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Biological plastics: Future revolution in medicine

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The term 'plastic' is often associated with synthetic materials that can be molded or shaped and can be used to improve appearance or function of materials. Even in medicine, synthetic plastics are being used in fabrication of disposable delivery devices, scaffolds, artificial organs etc. Nonetheless, most plastics are considered non-biodegradable and non-living thereby lacking interaction with local and systemic environment. This raises questions regarding their safety and efficacy in the long term. Currently, the new keyword in medicine is 'Biological Plastics' that are evolving at a rapid rate and aim to find solutions to address limitations of conventional medicine. 'Biological Plastics' are those that exist in the human body; namely cells, growth factors, scaffolds and their products including cytokines, chemokines and matrices. Of these various agents that are capable of repair, regeneration and rejuvenation of organs and tissues of the body, the most promising are Mesenchyme Stem Cells (MSC) which may be called 'The Living Drug' molecule. There is a paradigm shift in the way diseases are now being viewed owing to enhanced knowledge of these molecules. The possible therapeutic applications of cell-based therapy are limitless, and it is now important to involve interdisciplinary sciences in order to enhance efficacy of these biological plastics. With the advent of MSCs and knowledge about their plasticity, various classical dogmas have been challenged. Through this presentation, the aim is to explain the properties of these 'Biological Plastics' and their applications in myriad of health conditions.

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