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A NOVEL IDEA OF FRAMEWORK FOR BIOLOGICAL SELF-ORGANIZATION HELP'S HUMAN IN LIVING SYSTEM

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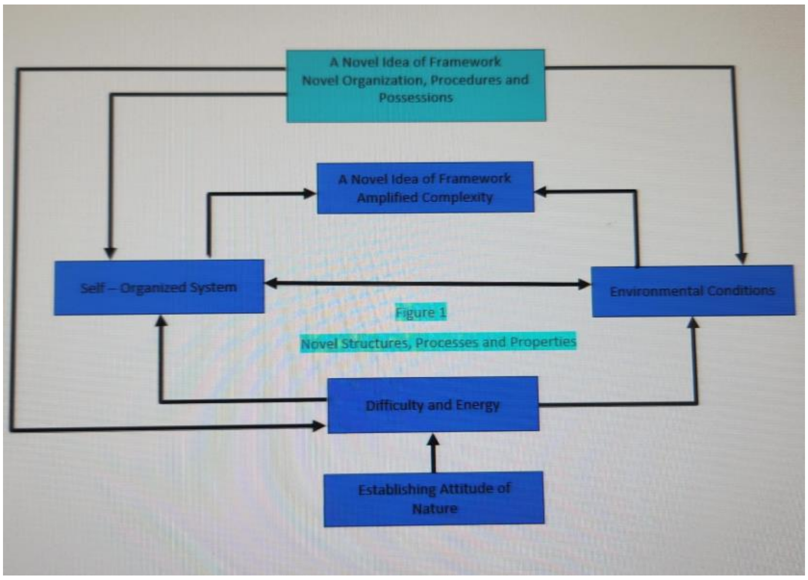
ABSTRACT

A framework for **biological self-organization** is a model where complex, life-sustaining structures and behaviors emerge from simple, localized interactions without central top-down control. By mimicking how nature maintains, repairs, and coordinates itself, this idea helps us understand living systems and directly improves human medicine, tissue engineering, and robotics. Living systems are thermodynamically open but closed in their organization. In other words, even though their material components turn over constantly, a material-independent property persists, which we call organization. Moreover, organization comes from within organisms themselves, which requires us to explain how this self -organization is established and maintained. In this paper we propose a Biological self-regulation is commonly described through discrete systems such as respiration, circulation, posture, digestion, autonomic function, sensory perception, and movement. However, these systems do not function independently. They are continuously coordinated through timing, rhythm, pressure, tension, sensory feedback, and motor adjustment. Many essential biological processes -- including breathing, heartbeat, gait, swallowing, peristalsis, vocalization, sexual arousal, and postural stabilization -- depend on cyclic or wave-like patterns that must begin, continue, adjust, complete, and transition at appropriate times, See Figure 1.

KEYWORDS: biological self-regulation; diaphragm; respiration; proprioception; vestibular system; interoception; peristalsis; autonomic regulation; respiratory-postural coupling; action framing; closure; temporal boundaries.



Setback

Existing scientific language often separates sensory perception, motor output, autonomic regulation, and structural anatomy into different explanatory domains. This separation can obscure how the body senses timing mismatch and restores coordinated action. The central problem addressed here is whether biological self-regulation depends not only on individual structures or pathways, but also on the continuous sensing and restoration of temporal relationships among interacting systems. In practical terms, the question is not only how the body moves or breathes, but how it knows when a process should initiate, continue, resolve, or reset.

Approach

The proposed framework integrates evidence from respiratory physiology, diaphragm-spinal anatomy, respiratory-postural coupling, interoception, vestibular-proprioceptive orientation, gastrointestinal motility, rhythmic entrainment, and behavioral time-framing. A central anatomical focus is the diaphragm, especially the crural relationship with the anterior lumbar spine and anterior longitudinal ligament. This is considered alongside the diaphragm's respiratory-postural functions, its influence on thoracoabdominal pressure, and its broader relationships to pericardial, cervical fascial, and skull-base orientation systems. The neck is considered a vulnerable regulatory gateway where airway, swallowing, voice, cervical proprioception, vestibular orientation, and autonomic state converge. Peristalsis is included as a model of internally generated rhythmic locomotion, demonstrating that temporally patterned movement occurs throughout visceral physiology without conscious motor planning.

EXPECTED / PRELIMINARY RESULTS

The synthesis suggests that Biological self-organization may be understood as an integrative sensory-regulatory capacity rather than a purely motor mechanism. Motor output is one expression of the process, but the organism must first sense timing, phase, pressure, rhythm, orientation, mismatch, and completion before effective correction can occur. From this perspective, health may involve preservation of temporal boundaries and adaptive return to baseline across respiratory, cardiovascular, gastrointestinal, musculoskeletal, autonomic, and behavioral systems. Disruption of temporal coherence may appear physiologically as bracing, incomplete respiratory cycling, impaired postural coordination, altered visceral rhythm, or autonomic instability, and behaviorally as procrastination, lateness, action drift, failure of closure, or difficulty transitioning between states.

Why Biological self-organization, and Not Time Motor?

Core argument: Sense comes before correction. Motor output is what the body does; sensing is how the body knows what needs to be done, when, how much, in what direction, and when to stop. Biological self-organization therefore refers to the sensory-regulatory layer that makes motor function intelligent, because Biological self-organization is not the opposite of motor function; it is the sensing layer that makes motor function intelligent. In Plain-language version: The Human body may know how to walk automatically, but Biological self-organization tells the organism when to start, how fast to go, when to turn, when to stop, and when the action is complete. Without timing, movement becomes wandering rather than oriented life.

CONCLUSION

Biological self-organization is proposed as a temporal coherence framework for biological self-regulation. It suggests that living systems maintain function not merely by producing movement, breath, circulation, digestion, perception, or behavior, but by sensing when these processes should begin, adjust, complete, and reset. Future research should examine whether respiratory-postural coupling, vestibular-proprioceptive integration, diaphragm-spinal continuity, autonomic rhythm, visceral motility, and behavioral action-framing can be experimentally linked as components of a broader self-regulating timing architecture in the human body.

Competing / Conflict of Interest

None. The authors declare that there are no conflicts of / or competing interests.

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Authors' Contributions: Both Authors contributed to conceptual work, framework, final draft write-up, critical reading and editing. All authors read and approved the final manuscript.

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2. Why Biological self-organization?: Explain why sensing timing precedes motor correction; defend the name against TimeMotor /TimeMotorSense alternatives.
3. Rhythmic Processes in Biology: Breathing, heartbeat, peristalsis, gait, swallowing, sexual arousal, sleep-wake rhythm, and hormonal pulses.
4. Diaphragm-Spine-Neck-Vestibular Axis: Present diaphragm crura/ALL evidence, respiratory-postural function, pressure regulation, cervical fascia, and orientation systems.
5. Peristalsis and Internal Locomotion: Show that wave-based timing is built into visceral physiology.
6. Respiratory Allowance and Non-Interference: Frame breathing as automatic regulation that can be voluntarily allowed rather than consciously forced.
7. Sexual Arousal as Rhythmic Self-Regulation:

Optional adult physiology section: autonomic, vascular, pelvic floor, breath, movement, and partner synchronization; keep language clinical.

8. Behavioral Time Framing: Translate Biological self-organization into action boundaries, procrastination, lateness, closure, and relational safety.
9. Testable Predictions and Methods: Suggest measurable hypotheses using respiratory timing, postural sway, cervical proprioception, HRV/RSA, gait-breath coupling, GI motility, and behavioral timing tasks.
10. Limitations: Separate established anatomy from proposed integration; avoid overclaiming direct causality.

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