



The Specifications for Biomaterials for Advanced Medical Technologies

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Abstract:

The philosophy of regenerative medicine is now well understood: regenerative medicine aims to facilitate, or even uniquely induce, the regeneration of tissues and organs under conditions of serious and debilitating disease, trauma or malformation. These are conditions that are progressive, degenerative, irreversible and/or intractable in terms of traditional therapies. The regenerative processes that may be induced in these therapies do not normally and naturally occur in mammalian species under these conditions. Although the details will vary, and the precise conditions under which regeneration of human tissues and organs can be induced will be profoundly different depending on which tissues and organs are involved, there are a few extremely important principles that underpin these therapeutic measures. Fundamentally, there is only one component that is essential for the process, and that is the relevant cell. However, whatever the cell type, we cannot expect it to recreate the precise tissues of the body that we require for a specific therapy, unless we provide them with exactly the right signals, under optimal conditions and in the right sequence. Clearly there will not be a single set of requirements for the materials of the template for all of the applications, and they will depend on the tissue or organ that is involved, as well as the location of the regenerative process, that is whether the process is being carried out ex vivo or in vivo, and the nature of the bioreactor system. Different specifications for the template under different situations will be discussed.

Speaker:

Prof David Williams left the University of Liverpool, UK, in 2007. While retaining the title of Emeritus Professor at Liverpool, he is currently Professor and Director of International Affairs, Wake Forest Institute of Regenerative Medicine, North Carolina, USA, a Visiting Professor in the Christian Barnard Department of Cardiothoracic Surgery, Cape Town, South Africa, a Visiting Professorial Fellow at the Graduate School of Biomedical Engineering, University of New South Wales, Australia, and a Guest Professor, Tsinghua University, Beijing, China. Prof Williams is the Editor-in-Chief of *Biomaterials*. He has had 40 years experience in the biomaterials, medical device and tissue engineering fields.