Persistence as the First Principle

A Philosophical Foundation for Coherence Medicine

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Abstract

Modern medicine classifies disease primarily by anatomy, pathology, and molecular mechanism. Systems biology, cybernetics, Network Physiology, and the Free Energy Principle have each challenged this reductionist view by emphasizing regulation rather than structure. Yet these approaches still begin with living systems already in existence. They ask how organisms regulate themselves, not why living systems can persist at all.

This paper proposes a deeper foundation. Persistence—not coherence—is the first principle. Every stable entity, from elementary particles to ecosystems, exists only because it continuously maintains an organized pattern against perturbation. Persistence requires regulation; regulation requires information processing; information processing requires coherence. Coherence is therefore not an axiom but the measurable manifestation of successful regulation.

From this perspective, coherence medicine becomes a special case of a more general science of persistence. Health is the persistence of coherent regulation. Disease is the progressive loss or pathological reorganization of that persistence.

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1. The Problem

Scientific revolutions often begin by replacing the question rather than the answer.

Classical medicine asks:

> *What disease does this patient have?*

Systems medicine asks:

> *Which regulatory network has failed?*

This paper asks a deeper question still:

Why do living systems remain stable long enough to regulate anything at all?

The answer proposed here is that persistence is the fundamental property requiring explanation.

Nothing in nature simply exists.

Everything that exists persists.

Persistence is therefore the primary scientific phenomenon.

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2. From Objects to Persistent Patterns

Western science inherited an ontology of objects.

Atoms, cells, organs and organisms are treated as things possessing properties.

Modern physics has steadily replaced this ontology with one of processes.

Quantum field theory describes elementary particles not as tiny objects but as stable excitations of underlying fields.

Fluid dynamics describes vortices as persistent structures within continuous flow.

Ecology increasingly studies ecosystems as dynamic attractors rather than collections of species.

The same shift appears throughout complexity science.

Stable entities are better understood as persistent organizations than as permanent substances.

The organism belongs naturally within this process ontology.

A living organism is not a collection of molecules.

It is the continued persistence of a particular organization of matter and information.

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3. Persistence Requires Regulation

Persistence is impossible without active regulation.

Every persistent system faces continual perturbation.

Energy fluctuates.

Resources vary.

Internal components degrade.

External conditions change.

Without mechanisms that compensate for disturbance, persistence immediately collapses.

Cybernetics recognized this structure long before molecular biology.

Wiener demonstrated that every regulator compares the current state with a reference state and acts to reduce deviation.

Ashby generalized this through the Law of Requisite Variety: regulation succeeds only when regulatory complexity matches environmental complexity.

Homeostasis represents the simplest expression of this principle.

Allostasis extends regulation into prediction.

The Free Energy Principle generalizes the same architecture across biological scales.

These theories do not compete.

They describe different aspects of one requirement:

Persistent systems must regulate themselves.

Thus:

Persistence implies regulation.

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4. Regulation Requires Information

Regulation cannot occur without information.

A controller must distinguish internal from external states.

It must measure deviations.

It must compare observations with references.

It must generate corrective action.

Each of these operations is informational.

Feedback is information.

Prediction is information.

Adaptation is information.

Regulation therefore cannot be separated from information processing.

This insight connects cybernetics directly with Shannon's information theory.

The organism becomes understandable as an information-processing network whose continued existence depends upon maintaining informative relationships among its components.

Thus:

Regulation implies information processing.

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5. Information Processing Requires Coherence

Information cannot be processed efficiently within a completely disorganized network.

Signals must arrive.

Subsystems must communicate.

Timing must remain coordinated.

Connections must remain functional.

The network must reorganize when perturbation occurs.

These requirements correspond directly to the measurable components already identified in Network Physiology:

- synchronization;
- connectivity;

- information flow;
- adaptability.

Together these define coherence.

Coherence is therefore not an independent first principle.

It is the observable condition allowing information processing to remain effective.

Thus:

Information processing implies coherence.

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6. Synchronization as the First Observable

Among the four components of coherence, synchronization occupies a unique position.

Unlike connectivity or adaptability, synchronization already possesses a mature mathematical formalism through the Kuramoto order parameter.

Synchronization therefore represents the first directly measurable manifestation of persistence.

The widespread appearance of oscillatory behavior throughout nature is therefore unsurprising.

Oscillation appears in:

- quantum systems;
- molecular chemistry;
- cardiac rhythms;
- neuronal activity;
- endocrine secretion;
- circadian regulation;
- ecological population dynamics.

Oscillation itself is not the first principle.

Rather, oscillatory synchronization provides nature with an exceptionally efficient mechanism for maintaining coherence across coupled systems.

The ubiquity of oscillation therefore supports—not establishes—the persistence framework.

7. Health

Health is often defined negatively as the absence of disease.

This definition explains nothing.

Within the persistence framework:

Health is the sustained capacity of a living system to preserve coherent regulation under perturbation.

Health therefore becomes dynamic rather than static.

It is not equilibrium.

It is the continuing restoration of coherence after disturbance.

8. Disease

Disease is not primarily molecular.

Nor is it primarily anatomical.

Disease represents failure of persistence.

This failure may arise through multiple mechanisms:

- loss of synchronization;
- pathological synchronization;
- corruption of regulatory references;
- destruction of regulatory nodes;
- structural interruption of regulatory pathways.

These become different mechanisms by which persistence is degraded.

Organ-specific pathology becomes the visible consequence rather than the fundamental classification.

9. Why Coherence Matters

Coherence does not replace molecular biology.

It organizes it.

Genes become components of regulatory architecture.

Proteins become regulatory mechanisms.

Organs become specialized subnetworks.

The organism becomes a persistent information-processing system whose continued existence depends upon maintaining coherence across multiple spatial and temporal scales.

Coherence therefore occupies the same role within biology that temperature occupies within thermodynamics.

Temperature is not fundamental.

It is an emergent property summarizing collective molecular behavior.

Likewise, coherence summarizes collective regulatory behavior.

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10. A New Scientific Hierarchy

The argument developed here yields a simple logical chain.

Persistence

↓

Regulation

↓

Information Processing

↓

Coherence

↓

Health

Each level follows necessarily from the previous one.

Coherence is no longer assumed.

It is derived.

Medicine therefore becomes one application of a far more general theory describing the persistence of organized systems.

Conclusion

The central claim of this paper is modest but fundamental.

Living systems should not be understood primarily as collections of components.

They should be understood as persistent organizations.

Persistence demands regulation.

Regulation demands information.

Information demands coherence.

Health is the successful maintenance of this hierarchy.

Disease is its progressive failure.

Coherence medicine therefore does not introduce a new biological principle.

It identifies coherence as the measurable expression of a deeper and more universal principle:

Persistence.

Annotated References

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Introduces a process ontology in which persistent patterns replace static objects as the primary units of explanation. Provides the philosophical motivation for treating persistence rather than substance as fundamental.

Konstapel, J. (2026). ***The Universe as Oscillation*****.**

Argues that oscillatory behavior recurs across multiple scales of nature. Used here not as ontological proof but as independent support for synchronization as the first measurable manifestation of persistence.

Konstapel, J. (2026). ***The Coherence Principle*****.**

Develops coherence as the measurable joint state of synchronization, connectivity, information flow, and adaptability. Within the present paper, coherence is derived from persistence rather than assumed as the starting axiom.