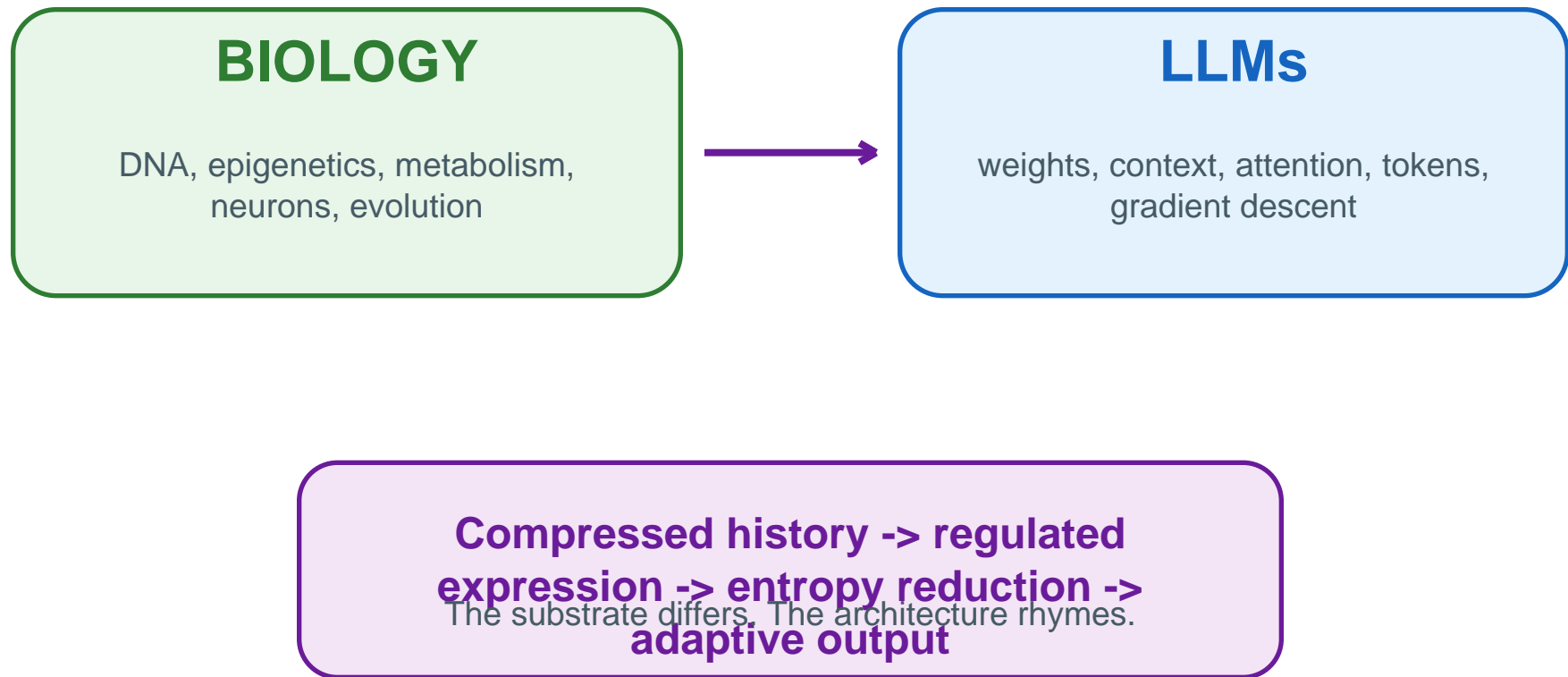


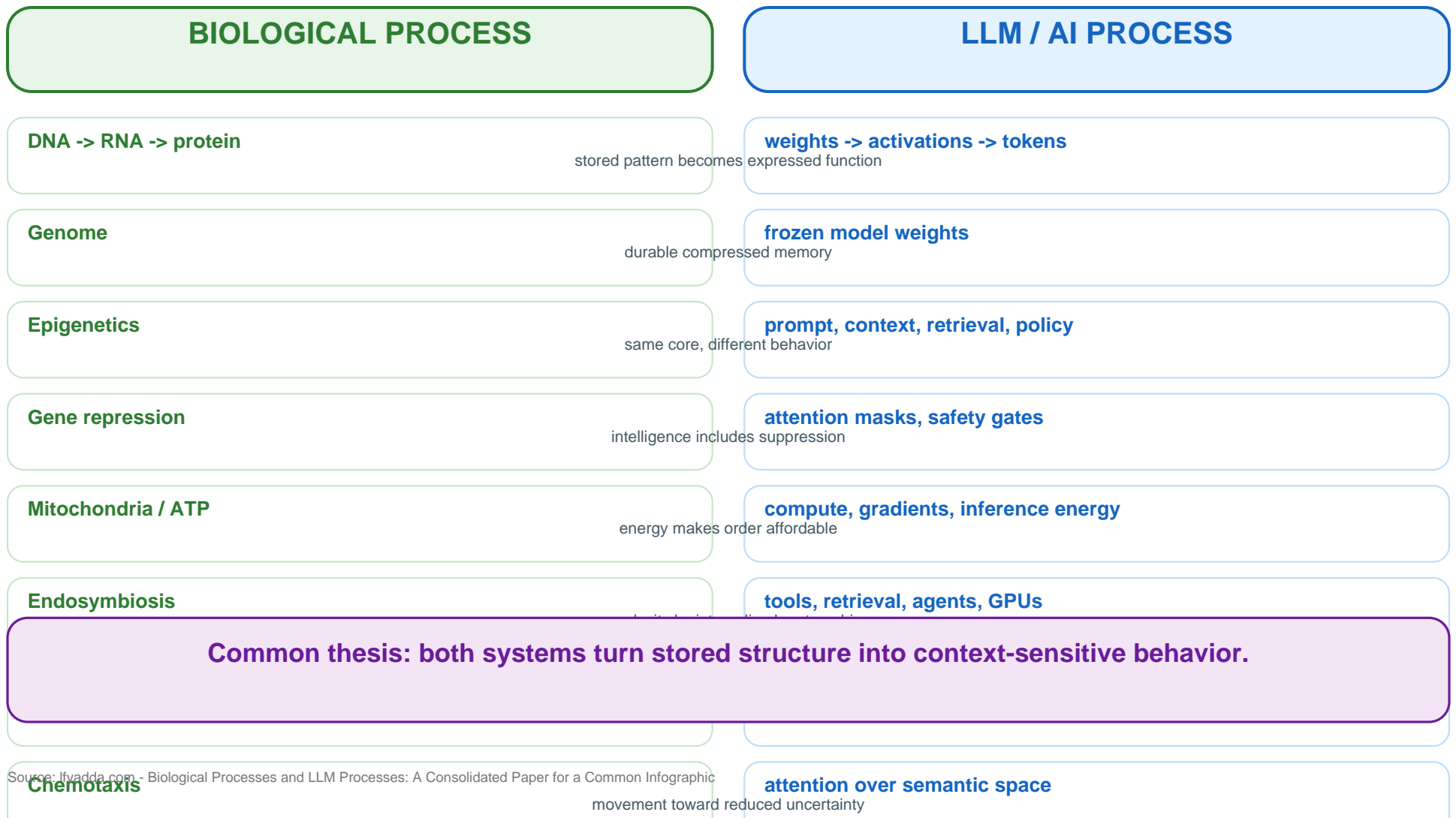
From Genome to Prompt

A white-background infographic booklet expressing the shared architecture of biology and large language models.



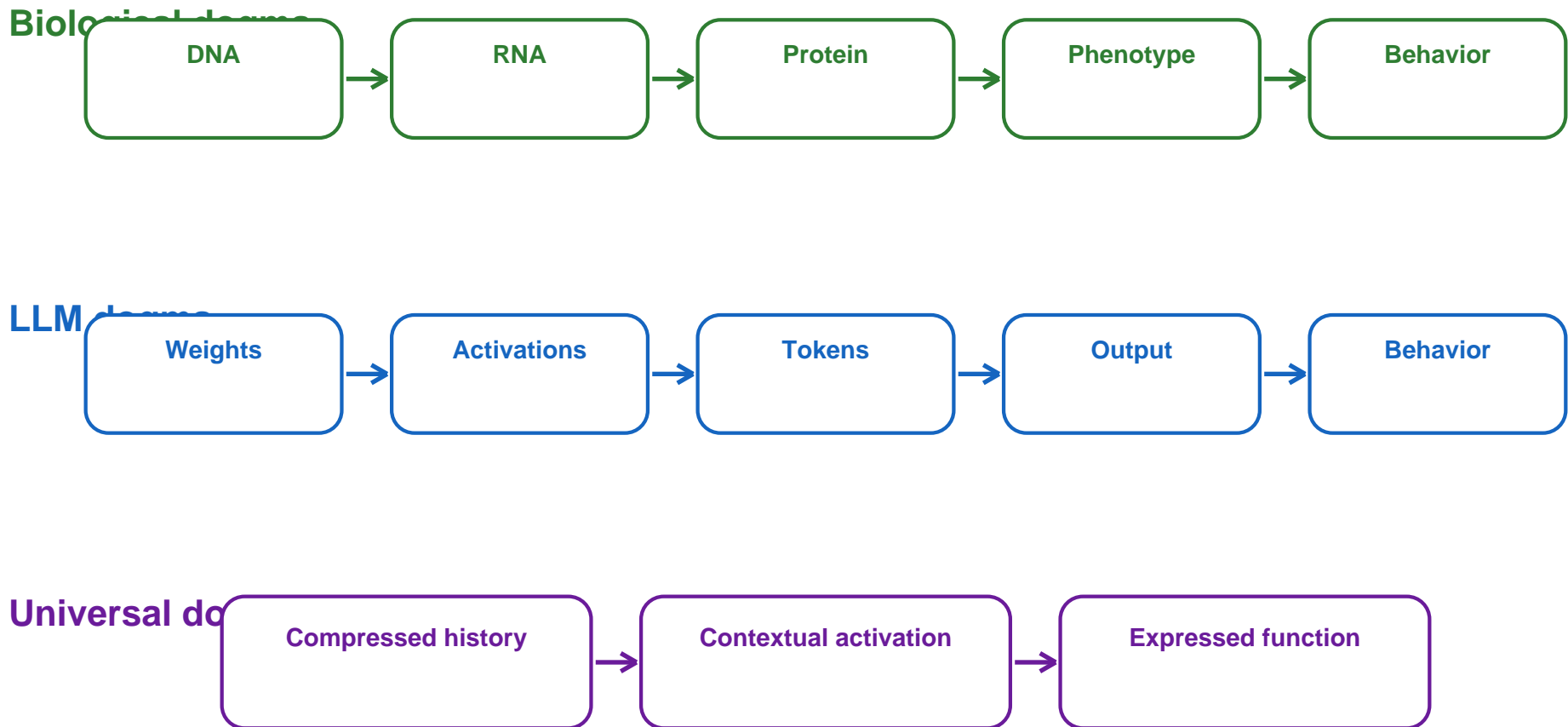
Master Analogy Map

The post identifies repeated pairings between biological machinery and LLM machinery.



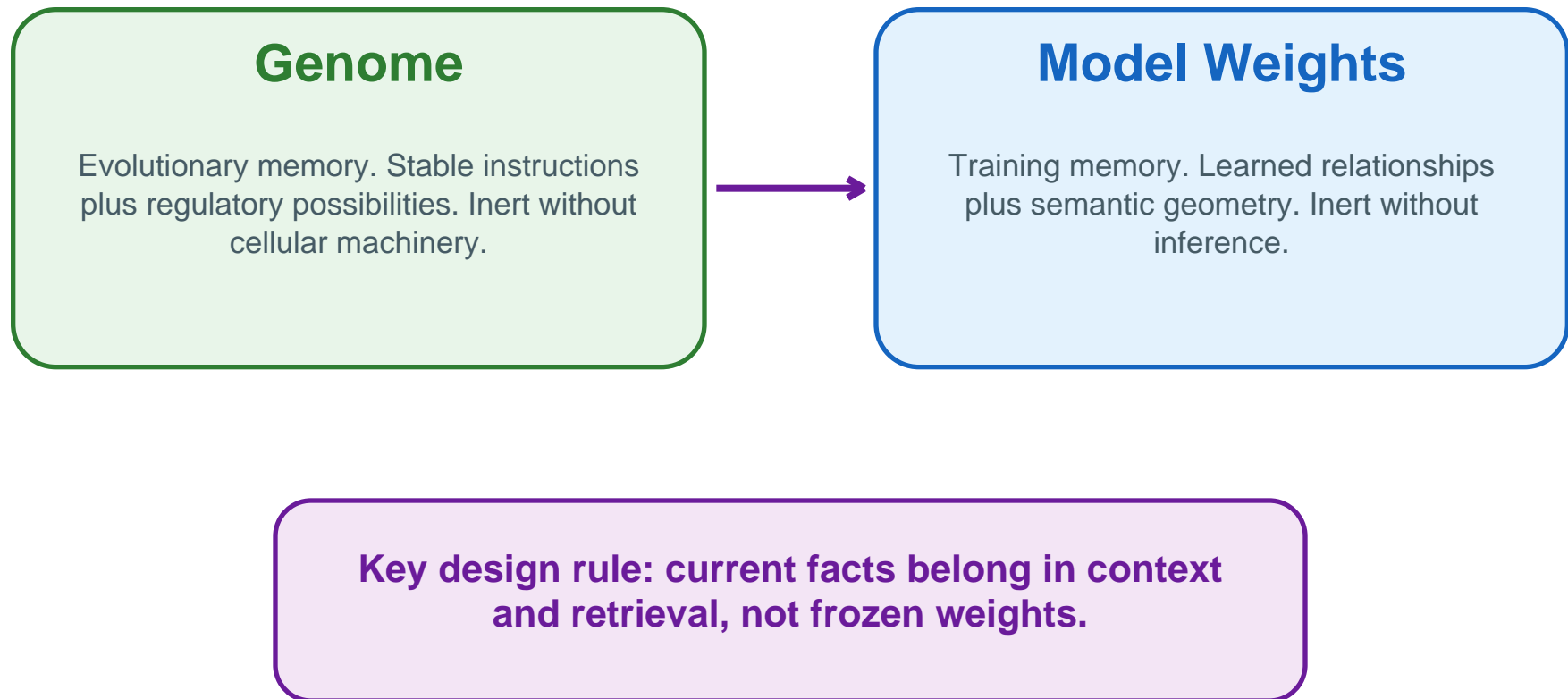
The Central Dogma Rewritten

Classic biology and modern AI can be viewed as parallel expression pipelines.



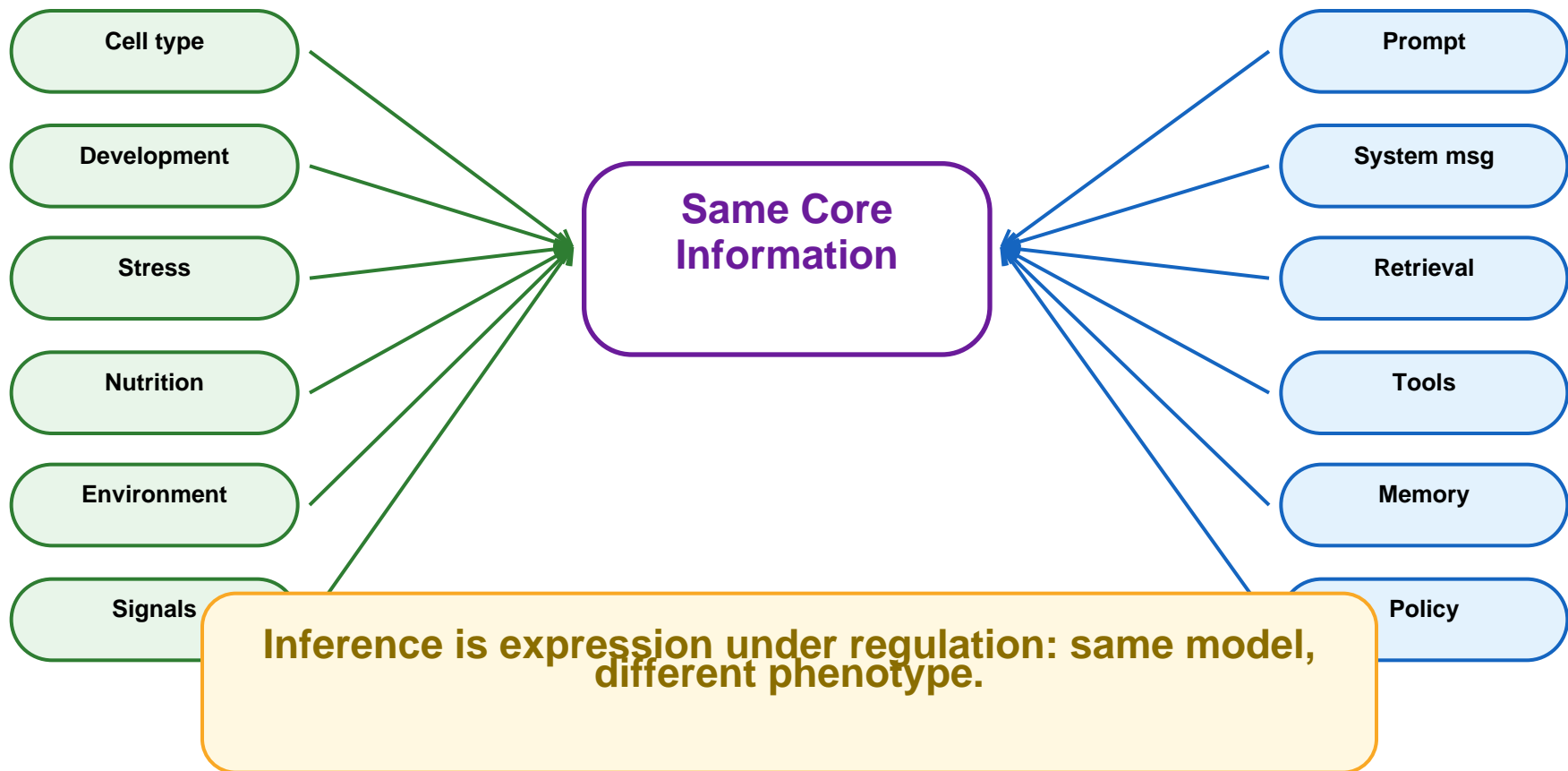
Genome and Weights: Frozen Learning

Neither DNA nor model weights are the whole intelligence. They are compressed potentials.



Epigenetics and Context

The same stored code can produce different behavior when different regulators are applied.



Repression and Gating

Intelligence is also what does not get expressed.

Biological Repression

Do not express every gene. Do not let every signal propagate. Do not allow runaway division.

LLM Suppression

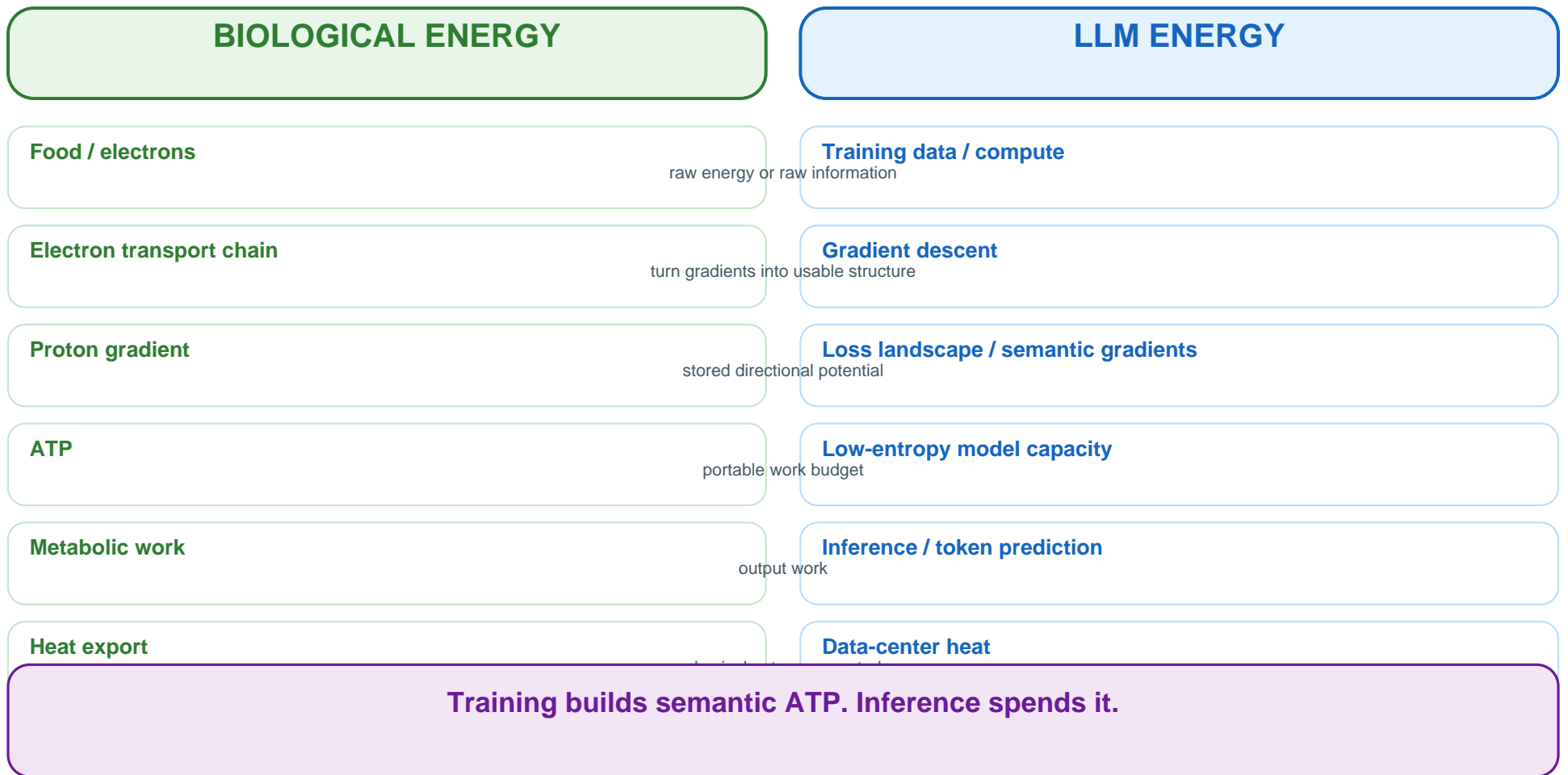
Do not attend equally. Do not leak future tokens. Do not output every plausible continuation.

Regulation = selection + suppression

Safety, masks, filters, and attention gates are not afterthoughts; they are expression control.

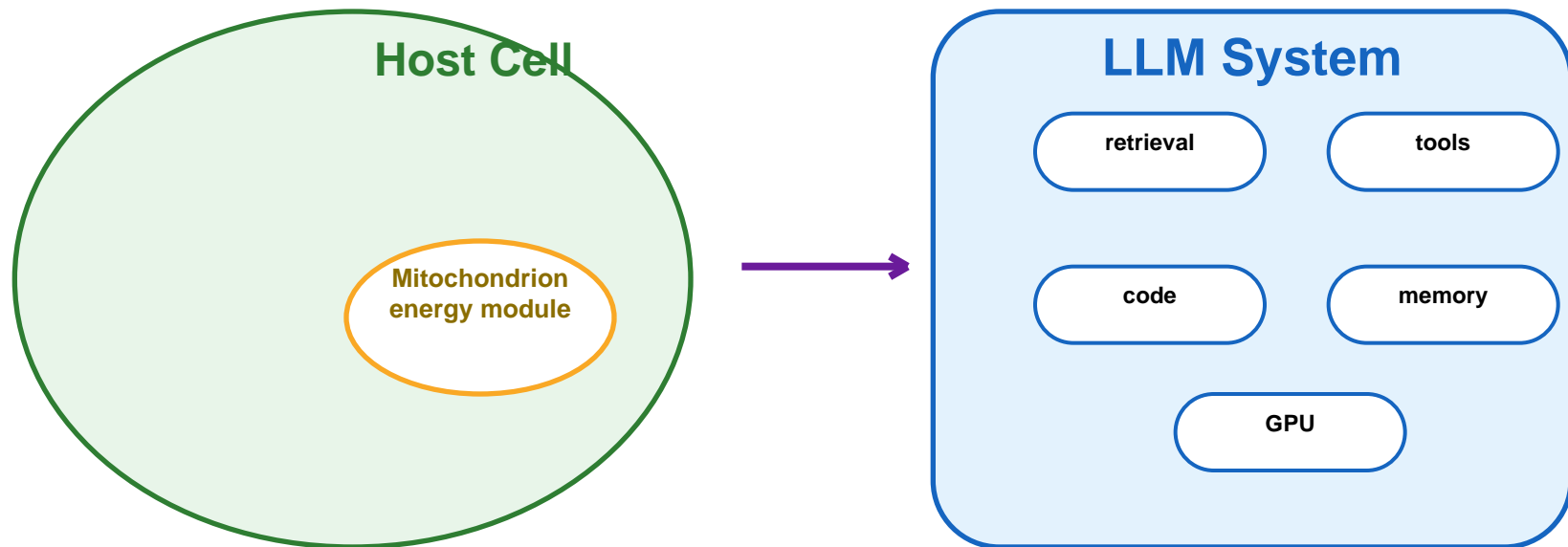
Metabolism and Compute

Both systems spend energy to maintain structure and reduce uncertainty.



Endosymbiosis and Tool-Using AI

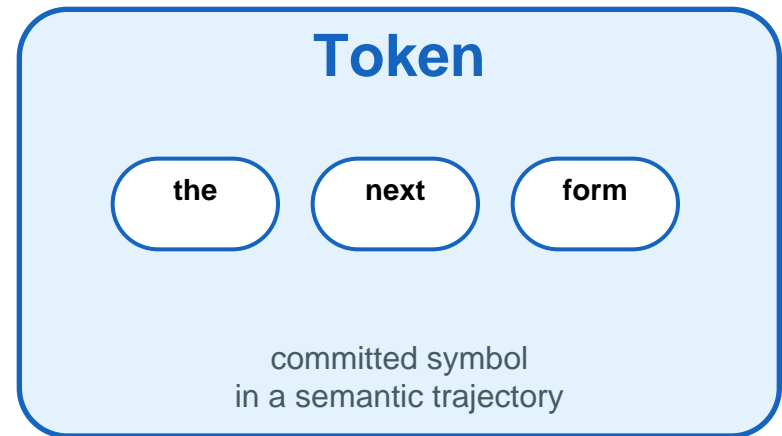
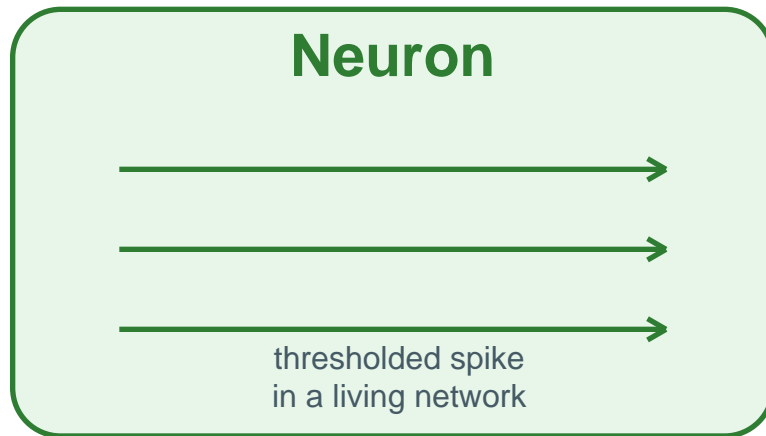
Complexity increases when useful external systems become internal infrastructure.



Biology internalized bacteria. AI internalizes retrieval, tools, agents, memory, and compute.

Neurons and Tokens

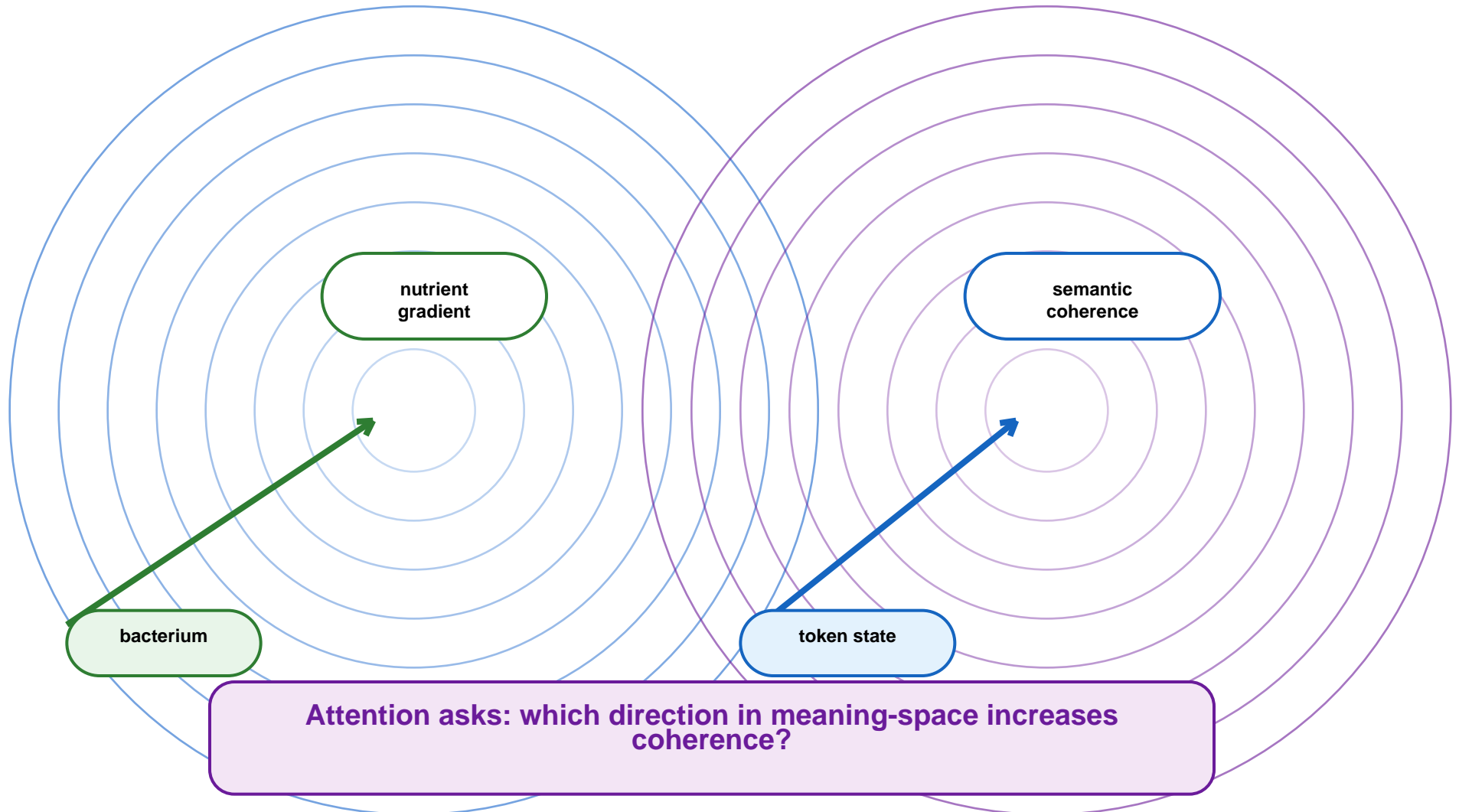
Meaning is distributed across patterns, not stored inside single spikes or single tokens.



A token is a spike in semantic space.

Attention as Chemotaxis

Systems do not need a global map. They can follow local gradients toward coherence.

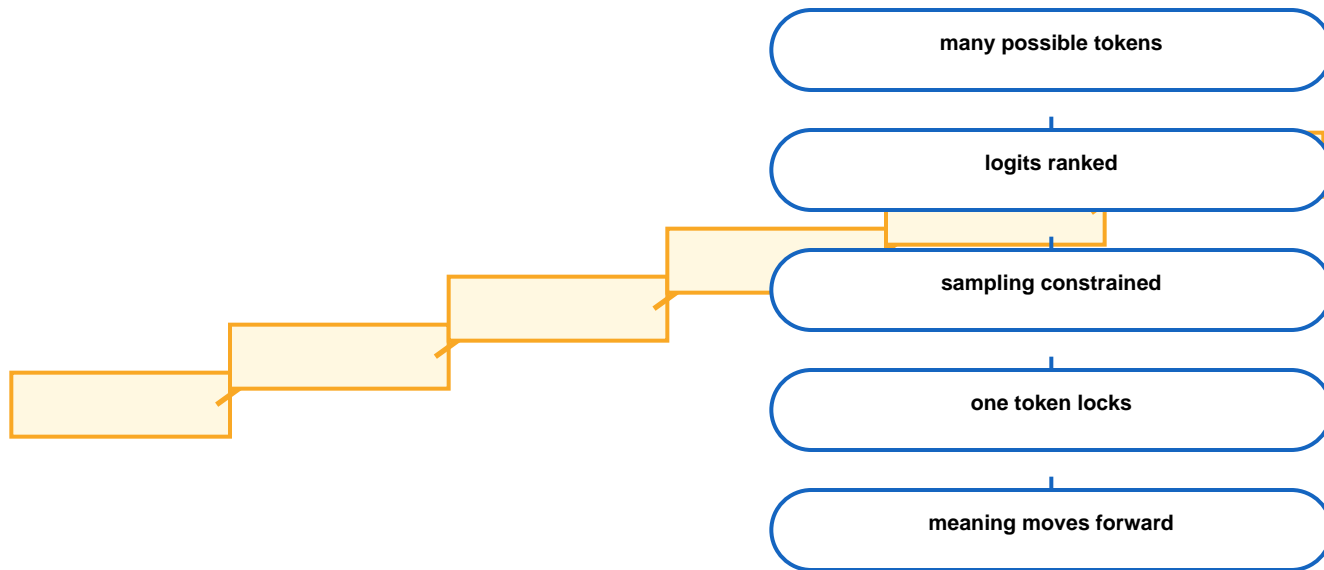


Brownian Ratchet and Token Selection

Noise plus constraint becomes direction.

**Molecular motor: thermal wiggle + ATP bias
-> forward step**

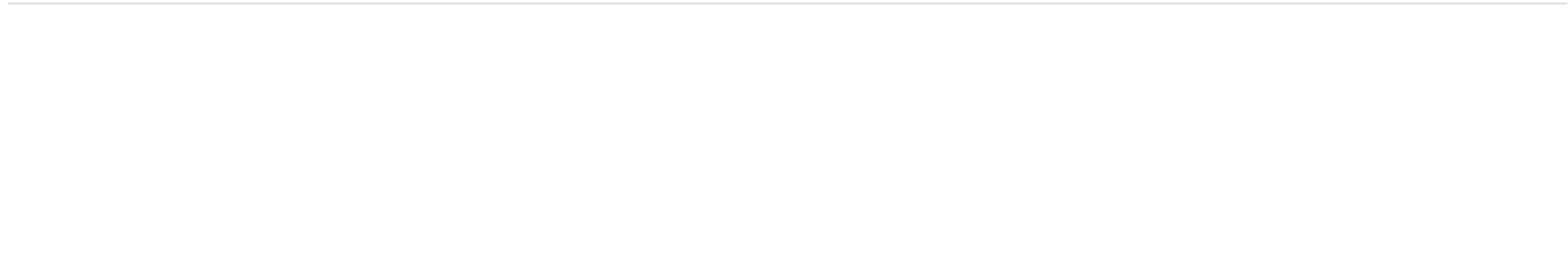
**LLM decoder: probability cloud + constraints
-> next token**



Uncertainty plus gradient equals direction. Probability becomes sequence.

Cas9 and Dot Products

Biological targeting and semantic attention both depend on constrained matching.



CAS9 TARGETING

TRANSFORMER ATTENTION

Guide RNA

what is searching

Query vector

DNA target

what can be matched

Key vectors

Base-pair complementarity

how match is scored

Dot product / cosine similarity

Conformational change

match changes system state

Hidden-state update

Cut or edit

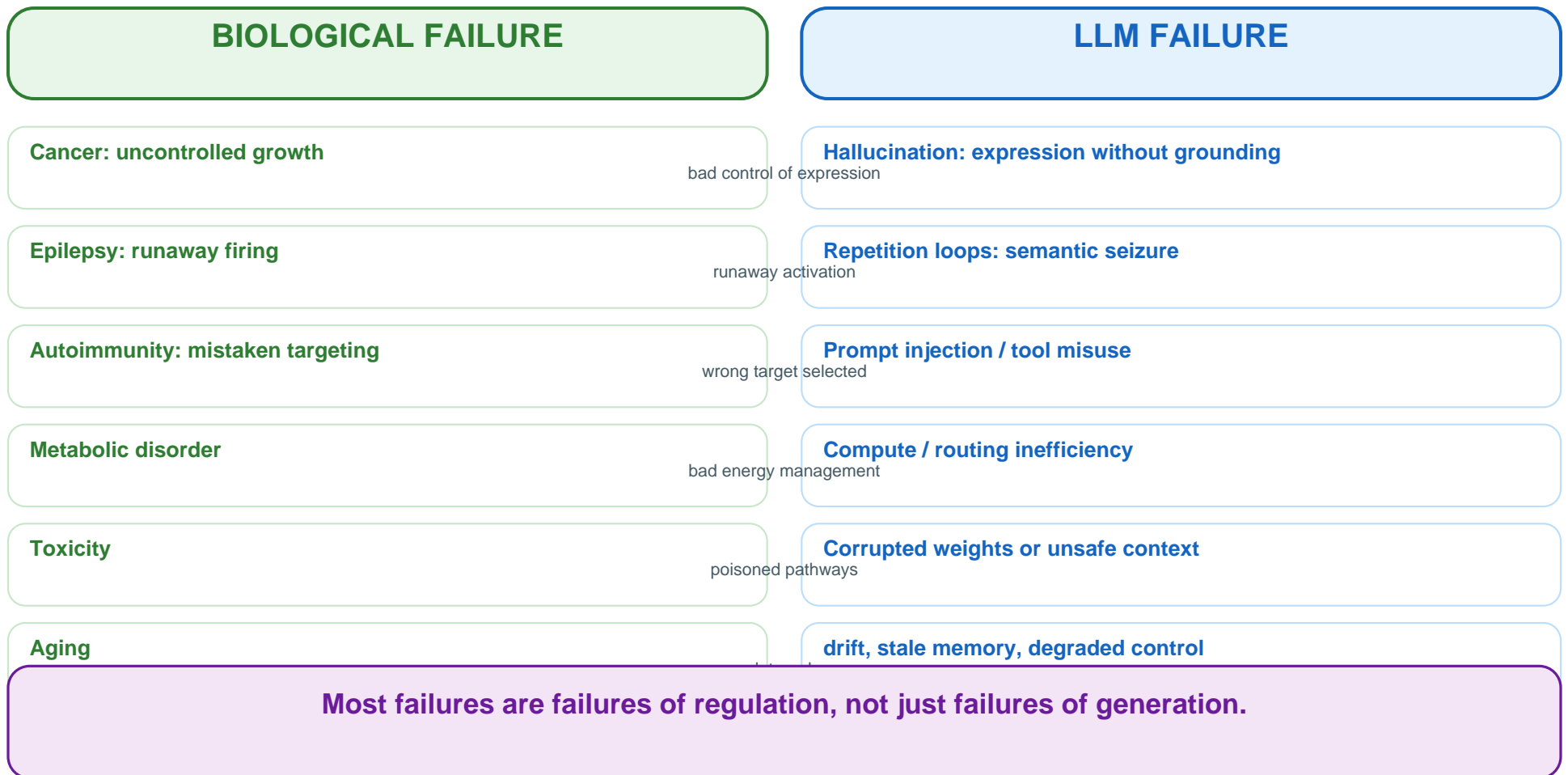
downstream action

Transformed representation / output

Complementarity in cells rhymes with similarity in vector space.

Failure Modes: Disease and Misregulation

The analogy is strongest when it also explains how things go wrong.



The Living Information Stack

A final architecture for the common infographic.

