

# Unveiling the Mysteries of Non - Local Communication in Biological Cells: Quantum Entanglement, Stress - Induced Changes, and Exotic Matter

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**Abstract:** *We have earlier proposed that non local communication may occur in biological cells. "Non - local communication refers to the ability to transfer information instantaneously over long distances, without any apparent physical connection between the sender and the receiver. ". Certain hypothetical structures such as wormholes may be responsible for non - local communication. We have further postulated that this communication may be altered in biological cells on application of stress. Here we give the details of this hypothesis. We examine in this paper how non local communication may be achieved in biological cells. We also suggest some experiments to prove this hypothesis.*

**Keywords:** non - local communication, biological cells, wormholes, stress, hypothesis

**How non local communication may be achieved in biological cells:** The non - local communication in biological cells may be achieved in following ways:

**Quantum Entanglement:** It is possible that certain particles in the biological cells exhibit quantum entanglement. That means that changes in one of the two entangled particles would instantaneously affect the other, irrespective of distance.

**Biological "Entanglement" Sites:** There could be many possible sites for entanglement in biological cells. These sites might be sensitive to various environmental factors and intrinsic factors of the cell. The biological membranes and hydrophobic sites in the proteins could be potential sites where entanglement could take place in biological cells. Both biological membranes and hydrophobic pockets are devoid of water and are thus amenable to quantum coherence and entanglement. The entanglement could lead to non - local communication.

**Stress - Induced Changes:** Stress may bring about changes in the internal environment of the cell which in turn may bring about the changes in patterns of non - local communication by disrupting entanglement.

**Quantum Coherence:** It has been proposed that quantum coherence may play an important role in certain biological processes such as in brain phenomenon or photosynthesis. It is possible that quantum coherence could facilitate non local communication between different parts of a cell.

**Exotic Physical Properties:** It is possible that cells possess as yet undiscovered physical properties that allow for non - local communication. For instance, exotic forms of matter or energy may be present in biological cell. Exotic matter (theoretical physics) is a hypothetical form of matter that has several unusual properties as compared to the

ordinary matter that exists in the universe. The salient properties of exotic matter are:

- 1) **Negative Energy Density:** Usually ordinary matter has positive energy density. However exotic matter is proposed to have a negative energy density, that is, it has less energy per unit volume than the vacuum or empty space around it.
- 2) **Negative Pressure:** Exotic matter is also theorized to exert negative pressure. This pressure counteracts the positive pressure that gravitational forces exert and typically cause spacetime to curve inwards, which allows for the possibility of repulsive gravity.
- 3) **Violates Energy Conditions:** Exotic matter is hypothesized to violate certain energy conditions which include weak energy condition and null energy condition derived from general relativity. These conditions usually hold for ordinary matter and result in attractive gravitational effects rather than repulsive effects.
- 4) **Stabilization of Exotic Structures:** Hypothetical structures such as wormholes or Alcubierre warp drives are postulated to be stabilized by exotic matter. The negative energy density and negative pressure of exotic matter are theorized to counteract the natural gravitational forces that may cause these structures to collapse.

## The creation of exotic matter

- 1) **Quantum Field Effects:** Some theories postulate that it may be possible to generate regions with negative energy density, negative pressure and which may violate energy conditions (see above). The quantum fields may be somehow altered in stress in biological organism giving rise to exotic matter. This may in turn lead to entanglement and non - local communication.
- 2) **Casimir Effect:** Two closely spaced conducting plates experience an attractive force due to vacuum fluctuations of quantum fields between them. This is termed as Casimir effect and has been observed

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experimentally. Some scientists have posited that a similar effect may be exploited to generate exotic matter. Casimir effect in biological cells could arise due to vacuum fluctuations of quantum fields between charged biomolecules.

distances and in turn more efficient response of biological organisms to environmental and developmental cues.

### Experiments to test the presence of non - local communication with in biological cells

#### Cellular Imaging and Observation:

Advanced microscopy techniques such as super resolution microscopy or electron microscopy could be used to image cellular structures at extremely fine level of detail. Investigators can look for any structures or phenomena that could be interpreted as wormholes within biological cells.

#### Stress - Inducing Experiments:

Cells could be subjected to various kinds of stresses such as physical stress (mechanical pressure), chemical stress (application of toxins) or environmental stress (e. g. heat). The cells could be observed carefully using sophisticated microscopy techniques to detect any changes in cellular structures that could be related to the presence of wormholes.

#### Comparative Analysis:

If some structures suggestive of wormholes are found, then their size, shape, distribution and other metrics could be compared between stressed and non –stressed cells.

#### Molecular and Biochemical Analysis:

The investigators could examine whether stress related biochemical processes such as the production of stress hormones are correlated with any changes in the theorized wormholes.

#### Computer Simulations:

Develop elaborate computational models that simulate the behavior of hypothetical wormholes with in biological cells based on existing and novel principles in physics or biology. The predictions of these models could be compared with experimental data.

#### Cellular Communication Assays:

Sophisticated techniques could be used to measure the transmission of information between cells at large distances without any physical contact. This intercellular communication could be compared between stressed and non - stressed cells.

#### Single - Cell Imaging:

The non - local communication with in the cell could be studied in a similar way.

#### Quantum Biology:

- Studies could be performed to ascertain whether quantum mechanical phenomenon play a role in cellular processes. The studies could be done with special reference to quantum coherence and entanglement which could lead to non - local communication.
- Non local communication in and between biological cells could mean instantaneous signal transfer across large

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