

Technical Endnotes: 1. Quantum Coherence: Refers to a state in which particles or systems share a consistent phase relationship, allowing them to interfere and behave in a non-classical, wave-like manner. In biology, coherence implies functional synchronization at the molecular or cellular level that may boost efficiency. 2. Quantum Tunneling: A phenomenon where a particle crosses a barrier it classically shouldn't be able to. Enzymes use tunneling to speed up reactions that would otherwise take extremely long. 3. Nitrogen-Vacancy Centers (NV centers): Defects in diamond lattices that can detect extremely subtle magnetic fields and are used in quantum sensing – even inside biological environments. 4. Orchestrated Objective Reduction (Orch-OR): A hypothesis by Hameroff and Penrose proposing that consciousness arises from quantum computations in neuronal microtubules. 5. Quantum Simulations: The use of quantum computers to model complex quantum systems (like neural microstructures) that classical computers can't accurately simulate. 6. Relational Quantum Mechanics: An interpretation suggesting that physical properties only exist relative to other systems – i.e., an observer is required for a quantum state to take on meaning. 7. Entropy Redirection: In living systems, entropy isn't eliminated but is rerouted into energy gradients or information structures, creating temporary order.