

Photochemical synthesis of bioinspired inorganic-organic hybrid protocell-like self-sustaining supramolecular assemblies, “Jeewanu” in a laboratory simulated possible prebiotic atmosphere

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#### Abstract

Sunlight exposed sterilized aqueous mixture of some inorganic and organic substances shows photochemical formation of self-sustaining biomimetic supramolecular assemblies, “Jeewanu” capable of showing multiplication, growth and metabolic activities (1). The studies using optical and electron microscopy (SCM, TEM, AFM), XRD, EPR, FTIR, LCMS have revealed the presence of various molecules of biological interest viz. amino acids in free as well as in peptide combination, nucleic acid bases as purines as well as pyrimidines, sugars and phospholipids and ferredoxin-like materials in them. These microstructures have been found to show a definite boundary wall and an intricate internal structure. The presence of enzyme-like activities nitrogenase (2) and phosphatase-like activities have been detected in the mixture. Jeewanu have been found to catalyse photoautotrophic processes in the mixture.

In the possible prebiotic atmosphere possibly photosynergistic collaboration of non-linear coherent processes at mesoscopic level led to emergence of biomimetic hybrid supramolecular assemblies similar to Jeewanu capable of showing various functional properties viz. self-organisation and self-sustenance.

- a. Keywords : Jeewanu, inorganic-organic hybrid systems, self-organisation, self-sustaining, bioactive, supramolecular assemblies, biomimetic systems, bioinspired

#### References

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