

Letter to the Editor

Stem cell transplantation from a space person in a haematological cancer patient

Sir,

Epigenetic changes are a reversible process. The epigenetic changes are: methylation, histone modification, and non-coding RNA. Through processes such as DNA methylation, histone modification and non-coding RNA action, the chromatin state is altered, thereby influencing gene activation. Moreover, epigenetic modifications can respond to environmental exposures. DNA methylation typically silences genes by adding methyl groups to cytosine bases neighbouring guanines; chemical modifications in histone tails can either loosen or tighten DNA winding around histones, affecting accessibility to transcription factors; and non-coding RNAs can interfere with transcription or translation processes. These changes occur during cell division and can even be passed to the next generation. Epigenetics refers to the changes in gene expression or phenotype without alterations in DNA sequence.¹ Epigenetic regulation controls gene expression by chromatin regulators that bind to DNA, by modifications of chromatin such as histone modification and DNA methylation, or by non-coding RNAs.² Space is created by the continuous process of supernova formation, i.e., the bursting of a star or by nuclear fission, releasing photons consisting of hydrogen and helium gas particles. This leads to new star or a planet formation like our Earth.⁴ So we can say that space is the first part of humans' livings. Haematopoietic stem cell transplantation is a procedure where dysfunctional or depleted bone marrow is replaced by normal bone marrow stem cell taken from a healthy donor. It is mainly used in malignancies of bone marrow, where dysfunctional bone marrow is replaced by normal healthy bone marrow.⁶ Now, in epigenetics, studies have heightened the expectation that they have the potential to enhance the efficacy of transplantation by regulating immune response, improving donor cell engraftment, and manipulating the tumour microenvironment. The stem cells of human bone marrow in space undergo epigenetic changes, regenerating new bone marrow formation. This is an epigenetic genomic change in the bone marrow of a person travelling to space. Among these changes, methylation can be said to be one of the epigenetic changes.³ The blue colour of Neptune and Uranus is nothing but due to methane gas, as well as the continuous release of dust particles, hydrogen and helium gases from supernova formation. So, we can correlate it to the methylation process of epigenetic changes. These are the planets where life is expected to exist, like Earth.⁴ So, in the formation of new bone marrow due to epigenetic changes, we can hope for a new life after transplantation of such epigenetically changed bone marrow stem cells in

haematological cancer patients with few chances of remission. It will completely remove the tumour organoids. Organoids are multicellular structures generated from ESCs, iPSCs, aSCs, or differentiated cells obtained from healthy individuals or patients, including tumour tissues. They have the capacity for self-renewal and proliferation *in vitro* while preserving the structural and functional characteristics of their tissue of origin.⁵ Different genetic factors and their epigenetic changes during reprogramming of stem cells into induced pluripotent stem cells (iPSCs) have significant potential for enhancing the efficacy of cell replacement therapies. Owing to their plasticity, stem cells are very useful in the field of regenerative medicine, especially as a potential cell-replacement therapy for many diseases.⁷

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