *Evolutio Unfolding Theory and “Platonic Space”: On Conceptual Priority and Lineage*, 2025-12-15 (4).

EM48730992 *Evolutio Unfolding Theory and “Platonic Space”: Anatomy of a Conceptual Appropriation, Renaming and Rebranding*, 2026-03-30 (7).

EJ15308831 *Epistemic Chameleonism: A Structural and Conceptual Comparative Analysis of the Evolutio Unfolding Theory (2020) and the “Platonic Space” Framework (2025)*, 2026-05-27 (5).

EJ44455471 *Epistemic Immunity: A Binary Diagnostic Test for Structural Conceptual Appropriation*, 2026-07-02 (6).

The result is a single persistent antibody, deployed across multiple contexts of documentation. The future evolution of the system may explore how to maximize distribution, redundancy, and semantic diversity without multiplying the ontological identity of the antibody. That is a question for subsequent versions, not for the first implementation.

6 Validation and Deployment

The antibodies are not static documents. They enter the semantic web through an automated pipeline.

6.1 Harvesting and Ingestion Pipeline

The script `evolutio_graph_builder.py` discovers the URLs of EVOLUTIO publications through the site sitemaps. For each page, it extracts every `<scripttype="application/ld+json">` block, filters out irrelevant structures such as `BreadcrumbList`, parses each relevant block with `rdflib`, merges the resulting triples, and serializes the graph as `evolutio_master_graph.ttl`.

The resulting file is transferred to the EVOLUTIO semantic server and loaded into Virtuoso using `DB.DBA.TTLP`. After loading, the graph contains the epistemic antibodies and the associated determination records.

6.2 SPARQL Verification of Antibody Binding

To confirm that the antibodies have bound to their target, the public endpoint can be queried with:

```
PREFIX epim:
  <https://www.evolutio.ar/ontologies/epimsys#>
PREFIX rdfs: <http://www.w3.org/2000/01/rdf-schema#>

SELECT ?subject ?property ?object
WHERE {
  ?subject ?property ?object .
  FILTER(CONTAINS(LCASE(STR(?subject)),
    "platonian-space"))
}
ORDER BY ?property
```

This query returns every triple whose subject is the derivative framework node or one of its associated nodes. The deployed graph contains the type declaration, the label, the hasDetermination edge, the authoredBy edge, the infringingDocument edge, the subordination edges, and the determination record. This is the machine-readable equivalent of a positive immunofluorescence signal.

6.3 Public Distribution

The full .ttl graph is also published as a public dataset on Hugging Face. The dataset card declares CC-BY-4.0 for the graph triples, while the linked publications remain under strict copyright. This dual strategy maximizes discoverability while preserving the integrity of the original literary work.

7 Conclusion

The epistemic antibody system has moved from metaphor to implementation. The epimsys ontology supplies the formal vocabulary. The CLEO Protocol produces the determination. The determination triggers the antibody. The JSON-LD blocks instantiate the antibodies. The harvest-and-load pipeline extracts them into a public RDF graph. The SPARQL endpoint exposes them as queryable facts.

The architecture is organized around a precise separation of epistemic functions: recognition, performed by the CLEO Protocol; registration, performed by the CLEO Determination; and semantic persistence, performed by the Epistemic Antibody. This separation clarifies what each component does and, equally important, what it does not do. The antibody does not adjudicate. It does not prove. It does not force recognition. It makes available, structured, persistent, and recoverable a determination that has already been produced by a formal epistemic procedure.

In the case of "Platonic Space", a single persistent antibody identity, deployed across multiple publications, now binds the derivative framework to its original source, to its author, and to the documentary record. The system increases the machine-readable persistence and recoverability of the declared lineage across changing information environments.

This is the epistemological equivalent of acquired immunity: not the destruction of the pathogen, but the permanent labeling of its identity.

Author Contributions

The author is solely responsible for the conceptualization, design, and writing of this work. The original idea, the theoretical framework, and all conceptual developments presented here are entirely his own. The only external assistance used in the preparation of this article was a generative AI tool, which was employed exclusively for the technical coding of the OWL ontology (epimsys) and the JSON-LD blocks described in the text. All AI-generated code was reviewed, validated and edited by the author, who assumes full responsibility for its accuracy and integrity.

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Dr. Agustín Ostachuk is a transdisciplinary scientific researcher investigating the fundamental nature of life, evolution, and development. His work bridges theoretical biology, philosophy of biology, evolutionary biology, and complexity science. He is the author of the **Evolutio Unfolding Theory (2020)**, a teleological account proposing that evolution unfolds through formal agents embedded in morphogenetic fields. He is the Founding Director of **EVOLUTIO**, a research center devoted to advancing new frameworks for evolution and development, and to cultivating a life-centered, Earth-rooted mode of existence.