

3–6–9–12–15 Biological Emergence Ladder

3 Primordial Fields

1. Prion Field — Structure-first biology
2. Bacterium Field — Energy-first biology
3. Viroid Field — Information-first biology

6 First-Order Behaviors

1. Boundary
2. Fusion
3. Amplification
4. Decoherence
5. Grouping
6. Separation

9 Origin Adaptations

Viroid:

1. Rolling-circle replication
2. Self-cleavage ribozymes
3. Secondary structure stabilization

Bacterium:

4. Chemiosmotic metabolism
5. Horizontal gene transfer
6. Binary fission

Prion:

7. Fold-state templating
8. Amyloid aggregation
9. Stress-induced misfolding

12 Transitional Subsystems

Boundary & Compartment:

1. Lipid vesicles
2. Primitive channels
3. Phase-separated microdomains

Metabolic & Energetic:

4. Chemiosmotic gradient
5. Autocatalytic cycles
6. Redox scaffolds

Informational & Replicative:

7. Template polymerization
8. RNA–peptide coevolution
9. Partitioning & fidelity

Structural & Cytoskeletal:

10. FtsZ/Min division-placement
11. MreB/Crescentin polarity-shape
12. ESCRT-III membrane remodeling

15 Multicellular Coherence Systems

Funga-lineage:

1. Mycelial mat
2. Tip-polarity growth
3. Synchronized sporulation
4. Symbiotic interfaces
5. Resource redistribution networks

Flora-lineage:

6. Photosynthetic sheets
7. Branching/transport filaments
8. Anchoring/root-like systems
9. Gas-fluid exchange surfaces
10. Positional differentiation

Fauna-lineage:

11. Contractile sheets
12. Internal lumens
13. Proto-nerve nets
14. Immune-like recognition
15. Motile colony/body-plan coherence