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Astrobiology cum Extraterristial Intelligence & Space Microbial Microgravity explanation with Space Microbiology: BIO-CHEM-PHY Life Sign in Universe

Amit Rastogi[1], Elena Baryshnikova[2]

[1]Research Scientist cum Research Assistant Professor cum CEO cum Director Executive, Amit Biosciences & Bio Nanotechnology, An Autonomous Non-Employed Non-Profit Research & Development

[2]Co – Founder, Amit Biosciences & Bionanotechnology

Mail id: amit010@yandex.com

ABSTRACT

Radio is common instrument for communication among intelligent civilizations by Space finder whereas most SETI programs search for signals at radio wavelengths operated at Space agencies worldwide & space finder antenna is applicable to records space alien signals on Earth interpreted by super or quantum computer in SETI Lab. Fundamental Life which includes BIO-CHEM –PHY is a cosmological phenomenon and thought to be migrated from Mars Planet on this Earth Globally. Moreover, Search for Extra-Terrestrial Intelligence in 2023 is a well established concept with research development by multinational research agencies or centres such as NASA, DLR, Roscosmos, JAXA, ESA, and CSA which are some world class lab they evident it. Space Life Sciences research in the field of microbiology at International Space Station is the part to understand the effect of diverse challenges of the spaceflight environment on microorganisms that research utilises advanced molecular biology, genomics, bioinformatics,and cultivation technologies to understand spaceflight microbial community fundamental properties, interactions with humans, and adaptation to other planets or interplanetary space.Spores of *Bacillus subtilis*, cells of the endolithic cyanobacterium *Chroococcidiopsis*, and the lichen *Xanthoria elegans are martian microbes.* The scope of space microbiology is to understand the space environment and condition for understanding basic biological mechanisms of microorganisms. Several *in vivo* and *in vitro* experiments have been performed in simulated microgravity conditions on Earth to study the response of different microorganisms in both real and simulated microgravity conditions.

Advanced Space Biotechnology: An Introduction

Radio is common instrument for communication among intelligent civilizations by Space finder whereas most SETI programs search for signals at radio wavelengths operated at Space agencies worldwide & space finder antenna is applicable to records space alien signals on Earth interpreted by super or quantum computer in SETI Lab (https://www.theexpertta.com/bookfiles/OpenStaxAstronomy/Astronomy_30.4.%C2%A0The% 20Search%20for%20Extraterrestrial%20Intelligence_pg1123%20%201133.pdf). Fundamental Life which includes BIO-CHEM –PHY is a cosmological phenomenon and thought to be migrated from Mars Planet on this Earth Globally. Moreover, Search for Extra-Terrestrial Intelligence in 2023 is a well established concept with research development by multinational research agencies or centres such as NASA, DLR, Roscosmos, JAXA, ESA, and CSA which are some world class lab they evident it. Moreover, extraterrestrial intelligence & life sign are associated with life clews on another planets or in another universes or in galaxies rather than Earth. Furthermore, Extraterrestrial life sign in the form of BIO-CHEM –PHY includes space microbes, DNA, RNA, Protein, enzymes, Bio-Space light where Bio-Space light recently is being used as light medicines (https://uomustansiriyah.edu.iq/media/lectures/3/3_2018_03_24!01_00_12_PM.pdf). If we talk about astrobiology it completely Philosophical & Technological both where technological section is based on the searching of extraterristial life sign, searching of new planets, searching of new galaxies with the help of spectroscopes, telescopes and accessories to explain astrobiology with philosophical section to explain it in the form of modern science. Moreover, Telescope used in astrobiology are range from Table Top Telescope to James Webb Space Telescope or till Large-Aperture Space Telescope. By using telescopes to communicate with extraterristial intelligence the signal radio frequency to be sent to space is around set at 203.385 GHz where as optimal wavelength region for communication with extraterrestrial intelligence in space is $\lambda = 1.5$ mm (Amit Rastogi et al., 2023).

Fundamental Life-detection measurement such as BIO-CHEM –PHY must be biosensitive contamination-free, repeatable as one or more features must be sufficiently from different sources too, detectable, preserved (survivable), reliable (measurably different from expected abiotic signals), compatible with life sign as we know from different sources and the biological interpretation of all of the above from different sources such planets or same planet universes or same universe and galaxies or same galaxy where as scientific values for life detection are reach, grasp, certainty and payoff (Amit Rastogi et al., 2023).

Biochemical molecules collected from space, universe or galaxies such as genetic DNA or RNA blueprint,1,3-Dihydroxyacetone (C3H6O3) and C100H70O12N3S2 was also considered as Extraterrestrial molecules. Furthermore, protein glycine (C2H5NO2), and the ethylene glycol (C2H6O2) was also considered as Extraterrestrial molecules by scientists (Amit Rastogi et al., 2023).

Extremophiles and extrmotolerent microorganism from Earth and from the space, universes and galaxies are sometimes known as Extraterristial microbes are strongly defined in science literature. Recently, extremophiles and extremotolerant microorganisms were isolated from Low Earth Orbit by the International Space Station (ISS) to show application in microbiology research as 'microbial observatory' to study the effect of space conditions on microbial flora where as space microbiology is necessary to understand the phenomenon and fundamental of origin of life on Earth. Space microbial diversity are studying by Scientists in their role in planetary protection (Amit Rastogi et al., 2023).

Space Microbiology and Planetary Protection

Planetary protection is necessary of planning for all extraterrestrial missions worldwide. However, Microbial Communities at Planets plays an important role in planetary protection and it is main research concern of worldwide space centres whereas the rules regarding to these activities are prepared by an international group known as the Committee on Space Research (COSPAR) (Paris, France). Spacecraft assembly facilities at by NASA at the California Institute of Technology, Jet Propulsion Laboratory (JPL), the Johnson Space Center and the Kennedy Space Center are unique microbiological environments to pursue and proceed research in Space Microbiology (https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1183353/).

Spores of *Bacillus subtilis*, cells of the endolithic cyanobacterium *Chroococcidiopsis*, and the lichen *Xanthoria elegans are martian microbes.* The scope of space microbiology is to understand the space environment and condition for understanding basic biological mechanisms of microorganisms, such as the role of gravity at the cellular, subcellular, and extracellular levels lavel of microbes, biological effects of the space radiation on microbes, survival factors for microbes in the upper boundary of Earth's biosphere, and the likelihood of interplanetary transport of microorganisms via meteorites (https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2832349/).

Research at International Space Stations at Microbial Observatory

Space Life Sciences research in the field of microbiology at International Space Station is the part to understand the effect of diverse challenges of the spaceflight environment on microorganisms that research utilises advanced molecular biology, genomics, bioinformatics, and cultivation technologies to understand spaceflight microbial community fundamental properties, interactions with humans, and adaptation to other planets or interplanetary space (https://www.nasa.gov/sites/default/files/files/Microbial-Observatory-Mini-Book-04-28-14-508.pdf).

Table1: Space Microbial Research at International Space Station ISS

Subject Area	**Potential Research outcome of study for ISS of this Investigations And As per Amit Biosciences and Bionanotechnology for ISS**
Microbial Physiology	To execute the effect of spaceflight environmental conditions on microbes & their physiology by DNA & RNA Analysis via techniques 16S rRNA To execute the effect of spaceflight environmental on their mobility metabolism and microbes response to stressors
Microbial Ecology	To study the effect of one space microbe on another space microbes and vice- versa in conditions to identify such as mechanisms of community change microbial interactions with the environment over time, microbial population dynamics, dynamics of succession etc
Molecular Microbiology	How and why? spaceflight environment cause alterations in microbial genomic diversity, genomic evolution, microbial sensing, and the microbial transcriptome, proteome, or metabolome
Microbial Interactions	How and why? Spaceflight environment cause alterations in microbe-microbe interactions, host-microbe interactions, plant-microbe interactions, and biofilm formation or function on Air, water, soil, oil, and on plants (single species and mixed populations)? Microbial interaction is also studied for gene exchange

Microorganism & Microgravity

Many microorganisms can survive, thrive and develop mechanism to servive in extreme environments, including space environment A diverse range of microorganisms has been sent into space to study the effects of the space environment. Moreover, several in vivo and in vitro experiments have been performed in simulated microgravity conditions on Earth to study the response of different microorganisms in both real and simulated microgravity conditions as a result of which microbial growth, physiology, virulence, pathogenesis, antibiotic resistance, stress tolerance and secondary metabolite

production was observed and it is part of international space agencies research programme till at the moment & for future till these agencies will exists. The variation in microbial secondary metabolite production (increased, decreased, fluctuate over time or uninfluenced) under microgravity conditions is mainly concern of multinational Global space agencies for to be used as these secondary metabolites as Biopharmaceuticals (https://www.cambridge.org/core/journals/international-journal-of-astrobiology/article/how-the-space-environment-influences-organisms-an-astrobiological-perspective-and-review/9114EFE89ADD99FCE5AD3FD49DD54B7B).

Advanced Conclusion

As interpretation of Alien civilization on quantum or super computer is an example of CHEM-PHY life from space. However, Biological computer can make it possible to Bio-CHEM-PHY Life including it to develop in lab as for Male & Female Civilization on Earth to make them Ageing Free, Young as Teen & to make them Biologically cum Sexually Active Forever. However, Space Microbiology is studied in International Space Centres Worldwide for the production of Therapeutics Biopharmaceuticals as with to study Biosciences concepts at discussed in Table 1 above. Moreover, Space Microbiology Research at ISS and others space centres Proceeds Microgravity Research to study the effect of Microgravity on Microbial Physiology in Space Craft or in such labs as well as to study their genetic Material such as DNA, RNA with original microbes as per collection.

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